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DIV SOLID WASTE MGT

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**JARDEN**  
zinc products

P.O. Box 1890, Greeneville, TN 37744-1890  
Phone: 423.639.8111 Fax: 423.639.4699

March 17, 2011

Mr. Joe Putnam  
Division of Solid Waste Management  
Fifth Floor, L&C Tower  
401 Church Street  
Nashville, Tennessee 37243-1535

RE: Variance Renewal Request For Copper Rich Wastewater Treatment Residue  
Jarden Zinc Products, L.L.C., TND 05-398-3862

Dear Mr. Putnam:

During the discussions between Jarden Zinc Products L.L.C., formerly Alltrista Zinc Products, TDEC-DWSM and the USEPA Region IV, Office of Solid Waste, in 1998 it was recommended that Jarden pursue a variance from the Subtitle C requirements for their F006 recycling arrangements. Jarden Zinc Products, L.L.C., received a variance from Tennessee Division of Solid Waste Management on November 20, 1998, allowing the operation to claim that the "Copper Rich Wastewater Treatment Residue" is a commodity and not a RCRA solid waste. A variance extension was granted on December 1, 2003 and expired on December 1, 2008, therefore requires that a renewal be submitted to the Division. Jarden Zinc Products L.L.C., hereby requests the Division renew Jarden Zinc Products, L.L.C.'s variance from classifying as a solid waste, the copper bearing residue produced from a wastewater treatment unit. Jarden is again making this request under the conditions listed in Tennessee Rule 1200-1-11-01(4)(b)(3)(i)-(vi).

**TNRdp1200\diSWM\ch1200-1-11\se1200-1-11-.01(4)(b)(3). The Commissioner may grant requests for a variance from classifying as a solid waste those materials that have been reclaimed but must be reclaimed further before recovery is completed if, after initial reclamation, the resulting material is commodity-like (even though it is not yet a commercial product, and has to be reclaimed further). This determination will be based on the following factors:**

*(i) The degree of processing the material has undergone and the degree of further processing that is required;*

Jarden Zinc Products, L.L.C., Greeneville, Tennessee, is a secondary zinc melting, casting and rolling mill that also operate a large copper cyanide plating process. All the wastewater generated from the electroplating operation is treated in a wastewater treatment unit that is specified under NPDES permit TN0001899. An alkaline chlorination process is utilized to complete the two-stage oxidation of cyanide. The total cyanide concentration in the wastewater discharge is consistently below 0.10 ppm. No significant changes have been made to either the manufacturing or wastewater treatment operation since the variance was issued in 1998.

During the cyanide oxidation process the soluble copper is precipitated from the solution as a solid sludge. The solid removed from this process carries the EPA waste code F006 and must be managed as a hazardous waste. This material continues to be very valuable to the copper industry. During the period of the variance, the material has been marketed to the following companies:

- Phelps Dodge Miami, Inc., Claypool, AZ
- Total Metal Recycling, Granite City, IL

Total Metal Recycling is a copper recycling broker. They blend other copper bearing materials such as Jarden's material and sell it to copper smelters for feed stock material. Freeport McMoRan Copper and Gold formerly Phelps Dodge Miami, Inc., whom has been Jarden's main customer for the Copper Rich Material, is a primary copper smelter. They buy the Copper Rich Material and place it directly into their smelting operation. Once the material from Jarden leaves the facility it requires no further processing or treatment to make it suitable as a direct substitute for copper ore. In fact, the copper recyclers noted above would blend Jarden's material with other sources that are less concentrated to make a more uniform concentrate for the copper smelting industry.

*(ii) The value of the material after it has been reclaimed;*

Since the issuance of the variance extension in 2003 through the period ending December 2010, Jarden has generated and sold over 5.3 million pounds of the copper bearing sludge. The filter cake material that is currently generated contains on average, 14.3% copper, (32.6% copper on a dry weight basis.) Considering the generation figure listed above, over 760,000 pounds of copper was recovered during this eight-year period. Therefore, over \$990,000 worth of copper has been recovered during the variance extension period.

*(iii) The degree to which the reclaimed material is like an analogous raw material;*

The smelting industry's ore contains between 1 to 3 percent copper. It is concentrated to 20-30 percent in the milling operation at Phelps Dodge. Much of it is in the form of

copper sulfate which when smelted generates a large degree of SO<sub>2</sub>. The SO<sub>2</sub> must be scrubbed from the emission gas during the smelting process. The material from Jarden's process is composed of Copper Oxide/Copper Hydroxide. There is a small amount of Copper Sulfide and Iron Sulfide in the material that is generated from a polishing step in the facility's wastewater treatment system. Therefore, this material is very analogous to raw material used by the smelting industry. It is actually of higher value to their process due to the higher initial copper content.

*(iv) The extent of an end market for the reclaimed material;*

There are numerous outlets for this material. I have named two above that are being used for reclamation of copper from the Copper Rich Material produced by Jarden. The following are actively seeking material such as the Copper Rich Material produced by Jarden:

- Xstrata Canada,
- Agmet,
- World Resources, Pottsville, PA
- Alpha Omega Recycling, Longview, TX
- EQ/Envirite, Canton, OH

*(v) The extent to which the reclaimed material is handled to minimize loss;*

The Copper Rich Material is produced as a filter cake. The filter cake is placed in one cubic yard supersaks, which are lined. The material is, and will be, shipped in either van semi-trucks or boxcars to the primary smelter, secondary smelter or smelter brokerage operation. Each container of material will have a descriptive label and conform to all Federal Occupational Health and Safety Administration and Federal Department of Transportation regulations and guidelines. This includes providing with each shipment a Material Safety Data Sheet for this material. Enclosed is a copy of this information for your review.

*(vi) Other relevant factors.*

Jarden Zinc Products, L.L.C., will periodically determine the TCLP, copper and moisture content within the material that is sent, directly or via a broker, to the primary or secondary smelting operation(s) for which the facility has contractual agreements. This analysis will be compared to the analysis specification established by the specific contract. Jarden will not send material that is considered "non-conforming material" by terms of the contract entered into with the smelter.

Jarden Zinc Products, L.L.C., understands that if the material does not meet the specification requirements set forth in any of these agreements it will immediately fall back within the requirements of RCRA. Jarden would then immediately begin compliance with the requirements of RCRA. However, this material is extremely consistent and Jarden is confident that the material will always meet the specifications of the copper smelters. Jarden will also agree to manage the material as an F006 hazardous waste until the moment the material is approved for shipment to the smelter or smelter broker.

**Summary:**

Classification of this material as a Listed Hazardous Waste imposes impediments, both physically and economically, to the beneficial recycling of this material back into commerce. It actually makes it more difficult to meet the intent of RCRA; which is to preserve our natural resources (i.e., ore bodies) by utilizing one process waste material as a raw material for an unrelated industrial process. Hopefully, this submission has provided you with enough information to justify the request and enable the Division to reissue this variance. If you, or anyone in your office, need any additional information, please contact me at your convenience.

Sincerely,



Hollie Binkley  
EH&S Director

Enclosures

cc: Mr. Tom Wennogle, Jarden Zinc Products L.L.C.  
Mr. Rick Mowrey, Jarden Corporation  
Mr. Fred Willingham, TDSW-JCBO



11/23/98  
cc: A. Giles  
B. Musick  
M. Hopkins  
M. Fletcher / RGM

State of Tennessee  
**DEPARTMENT OF ENVIRONMENT AND CONSERVATION**  
Division of Solid Waste Management  
Fifth Floor, L & C Tower  
401 Church Street  
Nashville, Tennessee 37243 - 1535

November 20, 1998

Mr. Rick Mowrey  
Zinc Products Company  
A Division of Alltrista Corporation  
PO Box 1890  
Greeneville, Tennessee 37744-1890

Re: Alltrista Zinc Products Company's, Installation ID Number TND 05-398-3862,  
Request For A Variance To Exclude (Waste Stream Number 13), Wastewater  
Treatment Sludge (F006), From Designation As A Waste Due To Marketability  
To Copper Recyclers.

Dear Mr. Mowrey:

We have reviewed your proposal to be granted a Variance under Rule 1200-1-11-.01(4)(a)3, which reads:

**(4) Variances from Classification as a Waste (40 CFR 260.30)**  
**(a) General**

*In accordance with the standards and criteria in subparagraph (c) of this paragraph, the Commissioner may determine on a case-by-case basis that the following recycled materials are not solid wastes:*

3. *Materials that have been reclaimed but must be reclaimed further before the materials are completely recovered.*

It is the Department's position that Alltrista's copper rich sludge meets the requirements of Rule 1200-1-11-.01(4)(a)3, and is in accordance with the conditions listed under Rule 1200-1-11-.01(4)(b). Alltrista has demonstrated that the material has value, in that copper smelters are already contracting to buy it. The sludge contains 40% or more copper, while copper ore typically contains less than one percent (1%).

Using this copper rich material will result in the conservation and recovery of resources, by allowing a cheaper source of copper, reduced energy demands, lessened need to mine more copper, as well as eliminates, or severely restricts the need to use valuable disposal capacity to handle this material.

The waste water treatment plant (filter press) recovers the copper, (F006 sludge), from the waste waters, but the sludge must be further reclaimed (smelted) before the materials are completely recovered.

It is the Department's position that the recycling of this material will present a very minimal risk to the environment or the public health.

Alltrista is granted a variance for this material, under the following conditions:

1. The material will continue to be handled and transported in a manner consistent with a commodity-like status; properly packaged and transported from Alltrista to the designated facility in a manner that prevents loss or spills;
2. That the process that generates, or recovers the materials does not change;
3. The Department must be informed, in writing, prior to sale of the material to new customers, any change in the production process, or any change to the copper content of the sludge. Changes will necessitate reevaluation of the variance.

Public notice of the proposed agency action was given in the local newspaper and on a local radio station. During this public notice period the Department received one request to be allowed time to study the proposed variance. We allowed time for that person to comment. However, the comment had nothing to do with the variance waste. The proper agency to address the concern of the commenter was pointed out.

This variance shall be for a period of five (5) years, or until December 1, 2003.

Should you have questions regarding this action, you may contact Bobby W. Morrison of my staff at (615) 532-0885.

Sincerely,



Tom Tiesler, Director  
Division of Solid Waste Management

cc: Mr. Larry Gilliam, Johnson City Environmental Assistance Center  
Ms. Nina Vo, Waste Activity Audit, DSWM Nashville Central Office  
Ms. Barbara Donoho, Waste Activity Audit, DSWM Nashville Central Office  
Ms. Elizabeth A. Jayne, Field Operations Support, DSWM Nashville Central Office



STATE OF TENNESSEE  
DEPARTMENT OF ENVIRONMENT AND CONSERVATION  
Division of Solid Waste Management  
Fifth Floor, L & C Tower  
401 Church Street  
Nashville, Tennessee 37243 – 1535

April 21, 2003

Mr. Rick Mowrey  
Alltrista Zinc Products, L.P.  
P. O. Box 1890  
Greeneville, TN 37744-1890  
TND 05-398-3862

CERTIFIED MAIL# 7002 2030 0004 2444 6745  
RETURN RECEIPT REQUESTED

RE: Alltrista Variance Extension To Exclude Wastewater Treatment Sludge  
(F006) As A Waste Due To Copper Content Recycling

Dear Mr. Mowrey:

We have reviewed your data package and request to be granted a variance extension associated with the compliance conditions found at Rule 1200-1-11-.01(4)(a)3, which reads:

(4) *Variances from Classification as a Waste.*

(a) *General*

*In accordance with the standards and criteria in subparagraph (b) and the procedures in subparagraph (c) of this paragraph, the Commissioner may determine on a case-by-case basis that the following recycled materials are not solid wastes:*

3. *Materials that have been reclaimed but must be reclaimed further before the materials are completely recovered.*

It is the Tennessee Department of Environment and Conservation's (TDEC's) position that Alltrista's "Copper Rich Material" continues to meet the scope of Rule 1200-1-11-.01(4)(a), and the variance standards and criteria conditions listed under Rule 1200-1-11-.01(4)(b)(3)(i-vi). Alltrista has demonstrated that the material has value, and copper smelters are contracting to purchase it. It is again noted that the sludge contains 40% or more copper on a dry weight basis, has a commodity value, and is handled as a commodity to minimize loss.

Mr. Rick Mowrey  
April 21, 2003  
Page 2

In addition to meeting the regulatory criteria, TDEC believes that continuing to reclaim and recycle this copper rich material will result in the conservation and recovery of resources, reduce energy demands, lessen the need to mine more copper, as well as reduce or eliminate the need to use waste disposal capacity to handle this material.

Alltrista is hereby granted a variance extension for this material, under the following conditions:

1. The described material will continue to be handled and transported in a manner consistent with a commodity-like status; properly packaged and transported from Alltrista to the designated facility in a manner that prevents loss or spills;
2. That the process that generates, or recovers the materials does not change in a material manner; and
3. The TDEC must be informed, in writing, prior to sale of the material to new customers, any change in the production process, or any change to the copper content of the sludge. Failure to meet the conditions will necessitate reevaluation of this variance.

This variance extension shall be for a period of five (5) years, to start on December 1, 2003 and end on December 1, 2008.

Should you have questions regarding this action, please contact Mr. Joe Putnam of my staff at (615) 532-0882.

Sincerely,



Mike Apple  
Director

JMA/rc/rickmowrey/ltrjfp

cc: Mr. Fred Willingham, Johnson City Environmental Assistance Center  
Ms. Nina Vo, Waste Activity Audit, DSWM Nashville Central Office  
Mr. Robert Nakamoto, Compliance and Field Operations Support Section  
DSWM, Nashville Central Office  
Central File



Zinc  
Products  
Company

Lot Number: NM - \_\_\_\_\_  
Date Shipped: \_\_\_\_\_

|                 |                     |   |
|-----------------|---------------------|---|
| SPECIFIC HAZARD | HEALTH              | 0 |
| 4-SEVERE        | FLAMMABILITY        | 0 |
| 3-SERIOUS       | REACTIVITY          | 0 |
| 2-MODERATE      | PERSONAL PROTECTION | B |
| 1-SLIGHT        |                     |   |
| 0-MINIMAL       |                     |   |

P. O. Box 1890, Greeneville, TN 37744-1890  
Phone: 423.639.8111 Fax: 423.639.3125

# Copper Rich Material

Emergency Number:  
For Spills - CHEMTREC 1-(800)-424-9300  
For General Information - 1-(423)-639-8111

This information is believed to be accurate and represents the information currently available to us. However we make no warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

#### SUBSTANCE IDENTIFICATION

Substance: Copper Rich Material  
Synonyms: Copper Rich Sludge, Copper Smelter Feedstock

#### COMPONENTS AND CONTAMINANTS

Hazardous Components(s):

Cupric Oxide (15-30%)  
CAS-Number 1317-38-0  
Aluminum Oxide (5-10%) CAS-Number 1344-28-1  
Silicon Dioxide (0.5-2.0%) CAS-Number 7631-86-9  
Water (40-65%)

Other contaminants: NA

Exposure Limits:

| Compound                    | OSHA   | NIOSH               | TWA | SARA 313 |
|-----------------------------|--|---------------------|-----|----------|
| Copper as Cu(Dust and Mist) | 1 mg/m <sup>3</sup>  | 1 mg/m <sup>3</sup> |     | ✓        |
| Silica, amorphous           | 80 mg/m <sup>3</sup> + %SiO <sub>2</sub>                   | 6 mg/m <sup>3</sup> |     |          |
| Aluminum Oxide              | 15 mg/m <sup>3</sup> (total)<br>5 mg/m <sup>3</sup> (resp) |                     |     |          |

#### FIRE AND EXPLOSION DATA

Fire and Explosion Hazard: Negligible fire hazard when exposed to heat or flame.  
Firefighting Media: Dry Chemical, Carbon Dioxide, Water Spray or Foam  
For large fires, use water spray, fog or alcohol foam  
Firefighting: No acute hazard. Move container from fire area if possible. Avoid breathing vapors or dust; Keep Upwind.  
First Aid:

Dilute the poison immediately with large amounts of water or milk and remove by gastric lavage unless the victim is already vomiting. (Dreisbach,

Handbook of Poisoning, 12th ed.) get medical attention immediately.  
Administration of gastric lavage should be performed by qualified medical personnel.

Carcinogens: Contains no substance found to be carcinogenic by NTP/ARC or OSHA.

#### PRECAUTIONS FOR SAFE HANDLING AND USE

Storage and Disposal: Observe all Federal, State and Local regulations when storing or disposing of this substance. For assistance, contact the District Director of the Environmental Protection Agency.

Protective Equipment:

Ventilation- Provide local exhaust or process enclosure ventilation to meet published exposure limits.

Respirator- The specific respirator selected must be based on contamination levels found in the work place, must not exceed the working limits of the respirator and be jointly approved by the national institute for occupational safety and health and the mine safety and health administration (NIOSH-MSHA).

Clothing- Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

Gloves- Employee must wear appropriate protective gloves to prevent contact with this substance.

Eye Protection- Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

Emergency Eye Wash- Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

REFER TO MATERIAL SAFETY DATA SHEET FOR MORE INFORMATION

08/18/2000

# MATERIAL SAFETY DATA SHEET

## COPPER RICH MATERIAL

Creation Date: 01/30/91

Revision Date: 08/03/10

Jarden Zinc Products  
2500 Old Stage Road  
P.O. Box 1890  
Greeneville, Tennessee 37744-1890

Emergency Number:

For Spills -- CHEMTREC 1 -(800)-424-9300

For General Information -- Hollie Binkley, EH&S Director  
423-639-8111 Ext. 416

This information is believed to be accurate and represents the information currently available to us. However we make no warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes.

### SUBSTANCE IDENTIFICATION

Substance: Copper Rich Material

Synonyms: Copper Rich Sludge, Copper Smelter Feedstock

### COMPONENTS AND CONTAMINANTS

Hazardous Component(s):

Cupric Oxide (15-30%)  
Aluminum Oxide (5-10%)  
Silicon Dioxide(0.5-2.0%)  
Water (40-65%)

CAS-Number 1317-38-0  
CAS-Number 1344-28-1  
CAS-Number 7631-86-9

**Exposure Limits:**

| Compound                     | TWA  |                     | SARA 313 |
|------------------------------|--|---------------------|----------|
|                              | OSHA   | NIOSH               |          |
| Copper as Cu (Dust and Mist) | 1 mg/m <sup>3</sup>  | 1 mg/m <sup>3</sup> | *        |
| Silica, amorphous            | 80 mg/m <sup>3</sup> +<br>%SiO <sup>2</sup>                | 6 mg/m <sup>3</sup> |          |
| Aluminum Oxide               | 15 mg/m <sup>3</sup> (total)<br>5 mg/m <sup>3</sup> (resp) |                     |          |

**PHYSICAL/CHEMICAL CHARACTERISTICS**

Description: Dark Brown Cake

Melting Point: 2,419 F (1,326 C)

Solubility in Water: Insoluble

**FIRE AND EXPLOSION DATA**

Fire and Explosion Hazard: Negligible fire hazard when exposed to heat or flame.

Fire fighting Media: Dry Chemical, Carbon Dioxide, Water Spray or Foam

For large fires, use water spray, fog or alcohol foam

Fire fighting: No acute hazard. Move container from fire area if possible. Avoid Breathing vapors or dust; Keep Upwind.

**REACTIVITY**

Reactivity: Stable under normal temperatures and pressures.

**Incompatibilities:**

Aluminum: possible explosion when heated.

Anilinium Perchlorate: Possible explosion and thermal decomposition.

Boron: Possible violent exothermic reaction upon warming.

Cesium Acetylene Carbide: Possible explosion at 350 C.

Dichloromethylsilane: Possible ignition.

Hydrazine: Vigorous reaction.

Hydrogen: Possible explosion hazard.

Hydrogen Sulfide: Hydrogen Sulfide is readily oxidized and may ignite upon contact.

Hydrogen Trisulfide: May cause violent decomposition and ignition.

Hydroxylamine: Vigorous reaction.

Magnesium: Possible incandescence and explosive reaction.

Phospham: May decompose with incandescence.

Phthalic Anhydride: Possible violent explosion.

Potassium: May incandesce and reduce to copper metal.

Rubidium Acetylide and Acetylene Carbide: Incandescence and vigorous reaction at 350 C.

Sodium: May reduce with incandescence.

Titanium: May react violent when

heated. Zirconium: Possible explosion.

Decomposition: Thermal decomposition may release toxic and/or hazardous gases.

Polymerization: Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

### HEALTH EFFECTS AND FIRST AID

#### Inhalation:

Acute Exposure- Inhalation of copper dust may cause irritation of the upper respiratory tract or an illness similar to the common cold with sensations of chills and stuffiness of the head.

Chronic exposure- Prolonged inhalation of dust or mist of copper salts may cause congestion of the nasal mucus membranes, sometimes of the pharynx, and on occasions ulceration and perforation of the nasal septum, atrophic changes in the mucous membranes were noted in subjects exposed to complex copper salts for long periods of time. Inhalation of copper compounds has caused injury to the lungs and liver with hemochromatosis in animals.

#### First Aid:

Remove from exposure area to fresh air immediately. If breathing has stopped, perform artificial respiration. Keep person warm and at rest. Treat symptomatically and supportively. Get medical attention immediately.

#### Skin Contact: Irritant.

Acute Exposure- May cause irritation. Copper salts have been reported to cause an itching papulovesicular, skin discoloration, and eczematoid lesions.

Chronic Exposure- Repeated or prolonged contact with some copper salts has resulted in irritation, necrosis, and greenish skin discoloration. Allergic contact dermatitis, although rare, has been reported.

Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and large amounts of water until no evidence of chemical remains (Approximately 15-20 Minutes). Get medical attention immediately.

#### Ingestion:

Acute Exposure- Ingestion of copper salts may cause an immediate metallic taste, salivation, nausea, epigastric burning, vomiting, diarrhea, ulcers, hemorrhagic gastritis, anuria, coma, convulsions and death.

Chronic Exposure- Repeated or prolonged exposure to copper salts has produced hemolytic anemia and liver, kidney, and spleen damage in animals.

**First Aid:**

Dilute the poison immediately with large amounts of water or milk and remove by gastric lavage unless the victim is already vomiting. (Dreisbach, Handbook of Poisoning, 12th ed.) get medical attention immediately. Administration of gastric lavage should be performed by qualified medical personnel.

**Carcinogens:** Contains no substance found to be carcinogenic by NTPIARC or OSHA.

**PRECAUTIONS FOR SAFE HANDLING AND USE**

**Storage and Disposal:** Observe all Federal, State and Local regulations when storing or disposing of this substance. For assistance, contact the District Director of the Environmental Protection Agency.

**Protective Equipment:**

**Ventilation-** Provide local exhaust or process enclosure ventilation to meet published exposure limits.

**Respirator-** The specific respirator selected must be based on contamination levels found in the work place, must not exceed the working limits of the respirator and be jointly approved by the national institute for occupational safety and health and the mine safety

a  
and health administration (NIOSH-MSHA).

**Clothing-** Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

**Gloves-** Employee must wear appropriate protective gloves to prevent contact with this substance.

**Eye Protection-** Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

**Emergency Eye Wash-** Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

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RGM/HB