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**TECHNICAL SOLUTIONS
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August 19, 2014
Mr. Jim Byer, Supervisor
Environmental Manager
160 W. Government Street, Suite 308
Pensacola, Florida 32502-5740

RE: Fluorescent Lamp End Cap Issue, Veolia ES Technical Solutions, L.L.C., 342 Marpan Lane, Tallahassee, FL 32305, EPA Identification Number FL0000207449.

Dear Mr. Byer,

Per our earlier notification and discussion, the Veolia Tallahassee Mercury Recovery and Reclamation Facility has been experiencing elevated total mercury concentrations in the weekly metal end cap samples above the 3 ppm (mg/kg) rolling average and 5 ppm weekly composite sample requirements. These levels, which are unique to the State of Florida, were established by the Florida DEP in the 1990's and in January 2000 were reduced to 1 ppm and 3 ppm respectively, unless the facility had an approved alternate management plan. On May 12, 2014 Veolia received permission from Florida DEP to temporarily store the aluminum end caps having elevated concentrations of total mercury at our Tallahassee facility in our 10-day area, while we investigated the issue and evaluated solutions. Enclosed please find the total mercury and TCLP results for the aluminum end caps we currently have in accumulation. As indicated, the total mercury concentrations are below the 260 mg/kg US EPA land disposal restriction (LDR) and below the 0.2 mg/L TCLP limit. Below is a summary of evaluations and actions Veolia has completed or is planning to complete in order to achieve the 62-737.840 FAC requirements.

Evaluation of Laboratory Methodology

As part of our investigation activities, Veolia contacted our currently laboratory contractor, Test America located in Nashville, TN (State of Florida Certification No. E87358), to determine whether quality control (QC) and quality assurance (QA) practices or methodology had changed in late 2013 and early 2014 to account for the higher values in the total mercury results. Test America indicated methodology (Method 7471A) and the internal QC/QA programs had not changed at the laboratory.



Evaluation of Changes in Lamp Manufacturing

Veolia evaluated the total mercury concentration in the end-cap byproducts at our other recycling operations. Each of our locations have different component and process configurations, but generally the separation technology for lamp recycling is similar. We determined the total mercury levels in the end-caps have increased gradually over the past year at all locations. As a result, Veolia looked at the changes the lighting industry has made in lamps over the past several years.

Historically, the older type lamps (T12) lamps were manufactured by dosing each lamp with a free liquid mercury or mercury vapor. During the past 10 years, the lamp manufacturing technology shifted from dosing free mercury into lamps to using a mercury amalgam chip connected to the electrical pins adjacent to the end-caps. The changes in manufacturing were made to lower the amount of mercury used in the lamps (e.g., TCLP compliant lamps or "green lamps") and to gain energy efficiencies (e.g., T8 and T5 lamps). The construction and configuration of the cathode within the lamp has also been modified for use with electronic ballasts. Veolia learned from the manufacturers, the useful life of these lamps, when used in a commercial setting, has increased from three years to five or six years. Veolia hypothesized the increase in receiving more of these newer lamps was impacting our ability to achieve the Florida DEP standards initially established in the 1990's.

Evaluation of Changes to Lamp Recycling Equipment

Veolia believes the mercury amalgam chip and increased internal metal components introduced into the newer lamps remain connected to the aluminum end-cap during the recycling operations. These residual materials have caused the higher mercury concentrations.

Veolia has performed a bench top test where we manually separated the internal components from the aluminum portion of the end-caps. . As presented in the attached results, the segregated aluminum end-caps had a total mercury concentration of 0.47 mg/Kg. The remaining material (chip) had a total mercury concentration of 13 mg/Kg. This result indicated the physical separation of the internal components from the aluminum will lower the total mercury on the aluminum.

Based on this result, Veolia contacted an equipment manufacturer, Applied Industrial, to explore the feasibility of using a shredder or crusher to further reduce the size of the end-caps and allow for the physical separation of the aluminum from the other internal components. The physical separation could be completed through magnetic separation. Applied Industrial has completed a preliminary pilot test (#1) of the process. The segregated aluminum end-caps and other internal components (chip) were subjected to total and TCLP mercury analysis. As presented in the attached results, the segregated aluminum end-caps had a total mercury concentration of 0.678 mg/Kg. The remaining material had a total mercury concentration of 3.8 mg/Kg.

Based on the preliminary pilot test #1, Veolia contracted Jordan Reduction Solutions to provide a preliminary design of a separation system. A larger sample of the end-caps has been sent to Jordan Reduction Solutions for a pilot test (#2) of the proposed shredder and then analytical testing. Veolia anticipates that several additional months are required to complete our pilot testing, complete the design, and install a solution. Based on our bench and preliminary investigations we have concluded



that further size reduction of the processed end-caps is necessary to allow a physical separation of metal components. This process will require the addition of a shredder or crusher to our existing lamp line. The anticipated construction will not require the modification of existing front end lamp recycling process or air scrubbing equipment. As discussed above, Veolia has secured preliminary price quotes for the equipment necessary to complete the project. We anticipate the final decision on the equipment specifications by the beginning of October 2014. The procurement and installation of the equipment should be completed by the end of December 2014.

Management of Accumulated End-caps

During the period from February to August 2014, Veolia has accumulated approximately 44 cubic yard containers of aluminum end-caps that do not meet the 5 ppm total mercury limit for a weekly composite sample. These end-caps are less than 260 mg/kg total mercury and less than 0.2 mg/L TCLP mercury concentrations. These end-caps are accumulated in one van trailer positioned on the pavement area North of the facility. Veolia is requesting an exception to FL 62-737.840 to dispose of the staged nonhazardous aluminum end-caps at a Subtitle D landfill. We are also seeking the ability to accumulate additional end-caps until February 2015 or until the process equipment modification can be made. Veolia will only accumulate end-caps that are less than 260 mg/Kg totals (Method 7471A) and less than 0.2 mg/L TCLP (Method 7470A). Any materials that fall out this range will be retested, reprocessed or processed within the facility mercury reclamation process or delivered to another mercury reclamation facility for processing.

Veolia is committed to developing and implementing a feasible technology to achieve a lower level of total mercury in the aluminum. The current mercury target established in FL 62-737.840 was based on old lamp manufacturing processes and therefore an older recycling technology. Veolia will provide updates to Florida DEP on a monthly basis regarding the technology changes. If necessary, Veolia will seek a wavier of the 60-day approval process for changes to the lamp lines. The end-cap technology will not impact the through-put of the lamp lines.

We look forward to the opportunity to discussing our approach for process improvement and managing the end-caps. If you have any questions or need additional clarification of this matter, please call me at (850) 877-8299.

Sincerely,

VEOLIA ES TECHNICAL SOLUTIONS, LLC.

Linda Dunwoody
Operations Manager
Tallahassee, FL

