



# Los Alamos National Laboratory

Los Alamos, New Mexico 87545

Operated by the University of California for the Department of Energy

December 23, 1999

*K - let's summarize  
a response soon.  
-BRZ*

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JAN 2000  
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Mr. James P. Bearzi  
Chief, Hazardous and Radioactive Materials Bureau  
New Mexico Environment Department  
2044 Galisteo Building A  
Santa Fe, New Mexico 87502

## Re: Beryllium Powder – Follow-up to November 5, 1999 Letter to NMED

Dear Mr. Bearzi:

The purpose of this letter is to follow-up on our letter to you dated November 5, 1999 (to which a correction was added by way of letter dated November 9, 1999), in which we indicated that we would be providing you some materials that address the interpretation of the requirements applicable to the management of beryllium materials and wastes. The occasion for our writing you the earlier letter and this letter has to do with our ongoing preparation for start up of our new Beryllium Technology Facility (BTF), which was recently toured by members of the New Mexico Environment Department. As part of our preparation we have undertaken a review of all regulations and requirements, including those of the Resource Conservation and Recovery Act (RCRA) and Hazardous Waste Act (HWA) that are potentially applicable to the operations of this facility. In the course of that review, we have come across an issue that we thought it appropriate to brief you on.

By way of background, the BTF will house a number of operations involving the use of beryllium, including the machining of beryllium metal, the cladding of items with beryllium, and the manufacturing of beryllium powder through a process that melts beryllium metal, atomizes it, and forms it into powder. It is this last process that we are addressing in the materials we are providing with this letter. More specifically, the issue involves the management of HEPA filters that service the building and filter all of the processes conducted within the building, including the process involving the manufacture of beryllium powder.

Not all wastes resulting from the use of beryllium materials are regulated under the RCRA/HWA regulations. In fact, the specific regulation governing the management of beryllium wastes, which is found at 40 Code of Federal Regulations (C.F.R.) 261.33(a)-(e), identifies only beryllium powder that is discarded as a commercial chemical product as a P listed waste. The comment in the C.F.R. to subsection (d) of 261.33 provides guidance as to what the scope of “discarded commercial chemical product” is meant to encompass:

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The phrase "commercial chemical product or manufacturing chemical intermediate having the generic name listed in . . ." refers to a chemical substance which is manufactured or formulated for commercial or manufacturing use which consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed, and all formulations in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed in paragraph (e) [P wastes, including beryllium powder] or (f) [U wastes]. Where a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in paragraph (e) or (f), such waste will be listed in either 261.31 or 261.32 or will be identified as a hazardous waste by the characteristics set forth in subpart C of this part.

The above referenced regulation, interpreted in light of the guidance provided by the comment, appears to us to contemplate the regulation of manufactured beryllium powder when it is discarded as a no longer wanted or needed commercial chemical product or manufacturing chemical intermediate. Thus the most obvious application would occur in the circumstance when all or a portion of beryllium powder that has been purchased or acquired is no longer wanted or needed by the owner, and the decision is made to discard this beryllium powder. The discarded beryllium powder would constitute a "discarded commercial chemical product" and would be subject to regulation as a P015 listed waste. On the other hand, wastes resulting from the manufacture of beryllium powder do not clearly come within the purview of the regulation, based on the terms defining the listing and guidance provided by the comment.

The above position is reflected in a number of documents that we are providing as attachments to this letter, most of which consist of letters of correspondence involving the Brush Wellman Company of Ohio, the sole manufacturer of beryllium powder for commercial purposes in the U.S., and U.S.E.P.A. and Ohio EPA. These documents include the following:

1. A Brush Wellman, Inc., position paper, titled "Characterization of Potential P015 Wastes," that addresses in Waste Description #1 discarded filter bags containing beryllium, and concluding that such bags do not meet the P015 listing because these solid wastes are manufacturing process wastes and do not meet the terms of the listing for the reasons stated therein. (Attachment 1).
2. A letter to Ron Josephson, U.S.E.P.A., from Stephen Q. Giblin of the Jones, Day, Reavis & Pogue law firm, [presumably on behalf of Brush Wellman], dated July 5, 1990, confirming Giblin's understanding that the P015 listing does not apply to a manufacturing process waste which contains beryllium. This letter refers to and attaches a letter from U.S.E.P.A.'s Devereaux Barnes to Joseph E. Cothorn of the

U. S. Air Force, dated March 10, 1989, which confirms that a final filtration element containing used beryllium dust does not meet the P015 listing. (Attachment 2).

3. Two letters from Jeffery A. Steers, Ohio EPA, to Larry Chako of Brush Wellman, dated October 8, 1993, and December 9, 1993, respectively, confirming that beryllium baghouse dust and filters containing such dust do not meet the P015 listing. (Attachment 3).

In the course of our review of regulatory interpretations that might have applicability to the management of beryllium powder, we came across three sets of correspondence that appear to raise an issue on the management of filters containing beryllium powder.

These include:

1. A letter to Rick Brandes, U.S.E.P.A. from Robert Chase, U.S. Department of the Army, dated October 26, 1992, and a response letter from Mr. Brandes to Mr. Chase, dated November 2, 1992. The letters address a situation where chemical product beryllium was used in two glove boxes and the issue of whether equipment associated with the use of the beryllium need be managed as containing a listed waste. The EPA interprets the regulation applicable to the management of beryllium containing wastes as not applying to the equipment, as the beryllium powder was used in the glove boxes, and as such did not constitute a discarded commercial chemical product. However, the EPA letter does caveat its interpretation by including the parenthetical statement "unless the purpose of the operation is to create the beryllium dust or powder as a commercial chemical product." (Attachment 4).
2. A letter to Rick Brandes, U.S.E.P.A., from Peter W. Colby, dated January 23, 1997, and a response letter from David Bussard, U.S.E.P.A., to Mr. Colby, dated July 24, 1997. These letters do not address the use of beryllium powder, but rather raise issues regarding the manufacture and testing of a drug (ultimately used in tablet form) called "warfarin." In the course of responding to a series of issues raised by the Colby letter, the EPA suggests that once a material starts to meet the listing description as the commercial chemical product or manufacturing intermediate, the equipment to be discarded containing such material meets the listing and should be managed as a hazardous waste. (Attachment 5).
3. A letter to Dennis M. Burchett, Clean Crop, from Matthew A. Straus, U.S.E.P.A., dated May 18, 1987, responding to an earlier inquiry from Mr. Burchett. The letter indicates that spent carbon originating from carbon scrubbers is subject to hazardous waste regulations because the carbon contains a listed waste, Phorate (P094), which is released to the air in the course of packaging the Phorate finished product. (Attachment 6).

James P. Bearzi, NMED

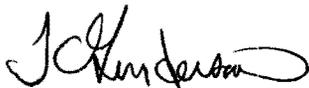
December 23, 1999

While the above correspondence takes an approach that appears to be contrary to the literal terms of the 261.33 language as interpreted by EPA in its comment to this regulation, we felt it raised an issue of some concern and so we contacted Brush Wellman and furnished them the above sets of correspondence (Attachments 4 and 5). Brush Wellman apparently referred the matter and materials to their Jones Day attorneys, who in turn wrote us a letter reaffirming the position that wastes resulting from the manufacturing process of beryllium powder (as provided in EPA's comment to the regulation) are outside the listing. We are attaching this letter, which is to Kathryn Creek of Los Alamos National Laboratory, from Stephen Q. Giblin, dated November 5, 1999. This letter in turn attaches the correspondence constituting Attachment 4 above. The November 5, 1999, letter and attachment are enclosed as Attachment 7.

Having ourselves reviewed all of the above materials, we have reached the conclusion that if one relies on the words used in the regulation, as interpreted by the comment provided immediately below the regulation, the listing for beryllium powder should not apply to wastes produced during the manufacturing process of beryllium powder. However, before operations at the BTF start up, we wanted to confirm with you and receive your input on the Ohio EPA - Brush Wellman position in managing wastes that will originate from our beryllium powder manufacturing process.

We look forward to hearing from you on this matter. We are available to discuss this matter further, should you so desire; please do not hesitate to contact me at 667-0079.

Sincerely,



Thomas C. Gunderson  
Special Assistant of the Environment  
DLDOPS

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## BRUSH WELLMAN INC.

### Characterization of Potential P015 Wastes

The purpose of this document is to review the characterization of various beryllium-containing wastes generated at Brush Wellman's facility in Elmore, Ohio. Under 40 C.F.R. ' 261.33, EPA has listed certain commercial chemical products and manufacturing chemical intermediates which are hazardous wastes when discarded.

As an initial matter, it is important to keep in mind that the lists appearing at ' 261.33 do not purport to regulate as hazardous wastes any manufacturing process wastes containing any of the listed chemical substances. Rather, the regulations cover only discarded commercial chemical products or manufacturing chemical intermediates having the generic names listed. As stated in EPA's comment appearing after ' 261.33(d), the listing "does not refer to a material, such as a manufacturing process waste, that contains any of the substances listed." Thus, just because a manufacturing process waste contains some amount of beryllium in whatever form, that waste is not necessarily a hazardous waste.

The current description for P015 is "beryllium." This description resulted from a technical correction to ' 261.33 whereby, among other things, the description for P015 was inadvertently changed from "beryllium dust" to "beryllium." 53 Fed. Reg. 13382 (April 22, 1988). Communications between Brush Wellman and EPA have confirmed Brush Wellman's understanding that the P015 listing was limited to the commercial chemical product "beryllium dust" and did not include the broader group of products which could be referred to as "beryllium." Moreover, it is clear from the CAS number assigned to P015, 7440-41-7, that EPA intends to regulate as a hazardous waste only metallic beryllium powder. Therefore, Brush Wellman's position is that the waste description "beryllium" listed as P015 refers to the commercial chemical product or manufacturing chemical intermediate commonly known as metallic beryllium powder.

Based on the foregoing analysis and a review of the manufacturing processes at the Elmore facility, Brush Wellman has determined that the stages during which the commercial chemical product or manufacturing chemical intermediate known as beryllium powder is handled extend from the powdering operations to the consolidation operations. These processes include attritioning, impact grinding, ball milling, atomization, blending, screening, packaging, die loading, can/bag loading, sintering, cold isostatic pressing, hot isostatic pressing and a confidential proprietary operation.

The following waste descriptions cover various beryllium-containing wastes generated at the Elmore facility. The subsequent analysis summarizes Brush Wellman's technical and legal bases for characterizing the particular wastes as either hazardous or non-hazardous.

#### **WASTE DESCRIPTION #1**

**Articles or equipment such as gloves, filter bags, rags, discarded ductwork or equipment contaminated with metallic beryllium powder as a pure or off-specification commercial chemical product or manufacturing chemical intermediate. These items are either cleaned and reused, containerized for disposal or compacted and containerized for disposal.**

#### CHARACTERIZATION

This solid waste is a manufacturing process waste and therefore not included within the P015 hazardous waste listing because:

1. It was not the intent of the Agency to list as hazardous wastes solid wastes derived from a manufacturing process which contain only minor amounts of P listed substances as constituents of the wastes. Rather, EPA intended to limit regulation to only those wastes which consist predominantly of the pure or off-specification commercial chemical product or manufacturing chemical intermediate and which are to be discarded. (Refs. 2 and 3)
2. The Agency would have listed these wastes specifically as a class of hazardous wastes if it was concerned they contained a hazardous constituent such as with respect to Hazardous Waste No. K126 (baghouse dust and floor sweepings in milling and packaging operations from the production or formulation of EDBC). (Ref. 1)
3. The treatment standard of metals recovery for P015 wastes under the LDR regulations did not contemplate the recovery of beryllium from these types of manufacturing process wastes. (Ref. 4)

#### REFERENCES

1. Comment following 40 C.F.R. ' 261.33(d)

The phrase "commercial chemical product or manufacturing chemical intermediate having the generic name listed in . . ." refers to a chemical substance which is manufactured or formulated for commercial or manufacturing use which consists of the commercially pure grade of the chemical, any technical grades of the chemical that are produced or marketed and all formulations in which the chemical is the sole active ingredient. It does not refer to a material, such as a manufacturing waste, that contains any of the substances listed in paragraph (e) or (f). When a manufacturing process waste is deemed to be a hazardous waste because it contains a substance listed in paragraph (e) or (f), such waste will be listed in either ' 261.31 or ' 261.32 or will be identified as a hazardous waste by the characteristics set forth in subpart C of this part.

2. 45 Fed. Reg. 33084, 33115 and 33116 (May 19, 1980)

The intent of the regulation was to encompass only those materials which were being thrown away in their pure form or as an off-specification species of the listed material, as well as the contaminated residues and debris from those materials. The final regulation has been redrafted to limit the application of this section to the commercial chemical product itself, its off-specification species and derived spill residues and debris.

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[T]he regulatory language has been clarified to restrict the application of this section to chemical products, or their off-specification species, and not to wastes which contain these materials as a constituents [sic].

3. RCRA Background Document, Section 15, pp. 3 and 20

Importantly, these chemicals were not listed to be used to cause solid wastes derived from manufacturing processes (and which might only contain very low concentrations of these chemicals) to be listed as hazardous wastes.

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[Section] 261.33 is exclusively designed to regulate these materials in the event they are discarded or intended to be discarded, are discarded as off-specification materials, are discarded as residuals in containers or inner liners of containers or are spilled. Where the Agency's interest in a chemical is because it is a hazardous constituent of a solid waste, the Agency will list the wastes or classes of wastes that typically or frequently contain such chemicals in " 261.31 and 261.32.

4. 40 C.F.R. ' 268.42, Table 2

#### SECONDARY CHARACTERIZATION

This solid waste is a manufacturing process waste which is not otherwise a hazardous waste because:

1. It is not listed at 40 C.F.R. " 261.31 or 261.32.
2. It does not exhibit a characteristic described at 40 C.F.R. " 261.20 - 261.24.
3. It is not mixed with a material listed at 40 C.F.R. " 261.31 or 261.32.
4. Is not derived from storage, treatment or disposal of a material listed at 40 C.F.R. " 261.31 or 261.32.

#### REFERENCE

1. 40 C.F.R. ' 261.3

#### WASTE DESCRIPTION #2

**Metallic beryllium powder as a pure or off-specification commercial chemical product or manufacturing chemical intermediate spilled inside or outside the plant.**

#### CHARACTERIZATION

Metallic beryllium powder as a pure or off-specification commercial chemical product or manufacturing chemical intermediate spilled inside or outside the plant is not a hazardous waste provided the material can be recovered for recycle or reuse. If the material is not recovered for recycle or reuse and thus is intended to be discarded, it is a hazardous waste. (Ref. 1)

However, if the material was the result of a *de minimis* loss of material as part of the manufacturing operation and is mixed with wastewater managed in a wastewater system regulated as a point source discharge, the mixture is not a hazardous waste. (Ref. 2)

#### REFERENCES

1. 40 C.F.R. ' 261.33

The following materials or items are hazardous wastes if and when they are discarded or intended to be discarded . . .

2. 40 C.F.R. ' 261.3(a)(2)(iv)(D)

[T]he following mixtures of solid wastes and hazardous wastes listed in Subpart D of this part are not hazardous wastes . . . if the generator can demonstrate that the mixture consists of wastewater the discharge of which is subject to regulation under either section 402 or section 307(b) of the Clean Water Act (including wastewater at facilities which have eliminated the discharge of wastewater) and:

A discarded commercial chemical product, or chemical intermediate listed in ' 261.33, arising from *de minimis* losses of these materials from manufacturing operations in which these materials are used as raw materials or are produced in the manufacturing process. For purposes of this paragraph (a)(2)(iv)(D), "*de minimis*" losses include those from normal material handling operations (e.g., spills from the unloading or transfer of materials from bins or other containers, leaks from pipes, valves, or other devices used to transfer materials); minor leaks of process equipment, storage tanks or containers; leaks from well maintained pump packings and seals; sample purgings; relief device discharges; discharges from safety showers and rinsing and cleaning of personal safety equipment; and rinsate from empty containers or from containers that are rendered empty by that rinsing.

#### WASTE DESCRIPTION #3

**Wastewater treatment sludge from the treatment of wastewater mixed with residual spills of metallic beryllium powder as a pure or off-specification commercial chemical product or manufacturing chemical intermediate.**

#### CHARACTERIZATION

As explained above, the mixture of the wastewater and residual spilled material is not a hazardous waste. The wastewater treatment sludge therefore is not derived from the treatment of a listed hazardous waste. Accordingly, the sludge is not a hazardous waste assuming it does not exhibit any characteristic of a hazardous waste or becomes mixed with any listed hazardous waste.

## REFERENCE

1. See Waste Description #2, Reference 2

## WASTE DESCRIPTION #4

**Containers or container liners which contained metallic beryllium powder as a pure or off-specification commercial chemical product or manufacturing chemical intermediate.**

## CHARACTERIZATION

Containers or container liners which contained metallic beryllium powder as a pure or off-specification commercial chemical product or manufacturing chemical intermediate may or may not be classified as hazardous waste depending on their final disposition. The following options are available:

1. Containers being used to collect metallic beryllium powder as a pure or off-specification commercial chemical product or manufacturing chemical intermediate from product collection systems or air cleaning devices do not contain a hazardous waste and do not need to be labelled as such because the material being collected in the containers is not intended to be discarded but rather will be recycled or reused. (Ref. 3)
2. Containers or container liners not cleaned either must be managed as hazardous waste or may be reused directly for the same purpose. Containers being held for reuse for the same purpose do not contain a hazardous waste and do not need to be labelled as such because the residual material contained therein is not intended to be discarded. (Ref. 4)
3. Containers or container liners may be reused or disposed of as solid waste provided they are emptied by removing the residual contents by triple rinsing using a solvent capable of removing the commercial chemical product or manufacturing chemical intermediate. Brush Wellman accomplishes this by vacuuming, scrubbing and triple rinsing with water and soap. (Ref. 2)
4. Rinsate is not a hazardous waste provided it is mixed with a wastewater managed in a wastewater system regulated as a point source discharge. (Ref. 1)

## REFERENCES

1. See Waste Description #2, Reference 2
2. 40 C.F.R. " 261.7(a)(1) and (b)(3)(i)

Any hazardous waste remaining in either (i) an empty container or (ii) an inner liner removed from an empty container, as defined in paragraph (b) of this section, is not subject to regulation under [RCRA].

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A container or an inner liner removed from a container that has held an acute hazardous waste listed in " 261.31, 261.32, or 261.33(e) is empty if: (i) The

container or inner liner has been tripled rinsed using a solvent capable of removing the commercial chemical product or manufacturing chemical intermediate.

3. See Waste Description #2, Reference 1
4. Comment following 40 C.F.R. ' 261.33(c)

Unless the residue is being beneficially used or reused, or legitimately recycled or reclaimed; or being accumulated, stored, transported or treated prior to such use, re-use, recycling or reclamation, EPA considers the residue to be intended for discard, and thus, a hazardous waste. An example of a legitimate re-use of the residue would be where the residue remains in the container and the container is used to hold the same commercial chemical product or manufacturing chemical intermediate it previously held. An example of the discard of the residue would be where the drum is sent to a drum reconditioner who reconditions the drum but discards the residue.

## **WASTE DESCRIPTION #5**

**Beryllium containing wastes from machining operations including chips and other particulate collected in air cleaning equipment.**

## **CHARACTERIZATION**

This solid waste is a manufacturing process waste and therefore not included within the P015 hazardous waste listing because:

1. It was the intent of the Agency to limit regulation to only those wastes which consist predominantly of the pure or off-specification commercial chemical product or manufacturing chemical intermediate and which are to be discarded.
2. The Agency would have listed these wastes specifically as a class of hazardous wastes if it was concerned they contained a hazardous constituent.

## **REFERENCES**

1. See Waste Description #1, References 1, 2 and 3