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United States Environmental Protection Agency
Washington, D.C. 20460
Office of Solid Waste and Emergency Response

August 19, 1994

Mr. Paul R. DiBella
Metals Recycling Technologies Corp
3350 Cumberland Circle
Suite 970
Atlanta, Georgia 30339

Dear Mr. DiBella:

This letter is written in response to your July 26, 1994 letter to Michael Shapiro. In your letter you requested a regulatory determination on the status of a lead/copper metal produced by Metals Recycling Technologies (MRT) at Nucor Corporation's electric arc steel furnace in Darlington, South Carolina. The lead/copper metal is derived from MRT's recovery process of K061/emission control dust from electric arc furnaces, a listed hazardous waste. Please understand that EPA Headquarters cannot comment on the regulatory status of the specific lead/copper metal produced at Darlington. The regulatory status of this material is properly determined by the State of South Carolina through its Department of Health and Environmental Control. The State of South Carolina is authorized to administer and enforce its own RCRA program. This letter will answer in general terms how federal RCRA regulations apply to the metal-bearing secondary materials when thermal recovery is involved. The main regulatory issue is how to determine whether a metal-bearing secondary material that has been reclaimed more clearly meets the definition of a partially reclaimed material or a fully reclaimed material.

Under EPA regulations, secondary materials being reclaimed that are also hazardous wastes remain hazardous wastes until the reclamation process is complete (or until a variance from the definition of solid waste is granted pursuant to 40 CFR Section 260.30). Whereas, secondary materials that have been completely reclaimed that had been hazardous wastes are no longer considered to be wastes. Reclamation is usually incomplete until the end-product of the process is fully recovered. 50 FR 614, 633, 634,

655, January 4, 1985); 56 FR 41164, 41173 (August 19, 1991). When thermal metal recovery is involved, EPA has stated that secondary materials destined for smelters remain hazardous wastes. After smelting, recovered metals that only need to be refined are products, not wastes. 56 FR at 41173.

In addition, there are other indicators of when a metal-bearing secondary material more closely meets the definition of a partially reclaimed material or a fully reclaimed material. When a metal-bearing secondary material has a very high metallic content of the recovered metal, e.g., over 90 percent, and the material also meets a product specification for a particular metal (e.g., prime western grade zinc is at least 98 percent zinc), this may indicate that the material is fully reclaimed. Conversely, a lower metallic content of the recovered metal in metal-bearing secondary materials indicates that the material is only partially reclaimed and must be reclaimed further in order to be applied for a particular end use.

In summary, a metal-bearing secondary material such as a lead/copper metal that is between 92 percent and 99 percent lead and also only needs to be refined prior to use would generally meet the definition of fully reclaimed material. Of course, the material actually must be sent on to refining, and not discarded or further reclaimed (e.g., placed into a smelter). Please note that under 40 CFR Section 261.2(f), respondents to enforcement actions must document claims that their secondary materials are exempt from the definition of solid waste. Further, good management practices of a metal-bearing secondary material is another indicator of whether a material is being managed more like a product than like a waste. For example, land storage of a metal-bearing secondary material in waste piles, surface impoundments or other land disposal units prior to refining or other management which results in release to the environment could lead to the conclusion that the metal-bearing secondary material was being managed as a waste rather than a product.

Please be aware that under Section 3006 of RCRA (42 U.S.C. Section 6926) individual States can be authorized to administer and enforce their own hazardous waste programs in lieu of the Federal program. When States are not authorized to administer their own program, the appropriate EPA Regional office administers the program and is the appropriate contact for any case-specific determinations. Please also note that under Section 3009 of RCRA

(42 U.S.C. Section 6929) States retain authority to promulgate regulatory requirements that are more stringent than Federal regulatory requirements.

I hope that this letter sufficiently responds to your questions and concerns. If you have any further questions or comments, please contact Paul Borst of my staff at (202) 260-6713.

Sincerely,

David Bussard, Director
Characterization and Assessment Division

Attachment

Metals Recycling Technologies Corp.
3350 Cumberland Circle, Suite 970
Atlanta, Georgia 30339
Telephone (404) 951-1542, Facsimile (404) 955-7610

July 26, 1994

Mr. Michael Shapiro
Director, Office of Solid Waste
United States Environmental Protection Agency
Regulatory Development Branch (OS-332)
401 M Street, S.W.
Washington, DC 20460

Dear Mr. Shapiro:

Metals Recycling Technologies Corp. "MRT" is writing to request a regulatory determination as to the status of a certain lead/copper metal (the "Lead/Copper Metal") produced with the MRT Process (defined below). MRT plans to sell its Lead/Copper Metal to U.S. lead producers who will (i) further refine this material to produce an even purer lead, and/or (ii) use it with other metal alloys to make specific lead-based alloys. The status of the Lead/Copper Metal produced during the MRT Process has not previously been considered by any state or federal environmental agency.

EPA has appropriately and repeatedly recognized that its regulatory jurisdiction under the Resource Conservation and Recovery Act (RCRA) over "wastes" and "partially reclaimed" materials does not, extend to "fully reclaimed" products that have been recovered but may require further "refining". Specifically, EPA has stated that: (i) "reclaimed metals that are suitable for direct use, or that only have to be refined to be usable are products, not wastes" (See Fed. Reg. 614, 634 (Jan.4, 1985)); and, (ii) recovered metals only needing to be refined (the processing step following smelting) are products, not wastes" (See 56 Fed. Reg. 41164, 41173 (Aug. 19, 1991)).

Background

MRT owns and operates a patented, hydrometallurgical process (the "MRT Process") that recycles electric-arc furnace dust ("EAF Dust") generated during the steelmaking process. The first commercial scale MRT Process facility is operating adjacent to Nucor Corporation's Darlington, South Carolina ("Nucor-Darlington") steelmaking plant. This facility recycles the EAF Dust generated at Nucor Darlington.

Overview of the MRT Process

The following is a general overview of the MRT Process. See Appendix "A" for a detailed flow chart of the MRT Process.

The MRT Process uses a heated, aqueous ammonium chloride solution to leach solubles in the EAF Dust into solution. The solubles in the EAF Dust include, among others, zinc oxide, lead oxide, cadmium oxide and copper oxide. The insolubles, which comprise approximately 70% of the original EAF Dust, contain primarily iron oxide.

After the EAF Dust is digested in the heated solution, the insolubles are filtered from the solution using a high-pressure membrane press. This "iron cake" (the "Iron Cake") is used on-site in the steelmaking process as an ingredient to make steel.

Following filtration, the remaining heated solution contains primarily zinc oxide, lead oxide, copper oxide and cadmium oxide. This solution is pumped to a tank, where the cementation step takes place. In this step, zinc metal particles are added to the solution. This induces an electrochemical reaction. The zinc particles partially dissolve and the copper, lead and cadmium oxides exchange ions with the partially dissolved zinc metal particles. The dissolved portion of the zinc particles gains the oxygens from each of the lead, cadmium and copper, and goes into solution as zinc oxide along with the zinc oxide contained in the solution from the original EAF Dust. The lead, copper and cadmium plate out as metals around the undissolved portions of the zinc metal particles. The solution, then loaded with zinc oxide, is sent to a crystallizer, where zinc oxide is crystallized and harvested. The zinc oxide crystallized from the MRT Process is of 99.8% plus purity and sold as a commercial product.

The Cementation Material and the Lead/Copper Metal

Prior to the operation of the first commercial scale recycling facility at Nucor Darlington, MRT operated the MRT Process on pilot scale and bench scale. On these scales, the material resulting from the cementation stage of the process was comprised primarily of zinc metal, with smaller amounts of lead, cadmium and copper metals present. The zinc metal levels of this material ranged from 50% to over 70%. At the Nucor-Darlington recycling facility, MRT has made enhancements to the cementation stage of the MRT Process. The result is a cementation material much lower in zinc content than the cementation material produced during pilot and bench scale operations.

The new cementation material, on a metals basis, has approximately the following composition: lead-87%, copper-5%, zinc-4% and cadmium 4%. Using hydrometallurgical technology recently developed by MRT and being implemented at the Nucor-Darlington recycling facility, the new cementation material is processed further. Through this process, MRT recovers the Lead/Copper Metal, cadmium metal and a zinc salt. The Lead/Copper Metal is sold to a lead refiner. The cadmium metal is sold as a product. The zinc salt is placed into the digestion step of the MRT Process where the zinc is recovered as zinc oxide and the salt precipitates calcium from solution in the form of a calcium salt. The calcium salt is returned to the steel mill in the Iron Cake to be used as a replacement raw material in the steelmaking process.

Based on MRT's experience at Nucor-Darlington, the Lead/Copper Metal has a metallic lead content of anywhere from 92% to over 99%. The remainder is comprised of primarily of copper metal, with smaller amounts of zinc metal present. MRT expects this Lead/Copper Metal to be dry, with a moisture content of .1% or less.

With regard to purity, when the Lead/Copper Metal leaves the MRT Process facility, it is comprised of well over 90% metallic lead. At these high levels of metallic lead concentration, the material can be (i) used alone or with other alloys in a number of nonland-use applications, and/or (ii) refined into an ever purer lead. Attached hereto as Appendix "B" are pages from a publication of the Lead Industries Association, Inc. (see footnote 1). Information on these pages shows that there are a number of direct uses for lead materials with metallic lead concentrations above 90%. This information also shows many uses for lead-based alloys with lead concentrations well below 90%. (see Appendix B, page 9, L55140 tin-lead solder, for which the Lead/Copper Metal would

provide an excellent use when combined with other alloys).

Further, a number of U.S. lead producers have indicated an interest in purchasing the Lead/Copper Metal. These producers intend to place the Lead/Copper Metal directly into the refining process, which is the final process in the making of pure lead. These lead producers will either further refine the Lead/Copper Metal into an even purer lead or combine it with other alloys to make specific composition lead-based alloys. Attached hereto as Appendix "C" is a letter from the Doe Run Company indicating that it would place the Lead/Copper Metal directly into the refining process.

Based on the foregoing, MRT respectfully requests a status determination on the Lead/Copper Metal.

Sincerely,

Metals Recycling Technologies Corp.

cc: Paul A. Borst, U.S. EPA
John E. Johnston, U.S. EPA Region IV

1. Lead Industries Association, Inc., Properties of Lead and Lead Alloys

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Enclosure

Appendix "C"

The Doe Run Company
Suite 300, 1801 Park 270 Drive
St. Louis, Missouri 63146

July 20, 1994

Mr. Paul R. DiBella
Metals Recycling Technologies Corp.
3350 Cumberland Circle Suite 970
Atlanta, GA 30339

Dear Mr. DiBella:

As I mentioned to you in our several conversations, The Doe Run Company is committed to doing its part to help manage the life cycle of lead, one of the oldest and most useful metals known to man. We believe prudent management of the lead life cycle is an environmentally sound policy.

The Doe Run Company is interested in pursuing a commercial relationship with Metals Recycling Technologies Corp. (MRT) for the purchase of the lead-rich material produced by the MRT Process. Based on our understanding of the composition of the lead rich material, The Doe Run Company would use the material at our Herculaneum, Missouri plant, placing it directly into the dross kettle, which is part of the lead refining process. We expect there will be no need to smelt the material.

We are in the process of drafting a proposed agreement for your review. Our agreement to purchase the lead-rich material produced by the MRT Process will be conditioned on MRT providing us with satisfactory assurances that MRT has received the appropriate regulatory determination that the lead-rich material is product, not a waste derived from electric-arc furnace dust. This means that MRT must be able to send the material to the Herculaneum plant without a hazardous waste manifest. While we believe your lead-rich material is a very attractive product for lead refining, the Herculaneum plant is not a RCRA permitted facility. Consequently, this facility cannot receive materials shipped under a hazardous

waste manifest.

The Doe Run Company looks forward to a mutually rewarding relationship with MRT. It appears as though MRT has one of the same primary objectives as The Doe Run Company -- prudently managing the life cycle of lead.

Sincerely,

Michael L. Deelo