

US EPA ARCHIVE DOCUMENT

## **APPENDIX A**

### **DATA ON AVAILABLE STABILIZATION CAPACITY**

This appendix has three sections:

**A-1:** Describes the information the Agency collected from selected treaters on available stabilization capacity for Phase IV mineral processing and TC metal wastes. Includes an overview of the Agency's approach, summarizes the results, and provides phone logs.

**A-2:** Discusses available capacities for metal waste stabilization and metal recovery for meeting the Phase IV TC metal and mineral processing waste LDR standards.

**A-3:** Provides a phone log of calls to TSDs who stabilize D008 and other TC-metal hazardous wastes.

**A-4:** Summary of meeting with representatives of Chemical Waste Management, Inc. to discuss comments and data related to Phase IV

**A-5:** Summary of minutes of April 30, 1996, meeting of EPA and representatives of lead recovery from batteries

## Appendix A-1

### ANALYSIS OF AVAILABLE STABILIZATION CAPACITY FOR PHASE IV WASTES

This appendix describes the information the Agency collected from selected treaters on available stabilization capacity for Phase IV mineral processing and TC metal wastes. The appendix is divided into three parts. Section 1.0 provides an overview of the Agency's approach, Section 1.2 summarizes the results, and Section 1.3 provides phone logs.

#### 1.0 Approach

The Agency's approach for evaluating available stabilization capacity for Phase IV TC metal and mineral processing wastes involved six main steps:

1. Develop interview guide;
2. Identify interviewees (e.g., commenters);
3. Conduct preliminary interviews for a few interviewees;
4. Modify interview guide to address problem areas identified in conducting preliminary interviews;
5. Finish interviews; and
6. Incorporate other information and conduct follow-up activities.

In Steps 1 and 2, EPA developed a preliminary interview guide and identified several commercial treaters and organizations who submitted comments to the proposed Phase IV rule.<sup>1</sup> Also, some treaters were identified from BRS data reviews<sup>2</sup> and previous interviews.<sup>3</sup> In Step 3, EPA conducted a few preliminary interviews and, based on the results, refined the draft interview guide to clarify questions and target key areas. The final phone interview guide used questions such as the following (individually tailored somewhat depending on data supplied previously):

1. How much waste do you treat? How much of this waste is hazardous, as defined under RCRA (i.e., RCRA Subtitle C wastes)? How much of the waste that your

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<sup>1</sup>These treaters were interviewed as follow-up to comments and thus did not count toward the limited number of non-federal employees who can be contacted pursuant to the Paperwork Reduction Act

<sup>2</sup>Raghuvan, Raghu, and Jim Laursen, Memorandum to Bill Kline and C. Pan Lee: Status Report on the Available Capacity Assessment for TC Metal and Mineral Processing Wastes. ICF Inc., June 1996.

<sup>3</sup>Schwartz, Stephan. Memorandum to Stan Moore and Suzanne Wade: Phone Calls to TSDs Who Stabilize D008 and Other TC-metal Hazardous Wastes. Versar Inc., May 1996.

**EXHIBIT 1  
SUMMARY OF PHONE LOG RESULTS**

Treater	Degree of Difficulty		Maximum Practical Capacity		Utilized Capacity	Need for Other Treatment	Additional Treatment Needed for:						Organic UHCs	
	Time	Cost	On site	Off site			Individual Standards							
							Cd	Pb	Se	Cr	As	Ni		Mixed Constituents
Chemical Waste Management Carlyss, LA	Minimal	Initial \$1000/waste stream; additional \$5-20/ton	200,000 gal/dy (234,000 tons/yr <sup>a</sup> )			75% incinerated to meet organic LDRs		X	X	X			X	X
Chemical Waste Management Oakbrook, IL	6 mths	Initial \$1000/waste stream				Incineration of organics		X	X	X			X	
Environmental Enterprises	3-5 yrs(due to permit modifications)				15,000 tons/yr	Incineration of organics								X
Environmental Quality, Inc. Detroit, MI	Minimal		360,000-450,000 tons/yr		300,000 tons/yr									
Envrionmental Technologies, Inc. King of Prussia, PA	4 wks		70,000 tons/yr	70,000 tons/yr		Low-level radioactive/TC metal wastes								
EnviroSafe	Minimal		150,000-200,000 tons/yr		Ohio: 1,000 tons/dy (260,000 tons/yr <sup>a</sup> ) Idaho: 100,000 tons/yr	Organic UHCs								X
GNI (Disposal Systems) Deer Park, TX	Minimal		1,159,000 tons/yr		333,000 wet tons of liquid wastes/yr 2,400 tons of solids/yr		X		X		X		X	
Heritage Envrionmental Services Indianapolis, IN	2 yrs				29,800 tons/yr <sup>b</sup>	Incineration of organic UHCs	X	X		X		X	X	X
LWD Inc. Calvert City, KY	Minimal				38,962 tons in 1995								X	
PDC Peoria, IL	Minimal				41,557 tons/yr <sup>b</sup>	Prior treatment of organic UHCs								X
Rollins Environmental Services Deer Trail, CO	Minimal		200,000 tons/yr		100,000-125,000 tons/yr	Send selenium-bearing wastes off site			X	X				
aEPA estimate														
bFrom 1993 BRS. See Attachment A-1														

### 1.3 Phone Logs

**Mr. Chuck Grant**  
**Environmental Manager**  
**Chemical Waste Management**  
**Location: Carlyss, LA**  
**Phone: 318-583-3774**  
**Fax: 318-583-4615**  
**Interview conducted by: Gillian Foster**  
**Date of interview: August 23, 1996**

Mr. Grant responded that their facility does treat Phase IV wastes, and plans on continuing treatment in the future. Approximately 25 percent of the wastes are treated to LDR standards, while 75 percent of the wastes are incinerated to meet organic LDRs, but need metals stabilization. Approximately 200,000 gallons/day of waste can be treated to UTS on site at the facility. Their facility will need to implement modifications to the types and quantities of reagents needed to treat various waste types in their stabilization facility. The time needed to modify recipes for treatment should be minimal. They estimate that it will cost approximately \$1000 per waste stream to develop new recipes. It is also estimated to increase treatment costs from \$5 to \$20 per ton. Approximately 20 to 30 percent of TC metal only waste streams have constituent concentrations above TC or UTS levels that would require additional or modified treatment. For these waste streams, meeting individual standards for selenium, chromium, and lead are going to be problematic. They recommend that the limit be set at 3.0 ppm TCLP for all three metals. They will not be able to treat TC metal-only wastes with organic UHCs because of Subpart CC.

**Mr. Mitch Hahn**  
**Chemical Waste Management**  
**Location: Oakbrook, IL**  
**Phone: 630-572-8800**  
**Interview conducted by: Gail Shaw**  
**Date of interview: September 10, 1996**  
**Date of follow-up interview: January 2, 1997**

Mr. Hahn responded that only hazardous waste is received for treatment at their facility, and Phase IV wastes are treated. Treatment is 100 percent on site. They have fixed stabilization tanks at their landfills. The quantity of Phase IV wastes that can be treated to UTS depends on the treatment method. Approximately 70 to 80 percent of the wastes can meet the lower UTS levels for metals, while 20 to 30 percent will require development of new treatment recipes (e.g., different ratios of stabilization agents). Of these 20-30%, 5-10% can not meet the lower standards and will not be accepted by this facility. Applying UHC standards will increase the metal bearing waste streams going to incinerators (i.e., for organics), but there is ample capacity.

There will be problems treating some of the wastes to individual standards. Difficulties with a mixed constituent waste stream depend on the metals, which have different stabilization levels and varying rates of leaching depending on pH. The facility does not know exactly what the impact of organic UHC will be on metal bearing waste streams because those waste streams have never needed to be identified. There will be no modifications made to the physical treatment process. However, all of the waste codes with lowered treatment levels will need to have their treatment recipes looked at to determine if any modifications need made. The difficulty of implementing modifications will vary depending on the difficulty of changes. First, a bench-scale test will be performed in the lab (requiring several days), then at the production level. It could take approximately 6 months to implement recipe modifications depending on when the facility receives the waste streams. The estimated cost is \$1000/profile to re-evaluate and develop a new recipe. Refer to the comments on the proposed rule submitted to EPA for supportive data.

In a follow-up call, Mr. Hahn said that they will not have to change any of their actual physical processes. The lower the standards are, the more difficult it will be to modify the recipes. He noted that meeting the hypothetical UTS levels for barium (D005), chromium (D007), lead (D008), selenium (D010), antimony, nickel, thallium, and vanadium would be easier than what was proposed in the August 1995 proposed rule. Only minor modifications to the treatment recipes, requiring several weeks, may be needed. The facility is working on new data.

**Mr. Gary Davis**  
**Vice President**  
**Environmental Enterprises**  
**Phone: 513-541-1823**  
**Fax: 513-541-1638**  
**Interview conducted by: Gail Shaw**  
**Date of interview: September 23, 1996**  
**Date of follow-up interview: January 7, 1997**

Mr. Davis responded that their facility treats approximately 15,000 tons/year. Approximately 50 percent is hazardous, while the other 50 percent is non-hazardous. He noted that 100 percent of treatment capacity is commercial. They treat Phase IV wastes; 100 percent are treated on site at the facility, and no wastes are part of a treatment train. Less than 50 percent of these Phase IV wastes can be treated to UTS at the present time. In the future, Mr. Davis estimated it could take three to five years to be able to treat to UTS (primarily because the permit would need to be changed). He noted that generally there would be no problems treating to individual standards. Treating a mixed constituent waste stream that has no organic UHCs is not problematic; however, treating a mixed constituent waste stream with organics will be difficult. They will need to be sent off site to an incinerator. Mr. Davis could not estimate what modifications, if any, would need to be made to treatment processes. He estimated it could take

several years, primarily due to changing the permit for part B. The facility can accept very little or no additional Phase IV wastes because they are currently close to capacity. The facility can provide supporting data if requested.

In a follow-up call, Mr. Davis noted that meeting the hypothetical UTS levels for barium (D005), chromium (D007), and lead (D008) would require modifications to both the treatment process and the treatment recipes. Each constituent would require six months to one year to implement the changes. Meeting the UTS levels for antimony and vanadium would need modifications to their treatment recipes, requiring one year to implement. The proposed UTS level for cadmium (D006) could not be met by the facility. Those waste streams would have to be sent off site for treatment. Mr. Davis noted that a UTS level of 0.20 mg/L for cadmium would not be achievable; however, a UTS level of 0.50 mg/L could be met.

**Mr. Scott Maris**  
**Technical Manager**  
**Environmental Quality**  
**Location: Detroit, MI**  
**Phone: 313-699-6230**  
**Fax: 313-699-3499**  
**Interview conducted by: Gail Shaw**  
**Date of interview: September 17, 1996**  
**Date of follow-up interview: January 8, 1997**

Mr. Maris responded that their facility treats 300,000 tons/year. Approximately 50 percent is hazardous, while the other 50 percent is non-hazardous. He noted that 100 percent of the treatment capacity is commercial. They do treat Phase IV waste; 100 percent of what is received on site is treated, and no percentage of the wastes are part of a treatment train. All of the Phase IV wastes can be treated to UTS at the present time and the same is expected in the future. The facility expects no problems treating to individual standards or a mixed constituent waste stream. Also, there will be no problems treating organic UHCs; their facility uses the process of chemical oxidation, with bleach being a common oxidant. No modifications will need made to the treatment process. The facility can accept another 20-50 percent of additional Phase IV wastes, increasing available capacity to 360,000-450,000 tons/year.

In meeting the hypothetical UTS levels, Mr. Maris confirmed in a follow-up call that the facility would have no difficulties. The levels are all the same or higher than the UTS levels they are currently meeting.

**Mr. Joseph DeSipio and Mr. Rick Valiga**  
**Principal**  
**Environmental Technologies, Inc.**  
**Location: King of Prussia, PA**  
**Phone: 610-354-9050**  
**Fax: 610-354-9851**  
**Interview conducted by: Gillian Foster and Gail Shaw**  
**Date of interview: August 27, 1996**  
**Date of follow-up interview: January 2, 1997**

Mr. DeSipio responded that the facility treats 65 percent de-Bevilled wastes and 25 percent TC metals. They also treat a small amount of biological wastes. The facility uses a three-phase treatment system consisting of physical sizing, chemical leaching with acids and reagents, and liquids processing. They extract metals out of the aqueous waste stream into usable concentrations that are sent to industrial processing facilities. The wastewater is neutralized and discharged into the sewer. Solid waste residue is then returned to the soil. In general, approximately 50 percent of the wastes treated are treated off site and 50 percent are treated on site. The interviewee believed that the percentage of wastes accepted at the facility that is part of a treatment train begun at the generator's facility is low. The interviewee estimated that the facility could provide 70,000 tons annually of off site capacity and 70,000 tons annually of on site capacity for typical metal wastes. The only problematic waste stream is TC metal wastes that are also low-level radioactive wastes. The facility does not currently treat these wastes. However, Mr. DeSipio indicated that the facility is planning to treat them in the future. The plant would need 4 weeks to be retrofitted to accept low-level radioactive/TC metal wastes. The dewatering systems for the soils that pass through would need to be expanded to handle increased quantities. The facility can accept almost no additional Phase IV wastes. They expect all individual standards to be met.

In a follow-up call, Mr. Valiga said that the facility would have no difficulties meeting the hypothetical UTS levels. He noted in particular that antimony, beryllium, nickel, thallium, vanadium, and zinc would create no treatment difficulties because they are easily soluble.



**Mr. Rod Bartchy**  
**Vice President of Public Affairs**  
**EnviroSafe**  
**Phone: 1-800-523-0781, ext. 5470**  
**Fax: 215-956-5438**  
**Interview conducted by: Gail Shaw**  
**Date of interview: September 25, 1996**  
**Date of follow-up interview: January 13, 1997**

Mr. Bartchy commented that their facility in Ohio treats 1,000 tons/day of primarily hazardous waste, depending on the level of business. 20,000 tons/year of capacity is available for Phase IV wastes. The facility in Idaho has the design capacity to treat up to 110,000 tons/year of primarily hazardous waste. The facility usually treats less than 50,000 tons/year in terms of actual receipts. 40,000 tons/year of capacity is available for Phase IV wastes. He noted that 100 percent of treatment capacity is commercial. They do treat Phase IV TC metal wastes; 100 percent of Phase IV wastes are treated on site at the facility, and a minority of wastes may be part of a treatment train. Most of these Phase IV wastes meet the UTS at the present time, and would not be a problem in the future. There would be no problems treating to individual standards or treating a mixed constituent waste stream. However, the facility can not treat organic UHCs. No modifications will need made to the treatment process except perhaps minor additive changes. Mr. Bartchy estimated the facilities could currently accept another 150,000 - 200,000 tons of additional Phase IV wastes. The facility can provide supporting data if requested.

In a follow-up call, Mr. Bartchy said that the facility would have no difficulties meeting the hypothetical UTS levels.

**Mr. Warren Norris**  
**Sales Manager**  
**GNI (Disposal Systems)**  
**Location: Deer Park, TX**  
**Phone: 713-930-0350**  
**Fax: 713-930-2511**  
**Interview conducted by: Gillian Foster**  
**Date of interview: August 21, 1996**  
**Date of follow-up interview: Left messages January 2 and January 8, 1997**

Mr. Norris responded that their facility treats mineral processing wastes and wastes that fail the TC metals only. The facility does not conduct off site treatment, only on site at the facility. None of the wastes are pretreated before reaching the site. The facility accepts liquid wastes that undergo oil removal (reclaimed for heat value), dewatering, and filtration. The liquid phase is deep well injected. The facility holds a no-migration petition variance. The solid phase is stabilized on site or shipped off site for incineration. The facility manages 333,000 wet tons of

liquid wastes before treatment per year. The facility has a capacity of 1,159,000 tons per year. The facility also manages 2,400 tons of solids per year. All volumes are approximate. None of the waste streams will cause the facility to make modifications in their treatment process. Approximately 50-75 percent of TC metal waste streams have constituent concentrations above TC or UTS levels. Mr. Norris expects that all TC and UTS standards will be able to be met for the TC metal waste streams. He noted that cadmium stabilization is difficult, although not impossible. Selenium does not stabilize well, and arsenic is very soluble and leaches readily. The facility handles arsenic by mixing the waste with aqueous wastes or water and then deep wells the arsenic containing liquid phase.

**Mr. Terry Farrell**  
**Heritage Environmental Services**  
**Location: Indianapolis, IN**  
**Phone: 317-486-2726**  
**Fax: 317-249-2046**  
**Interview conducted by: Gillian Foster**  
**Date of interview: August 20, 1996**  
**Date of follow-up interview: Left message January 8**

Mr. Farrell responded that their facility does not treat a significant volume of de-Bevilled wastes, if at all, and they do not accept TC organic waste streams. Approximately 60 percent of the wastes they stabilize are generated by their on site treatment facility. This facility treats plating wastes, acids, and caustic liquid wastes through metals precipitation and treatment. The treated wastewater is then filtered in a filter press that generates a liquid, which is discharged to a sewer, and a filter cake, which is stabilized and disposed in a landfill. About 40 percent of their waste stream is filter cake that arrives from off site for stabilization and disposal. In order to meet the UTS for underlying organics, the facility has two options: 1) pre-screen waste materials against organics and refuse those waste streams; 2) undergo a "significant facility expansion" by adding a treatment process to the treatment train that will address organics (e.g., chemical oxidation, or thermal treatment). The second option could take two years for the permit modification approval process, engineering, and construction. The time period would depend upon the type of permit modification that is required (e.g., Class I, II, or III). Almost 100 percent of the TC metal waste streams have constituent concentrations above TC or UTS levels that would require additional or modified treatment. Metals with organic UHCs are problematic at this facility. Their process is geared towards handling characteristic metals only. At the least, additional analytical expense would incur. Mr. Farrell believes that Phase IV would force waste streams to incineration because many waste metal waste streams would need to be incinerated for the organic UHCs. In a mixed constituent waste stream, nickel is the hardest constituent to stabilize. Lead, chromium, and cadmium follow nickel in stabilization difficulty. Cyanides present in the filter cake received from off site could require oxidation or chlorinating to meet the UTS.

**Ms. Kim Knotts**  
**Environmental Coordinator**  
**LWD Inc.**  
**Location: Calvert City, KY**  
**Phone: 502-395-8313**  
**Fax: 502-395-8153**  
**Interview conducted by: Gail Shaw**  
**Date of interview: September 17, 1996**  
**Date of follow-up interview: January 2, 1997**

Ms. Knotts responded that in 1995, their facility treated 35,320 tons of hazardous waste through incineration. Another 10 percent was non-hazardous. Additionally, 3,642 tons of hazardous waste and non-hazardous waste was treated through chemical stabilization (35 percent being non-hazardous). She noted that 99 percent of the treatment capacity is commercial. The facility does treat Phase IV waste; 100 percent can be treated to UTS at the present time and the same is expected in the future. The facility expects no problems treating to individual standards. There will be also be no problem treating organic UHCs; the facility will vary their stabilization process, using different chemicals to drive off the organics. Treatment problems may occur with mixed metals. No modifications will need to be made to the treatment process, except minor changes in stabilization processes for mixed metals. A few weeks will be necessary for these minor modifications.

In a follow-up call, Ms. Knotts noted that the facility has not tried to meet levels as restrictive as the hypothetical UTS levels.

**Mr. Mark Rein**  
**Assistant VP of Environmental Affairs**  
**PDC**  
**Location: Peoria, IL**  
**Phone: 309-688-0760**  
**Fax: 309-688-6801**  
**Interview conducted by: Gail Shaw**  
**Date of interview: September 17, 1996**  
**Date of follow-up interview: January 2, 1997**

Mr. Rein responded that the facility receives only hazardous waste for treatment. Phase IV wastes (30-40 percent of the waste stream) are treated; 100 percent of wastes received on site are treated. Approximately 30-40 percent of the waste stream is part of a treatment train. He noted that 90 percent of Phase IV wastes can be treated to UTS at the present time and the same

is expected in the future. No problems are expected in treating to individual standards or a mixed constituent waste stream. There will be a problem with organic UHCs. Their facility does not have the capability to treat UHCs. They are treated off site at another facility prior to being received at this facility. No modifications will be made to the treatment process. Refer to the comments on the August 1995 proposed rule submitted to EPA for supporting data.

In meeting the hypothetical UTS levels, Mr. Rein commented that the facility would have no difficulties except with lead (D008). For this constituent, the treatment recipes would need to be modified, requiring approximately one month.

**Mr. Richard Grondin**  
**Technical Manager**  
**Rollins Environmental Services**  
**Location: Deer Trail, CO**  
**Phone: 970-386-2293**  
**Fax: 970-386-2262**  
**Interview conducted by : Gillian Foster**  
**Date of interview: August 21, 1996**  
**Date of follow-up interview: January 10, 1997**

Mr. Grondin responded that 1 percent of their facilities' total waste stream is de-Bevilled wastes. Approximately 50 percent of the total waste stream is TC for metals only wastes. The facility does not conduct off site treatment, only on site at the facility. Twenty percent of its solid waste stream is comprised of incinerator residuals received from off site. Rollins provides stabilization, chemical precipitation, chemical reduction, chemical oxidation, and on site disposal in a Subtitle C landfill. The facility presently receives approximately 100,000 tons to 125,000 tons per year of waste that can be treated to UTS. The total capacity at the facility is approximately 200,000 tons per year. Approximately 99 percent of the waste stream is solid waste and only 1 percent is liquid waste. Treating selenium (D010) through stabilization to UTS is impossible at this facility. They generally exclude waste streams with high concentrations of selenium—currently five to ten tons per year. D010 wastes comprise less than 1 percent of the total waste treated at the facility. The UTS level for selenium is unachievable due to several factors: 1) selenium is an amphoteric metal; it is leachable in many matrices at both low and high pHs; 2) selenium cannot be reduced or oxidized efficiently; 3) the optimum pH for selenium stabilization is between 6 and 7. However, at pH 6-7, all other TC metals will readily leach from the matrix at levels above the TCLP and UTS standards. As a result, many selenium bearing wastes are sent to Canada for disposal. Mr. Grondin believed that the Phase IV LDRs would result in more D010 waste shipped to Canada for disposal. In treating chromium (D007), the facility will have to increase the amount of reagent used, thus increasing the cost. D007 wastes comprise 10 percent of the total waste stream. Generally though, no extensive modifications to the treatment processes will be necessary. Except for selenium, there should be no problem treating all other TC metal wastes and de-Bevilled wastes to UTS.

In meeting the hypothetical UTS levels, Mr. Grondin commented that the facility would have no difficulties except with selenium (D010), which could not be treated. For this constituent, he noted that a UTS level of 5.7 would be achievable.

In addition to phone conversations, a site visit to Deer Trail was conducted by Mr. Howard Finkel, Project Manager at ICF Incorporated, on August 20, 1996.



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June 14, 1996

**MEMORANDUM**

**To:** Bill Kline and C. Pan Lee, EPA

**From:** Raghu Raghavan and Jim Laurenson

**Subject:** Status Report on the Available Capacity Assessment for TC Metal and Mineral Processing Wastes.

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This memorandum addresses available capacities for metal waste stabilization and metal recovery for meeting the Phase IV TC metal and mineral processing waste LDR standards. We are currently conducting the following activities:

- We are combining and substantially updating the discussion of available commercial treatment capacity given in the background document for the capacity analyses supporting the proposed LDR rule.
- We have conducted a preliminary review of the biennial reporting system (BRS) for 1993 to identify commercial facilities providing metal waste stabilization and metal recovery capacities.
- We have compiled BRS information on the maximum operational capacity and utilized capacity for various treatment systems providing stabilization or metal recovery at these facilities.
- We have compared the BRS information with the results of the capacity analysis performed for the Third Third LDR rule (1990).
- We are in the process of contacting companies who are operating selected commercial facilities to improve our data and understanding of the available capacity for the wastes affected by the proposed rule.

The remainder of this memo presents our preliminary results of the BRS data review and our activities concerning the contacting of facilities.

A facility required to submit the BRS must complete a separate and independent Form PS for each on-site hazardous waste treatment, disposal, or recycling process system that was existing and operational, for which there were plans to build and start operations, or that was in the closure process. The information given in Form PS includes estimates of the maximum operational and actually used capacities for each system type available on site. After a preliminary review and comparison of data given in the Form PS in 1991 and 1993 BRS, we

decided to focus on the RCRA capacity related information and other data given in Form PS in 1993 BRS for the following metal recovery and stabilization systems:

- Metal Recovery Systems
  - M011 High temperature metals recovery
  - M012 Retorting
  - M013 Secondary Smelting
  - M014 Other metals recovery (e.g., ion exchange, reverse osmosis, acid leaching, etc.)
  - M019 Metals recovery - type unknown
- Stabilization
  - M111 Stabilization/Chemical fixation using cementitious and/or pozzolanic materials
  - M112 Other stabilization
  - M119 Stabilization - type unknown

By using the information given in Form PS to define the commercial capacity availability of each system, we were able to list separately the facilities having commercially available and non-commercial capacities for metal recovery and stabilization. The following lists are attached with this memo as an illustration of the preliminary results of maximum and utilized RCRA capacities that we obtained from use of Form PS in the 1993 BRS:

- Commercial stabilization systems and capacities;
- Non-commercial stabilization systems and capacities;
- Commercial metal recovery systems and capacities; and
- Non-commercial metal recovery systems and capacities.

The attached preliminary tables have been analyzed further by comparing their contents with information on the utilization of capacity given in other forms — Forms WR and GM — in the 1993 BRS. As mentioned before, the BRS information was compared with the results of the capacity analysis performed for the Third Third LDR rule.

Based on the analysis of 1993 BRS completed to-date, it seems that there are nearly 30 operational facilities providing commercial stabilization capacity. The utilized capacity for stabilization appears to be approximately 750,000 tons per year. The maximum operational capacity at these commercial facilities has yet to be confirmed. (For example, the attached table on commercial stabilization indicates that several facilities reported maximum capacities that far exceeded utilized capacities. These data must be confirmed through personal contacts of the facilities or by using other reliable sources of information.) However, it seems that the available stabilization capacity would be more than the previous estimate of 1 million tons per year. The 1993 BRS information also showed that additional stabilization capacity is utilized and available at nearly 60 non-commercial facilities. As for metal recovery, nearly 60 commercial facilities have reported the utilization of approximately 600,000 tons of capacity in 1993. Additional capacity for metal recovery is also being provided at nearly 120 non-commercial facilities. The maximum operational capacity at commercial metal recovery facilities must also be confirmed. (As with stabilization capacity, the attached table on commercial metal recovery shows large differences between maximum and utilized capacities.)

At present, we are trying to improve the data obtained from BRS on maximum operational and utilized capacities for commercial stabilization and metal recovery. It is necessary, however, to improve upon the quality of these numbers through a limited number of phone contacts of selected facilities. It is also necessary to obtain at least some qualitative information addressing the logistics and applicability of existing technologies to meet the UTS for newly identified mineral processing wastes and other TC metal wastes.

We have selected the following six companies to discuss the available capacity for metal waste stabilization:

1. Laidlaw Environmental Services, Inc.
2. Rollins Environmental Services
3. Chemical Waste Management
4. Peoria Disposal Company
5. Gibson Environmental
6. Republic Environmental Systems, Inc.

The first three companies operate commercial hazardous waste landfills in different states and commented on the proposed Phase IV LDR rule. Most of these landfills were reported in EPA's Commercial Treatment/Recovery Data Set (May 1990) and in the 1993 BRS to have stabilization capacity on site. The last three companies listed above were also reported in BRS to have large capacities for metal waste stabilization. All of these companies may be interested in providing available capacity on stabilization for some of the hazardous waste affected by Phase IV LDRs.

We have selected the following six companies to discuss the available capacity for metal recovery:

1. INMETCO, Inc.
2. Quemetco, Inc.
3. Revere Smelting and Refining Corp.
4. Recontek Inc.
5. ETICAM Process
6. Encycle Texas Inc.

INMETCO provided comments on the proposed Phase IV LDR rule. The next two companies showed high utilization of secondary smelting capacity at their facilities. The last three companies were selected due to the need for confirming that they are active in processing a wide range of metal-bearing hazardous wastes, as reported in the capacity analysis background document supporting the proposed rule. We are expecting to resolve some of the major discrepancies between maximum and utilized capacities shown in the attached table on commercial metal recovery systems (e.g., Phibro-Tech, Inc.) without contacting the facilities.

We are asking one or more of the following questions (depending on the information already provided or expected) after contacting the right person in each of these companies:

- What is the maximum capacity for stabilization and/or metal recovery installed at each of the facilities operated by the company? How was this capacity measured?



- When was the facility originally built? What kind of technology confirmation was required before designing, building, or starting operations at the facility?
- What is the current utilization of capacity at each facility? What percentage of capacity is utilized for commercial purposes? Are there any limitations in the use of commercial capacity? What is the non-commercial capacity used for?
- What are the types of capacities available? For example, is stabilization technology based on physical encapsulation or chemical fixation? As another example, what are the metals recovered from the wastes? Are there any technical limitations in the use of technology(ies) used at the facility?
- What types of industries/wastes are being provided with commercially available treatment capacity? Newly-identified mineral processing wastes? Other TC metals required to meet UTS?
- Will the company be interested in building and/or operating on-site metal waste stabilization or metal recovery facilities for selected new customers? Has the company considered or provided similar services in the past? What are the logistics and economic considerations in developing this additional capacity?

In addition to contacting these companies, we are in the process of contacting a few selected trade associations to confirm our new findings on the availability of commercial stabilization or metal recovery capacity, and the feasibility of building new waste treatment capacities on site. We also plan to discuss these topics with some technical specialists in metal waste stabilization or metal recovery. For example, we plan to contact one of the authors of the attached paper on chemical fixation, Gregory Indelicato, to discuss the applicability of new techniques in chemical fixation for hazardous waste treatment.

Please call Raghu Raghavan at 703-934-3417 or Jim Laurenson at 703-934-3648 if you have any questions on this memorandum.

**Commercial Stabilization Systems and Capacities<sup>1</sup>**  
**(Basis:1993BRS-Form PS)**

Facility	Facility Name	System Code	Maximum RCRA Capacity	Utilized RCRA Capacity
COD991300484	HIGHWAY 36 LAND DEVELOPMENT CORP	M111	40,000,000	17,233
CAD980883177	GIBSON ENVIRONMENTAL	M111	1,752,000	47,231
ILD000805812	PEORIA DISPOSAL CO INC	M111	1,167,640	41,557
PAD085690592	REPUBLIC ENVIRONMENTAL SYSTEMS, INC.	M111	547,500	8,862
UTD991301748	USPCI - GRASSY MOUNTAIN FACILITY	M111	468,000	14,880
ALD000622464	CHEMICAL WASTE MANAGEMENT	M111	428,442	57,370
MID000724831	ENVOTECH MANAGEMENT SERVICES, INC	M111	385,804	142,132
IND093219012	HERITAGE ENVIRONMENTAL SERVICES, INC	M111	350,000	29,800
MID074259565	DYNECOL INCORPORATED	M112	224,648	27,243
PAD059087072	MILL SERVICE INC - BULGER	M111	175,000	-
GAD096629282	CWM RESOURCE MANAGEMENT INC	M112	132,919	423
PAD004835146	MILL SERVICE INC - YUKON	M111	130,088	9,558
KYD985073196	LWD SANITARY LANDFILL, INC.	M111	120,000	656
NYD049836679	CWM CHEMICAL SERVICES, INC.	M111	106,392	60,822
OKD065438376	U.S. POLL. CONTROL, INC.-LONE MOUNTAIN	M111	95,200	93,568
OHD045243706	ENVIROSAFE SERVICES OF OHIO INC	M111	80,000	56,500
OHD980568992	ENVIRITE CORPORATION	M112	75,000	41,056
MID096963194	CHEM-MET SERVICES INCORPORATED	M111	73,502	19,960
ILD010284248	CID RECYCLING & DISPOSAL FAC	M111	67,200	2,843
IDD073114654	ENVIROSAFE SERVICES OF IDAHO, INC	M111	52,000	10,920
IND078911146	CHEMICAL WASTE MANAGEMENT OF INDIANA INC	M111	50,700	34,197
PAD010154045	ENVIRITE CORPORATION	M112	50,000	32,267
CTD072138969	ENVIRONMENTAL WASTE RESOURCES INC	M111	40,000	1,323
OHD083377010	ENVIRONMENTAL ENTERPRISES INC	M111	25,200	16,200
OHD000816629	SPRING GROVE RESOURCE RECOVERY INC	M111	15,230	2,116
IND984874230	ROANOKE WASTEWATER TREATMENT PLANT	M111	14,900	7,450
CTD089631956	EAST COAST ENVIRONMENTAL SERVICES	M111	5,000	22
NVT330010000	US ECOLOGY INC	M111	670	40,810
OKD000402396	PERMA-FIX TREATMENT SERV., INC.	M111	107	21
OKD082708371	HUGO RAILCAR	M111	55	32
GAT000001971	GEORGIA DEPARTMENT OF TRANSPORTATION	M111	8	8
OKD007224702	BARTLETT-COLLINS GLASS CO.	M111	4	4
CAT080010101	APPROPRIATE TECHNOLOGIES 11, INC.	M111	-	4
CAT080033681	CHEM-TECH SYSTEMS, INC.	M111	-	-
ILD000608471	CLEAN HARBORS OF CHICAGO INC	M111	-	-
LAD000777201	CHEMICAL WASTE MANAGEMENT	M111	-	50,973
NED981117153	HOUSTON J-M CORPORATION	M111	-	-
OKD096648837	NORRIS SUCKER ROD	M111	-	1
CAD021774559	AMERICAN BRASS & IRON FOUNDRY	M111	-	273
<b>TOTAL QUANTITY FOR COMMERCIAL FACILITIES</b>			<b>46,633,208</b>	<b>868,312</b>

*Louisiana, Texas*

<sup>1</sup> Data in this memorandum has not undergone extensive review by the Agency.

Non Commercial Stabilization Systems and Capacities  
(Basis: 1993 BRS-Form PS)

Facility	Facility Name	System Code	Maximum RCRA Capacity	Utilized RCRA Capacity
ID4890008952	USDOE IDAHO NAT'L ENGINEERING LABORATORY	M111	360,000	-
MID005356860	GMC, INLAND FISHER GUIDE	M111	190,360	107,871
LAD010395127	ROLLINS ENVIRONMENTAL SERVICES	M111	130,000	65
ALD003397569	ACIPCO (AMERICAN CAST IRON PIPE COMPANY)	M111	60,034	2,000
CAD009151671	E I DUPONT DENEMOURS & CO	M111	50,000	18,080
ALD046481032	SANDERS LEAD COMPANY, INC.	M111	44,777	26,019
ILD006271696	OLIN CORP	M112	40,320	1,309
ILD005263157	NORTHWESTERN STEEL & WIRE #2	M111	35,092	27,192
CAD009114919	CHEVRON USA PRODUCTS CO, RICHMOND REFIN	M111	31,590	-
AZ4570024055	DAVIS MONTHAN AFB	M111	25,000	24,167
LAD008184137	SCHUYLKILL METALS CORP	M111	25,000	10,499
IND005146683	THE FORD METER BOX CO., INC.	M112	15,000	1,721
NCD986181451	MANNINGTON CERAMIC TILE	M111	12,000	7,935
OHD032271975	MARION STEEL COMPANY	M112	4,500	3,277
NYD980779540	WEST VALLEY DEMONSTRATION PROJECT	M111	2,865	906
ALD983191966	VIRGINIA CAROLINA CHEMICAL SO	M111	2,500	2,500
VAD065417008	GRIFFIN PIPE PRODUCTS CO	M111	2,300	1,236
IND064708845	KUNKLE FOUNDRY CO.,INC.	M111	1,125	244
GAD033842543	TRI-STATE STEEL DRUM INC	M111	1,040	175
CO7890010526	U.S. DEPARTMENT OF ENERGY - ROCKY FLATS	M111	831	-
ALD095688875	ZENECA INC-COLD CREEK	M112	500	244
FLD984243097	BIO MEDICAL SERVICE CORP	M112	459	137
NM0890010515	U.S. DOE LOS ALAMOS NATIONAL LABORATORY	M111	173	60
MOD006308407	A.B. CHANCE COMPANY ALLEN STREET COMPLEX	M111	150	52
IND121581698	WABASH NATIONAL CORPORATION	M112	117	11
PAD004329835	PENNZOIL PRODUCTS CO ROUSEVILLE REFINERY	M111	100	65
CAD982412165	TOPPAN WEST, INC	M111	75	5
PAD041731670	CERDEC CORP - DRAKENFELD PRODUCTS	M111	75	23
MOT300010022	A C F IND SHIPPERS CAR LINE DIVISION	M111	40	10
MSD033353129	THE CLARION LEDGER	M111	34	34
MSD097909485	RELIABLE ELECTRIC UTILITY PROD	M111	25	12
FLD982120024	BOSTON WHALER INC	M112	24	24
IND056041213	LEER MIDWEST	M111	4	4
OKD000758557	CHROMALLOY DIVISION-OK	M111	3	24
GAD098583909	HERCULES INC OXFORD PLANT	M112	0	0
MOD981709272	IT ANALYTICAL SERVICES ST. LOUIS	M111	0	0
CTD981063431	PFALTZ & BAUER INC	M111	0	0
DC8170024311	NAVAL RESEARCH LABORATORY	M112	0	-
KSD007150477	GNB INCORPORATED	M111	-	170
OKD001824564	AMERICAN AIRLINES, M & E CENTER	M111	-	187
OKD007220148	AMERICAN AIRLINES, COMPOSITE CENTER	M111	-	38
OKD081398612	UNIT PARTS COMPANY	M111	-	212
OKT410010797	GEA RAINEY PLANT #II	M111	-	7
CAD001216548	JOSLYN JENNINGS CORP	M112	-	-
CAD056160336	LITTON IND ELECTRON TUBE DIV.	M112	-	-
CAD982324154	COMPOSITE STRUCTURES	M112	-	-
CO7890010526	U.S. DEPARTMENT OF ENERGY - ROCKY FLATS	M112	-	-
MED001097237	SNS PLASTICS CO INC	M112	-	8
OKD000829440	ZINC CORPORATION OF AMERICA	M112	-	3
VAD003444379	VIRGINIA METALCRAFTERS INC	M112	-	-

**Non Commercial Stabilization Systems and Capacities**  
**(Basis: 1993 BRS-Form PS)**

MOD985821719	MIDAMERICAN TRUCK MAINTENANCE	M119	-	-
OKD000829440	ZINC CORPORATION OF AMERICA	M119	-	3
MD6150004095	NATIONAL INSTITUTES OF HEALTH	M111	-	0
MD6150004095	NATIONAL INSTITUTES OF HEALTH	M112	-	0
<b>TOTAL FOR NON-COMMERCIAL FACILITIES</b>			<b>1,036,112</b>	<b>236,526</b>

**Commercial Metal Recovery Systems and Capacities**  
(Basi: 1993 BRS - Form PS)

Facility	Facility Name	System Code	Maximum RCRA Capacity	Utilized RCRA Capacity
NYD981182769	KBF POLLUTION MANAGEMENT INC	M019	4,035,363	1,757
CAD008488025	PHIBRO-TECH, INC.	M014	2,322,554	608,199
PAD002395887	HORSEHEAD RESOURCE DEVELOPMENT CO INC	M011	300,000	270,000
PAD990753089	GENERAL BATTERY CORP - READING COMPLEX	M013	83,600	3,894
MND006148092	GOPHER SMELTING & REFINING COMPANY	M013	48,000	60,251
ILD984766279	RECONTEK INC	M014	48,000	357
CAD069124717	MICRO METALLICS CORPORATION	M011	28,050	39
ALD046481032	SANDERS LEAD COMPANY, INC.	M013	25,000	5,200
PAD981038227	WORLD RESOURCES COMPANY	M014	24,250	20,446
MOD059200089	DOE RUN CO BUICK SMELTER	M013	21,175	1,339
PAD981110570	HORSEHEAD RESOURCE DEVELOPEMENT CO INC	M011	20,000	1,216
CAD088504881	KINSBURSKY BROTHERS INC.	M014	15,980	10,500
MND981098478	U.S. FILTER RECOVERY SERVICES, INC.	M014	8,655	418
CAD070148432	DREW RESOURCE CORPORATION	M014	8,501	3,346
CAD069124717	MICRO METALLICS CORPORATION	M014	5,976	31
MND985746569	RECYCLIGHTS, INC.	M014	5,622	610
LAD057109449	UOP - SHREVEPORT PLANT	M014	2,600	726
ILD005087630	UNITED REFINING & SMELTING CO	M011	2,500	126
IND093219012	HERITAGE ENVIRONMENTAL SERVICES, INC	M014	2,105	6
CAD001968361	LEARONAL INC	M014	1,142	100
NYD001325661	LEARONAL, INC.	M014	1,004	46
LAD981152903	NEW ORLEANS SILVERSMITHS	M014	890	157
FLD984217877	CHEMICAL POLLUTION CONTROL INC	M019	842	683
MID985567114	CYANO CORPORATION OF MICHIGAN INC.	M014	788	190
NYD048148175	MERCURY REFINING COMPANY INC	M012	510	311
PAD002390961	BETHLEHEM APPARATUS CO INC	M012	375	350
PAD987367216	ADVANCED ENVIRONMENTAL RECYCLING CORP	M012	345	172
OHD061614673	DAYTON WATER SYSTEMS	M014	259	197
CAD981689953	LESHER COMMUNICATIONS INC.	M014	209	23
ILD005087630	UNITED REFINING & SMELTING CO	M014	209	5
CAD982440273	BAY PHOTO LAB INC.	M014	186	80
CAD069138899	J&B ENTERPRISES	M014	133	53
NYD001325661	LEARONAL, INC.	M011	125	6
ILD000675249	AMERICAN CHEMICAL & REFINING	M014	104	52
KS1571924140	MCCONNELL AIR FORCE BASE	M014	104	-
LAD087029872	ALFRED'S PROCESSOR SALES/SERVICE	M014	100	39
PAD089352983	FEDERATED-FRY METALS	M013	83	83
MND981002470	ELECTROCHEMICALS, INC	M014	78	64
MAD000650051	WINDFIELD ALLOY INC.	M014	38	1
NYD086225596	AT&T NASSAU PLACE	M014	38	29
CAD981424732	QUICKSILVER RECYCLING INC	M019	36	32
IND005226949	REMOTE CONTROLS INC.	M014	27	27
NYD086225596	AT&T NASSAU PLACE	M011	25	12
RID001200609	PEASE & CURREN INC	M019	22	7
AZT050010685	ALLIED PRECIOUS METALS RECYCLING CO.	M013	20	60
CAD981424732	QUICKSILVER RECYCLING INC	M014	5	-
RID001200252	TECHNIC INC	M011	5	4
MAD000650051	WINDFIELD ALLOY INC.	M013	3	0

**Commercial Metal Recovery Systems and Capacities**  
**(Basi: 1993 BRS - Form PS)**

RID001200252	TECHNIC INC	M019	2	84
NYD071600100	STATE UNIVERSITY OF NY AT BINGHAMTON	M014	1	0
CAD069138899	J&B ENTERPRISES	M011	0	0
NYD030485288	REVERE SMELTING & REFINING CORPORATION	M013	-	114,362
CAD981160948	PHIBRO-TECH, INC. AKA ENTECH RECOVERY, I	M014	-	560
PAD087561015	INMETCO INC	M011	-	40,168
CAD982411993	MERCURY TECHNOLOGIES INTERNATIONAL	M012	-	-
IND000199653	QUEMETCO, INC.	M013	-	148,548
RID981886104	GANNON & SCOTT INC	M013	-	6
COD983788688	ENVIROSERVE INC.	M014	-	-
IND984891994	BOLIDEN METECH, INC	M014	-	64
MID985619824	NORTRU INCORPORATED	M014	-	-
RID063890214	BOLIDEN METECH INC	M014	-	153
RID981886104	GANNON & SCOTT INC	M014	-	32
IND000718130	REFINED METALS CORPORATION	M013	-	-
MOD030712822	SCHUYLKILL METALS CORPORATION	M013	-	-
CAD981978752	PASADENA CITY COLLEGE	M014	-	-
CAD982523102	PHOTOTEK	M014	-	-
TXD084281575	TEXAS INSTRUMENTS, INC.	M014	-	-
TXD981514383	ALPHA OMEGA RECYCLING, INC.	M014	-	-
TXD988079307	FUJI TRUCOLOR	M014	-	-
TX6213820529	LONGHORN ARMY AMMUNITION PLANT	M014	-	-
	<b>TOTAL QUANTITY FOR COMMERCIAL FACILITIES</b>		<b>7,015,635</b>	<b>1,295,222</b>

**Non Commercial Metal Recovery Systems and Capacities  
(Basis: 1993 BRS- Form PS)**

Facility	Facility Name	System Code	Maximum RCRA Capacity	Utilized RCRA Capacity
LAD008184137	SCHUYLKILL METALS CORP	M013	350,000	6,417
IND000717959	GENERAL BATTERY/EXIDE CORPORATION	M013	240,000	132,923
CAD008344285	DICEON ELECTRONICS INC	M014	127,284	58,687
MAD990886301	ALTRON INCORPORATED	M014	123,853	82,877
CAD980816763	VELIE CIRCUITS INC.	M014	114,679	110,509
MND050730175	HARD CHROME INC	M014	112,594	170,898
CAD983601360	SOUTH BAY CIRCUITS INC	M014	107,381	76,755
PAD990753089	GENERAL BATTERY CORP - READING COMPLEX	M013	106,400	4,956
IAD984568204	UNIVERSAL CIRCUITS INCORPORATED	M014	106,255	38,729
MID006409387	PLASTIC PLATE I	M014	92,160	43,536
MNT280010257	NICO PRODUCTS INC	M014	85,488	54,712
MND980700900	BUREAU OF ENGRAVING, INC - INDUSTRIAL DV	M014	84,762	42,400
CAD008492951	HUGHES MISSILE SYSTEMS CO	M014	72,448	130
MND045976107	PRO-TECH INC	M014	72,195	28,731
MND116224288	PROFESSIONAL PLATING INC	M014	45,872	19,187
PAD005031448	ERIE PLATING COMPANY	M014	45,746	45,746
NJD011417516	PLASTI CLAD METAL PRODUCTS INC	M014	43,853	6,649
MND981089832	UNIVERSAL CIRCUITS, INC.	M014	43,716	25,761
MID981090509	LACKS, AIRLANE	M014	42,952	42,952
FLD004092839	GULF COAST RECYCLING INC	M013	41,000	27,513
CAD983654633	TRUST PRINTED CIRCUITS	M014	33,361	17,608
MND980681589	AVTEC FINISHING SYSTEMS INC	M014	30,901	10,587
MND006481287	JOYNER'S SILVER AND ELECTROPLATING	M014	29,633	15,638
IND980898522	CUSTOM CIRCUITCRAFT, INC.	M014	26,022	15,613
CT4170022020	US NAVAL SUBMARINE BASE	M014	25,500	23
GAD070330576	GNB BATTERY TECHNOLOGIES	M013	25,200	24,010
RID059735761	ADVANCED CHEMICAL COMPANY	M014	18,657	827
ARD981908890	NUCOR YAMATO STEEL	M011	17,000	12,427
CAD009680232	GRAPHIC RESEARCH INC	M014	16,971	2,286
MND006219232	MICOM CORP	M014	13,136	11,259
NYD001273242	QUEENS PLATING COMPANY INC	M014	7,500	1,088
NHD982202673	ABC FABRICATORS INC	M014	6,844	3,332
PAD002116994	TORPEDO WIRE & STRIP INC	M014	4,918	624
MND053422762	UNIVERSAL CIRCUITS INC	M014	4,170	3,963
NYD041293127	R D SPECIALTIES INC	M014	3,753	4
AZD980896310	CONTINENTAL CIRCUITS	M014	3,700	751
MND085114890	TELEX COMMUNICATION INC	M014	3,508	718
AZD980816276	TALLEY DEFENSE SYS	M014	3,123	0
IND075954222	DIVERSFIELD SYSTEM INC.	M014	2,752	440
MAD001411081	RAYTHEON COMPANY	M014	2,717	1,368
MND006253801	SUPERIOR PLATING INC	M014	2,365	647
NYD052782497	NEWSDAY, INC.	M014	2,180	3
MND079731519	UNISYS CORPORATION	M014	1,719	3
CAD982519423	SAN JOSE MERCURY NEWS	M014	1,344	-
MND980615496	ROSEMOUNT AEROSPACE INC.	M014	1,043	518
AZD063274609	CONTINENTAL CIRCUITS CORP	M014	1,000	216
KYD985083625	APPALACHIAN REGIONAL MEDICAL CENTER	M014	957	11
CAD982436172	MULTILAYER TECHNOLOGY, INC.	M014	911	193

Non Commercial Metal Recovery Systems and Capacities  
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KYD074047556	GE AIRCRAFT ENGINES	M014	822	21
CAD983600339	KAISER FOUNDATION HOSPITALS	M014	651	580
DED003913266	OCCIDENTAL CHEMICAL CORPORATION	M012	600	153
GAD980847479	HITACHI CHEMICAL ELECTRO-PRODUCTS INC	M014	506	404
KYD130399363	HUMANA HOSPITAL-UNIVERSITY OF LOUISVILLE	M014	450	24
MOD985801380	MONSANTOA COMPANY	M014	436	108
KYD074051202	LEXINGTON CLINIC	M014	420	24
CAD063110605	CHEVRON PETROLEUM TECH. CO.	M014	415	9
CAD071557029	THE GRASS VALLEY GROUP, INC.	M014	410	98
ALD008163388	OCCIDENTAL CHEMICAL CORPORATION	M012	400	120
MAD981063001	CPC INCORPORATED	M014	375	129
MND981089790	WEST PUBLISHING COMPANY	M014	365	123
MND985668227	PRECISION DIVERSIFIED IND., INC.	M014	311	217
CA2170023152	USNAVY CHINA LAKE NAVAL AIR WPNS STN	M014	288	288
MND083467688	MAYO FOUNDATION	M019	280	240
OKD055943286	GRAPHIC ELECTRONICS	M014	271	-
PAD134752583	BURNDY CORP	M014	258	67
PAD980554570	OSRAM SYLVANIA INC - WARREN	M014	252	39
NHD986466688	CIRCUIT CONNECT INC	M014	250	188
FL2800016121	USAF CAPE CANAVERAL STATION	M014	218	37
NYD045201688	AMERICAN BOARD CO	M014	209	197
MAD001014174	AGFA DIVISION, MILES INC,	M014	204	33
ALD004019642	OCCIDENTAL ELECTROCHEMICALS CORP.	M012	200	88
MDD121338297	CARROLL COUNTY ITEMS	M014	163	16
NYD082788126	GEOMETRIC CIRCUITS, INC.	M014	150	83
PAD003004587	ATOTECH USA INC - STATE COLLEGE	M014	133	21
CAD108148958	SAINT JOSEPH MEDICAL CENTER	M014	125	63
NYD045606480	3M PRINTING & PUBLISHING	M014	125	11
CAD047784574	KETEMA A&E	M014	119	3
LAD062666540	PIONEER CHLOR ALKALI COMPANY	M014	115	33
CAD008314908	SOLAR TURBINES INC-HARBOR DRIVE FACILITY	M019	110	22
CTD983876814	COMPONENT TECHNOLOGIES, INC.	M019	92	64
CAD047297593	NATIONAL SMELTING & REFINING	M014	91	-
NYD002241982	HADCO CORPORATION	M014	87	15
OHD004174827	R.R. DONNELLEY & SONS COMPANY	M014	87	46
MND058330473	ADVANCED FLEX, INC. - PLANT 1	M014	87	13
MAD086538394	RAYTHEON COMPANY	M014	78	9
MNT280010414	UNIVERSITY OF MINN MPLS CAMPUS	M014	66	59
KYD981854987	ST. JOSEPH HOSPITAL	M014	65	32
KYD045739471	AMERICAN GREETINGS CORPORATION	M014	62	3
MND000819268	ALLIANT TECHSYSTEMS, INC T.C. AMMUN.	M014	60	20
NYD049838568	EXCEL PRECISION, INC.	M014	59	14
AKD000643239	BP EXPLORATIOIN ALASKA INC PRUDHOE BAY	M014	58	55
CTD001183763	CIRCUIT WISE INC	M014	54	2
KYD068324037	LEXINGTON HERALD LEADER COMPANY	M014	50	17
NYD987000759	COLOR DATA EAST	M014	50	9
MND982425589	STAR TRIBUNE NEWSPAPER	M014	48	5
CAD076243815	TELEDYNE AIRCRAFT PRODS-CAST PRODS OPS	M014	44	37
NHD081255788	ADVANCED CIRCUIT TECHNOLOGY	M014	42	31
KYD985085166	OUR LADY BELLEFONTE HOSPITAL	M014	40	34



**Non Commercial Metal Recovery Systems and Capacities  
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KY6210020479	USAARMC AND FORT KNOX	M014	38	28
KYD144303864	HARDIN MEMORIAL HOSPITAL	M014	35	25
MND982639775	T.R.C. CIRCUITS INC.	M014	34	7
COD981549413	SAS CIRCUITS INC	M014	33	18
CTD001159557	COMBUSTION ENGINEERING, INC.	M014	32	1
KYD006383665	GATEWAY PRESS INC.	M014	30	12
PA0890090004	US DOE - BETTIS ATOMIC POWER LAB	M014	30	0
MND006147102	QUEBECOR PRINTING INC.	M014	30	15
MAD991289505	CHILDREN'S HOSPITAL CORP.	M014	28	17
CAT080031461	CSUF	M014	25	1
CAD983576760	PROGRESSIVE CIRCUIT PROD	M014	25	1
GA7360015450	VA MEDICAL CENTER	M014	23	8
KYD068135516	HIGHLANDS REGIONAL MEDICAL CENTER	M014	23	23
MD3750832062	FREDERICK CANCER RESEARCH AND DEVELOPN	M014	22	1
MND048166672	INSTANT WEB, INC	M014	22	12
CAD080129000	GENENTECH INC	M014	21	2
FL6800014585	USNASA KENNEDY SPACE CENTER	M014	21	15
NYD033490640	ANDIN INTERNATIONAL	M014	20	7
FLD060240207	MARTIN MARIETTA MISSILE SYSTEMS	M014	18	5
CAT000618603	CHEVRON RESEARCH & TECHNOLOGY	M014	18	1
CA2890012584	LAWRENCE LIVERMORE NATIONAL LABORATOR	M014	18	1
CAD009220898	TELEDYNE RYAN AERONAUTICAL	M014	18	0
COD085270270	BALL AEROSPACE & COMMUNICATIONS GROUP	M014	16	2
FLD004100152	E-SYSTEMS ECI DIV	M014	16	0
UTD980959191	HERCULES AEROSPACE	M014	15	6
MND081138604	ALLIANT TECHSYSTEMS PROVING GROUND	M019	15	0
MND981536006	LITHO SPECIALTIES, INC.	M014	14	12
MED037719846	US DEPRTMENT OF VETERAN AFFAIRS	M014	13	1
CA7170024528	USNAVY NAVAL WEAPONS STN CONCORD	M014	13	1
MND980826457	MCF-STILLWATER	M014	12	0
CTD001183763	CIRCUIT WISE INC	M019	12	1
FLD980841746	MARTIN MARIETTA ELECTRONIC SYSTEMS	M014	12	1
MS6210809871	WATERWAYS EXPERIMENT STATION	M014	11	1
KYD980844757	RIVERPORT IMAGING	M014	10	3
KY5170024173	NAVAL ORDNANCE STATION	M014	10	2
MND985703024	SOURCE, INCORPORATED	M019	10	7
CAT000617597	USC HEALTH SCIENCES CAMPUS	M014	10	8
NYD043835081	AIR TECHNIQUES INC	M014	10	3
FL2570024404	USAF PATRICK	M014	10	7
MDD050793926	TOWSON STATE UNIVERSITY	M014	9	1
VAD000820712	UNIVERSITY OF VIRGINIA	M014	9	5
ME8170022018	US NAVAL AIR STATION	M014	9	1
MND985684620	IMPRESSIONS INC.	M014	8	5
CAD075301390	TELEDYNE AIRCRAFT PRODUCTS	M014	8	7
FLD984225821	HEALTHSOUTH DOCTORS'HOSPITAL	M019	8	6
MND041786930	ADVANCED FLEX, INC. - PLANT 2	M014	8	6
MND985667047	QUEBECOR PRINTING ST. CLOUD, INC.	M014	7	6
FLD004104105	HONEYWELL INC	M014	7	1
KYD985095140	GOOD SAMARITAN HOSPITAL	M014	6	3
MOD071999783	UMSL DANGEROUS CHEMICALS STORAGE BLDG	M014	6	1

Non Commercial Metal Recovery Systems and Capacities  
(Basis: 1993 BRS- Form PS)

ME9570024522	US AIR FORCE BASE - LORING	M014	5	2
NYD002235182	MARTIN MARIETTA CORP AIR FORCE PLNT#59	M014	5	1
NYD981875461	PEPSI-COLA COMPANY	M014	5	8
MND985677210	CONTAINER GRAPHICS CORP	M014	4	2
MAD041710609	TECH-ETCH, INC.	M014	4	1
NMD041358904	NEW MEXICO INST. OF MINING & TECHNOLOGY	M014	4	2
CAT000613372	KCA ELECTRONICS INC.	M014	3	1
KSD980852669	UNIVERSITY OF KANSAS	M014	3	1
CAD099457061	MAGNAVOX ELECTRONIC SYSTEMS CO	M014	3	0
CA1800005034	USNASA AMES RESEARCH CENTER	M014	3	177
CAT000617589	USC UNIV PARK CAMPUS	M014	3	2
MND000819292	ADVANCED FLEX, INC. - PLANT 3	M014	2	1
FL8170023792	USN COASTAL SYSTEMS CENTER	M014	2	0
CAT080033392	CALIFORNIA STATE UNIVERSITY NORTHRIDGE	M014	2	-
MND980792642	MANKATO STATE UNIV	M014	2	1
CAD072518517	BECKMAN INSTRUMENTS INC	M014	2	2
VAD046960449	BABCOCK & WILCOX CO N N F D	M014	1	1
ME7170022019	PORTSMOUTH NAVAL SHIPYARD	M019	1	1
CAD079622569	AEROJET ELECTRONIC SYSTEMS PLANT	M014	1	-
MAD001027325	GARE INCORPORATED	M014	1	0
FLD064824030	MCDONNELL DOUGLAS MISSILE PRODUCTION	M014	1	0
MAD001423631	NORTHEASTERN UNIVERSITY	M014	1	0
NYD000810986	CORNELL UNIVERSITY LIFE SAFETY	M014	1	0
CAD009587700	TELEDYNE ELECTRONIC TECHNOLOGIES	M014	0	0
CAD047791421	CARPENTER TECH. CORP. -SPECIAL PROD. DIV	M014	0	0
MO4213820489	LAKE CITY ARMY AMMUNITION PLANT	M014	0	0
MID041793589	PARLIN INDUSTRIES INCORPORATED	M014	0	0
CTD010174613	KLOCK CO DIV OF WICKES CO INC	M014	0	0
CA1170090020	USNAVY PT LOMA NAVAL COMPLEX	M014	0	0
NYD000799239	SYRACUSE UNIVERSITY (QUAD)	M014	0	2
KSD007233323	KANSAS PLATING INC	M014	0	0
NY6360010312	VAMC - NORTHPORT	M014	0	0
MAD071723563	NEW ENGLAND DEACONESS HOSPITAL	M014	0	0
NHD073976904	GENCORP POLYMER PRODUCTS	M014	0	0
CAD066233966	QUEMETCO, INC.	M013	-	1,609
PAD002330165	EAST PENN MFG CO	M013	-	146
CAD000628032	AIRCRAFT X-RAY LABORATORIES, INC	M014	-	3
CAD001425206	RAYTHEON COMPANY ESD	M014	-	-
CAD008319089	CHROMALLOY ADV TURBINOLGY	M014	-	-
CAD020530846	GDE SYSTEMS INC	M014	-	-
CAD028878015	STANFORD UNIVERSITY HOSPITAL	M014	-	-
CAD069130995	HEWLETT-PACKARD COMPANY	M014	-	-
CAD980673347	U.S. CIRCUIT, INC.	M014	-	-
CAD980737837	SACRAMENTO BEE	M014	-	-
CAD980885941	ALLERGAN MEDICAL OPTICS	M014	-	-
CAD981385958	AMBITECH, INC	M014	-	-
CAD982417172	NAPA PIPE CORP	M014	-	-
CAD982484826	UNIVERSAL CIRCUITS	M014	-	-
CAD990843716	ILC TECHNOLOGY	M014	-	-
CAT000646257	FLIGHT ACCESSORY SERVICE DIV. OF HAWKER	M014	-	-