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August 2, 1996

Michael Petruska
Chief, Waste Treatment Branch
Office of Solid Waste
U.S. Environmental Protection Agency
2800 Crystal Drive
6th Floor
Mail Code 5302W
Crystal City, VA 22202

Dear Mr. Petruska:

As a follow up to our June 6, 1996 meeting and in response to the July 22, 1996 letter to the American Foundrymens Society (AFS) from the Office of Solid Waste-Waste Treatment Branch, the following comments are provided on the impact of the land disposal restrictions (LDR), Phase IV rulemaking on the foundry industry. Specifically, AFS was asked to provide information on the ability and the cost involved to treat foundry waste to meet the universal treatment standards (UTS) levels. Attachments 1 and 2 contain specific analytical data, cost data and information on the variability of foundry waste. The information in attachment 1 is provided by RMT and based on their experience assisting foundries solve solid waste problems.

Waste Volume

As noted in our November 27, 1995 comments, the foundry industry generates 410,000 tons per year of hazardous waste. Of this amount, 110,000 tons is air pollution control dust/sludges (APCDS) and 300,000 is waste sand (WS). A majority (73%) of the APCDS is rendered nonhazardous using inline treatment processes and will be unaffected by LDR-Phase IV. The WS and the remaining APCDS, together totaling 330,000 tons, is either treated in tanks (80%) or shipped offsite (20%) for treatment and disposal or for use in other production processes such as a fluxing material at secondary smelters. Of the quantity treated in tanks, approximately 200,000 tons are treated with iron filings to stabilize lead and/or cadmium.

TREATMENT INCREASES DUE TO UTS REQUIREMENTS

The economics associated with treating wastes to meet the proposed universal treatment standards (UTS) can be addressed, in part, by evaluating increases in dosages of reagents required for effective treatment. In some cases, the same treatment approach and reagent dosages may effectively treat foundry wastes to pass either the existing TCLP criteria and also meet the proposed UTS requirements. On the other hand, increased dosages or alternative chemical additives might be required for treating some wastes.

Examples of foundry wastes that would require additional dosages to meet the proposed UTS are attached to this report as Exhibits 1-6. A brief analysis of the costs associated with the dosage increases is presented in Table 1. Estimates were based upon a delivered cost for chemicals of $300 per ton. Most of the examples outlined in Table 1 demonstrate that a cost increase for treatment chemicals of $15-$30 per ton would be required to treat the wastes to UTS levels.

For the example shown in Exhibit 2, none of the dosages tested was effective in treating the waste to UTS levels, although higher dosages would likely work. Based on the results of studies performed on similar foundry waste materials, it is likely that the dosage increase required to treat this waste to meet the proposed UTS would lie in the 80%-100% range. For this waste material, such a dosage increase would likely cost about $9-$15 per ton of waste.

It is likely that the average cost increase (industry-wide) associated with treating wastes to meet UTS standards would be somewhat less than $15 per ton. However, cost increases for specific wastes could be as high as $30 per ton, as is demonstrated in Table 1. For a facility generating 1,000 tons of such a waste per year, the added treatment cost could be as high as $300,000.

Table 1. Dosages of Chemicals Required to Meet UTS

Exhibit Number	Dosage Required to Meet Existing Phase III Regulations (%)	Estimated Dosage Needed to Meet Proposed UTS (%)	Estimated Dosage Increase (%)	Cost Differential
1	30	40	33	$30
2	5	x	x	x
3	5	15	200	$30
4*	15/20	20/25	33/25	$15/$15
5	15	25	67	$30
6	3	7	133	$12

x Treatment was not effective in meeting UTS in treatability study

* Two dosage schemes were included in study

Ratio IF to Foundry

Information re: How much ~~foun~~ iron filings are in foundry sands.

TEST RESULTS

Not BDAT

SAMPLE	pH$_f$	SCREENING TCLP TEST RESULTS Cadmium mg/L	Copper mg/L	Lead mg/L	Zinc mg/L
Standard TCLP Test					
Untreated	4.8	25		360	2500
* + 10% MgO & 20% TSP	7.0	0.96		<0.2	2.8
+ 15% MgO & 20% TSP	6.9	1.8		<0.2	8.0
** + 20% MgO & 20% TSP	9.3	<0.01	0.029	<0.2	<0.02

* Meets UTS for lead but not for cadmium

** Meets UTS for both lead and cadmium

SOURCE MATERIAL: BAGHOUSE DUST

BENCH SCALE TESTING RESULTS
AUGUST 16, 1990

SAMPLE			TCLP RESULTS		
	pH_s	pH_f	Solution	Cadmium mg/L	Lead mg/L
Untreated	8.9	4.6	2	3.6	450
+ 2.5% TSP	8.5	4.5	2	1.4	14
+ 5% TSP	8.0	5.4	1	0.31	0.7
+ 7.5% TSP	7.4	5.0	1	0.23	0.4
+ 2.5% H_3PO_4	7.6	5.3	1	0.36	1.5
+ 5.0% H_3PO_4	7.3	5.2	1	0.22	0.5
* + 7.5% H_3PO_4	6.8	5.0	1	0.23	0.3

* Meets UTS for lead but not for cadmium

SOURCE MATERIAL: WASTE SAND

TEST RESULTS PROJECT #:

	SAMPLE	SCREENING TCLP TEST RESULTS pH,	Cadmium mg/L	Chromium mg/L	Zinc mg/L
	Untreated	5.97	6.9	12.3	450
*	+ 5% MgO	7.72	0.96	<0.15	4.2
	+ 5% MgO & 5% $FeSO_4$	7.28	1.18	<0.15	21.6
	+ 5% MgO & 10% $FeSO_4$	6.29	2.91	<0.15	183
	+ 5% MgO & 5% TSP	6.24	1.59	0.45	10.8
	+ 5% MgO & 7.5% TSP	5.89	1.80	2.91	10.2
	+ 7.5% MgO & 5% TSP	6.44	1.14	0.27	13.2
**	+ 7.5% MgO & 7.5% TSP	7.47	<0.15	<0.15	<0.15

* Meets UTS for chromium but not for cadmium

** Meets UTS for both chromium and cadmium

SOURCE MATERIAL: BAGHOUSE DUST

WASTE TREATMENT
BENCH-SCALE TREATMENT TESTING RESULTS

SAMPLE COMPOSITE		pH_s	pH_f	Solution	TCLP RESULTS Cadmium mg/L	Lead mg/L
UNTREATED COMPOSITE 1		9.0	7.4	2	4.4	34
+ 5% MgO & 5% TSP		7.5	7.3	2	0.63	<0.1
UNTREATED COMPOSITE 2		7.1	5.6	2	5.2	14
+ 5% MgO & 5% TSP		8.0	6.3	2	2.1	<0.1
+ 5% MgO & 10% TSP	*	7.4	6.6	2	0.65	<0.1
+ 5% MgO & 15% TSP	**	6.5	9.0	2	<0.005	<0.1
+ 10% MgO & 10% TSP	*	7.8	6.8	2	0.46	<0.1
+ 10% MgO & 15% TSP	**	7.6	9.1	2	<0.005	<0.1
HAZARDOUS WASTE CRITERIA					1.0	5.0

		COMPOSITIONAL ANALYSIS Cadmium	Lead	Zinc
Composite of All 3 Foundries	composit 1	260	5,700	5,900
	composit 2	370	9,400	100,000

* Meets UTS for lead but not for cadmium

** Meets UTS for both lead and cadmium

SOURCE MATERIAL: WASTE SAND

TEST RESULTS

RMT, INC
March 9, 1995

Project #:

	SCREENING TCLP TEST RESULTS				
	SAMPLE	pH_f	Cadmium	Lead	Zinc
			mg/L	mg/L	mg/L
	Untreated	5.73	9.4	19.7	1560
	+ 5% MgO & 5% TSP	6.23	4.3	0.7	760
*	+ 5% MgO & 10% TSP	6.65	0.8	<0.2	38
	+ 10% MgO & 5% TSP (A)	6.25	3.7	0.4	480
	+ 10% MgO & 5% TSP (B)	6.75	4.1	0.4	480
*	+ 10% MgO & 10% TSP	6.74	0.7	<0.2	34
*	+ 15% MgO & 5% TSP	8.27	0.35	<0.2	1.5
**	+ 15% MgO & 10% TSP	9.24	<0.05	<0.2	<0.05
**	+ 15% MgO & 15% TSP	9.07	<0.05	<0.2	<0.05

* Meets UTS for lead but not for cadmium

** Meets UTS for both lead and cadmium

SOURCE MATERIAL: BAGHOUSE DUST