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*Creating the Future of Zirconium Chemicals*

Certified #Z 055 099 730

April 24, 1995

Mr. Charles E. Gaskin  
Licensing Branch, NMSS  
U.S. Nuclear Regulatory Commission  
Mail Stop R 8-D-14  
Washington, D.C. 20555

Reference: Magnesium Elektron, Inc., Docket No. 40-<sup>8984</sup>~~9084~~

Dear Mr. Gaskin:

As the NRC Staff requested at our last meeting, I am writing to describe the measures that Magnesium Elektron, Inc. (MEI) is implementing to reasonably assure that it does not generate licensable material in its future operations.

As we discussed at our January 31 meeting, and as was described in the letter we provided that same date, MEI is implementing a change in its process to ensure that it does not generate licensable material. Currently, we employ a two-step neutralization process. At the first stage of neutralization, a silica waste stream containing no appreciable radioactive material is produced, and at the second stage, the sludge containing the uranium and thorium residue is produced. We are currently preparing to change our facility to employ a one-step neutralization, which will no longer separate the silica and sludge streams. As a result, the silica sludge thereafter produced will have a lower source material content - well below the exempt level - as indicated below.

Mass-balance calculations and analysis of sludge that has been produced since we changed neutralizing agents in mid-1994 (from sodium carbonate to sodium hydroxide) indicate that we are currently producing a sludge with an average source material concentration near 400 ppm at a water content of approximately 85%. With one step neutralization, the total weight of solids in the combined silica-sludge waste stream will be increased by a factor of six. This silica sludge will be sent to a filter press to extract excess moisture, producing a filtercake with a moisture content of approximately 50%, similar to moist sand. By our calculations, this will result in a source material concentration in this filtercake of about 200 ppm. The concentration of source material

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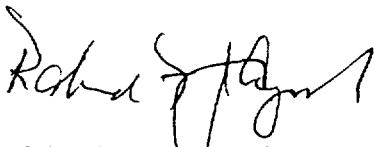
in each batch of filtercake will be measured by gamma spectroscopy at MEI's site to confirm it is below the exempt level before release. It should be noted that with the addition of the silica, the concentration of source material would remain below the exempt level even if the moisture content of the filtercake were reduced to zero.

MEI intends to sell the filtercake material to cement manufacturers. Upon confirmation that the concentration of source material in each batch of filtercake is below the exempt level, the filtercake will be transferred by trucks to a cement manufacturing firm. There, the filtercake will be fed into a cement production kiln, mixed thoroughly with other raw materials (e.g., gypsum, etc), and calcined. According to our consultant's report, the source material concentration in the final calcined cement will be at approximately five times lower than the filtercake, or about 40 ppm. This is equivalent to about 11 picocuries per gram, which is within the range of background concentrations of these radionuclides in soil. When the cement is later used, the calcined mix will be combined with water and other amendments, reducing the concentration further by a factor of three, or to about 14 ppm or 4 picocuries per gram. These very low concentrations pose negligible risk to the public or cement factory workers.

We are confident that these measures will be sufficient to keep future arisings below licensable levels. This will allow MEI to release the material and avoid the accumulation of waste on site. As we discussed at our last meeting, we would appreciate your written confirmation, based on our representations, that the NRC is no longer considering licensing our operations.

Thank you for your attention to this matter. If you have any questions, please call me at (908) 782-5800, or David Lewis at (202) 663-8474.

Sincerely,



Richard F. Jaeger, PhD.  
Manager of Environmental & Technical Affairs

CC: Dr. Robert Stern, NJDEPE  
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