

AIR CYCLE CORPORATION

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Mr. Carl Herbrandson, Ph.D.
Site Assessment and Consultation Unit
Environmental Surveillance and Assessment Section
Minnesota Department of Health
121 East Seventh Place, Suite 220
St. Paul, MN 55101

Re: Report of Drum-Top Crusher Demonstration at MN Airport

Dear Mr. Herbrandson:

Thank you for forwarding me a copy of the Health Consultation that you prepared to examine the environmental issues related to drum-top crushing units, such as the Bulb Eater™. Our primary goal at Air Cycle is to promote safe and effective means for generators to manage their spent fluorescent lamps. We have designed the Bulb Eater™ with a focus on environmental protection and operator safety; and it is for that reason that we have always been more than willing to participate in any testing of the Bulb Eater's efficiencies in that regard. However, I must express my disturbance at what I feel are inaccuracies in this report, which cast the Bulb Eater™ system in a disadvantageous and false light. It is for that purpose that I am writing you today to highlight these issues. I understand that you have spoken with our Regulatory Compliance Specialist, Ryan Evans, and that our first course of action is to notify you of the problems we have with this report. It is my hope that we can begin an overdue dialogue about these issues, and correct some of the misinformation that has proliferated through this document.

Through our involvement in the electronic ballast industry years ago, we saw a growing need to design equipment to make lamp disposal easy and more efficient. Air Cycle developed a system to meet those needs as well as provide even greater protection from the mercury vapors contained within the lamps. In 1999, we started production on the Bulb Eater™, and have received consistently growing interest in the system from the lamp generator community over the past four years as evidenced by a front page piece in the Wall Street Journal as "New Trends in the Workplace" and being voted "Product of the Year" by the readers of Today's Facility Manager magazine in 2001. Today, we are a full-service recycling provider offering lamp, ballast, battery, and computer hardware recycling services throughout North America. The Bulb Eater™ remains the cornerstone of our business, and is currently in its sixth generation, as we are constantly working to improve our product(s) to provide the safest and most efficient lamp crushing system available. It is important to note that these systems are not the crude homemade crushers of years ago, but instead advanced systems complete with relatively sophisticated filters that in many cases capture the mercury vapors so well that the mercury vapor exposure is non-detectable.

In early 2002 we received a call from the Minnesota generator who sponsored the Bulb Eater™ demonstration discussed in your report. We were told that they wanted to demonstrate the Bulb Eater™ for representatives of various local and state environmental agencies, and they invited us to attend. We consented to the demonstration and accepted the invitation. When we arrived, those in attendance met in a conference room for about 45 minutes, and then we adjourned to the location of the facility where the demonstration would be conducted.

The area where the demonstration took place was a 4-5 minute walk from the conference room where we first gathered. This is the basis for the first error in this report. Your report makes mention of the location of the demonstration area being near or adjacent to the lunchroom. This is not correct. Perhaps there was confusion between the conference room, where we first gathered, and the location of the demonstration. The conference room was located near the lunchroom area, but these locations were, as I mentioned, a good 4-5 minute walk away from the location where the Bulb Eater™ was demonstrated.

Furthermore, the report characterizes the location of the demonstration as a “large room” with “considerable employee traffic and reasonably high air flow through the room.” These claims are also false. As to the employee traffic: During the time that we were in that room the door was opened only 1 time, and that was by someone looking for someone attending the demonstration. Thus, that individual would not have even been in the room if we had not been demonstrating the equipment. No other employee traffic was evident at that location throughout our time there. Additionally, the “large room” was a storage or boiler room of some type, with limited ventilation at best. This is quite different than the environment described in the report. This is evidenced in the report data where at 11:53 the door was open by the aforementioned individual and by 11:54, with no change in the crushing operations, the mercury readings dropped by almost 90% of the previous reading. Had there been good ventilation in the room, the readings would not have dropped so dramatically when a single door opened. We were concerned at the choice of location, but given the fact that this was only a short demonstration, there was no need to delay the proceedings to move the demonstration to a location that would be more suitable to operating the Bulb Eater™. We advocate that the Bulb Eater™ be used in well-ventilated areas, to help prevent even the slightest mercury exposure to those operating the machine. As we do with all of our customers, we advised the generator that the Bulb Eater™ should be used in such an area, but were told that the location was chosen to accommodate the relatively large group attending the demonstration and that any ongoing crushing would be done elsewhere. Had we known that this was going to be treated as a “study” and not just a demonstration, we would have required much stricter adherence to our recommended operating procedures; and required a much more scientifically valid testing process. We were simply trying to be accommodating for what we understood to be a short product demonstration.

That this entire report is derived from 8 minutes of informal and poorly documented use of the Bulb Eater™ is reason enough to question its validity. However, despite these factors and inaccuracies, **the results that are revealed in the report show that the Bulb Eater still passed every established regulatory standard governing mercury emissions.** It is claimed in the report that, “the measured mercury concentrations in breathing space approached the Minnesota OSHA TWA (8 hour) limit of 50,000ng/m³.” That is not accurate. While the instant readings approached the time-weighted average standard, those readings were at the point of exhaust and not the operator’s breathing zone. Furthermore, comparing instant readings to time-weighted average (TWA) standards is misleading to readers who may not understand the rather significant

difference. As the report then correctly notes, the established standards are time-weighted values, and thus exposure levels would not exceed the Federal OSHA standard of 100,000ng/m³ or the Minnesota OSHA limit of 50,000ng/m³. Nonetheless, despite results which show that the Bulb Eater's mercury emissions pass all the established regulatory standards for workers in Minnesota, the report concludes "excessive exposures to mercury can occur." I appreciate that the MDH wants to protect human health to the best of its ability, however, if the MDH disagrees with the established standards for safe levels of mercury exposure, then I respectfully suggest that would be a topic to take up with OSHA in a separate document, and not proliferated as an established standard related to drum-top crushing equipment. Furthermore, the "testing" was done using a Lumex mercury analyzer, which is not the proper OSHA testing protocol, further confounding what limited data is contained in this report.

The way in which information has been communicated in this document is severely misleading to people who are not already familiar with the true regulatory standards for safe mercury exposure, and confusion results because of this misinformation. We have already fielded dozens of calls from generators who have been confused by this report, and who do not understand why the report doesn't evaluate the Bulb Eater's effectiveness against those established standards. The line between established regulatory standards and MDH opinion is unclear at best, and the two need to be decisively separated, with the later being removed from the analysis portion of this document. If the MDH wishes to change the regulations for mercury exposure, that is an issue that should be taken up with the appropriate regulatory agency. It is, however, not a matter to be discussed in this report about our product, giving the impression that the Bulb Eater™ does not meet every established standard for mercury exposure that generators of fluorescent lamps are held to.

What is also troubling to me is that we were not consulted at any point during the preparation of this report, which has led to its contents being not only inaccurate as of February 2002, but even farther from reality today. The forward portion of the document states: "Any conclusions.... are shared with the groups and organizations that provided the information." While we did not provide information per se, as manufacturers of the equipment at issue, I would have assumed that any report would have been submitted to us for review to ensure accuracy. There are several portions of the report that contain inaccuracies which could have been avoided had we seen (or even known about) this report.

Additionally, even though this report shows that the Bulb Eater™ demonstrated in February 2002 passed every mercury emission standard, we have still worked since then to improve upon that model. The Bulb Eater™ model that this report is based on is not the same as the models that we have sold to customers since shortly after the demonstration was given. Again, had we been advised of the existence and content of this report, we would have alerted the MDH to the outdated nature of the equipment in question. As it stands, the MDH has promulgated a recent document that discusses equipment technology that is over 2 years old. This is potentially very confusing to people interested in using modern incarnations of the Bulb Eater™. Over the past 2 years, we have conducted extensive scientific testing in conjunction with both the US Navy and the Federal EPA, as well as other organizations. In one of those tests, the data showed non-detectable levels of mercury vapor, as in instant reading, in the operator's breathing zone and also non-detectable levels time-weighted at the point of exhaust. This is most impressive considering over 1500 lamps were crushed far exceeding what the average operator crushes per day and far exceeding the number of lamps crushed during the 8 minutes of crushing this report is based on. What recent tests have also begun to show is that the only alternative to crushing lamps, managing them intact

in boxes or fiber drums, has the potential to result in far greater uncontrolled releases of mercury due to accidental breakage of the lamps when handled, stored, and/or transported. These uncontrolled releases are minimized to many times below established levels using the Bulb Eater™.

Finally, while Minnesota has every right to comment on the proposed regulations in the state of Virginia, those comments have absolutely no place whatsoever in this report. As they are attached and distributed with this report, those comments contained therein have the same power to confuse readers as the report itself. I draw your attention specifically to section 6 of your letter (included as attachment #4). Section 6 mentions that "...measurements made in Minnesota, demonstrate that this equipment cannot consistently meet the federal OSHA standard.... Much less a lower state OSHA standard...." I can only assume that the "measurements" to which the letters refer are those derived from this demonstration in 2002. If that is the case, then this statement is false, as even under the poor circumstances surrounding the Bulb Eater™ demonstration, mercury emissions were far below both the Minnesota OSHA limit (.05mg/m³ TWA) and the Federal OSHA limit (.1mg/m³ TWA). While the MPCA has every right to comment on the proposed Virginia regulations as they see fit; those comments, especially false and/or unsupported statements, should not have been included with this report.

In the forward to the health consultation, it states that "a health consultation is a working document.... If more data become available, MDH can write follow up documents to describe newly available data, information, or changing conditions." While I strongly feel that it was irresponsible to publish and distribute this report without at least consulting with us about its accuracy, I would like to work with you to correct these errors and the damage they have done to our business and reputation. Therefore, I respectfully request that the aforementioned errors be reviewed and corrected; and a subsequent document be issued by MDH setting forth both the corrections, and a clarification of what portion of the document is fact and which is only the opinion of MDH. I am more than willing to discuss with you any of the issues that I have brought up in this letter, and I would be happy to provide any documentation that I have to assist in addressing these problems in a swift and thorough manner. We at Air Cycle are striving to work with Minnesota, and all other states, to increase the rate of recycling fluorescent lamps through safe and efficient lamp management practices. It is only through effective communication between state agencies, generators, and those who provide recycling services, that we will accomplish our goals.

Thank you in advance for your prompt reply. I look forward to hearing from you soon.

Sincerely,

Scott Beierwaltes
V.P. Sales