



**ADDENDUM**  
**MIDLOTHIAN CUMULATIVE RISK ASSESSMENT**

Center for Combustion Science and Engineering  
Multimedia Planning and Permitting Division  
U.S. Environmental Protection Agency  
Region 6  
Dallas, TX 75202

October 31, 1997



In January 1996, the United States Environmental Protection Agency (USEPA) published the Midlothian Cumulative Risk Assessment (Midlothian Risk Assessment) that examined possible health risks associated with emissions from Chaparral Steel, North Texas Cement, Texas Industries, and Holnam Texas, L. P. The conclusion of the Midlothian Risk Assessment was that the available site data showed that potential health risks were below levels of regulatory concern. However, the report also stated that theoretical models indicated that there was a potential for noncancer health effects; primarily from antimony emissions associated with Chaparral Steel Company. Based on new data and revised calculations in this Addendum to the Midlothian Risk Assessment, the first conclusion originally stated in the report should be revised to read:

Neither available site data or conservative theoretical models show that there are cancer risks or the potential for non-cancer health effects above regulatory levels of concern.

The second original conclusion that theoretical potential health impacts above regulatory levels of concern are due to Chaparral Steel is no longer correct based on the change in the first conclusion. This change is warranted based on new data submitted by Chaparral Steel that predicts much lower emission rates for antimony than those originally estimated by EPA Region 6. As a part of the Midlothian Risk Assessment, the USEPA made theoretical calculations that indicated that antimony in electric arc furnace (EAF) dust from Chaparral Steel may be associated with noncancer health risk. This caused USEPA to look further at antimony concentrations in water and soil in the Midlothian area. As a result of further study, the USEPA concluded that actual soil and water concentrations were much lower than the concentrations predicted by the theoretical model.

In response to concerns identified by EPA in the Midlothian Risk Assessment, Chaparral Steel sampled and analyzed its emissions of antimony from the baghouses and determined antimony concentrations in EAF dust. In the Midlothian Risk Assessment, without the benefit of this site-specific data, the USEPA assumed a value for the concentration of antimony and calculated antimony emissions. Based on the new antimony data, USEPA has concluded that the antimony emission rate assumed in the Midlothian Risk Assessment for Chaparral Steel was too high. For this reason, the theoretical calculations concerning antimony are revised in this addendum.

When the theoretical risk calculations for antimony are revised based on actual antimony emissions and concentrations of antimony in EAF dust, the theoretical exposures from Chaparral Steel do not pose a potential impact to human health. This conclusion is consistent with that reached by USEPA with respect to the actual measured concentrations of antimony in soil and water.

## INTRODUCTION

The Midlothian Risk Assessment evaluates theoretical risks posed by releases of constituents from the Chaparral Steel, North Texas Cement, Texas Industries, and Holnam Texas, L. P. In the absence of specific information regarding concentrations of constituents in emissions from these facilities, the USEPA made assumptions in keeping with emissions profiles from similar facilities. The source of some of this information was a document entitled *Detailed Summary of Information Collection Request Responses For Electric Arc Furnace (EAF) NESHAP* (RTI, 1993). This document is referred to as the ICR in the Midlothian Risk Assessment.

Out of 77 steel facilities surveyed in the ICR, only one reported an antimony concentration in EAF dust. The antimony concentration in EAF dust from the single reporting steel facility was 0.52% or 5200 milligrams per kilogram (mg/kg) (or parts per million, ppm). Because antimony emissions and antimony concentrations in EAF dust from Chaparral Steel were not known prior to the publication of the Midlothian Risk Assessment, the antimony concentration from Chaparral Steel emissions was assumed to be the same as that found in EAF dust from the single facility reporting antimony emissions in the ICR (5200 ppm).

In addition, in its August 1988 report entitled "Best Demonstrated Available Technology (BDAT) Background Document for K061," USEPA found that the concentration range for antimony in EAF dust (K061) was 5.03 ppm to 294 ppm. These concentrations are also well below the 5200 ppm concentration assumed in the Midlothian Risk Assessment. EPA Region 6 chose the more conservative value of 5200 ppm because it felt that such conservatism was warranted given the overall lack of data about the processes used by Chaparral Steel.

In the Midlothian Risk Assessment, the USEPA acknowledged the uncertainty associated with estimation of emissions, indicating that: "The availability and quality of chemical-specific emission rates presented one of the largest sources of uncertainty associated with this screening level assessment." In the case of antimony, uncertainty regarding emission rates resulted in calculated theoretical noncancer risks that are considerably above what would be calculated using actual concentrations of antimony in air, water, and soil. This disparity was illustrated in Section 5 of the Midlothian Risk Assessment.<sup>1</sup>

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<sup>1</sup>For example, noncancer risks posed by ingestion of predicted concentrations of antimony in drinking water were 3. This value is slightly above the value of 1, indicating there may be a concern for potential noncancer effects. However, water samples collected from the Midlothian water supply by the Texas Natural Resource Conservation Commission (TNRCC) did not detect antimony at a concentration of 0.002 mg/L. If it is conservatively assumed that antimony is present at half the detection limit (0.001 mg/L), the calculated risk is 0.05, well below the risk calculated using the antimony concentrations predicted in the Midlothian Risk Assessment.

To lessen the uncertainty regarding antimony emissions and risks calculated using the ICR data, information regarding antimony emissions from Chaparral Steel baghouses and antimony concentrations in EAF dusts is used to re-calculate risks associated with theoretical human exposures to antimony in air, water, and soil. These data are discussed in detail below.

## **OBJECTIVES**

The objective of this addendum is to respond to information regarding antimony emissions from Chaparral Steel baghouses and antimony concentrations in EAF dusts submitted by Chaparral Steel after the Midlothian Cumulative Risk Assessment was finalized. This information slightly changes the conclusions of the report. The overall conclusion of the report—that cancer risks and the potential for noncancer health effects are below regulatory levels of concern—remain unchanged. The changes presented do not affect the EPA's decision about whether or not it should effect some regulatory action above and beyond that undertaken by Texas in the State permitting process.

## **EVALUATION OF NEW DATA CONCERNING CONCENTRATIONS OF ANTIMONY IN FACILITY EMISSIONS**

The best available information was used to estimate antimony emissions. These emission estimates have been used in recalculating risks. Fugitive emissions were calculated using total particulate fugitive emissions presented in the 1995 emissions inventory estimates for the "A" and "B" furnaces, together with the 95% upper confidence limit (95% UCL) of the arithmetic mean antimony concentration for Chaparral EAF dust. EAF dust antimony data used to calculate the 95% UCL are presented in Tables 1 and 2. Additional EAF data not used in these calculations are presented in Table 3<sup>2</sup>. The data from Tables 1 and 2 were subjected to quality assurance-quality control procedures. The 95% UCL antimony concentration calculated from these data was 84.0 ppm. This value was calculated in accordance

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<sup>2</sup> EAF dust antimony data presented in Table 1 are from six EAF dust samples obtained by Chaparral on January 28 through February 8, 1996. The laboratory reports for these analyses are attached to this addendum (Attachment B).

Data presented in Table 2 are the results of antimony analyses of three EAF dust samples obtained during the source emissions survey conducted by METCO Environmental in January and February 1996. During this survey, one sample of EAF dust was obtained from each of the "A," "B," and "C" baghouses. The laboratory reports for these analyses are attached to this addendum (Attachment C).

Table 3 presents the results of analyses performed in February 1996 of EAF dust digestate samples that had been retained as part of Chaparral's ongoing dust analysis program. At the request of Chaparral, Maxim Technologies, Inc. analyzed archived digestate samples for antimony. Since the request came after initial sample preparation, routine quality assurance/quality control (QA/QC) analyses could not be performed. These data do, however, provide an indication of the general range of antimony concentration found in Chaparral's EAF dust, and are consistent with data used for the 95% UCL calculations.

with USEPA guidance presented in Supplemental Guidance to RAGS: Calculating the Concentration Term (USEPA, 1992).

Stack antimony emissions for Baghouses B and C used in these revised risk calculations were measured by METCO Environmental (METCO) during stack sampling conducted as part of a source emissions survey in January-February 1996. Baghouse A antimony emissions were calculated using data also obtained by METCO for inlet flow rates for Baghouse A, Baghouse B stack flow rates, and actual measured Baghouse B antimony emissions. Stack emission rates for antimony are presented in Table 4.

The fugitive, stack, and total (i.e., fugitive + stack) antimony emissions values (in g/sec) obtained in the manner described above are lower than those used by Region 6 in their January 1996 Midlothian Risk Assessment report. A comparison of these emissions values is presented in Table 4.

A more detailed description of the basis for antimony emissions used in this revised risk assessment are presented below in Attachment A.

#### **REVISED RISK CALCULATIONS FOR ANTIMONY EXPOSURE**

Due to the disparity in the measured antimony emissions and antimony concentrations in EAF dust versus the concentration assumed in the Midlothian Risk Assessment, the risks posed by antimony exposure have been revised. With the exception of Chaparral Steel's antimony emissions, all exposure and risk assessment assumptions from the Midlothian Risk Assessment are used in the revised risk calculations. The revised risk assessment calculations resulting from the use of more certain estimates of antimony emissions and EAF concentrations from Chaparral Steel are presented in Table 5.

As presented in Table 5, the hazard indices re-calculated using the Chaparral Steel antimony data are below one. This indicates that the hypothetical adult resident, child resident, farmer, and fisherman in the SCS and Joe Pool Lake watersheds are not predicted to experience any adverse health effects as a result of exposure to modeled concentrations of antimony in air, water, and soil resulting from emissions from Chaparral Steel, North Texas Cement Company, Texas Industries, and Holnam Texas, L. P.

According to the revised calculations presented in this addendum, the conclusions presented in Section 5 of the Midlothian Risk Assessment are revised to state that:

Neither available site data or conservative theoretical models show that there are cancer risks or the potential for non-cancer health effects above regulatory levels of concern.

#### **REFERENCE**

USEPA (United States Environmental Protection Agency) 1992. **Supplemental Guidance to RAGS: Calculating the Concentration Term.** Office of Solid Waste and Emergency Response. PB92-963373. May 1992.

**Table 1**  
**Antimony Concentrations in Chaparral EAF Dust**  
**Sampled on January 28 - February 8, 1996**

<b>Sample No.</b>	<b>Antimony (mg/kg)</b>
01A	64.6
02A	68.0
03A	50.5
04A	54.0
05A	50.7
06A	81.9

**Table 2**  
**Antimony Concentrations in Chaparral EAF Dust**  
**Sampled by METCO in February, 1996**

<b>Sample</b>	<b>Antimony (mg/kg)</b>
Baghouse A	89.2
Baghouse B	55.7
Baghouse C	107.0

**Table 3**  
**Antimony Concentrations in Chaparral Steel EAF Dust**  
**Obtained from Archived Digestate Samples**

Sample No.	Antimony (mg/kg)
01A	59.1
02A	43.2
03A	<20
04A	44.2
05A	39.7
06A	29.9
07A	44.2
08A	34.6
09A	32.7
10A	33.3
11A	<20
12A	33.4
13A	69.8
14A	<20
15A	<20
16A	<20
17A	<20
18A	<20
19A	<20
20A	<20
21A	<20
22A	35.1
23A	33.5
24A	28.8
25A	30.9
26A	29.2
27A	30.5
28A	43.6
29A	47.5
30A	26.6
31A	43.8
32A	51.7

**Table 4**  
**Antimony Emissions for Chaparral Steel Company**

<b>Emissions Source</b>	<b>Best Available Value (g/s)</b>	<b>Midlothian Risk Assessment Estimate (g/s)</b>
Fugitives	0.000061	0.0098
Baghouse A	0.00021	0.0032
Baghouse B	0.00038	0.0081
Baghouse C	0.00038	0.0086
<b>Total</b>	<b>0.0010</b>	<b>0.030</b>

**Table 5**  
**Revised Risk Assessment Calculations for Antimony Exposures**

<b>Receptor</b>	<b>*Hazard Index for Receptor Points A1, B1, and C1</b>		
	<b>A1</b>	<b>B1</b>	<b>C1</b>
Adult Resident	0.02 (3)	0.02 (3)	0.02 (3)
Child Resident	0.039 (6)	0.039 (6)	0.039 (6)
Farmer	0.02 (3)	0.02 (3)	0.026 (4)
Fisherman, SCS Lake Watershed	0.02 (3)	0.02 (3)	0.02 (3)
Fisherman, Joe Pool Lake Watershed	0.02 (3)	0.02 (3)	0.02 (3)

\* For comparison, the hazard index calculated in the January 31, 1996 USEPA risk assessment is shown in parenthesis

Attachment A  
Antimony Emissions Calculations for Chaparral Steel Company

**Attachment A**  
**Antimony Emissions Calculations for Chaparral Steel Company**

- 1) **Total Antimony (Sb) emissions = total fugitive emissions + baghouse (BH) "A" emissions + BH "B" emissions + BH "C" emissions**
- 2) **Fugitive Sb Emissions**  
= furnace "A" fugitives + furnace "B" fugitives  
= furnace "A" total particulates x EAF Sb conc. + furnace "B" total particulates x EAF Sb conc.  
= 12.5 tpy<sup>1</sup> x %0.0084%\* + 12.5 tpy<sup>1</sup> x 0.0084%  
= 0.0021 tons/yr Sb  
= 0.000061 gm/s  
**\*NOTE: Upper 95% UCL Sb concentration for Chaparral EAF dust = 84.0 ppm**
- 3) **BH "A" Sb Emissions<sup>2</sup>**  
= BH "B" emissions x BH "A" Inlet flow/BH "B" stack flow  
= 0.003 lbs/hr x 395,289 ACFM/679,559 ACFM  
= 0.0017 lbs/hr  
= 0.00021 gm/s
- 4) **BH "B" Sb Emissions<sup>2</sup>**  
= 0.003 lbs/hr  
= 0.00038 gm/s
- 5) **BH "C" Sb Emissions<sup>2</sup>**  
= 0.003 lbs/hr  
= 0.00038 gm/s
- 6) **Total Sb Emissions**  
= 0.000061 + 0.00021 + 0.00038 + 0.00038 gm/s  
= 0.001 gm/s

**References**

1. Revised Chaparral Steel Emissions Inventory for 1995.
2. METCO Environmental. Source Emissions Survey of Chaparral Steel Company, Midlothian.

Texas, Volume 1. January and February, 1996.

1:



Attachment B  
Laboratory Report for Table 1 EAF Dust Analyses

# MAXIM

TECHNOLOGIES INC

2575 Lone Star Drive P.O. Box 224227 \* Dallas, Texas 75222 \* 214-631-2700

Client Jerry Balbo  
Chaparral Steel  
300 Ward Road  
Midlothian, TX 76065

Client No. 1544301  
Report No. D6-02-047  
Report Date 02/21/96 15:23

Project EAF Dust

Phone: 214-299-5212 Fax: 214-375-2182

Date Sampled 01/28/96 02/08/96

Sampled By Client

Sample Type Solid

Transported by Bob Garrett

P.O. # CT-145-96

Date Received 02/09/96

SPECIAL REPORT FOR ANTIMONY ONLY - REPORT FOR OTHER EAF DUST  
METALS RESULTS WILL FOLLOW WHEN COMPLETED.

Lab No.

D6-02-047-01  
D6-02-047-02  
D6-02-047-03  
D6-02-047-04  
D6-02-047-05  
D6-02-047-06

Sample Identification

RC 301625  
RC 301769  
RC 301646  
RC 301727  
RC 301762  
RC 301673

Our letters and reports are for the exclusive use of the  
client to whom they are addressed and shall not be reproduced  
except in full without the approval of the testing laboratory.  
The use of our name must receive our prior written approval.

MAXIM

William J. Case  
Reviewed By

William J. Case  
William J Case, Supervisor

Order # D6-02-047  
 02/21/96 15:21  
 Client: Chaparral Steel

TEST RESULTS BY SAMPLE

Sample: 01A RC 301625

Collected: 01/28/96

Category: S

<u>Test Name</u>	<u>Method</u>	<u>Result</u>	<u>Units</u>	<u>Detection Data</u>		
				<u>Limit</u>	<u>Started</u>	<u>Analyst</u>
Antimony	SUB46-6010A	66.6	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SUB46-7130	0.0608	%	0.01	02/28/96	TAM
Calcium Oxide	SUB46-7140	7.09	%	0.01	02/19/96	TAM
Digestion of Dust	SUB46-3050A	02/14/96	Date Com			CWF
Iron Oxide	SUB46-7380	40.0	%	0.01	02/20/96	TAM
Lead Oxide	SUB46-7420	2.35	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.8	%	0.01	02/17/96	NOLI
Magnesium Oxide	SUB46-7460	3.12	%	0.01	02/19/96	TAM
Zinc Oxide	SUB46-7950	22.9	%	0.01	02/20/96	TAM

Sample: 02A RC 301769

Collected: 02/01/96

Category: S

<u>Test Name</u>	<u>Method</u>	<u>Result</u>	<u>Units</u>	<u>Detection Data</u>		
				<u>Limit</u>	<u>Started</u>	<u>Analyst</u>
Antimony	SUB46-6010A	68.0	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SUB46-7130	0.0683	%	0.01	02/20/96	TAM
Calcium Oxide	SUB46-7140	5.67	%	0.01	02/19/96	TAM
Digestion of Dust	SUB46-3050A	02/14/96	Date Com			CWF
Iron Oxide	SUB46-7380	34.8	%	0.01	02/20/96	TAM
Lead Oxide	SUB46-7420	3.21	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.2	%	0.01	02/17/96	NOLI
Magnesium Oxide	SUB46-7460	2.89	%	0.01	02/19/96	TAM
Zinc Oxide	SUB46-7950	29.4	%	0.01	02/20/96	TAM

Sample: 03A RC 301646

Collected: 02/03/96

Category: S

<u>Test Name</u>	<u>Method</u>	<u>Result</u>	<u>Units</u>	<u>Detection Data</u>		
				<u>Limit</u>	<u>Started</u>	<u>Analyst</u>
Antimony	SUB46-6010A	50.5	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SUB46-7130	0.0625	%	0.01	02/20/96	TAM
Calcium Oxide	SUB46-7140	4.94	%	0.01	02/19/96	TAM
Digestion of Dust	SUB46-3050A	02/14/96	Date Com			CWF
Iron Oxide	SUB46-7380	31.9	%	0.01	02/20/96	TAM
Lead Oxide	SUB46-7420	2.44	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.8	%	0.01	02/17/96	NOLI
Magnesium Oxide	SUB46-7460	2.71	%	0.01	02/19/96	TAM
Zinc Oxide	SUB46-7950	32.4	%	0.01	02/20/96	TAM

Order # D6-02-047  
 02/21/96 15:21  
 Client: Chaparral Steel

TEST RESULTS BY SAMPLE

Sample: 04A RC 301727

Collected: 02/04/96

Category: S

Test Name	Method	Result	Units	Detection Date		
				Limit	Started	Analyst
Antimony	SUB46-6010A	54.0	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SUB46-7130	0.0682	%	0.01	02/20/96	TAM
Calcium Oxide	SUB46-7140	4.10	%	0.01	02/19/96	TAM
Digestion of Dust	SUB46-3050A	02/14/96	Date Com			CVM
Iron Oxide	SUB46-7380	34.7	%	0.01	02/20/96	TAM
Lead Oxide	SUB46-7420	2.65	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.4	%	0.01	02/17/96	MOU
Magnesium Oxide	SUB46-7460	2.05	%	0.01	02/19/96	TAM
Zinc Oxide	SUB46-7950	32.4	%	0.01	02/20/96	TAM

Sample: 05A RC 301762

Collected: 02/06/96

Category: S

Test Name	Method	Result	Units	Detection Date		
				Limit	Started	Analyst
Antimony	SUB46-6010A	50.7	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SUB46-7130	0.0612	%	0.01	02/20/96	TAM
Calcium Oxide	SUB46-7140	3.67	%	0.01	02/19/96	TAM
Digestion of Dust	SUB46-3050A	02/14/96	Date Com			CVM
Iron Oxide	SUB46-7380	27.9	%	0.01	02/20/96	TAM
Lead Oxide	SUB46-7420	2.24	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.5	%	0.01	02/17/96	MOU
Magnesium Oxide	SUB46-7460	2.23	%	0.01	02/19/96	TAM
Zinc Oxide	SUB46-7950	38.7	%	0.01	02/20/96	TAM

Sample: 06A RC 301673

Collected: 02/08/96

Category: S

Test Name	Method	Result	Units	Detection Date		
				Limit	Started	Analyst
Antimony	SUB46-6010A	81.9	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SUB46-7130	0.0732	%	0.01	02/20/96	TAM
Calcium Oxide	SUB46-7140	4.14	%	0.01	02/19/96	TAM
Digestion of Dust	SUB46-3050A	02/14/96	Date Com			CVM
Iron Oxide	SUB46-7380	34.1	%	0.01	02/20/96	TAM
Lead Oxide	SUB46-7420	2.77	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.5	%	0.01	02/17/96	MOU
Magnesium Oxide	SUB46-7460	2.24	%	0.01	02/19/96	TAM
Zinc Oxide	SUB46-7950	31.1	%	0.01	02/20/96	TAM

**QUALITY ASSURANCE / QUALITY CONTROL TOTAL METALS**

ANALYSIS	PARAMETER	RESULTS
Cal blank 1	Antimony	<0.1
Cal blank 2	Antimony	<0.1
Prep blank	Antimony	<0.1

ANALYSIS	PARAMETERS	RESULTS %
ICC	Antimony	100

ANALYSIS	PARAMETER	RESULTS %
ICV	Antimony	93
ICS 1	Antimony	89
CCV	Antimony	103
ICS 2	Antimony	102

ANALYSIS	PARAMETER	RESULTS %
LCS	Antimony	102
	Antimony	105

ICV = Initial Calibration Verification  $\pm$  or - 10%  
 ICS = Interference Check Standard ICP ONLY  $\pm$  or - 20%  
 LCS = Laboratory Control Standard  $\pm$  or - 20% and  $\pm$  or - 30% Silver and Antimony  
 ICC = Initial Calibration Check ICP ONLY  $\pm$  or - 5%  
 Blank =  $\leq$  Detection Limit RPD = Relative Percent Difference  $\leq$ 20%

Attachment C  
Laboratory Report for METCO Baghouse Dust Samples (Table 5)

**SOURCE EMISSIONS SURVEY  
OF  
CHAPARRAL STEEL COMPANY  
MIDLOTHIAN, TEXAS  
VOLUME II**

**JANUARY AND FEBRUARY 1996**

**FILE NUMBER 96-15**

Job # 96-155

Client Chaparral Steel

Location Midlothian, TX

UNIT Baghouse Dust

DATE 2-16-98

Sample	Sb mg/Kg	As mg/Kg	Cd mg/Kg	Cr mg/Kg	Cu mg/Kg	Fe mg/Kg	Pb mg/Kg	Mn mg/Kg	Hg mg/Kg	Mo mg/Kg	Ni mg/Kg	Zn mg/Kg
A Baghouse Dust	89.2	146	734	795	1,720	154,000	22,500	20,300	13.9	< 27.9	299	163,000
B Baghouse Dust	55.7	108	556	861	1530	133,000	18,200	19,500	15.4	48	287	128,000
C Baghouse Dust	107	134	735	1,710	2,700	213,000	26,100	24,600	1.4	33.5	172	228,000



CERTIFICATE OF ANALYSIS

t:

Environmental  
 Dooley Road  
 s, TX 75244  
 Hanoch Toren

Work Order #: 96-02-036  
 Client Code: METCO  
 Report Date: 02/15/96  
 Work ID: Multi-metals Trains  
 Date Received: 02/08/96

SAMPLE IDENTIFICATION

<u>Sample Description</u>	<u>Lab Number</u>	<u>Sample Description</u>
Composite B Baghouse Run 1	02	Composite B Baghouse Run 2
Composite B Baghouse Run 3	04	Composite B Baghouse Blank
Composite C Baghouse Run 1	06	Composite C Baghouse Run 2
Composite C Baghouse Run 3	08	Composite C Baghouse Blank
Audit Filter	10	A Baghouse Dust
B Baghouse Dust	12	C Baghouse Dust

Data are reported on an as-received basis unless stated otherwise. Estimated Quantitation Limits (EQL's) are listed for most analytes. EQL's are the lowest concentrations that can be reliably measured under routine laboratory conditions. Unless otherwise noted, method blanks had no targets found above their EQL's and results were not corrected for blanks.

  
 Certificate approved by  
 Peggy J. Schuler



Ross Analytical Services, Inc.  
16433 Foltz Industrial Parkway • Strongsville, Ohio 44136  
(216) 572-3200 • Fax (216) 572-7620 • 1-800-325-7737

CERTIFICATE OF ANALYSIS

ent:

co Environmental  
15 Dooley Road  
las, TX 75244

n: Hanoch Toren

Work Order #: 96-02-037  
Client Code: METCO  
Report Date: 02/15/96  
Work ID: Multi-metals Trains  
Date Received: 02/08/96

SAMPLE IDENTIFICATION

<u>Number</u>	<u>Sample Description</u>	<u>Lab Number</u>	<u>Sample Description</u>
KMnO4 B	Baghouse Run 1	02	HCl B Baghouse Run 1
KMnO4 B	Baghouse Run 2	04	HCl B Baghouse Run 2
KMnO4 B	Baghouse Run 3	06	HCl B Baghouse Run 3
KMnO4 B	Baghouse Blank	08	HCl B Baghouse Blank
KMnO4 C	Baghouse Run 1	10	HCl C Baghouse Run 1
KMnO4 C	Baghouse Run 2	12	HCl C Baghouse Run 2
KMnO4 C	Baghouse Run 3	14	HCl C Baghouse Run 3
KMnO4 C	Baghouse Blank	16	HCl C Baghouse Blank

Data are reported on an as-received basis unless stated otherwise. Estimated Quantitation Limits (EQL's) are listed for most analytes. EQL's are the lowest concentrations that can be reliably measured under routine laboratory conditions. Unless otherwise noted, method blanks had no targets found above their EQL's and results were not corrected for blanks.

  
Certificate approved by  
Peggy J. Schuler

TEST METHODOLOGIES

Mercury was determined in aqueous samples and leachates by cold vapor atomic absorption after acid/permanganate digestion as in EPA Methods 245.1 and 7470A. A single analysis was performed unless otherwise noted.

"Multi-metals train" samples were prepared for analysis according to "Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes", 40 CFR 266, Appendix IX, Section 3.1. Prepared samples were analyzed by Inductively Coupled Plasma Emission Spectroscopy (ICP) as in EPA Method 6010A, unless otherwise noted.

Metals were determined in solid and non-aqueous liquid samples by digestion with nitric acid, hydrogen peroxide, and hydrochloric acid as in EPA Method 3050A, followed by Inductively Coupled Plasma Emission Spectroscopy as in EPA Method 6010A, unless noted otherwise.

Mercury was determined in solid and non-aqueous liquid samples by cold vapor atomic absorption after acid/permanganate digestion as in EPA Methods 245.5 and 471A. A single analysis was performed unless otherwise noted.

Mercury was determined in aqueous samples and leachates by cold vapor atomic absorption after acid/permanganate digestion as in EPA Methods 245.1 and 7470A. A single analysis was performed unless otherwise noted.

000005

Work Order # 96-02-036

Ross Analytical Services, Inc

Reported: 02/15/96

Sample volume

<u>Lab No.</u>	<u>Sample Description</u>	<u>Result</u>	<u>Units</u>	<u>EOL</u>
1D	HNO3 FW B Baghouse Run 1	110	Total mL	5
1E	Imps. BH B Baghouse Run 1	463	Total mL	5
2D	HNO3 FW B Baghouse Run 2	113	Total mL	5
2E	Imps. BH B Baghouse Run 2	455	Total mL	5
3D	HNO3 FW B Baghouse Run 3	105	Total mL	5
3E	Imps. BH B Baghouse Run 3	445	Total mL	5
4D	HNO3 FW B Baghouse Blank	110	Total mL	5
4E	Imps. BH B Baghouse Blank	295	Total mL	5
5D	HNO3 FW C Baghouse Run 1	108	Total mL	5
5E	Imps. BH C Baghouse Run 1	445	Total mL	5
6D	HNO3 FW C Baghouse Run 2	88	Total mL	5
6E	Imps. BH C Baghouse Run 2	445	Total mL	5
7D	HNO3 FW C Baghouse Run 3	107	Total mL	5
7E	Imps. BH C Baghouse Run 3	480	Total mL	5
8D	HNO3 FW C Baghouse Blk	95	Total mL	5
8E	Imps. BH C Baghouse Blank	390	Total mL	5

000006

Work Order # 96-02-037

Ross Analytical Services, Inc

Reported: 02/15/96

Sample volume

<u>Lab No.</u>	<u>Sample Description</u>	<u>Result</u>	<u>Units</u>	<u>EOL</u>
A	KMnO4 B Baghouse Run 1	187	total mL	5
A	HCl B Baghouse Run 1	415	Total mL	5
A	KMnO4 B Baghouse Run 2	390	Total mL	5
A	HCl B Baghouse Run 2	225	Total mL	5
A	KMnO4 B Baghouse Run 3	387	Total mL	5
A	HCl B Baghouse Run 3	218	Total mL	5
A	KMnO4 B Baghouse Blank	385	Total mL	5
A	HCl B Baghouse Blank	220	Total mL	5
A	KMnO4 C Baghouse Run 1	385	Total mL	5
A	HCl C Baghouse Run 1	225	Total mL	5
A	KMnO4 C Baghouse Run 2	390	Total mL	5
A	HCl C Baghouse Run 2	240	Total mL	5
A	KMnO4 C Baghouse Run 3	400	Total mL	5
A	HCl C Baghouse Run 3	200	Total mL	5
A	KMnO4 C Baghouse Blank	380	Total mL	5
A	HCl C Baghouse Blank	222	Total mL	5

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Name: ROSS\_ANALYTICAL\_SERVICES Contract: METCO

Code: ROSS Case No.: SAS No.: SDG No.: BAGHOU

File: ILM03

EPA Sample No.	Lab Sample ID
ABAGDUST	02-036-10A
ABAGDUSTD	02-036-10A-D
ABAGDUSTSD	02-036-10A-SD
ABAGDUSTS	02-036-10A-S
AUDIT	02-036-09A
BBAGBLK	02-036-04A
BBAGDUST	02-036-11A
BBAGR1	02-036-01A
BBAGR2	02-036-02A
BBAGR2D	02-036-02A-D
BBAGR2SD	02-036-02A-SD
BBAGR2S	02-036-02A-S
BBAGR3	02-036-03A
CBAGBLK	02-036-08A
CBAGDUST	02-036-12A
CBAGR1	02-036-05A
CBAGR2	02-036-06A
CBAGR2D	02-036-06A-D
CBAGR2SD	02-036-06A-SD
CBAGR2S	02-036-06A-S

ICP interelement corrections applied ? Yes/No YES

ICP background corrections applied ? Yes/No YES

If yes - were raw data generated before application of background corrections ? Yes/No NO

Comments:

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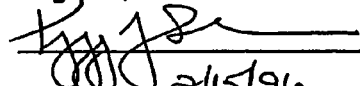


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I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for no less than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or the Laboratory's designee, as verified by the following signature.

Signature:   
2/15/96

Name: Peggy J. Schuler  
Title: Quality Control Chemist



000020



2A  
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Name: ROSS\_ANALYTICAL\_SERVICES Contract: METCO  
 Code: ROSS Case No.: SAS No.: SDG No.: BAGOUI  
 Initial Calibration Source: PLASMA CHEM  
 Continuing Calibration Source: PLASMA CHEM

Concentration Units: ug/L

Element	Initial Calibration			Continuing Calibration				M	
	True	Found	%R(1)	True	Found	%R(1)	Found		%R(1)
Aluminum	5000.0	5342.31	106.8	10000.0	10376.39	103.8	10205.13	102.1	NR
Antimony	5000.0	4965.36	99.3	10000.0	9686.68	96.9	10158.67	101.6	P
Barium									NR
Bismuth									NR
Calcium	500.0	520.22	104.0	1000.0	1011.54	101.2	995.47	99.5	NR
Cadmium	1000.0	1037.39	103.7	2000.0	2029.89	101.5	1992.91	99.6	P
Chromium	1000.0	1030.90	103.1	2000.0	2012.97	100.6	1965.08	98.3	NR
Copper	10000.0	10586.94	105.9	20000.0	21065.06	105.3	20531.04	102.7	P
Lead	5000.0	5177.05	103.5	10000.0	10051.36	100.5	9870.73	98.7	P
Lithium									NR
Magnesium	500.0	512.81	102.6	1000.0	1005.27	100.5	981.08	98.1	NR
Manganese	2.0	2.06	103.0	5.0	5.37	107.4	5.53	110.6	P
Nickel	1000.0	1049.38	104.9	2000.0	2091.87	104.6	2044.09	102.2	CV
Selenium	1000.0	1052.30	105.2	2000.0	2040.16	102.0	1990.92	99.5	P
Silver									NR
Sodium									NR
Zinc									NR
Vanadium									NR
Fluorine	1000.0	985.02	98.5	2000.0	1965.43	98.3	2050.28	102.5	P

Control Limits: Mercury 80-120; Other Metals 90-110; Cyanide 85-115

2A  
INITIAL AND CONTINUING CALIBRATION VERIFICATION

Name: ROSS\_ANALYTICAL\_SERVICES\_ Contract: METCO\_\_\_\_  
 Code: ROSS\_ Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: BAGHOU  
 Initial Calibration Source: PLASMA CHEM\_  
 Continuing Calibration Source: PLASMA CHEM\_

Concentration Units: ug/L

Element	Initial Calibration			Continuing Calibration				M	
	True	Found	%R(1)	True	Found	%R(1)	Found		%R(1)
Barium				10000.0	10237.21	102.4			NR
Boron				10000.0	9963.17	99.6	9512.26	95.1	P
Calcium									NR
Chromium									NR
Cobalt				1000.0	994.67	99.5			P
Copper				2000.0	2009.29	100.5			NR
Iron				2000.0	1979.97	99.0			P
Lead				20000.0	20714.26	103.6			P
Magnesium				10000.0	9889.37	98.9			P
Manganese				1000.0	984.00	98.4			NR
Mercury	2.0	2.10	105.0	5.0	5.17	103.4	5.31	106.2	P
Molybdenum				2000.0	2053.87	102.7			P
Nickel				2000.0	1998.19	99.9			NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Zinc				2000.0	1991.80	99.6	1938.85	96.9	P

Control Limits: Mercury 80-120; Other Metals 30-110; Cyanide 85-115







000047

U.S. EPA - CLP

2B  
CRDL STANDARD FOR AA AND ICP

Name: ROSS\_ANALYTICAL\_SERVICES\_ Contract: METCO\_\_\_\_  
 Code: ROSS\_\_ Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: BAGHOU  
 CRDL Standard Source: \_\_\_\_\_  
 CRDL Standard Source: SOLUTIONS PL

Concentration Units: ug/L

Element	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Barium				400.0	408.41	102.1		
Bismuth								
Calcium								
Cadmium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Lithium								
Manganese								
Mercury								
Nickel								
Niobium								
Platinum								
Potassium								
Selenium								
Silver								
Sodium				40.0	42.89	107.2		
Strontium								
Titanium								
Zinc								



3  
BLANKS

ame: ROSS\_ANALYTICAL\_SERVICES\_ Contract: METCO\_\_\_\_  
ode: ROSS\_ Case No.: \_\_\_\_\_ SAS No.: \_\_\_\_\_ SDG No.: BAGHOU  
ration Blank Matrix (soil/water): WATER  
ration Blank Concentration Units (ug/L or mg/kg): UG/L\_

Element	Initial Calib. Blank (ug/L)		Continuing Calibration Blank (ug/L)						Preparation Blank		M
	1	C	1	C	2	C	3	C	1	C	
Barium	11.5	B	8.5	U	14.4	B	10.3	B	8.500	U	NR
Bromine			18.8	U	18.8	U	-24.6	B	18.800	U	P
Calcium											NR
Chlorine											NR
Copper	0.8	B	1.1	B	0.9	B	1.0	B	0.600	U	NR
Iron	2.6	U	2.6	U	2.6	U	4.9	B	2.600	U	P
Mercury	14.0	U	14.0	U	14.0	U	14.0	U	14.000	U	NR
Manganese	71.7	U	75.8	B	71.7	U	71.7	U	71.700	U	P
Nickel	18.0	B	12.2	B	8.0	U	8.0	U	8.000	U	P
Strontium											NR
Sulfur	-1.0	B	0.8	U	0.8	U	0.8	U	0.800	U	NR
Zinc	0.04	U	0.07	U	0.07	B	0.07	U	0.130	B	CV
Vanadium	5.8	U	5.8	U	5.8	U	5.8	U	5.800	U	P
Chromium	2.8	U	5.5	B	7.2	B	2.8	U	2.800	U	P
Lead											NR
Aluminum											NR
Phosphorus											NR
Fluorine											NR
Silicon											NR
Sodium											NR
Potassium											NR
Ammonium			2.2	U	2.2	U	2.2	U	4.460	B	P

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3  
BLANKS

Name: ROSS\_ANALYTICAL\_SERVICES Contract: METCO  
 Code: ROSS Case No.: SAS No.: SDG No.: BAGHOU  
 Preparation Blank Matrix (soil/water): WATER  
 Preparation Blank Concentration Units (ug/L or mg/kg): UG/L

Element	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L)						Preparation Blank	C	M
			1	C	2	C	3	C			
Aluminum											NR
Antimony			9.9	B	14.0	B	11.5	B	34.200	B	P
Asenic	18.8	U	28.2	B	18.8	U	28.6	B	29.110	B	P
Bismuth											NR
Barium											NR
Beryllium											NR
Boron			1.2	B	1.6	B	0.6	U	0.750	B	P
Bromine											NR
Cadmium			-2.8	B	-3.5	B	3.2	B	2.600	U	P
Calcium											NR
Chlorine			14.0	U	14.0	U	14.0	U	14.000	U	P
Chromium			71.7	U	71.7	U	92.6	B	71.700	U	P
Cobalt			13.5	B	15.0	B	9.2	B	15.030	B	P
Copper											NR
Cesium											NR
Germanium			0.8	U	0.8	U	0.8	U	0.800	U	P
Mercury			0.07	U	0.07	U	0.07	U	0.152	B	CV
Molybdenum			5.8	U	5.8	U	5.8	U	5.870	B	P
Nickel			4.1	B	2.8	U	3.8	B	5.090	B	P
Potassium											NR
Rhenium											NR
Selenium											NR
Silver											NR
Sodium											NR
Strontium											NR
Titanium											NR
Zinc	2.2	U	2.2	U	2.6	B	4.3	B	2.530	B	P

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4

ICP INTERFERENCE CHECK SAMPLE

Name: ROSS\_ANALYTICAL\_SERVICES Contract: METCO  
 Site: ROSS Case No.: SAS No.: SDG No.: BAGHOU  
 Number: TJA 36 ICS Source: CPI

Concentration Units: ug/L

Analyte	True		Initial Found			Final Found		
	Sol. A	Sol. AB	Sol. A	Sol. AB	%R	Sol. A	Sol. AB	%R
Barium	500000	500000	493094	495089.8	99.0	466533	473708.2	94.7
Bismuth		1000		1080.4	108.0		1005.0	100.5
Chromium		1000		1067.2	106.7		1193.1	119.3
Cadmium								
Yttrium								
Molybdenum								
Cobalt		1000		916.5	91.6		883.7	88.4
Copper	500000	500000	486237	478063.0	95.6	468600	459935.0	92.0
Iron		500		441.3	88.3		430.6	86.1
Aluminum								
Vanadium		500		480.1	96.0		447.4	89.5
Nickel	200000	200000	181054	177549.3	88.8	174242	172159.0	86.1
Lead		1000		897.6	89.8		867.3	86.7
Strontium								
Zinc	500000	500000	486757	489750.2	98.0	464458	469789.6	94.0
Manganese		500		484.3	96.9		468.3	93.7
Selenium								
Chlorine		1000		903.8	90.4		857.6	85.8
Vanadium		1000		850.4	85.0		826.3	82.6
Barium								
Strontium								
Yttrium								
Barium								
Cadmium		1000		909.3	90.9		890.1	89.0

FORM IV - IN

ILM02.1

5A  
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Name: ROSS\_ANALYTICAL\_SERVICES Contract: METCO ABAGDUSTS  
 Code: ROSS Case No.:            SAS No.:            SDG No.: BAGHOU  
 Matrix: SOIL Level (low/med): LOW  
 Spike Level for Sample: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Element	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Spike Added (SA)	%R	Q	M
Barium	80-120	234.3204	89.1827	194.17	74.7		NR
Bismuth	80-120	372.5728	146.4423	194.17	116.5		P
Boron							NR
Calcium							NR
Chromium	80-120	954.3204	734.0385	194.17	113.4		NR
Cobalt		1012.5728	795.1442	194.17	112.0		P
Copper		1853.6893	1724.4231	194.17	66.6		NR
Lead		159021.5048	153704.9038	3883.50	136.9		P
Manganese		22572.3301	22548.3654	194.17	12.3		P
Mercury		20183.7864	20344.2788	194.17	-82.7		NR
Nickel		15.1538	13.8824	0.77	165.1		P
Nitrogen	80-120	181.6019	27.8846	194.17	93.5		CV
Phosphorus	80-120	487.0388	299.0865	194.17	96.8		P
Selenium							NR
Silver							NR
Sulfur							NR
Vanadium							NR
Zinc		163908.1068	163409.6154	194.17	256.7		NR
							P

Notes:

5A  
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Name: ROSS\_ANALYTICAL\_SERVICES Contract: METCO ABAGDUSTSD  
 Code: ROSS Case No.: SAS No.: SDG No.: BAGHOU  
 Matrix: SOIL Level (low/med): LOW  
 Volume for Sample: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Element	Control Limit %R	Spiked Sample Result (SSR) C	Sample Result (SR) C	Spike Added (SA)	%R	Q	M
Aluminum							NR
Antimony	80-120	272.0588	89.1827	196.08	93.3		P
Asenic	80-120	410.5392	146.4423	196.08	134.7		P
Bismuth							NR
Barium							NR
Boron							NR
Calcium	80-120	926.7647	734.0385	196.08	98.3		P
Chromium							NR
Cobalt							P
Copper							NR
		1772.3039	1724.4231	196.08	24.4		P
		147620.5392	153704.9038	3921.57	-155.2		P
		21915.0980	22548.3654	196.08	-323.0		P
Iron							NR
Lead							NR
Manganese							NR
Mercury		19310.0000	20344.2788	196.08	-527.5		P
Nickel							CV
Nitrogen	80-120	194.6569	27.8846	196.08	99.3		P
Phosphorus	80-120	462.3529	299.0865	196.08	83.3		P
Potassium							NR
Selenium							NR
Silver							NR
Sulfur							NR
Titanium							NR
Zinc							NR
		156362.4020	163409.6154	196.08	-3594.1		P

Notes:

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5B  
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Name: ROSS\_ANALYTICAL\_SERVICES\_ Contract: METCO\_

ABAGDUSTA

Code: ROSS\_ Case No.: SAS No.:

SDG No.: BAGHOU

ix: SOIL

Level (low/med): LOW

Concentration Units: ug/L

alyte	Control Limit %R	Spiked Sample / Result (SSR) C	Sample Result (SR) C	Added (SA)	%R	Q	M
minum							NR
imony_		84461.50	927.50	100,000	83.5		P
enic		194191.50	1523.00	100,000	96.3		P
ium							NR
yllium							NR
nuth							NR
mium				6m			NR
cium				2/15/96			NR
omium_							NR
alt							NR
per							NR
n							NR
d							NR
hium							NR
nesium							NR
ganese							NR
cury							NR
ybdenu							NR
kel							NR
assium							NR
enium_							NR
ver							NR
ium							NR
llium							NR
adium_							NR
c							NR

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5B  
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

Name: ROSS\_ANALYTICAL\_SERVICES\_ Contract: METCO\_

ABAGDUSTAD

Code: ROSS\_ Case No.: SAS No.:

SDG No.: BAGHOU

Matrix: SOIL

Level (low/med): LOW

Concentration Units: ug/L

Element	Control Limit %R	Spiked Sample /Result (SSR)	C	Sample Result (SR)	C	Added (SA)	%R	Q	M
Aluminum									NR
Antimony		100965.50		927.50	B	100.000	100.0		P
Chromium		193341.50		1523.00	B	200.000	95.9		P
Cadmium									NR
Chlorine									NR
Cobalt						600			NR
Copper						2/15/96			NR
Lead									NR
Manganese									NR
Mercury									NR
Nickel									NR
Vanadium									NR
Zinc									NR
Barium									NR
Bismuth									NR
Chromium									NR
Lead									NR
Mercury									NR
Nickel									NR
Vanadium									NR
Zinc									NR

Notes:

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6  
DUPLICATES

EPA SAMPLE NO.

ABAGDUSTD

Name: ROSS\_ANALYTICAL\_SERVICES Contract: METCO

Code: ROSS Case No.: SAS No.: SDG No.: BAGHOU

ix (soil/water): SOIL Level (low/med): LOW

ids for Sample: 100.0 \* Solids for Duplicate: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Contrbl Limit	Sample (S) C	Duplicate (D) C	RPD	Q	M
Aluminum						NR
Antimony		89.1827 B	102.0098 B	13.4		P
Arsenic		146.4423 B	171.5686 B	15.8		P
Barium						NR
Beryllium						NR
Bismuth						NR
Cadmium		734.0385	715.2451	2.6		P
Calcium						NR
Chromium		795.1442	887.3529	11.0		P
Cobalt						NR
Copper		1724.4231	1621.8137	6.1		P
Iron		153704.9038	183479.9020	17.7		P
Lead		22548.3654	21557.1078	4.5		P
Lithium						NR
Magnesium						NR
Manganese		20344.2788	21173.6765	4.0		P
Mercury		13.8824	14.0769	1.4		CV
Molybdenum		27.8846 U	28.4314 U			P
Nickel		299.0865	316.4216	5.6		P
Potassium						NR
Selenium						NR
Silver						NR
Sodium						NR
Thallium						NR
Zinc		163409.6154	156582.8431	4.3		NR
						P

FORM VI - IN

ILM02.1

6  
SPIKE DUPLICATES

EPA SAMPLE NO.

ABAGDUSTSD

Name: ROSS\_ANALYTICAL\_SERVICES\_ Contract: METCO\_

Code: ROSS\_ Case No.: SAS No.: SDG No.: BAGHOU

ix (soil/water): SOIL\_ Level (low/med): LOW\_

ids for Sample: 100.0 \* Solids for Duplicate: 100.0

Concentration Units (ug/L or mg/kg dry weight): MG/KG

Analyte	Control Limit	Sample (S) C	Duplicate (D) C	RPD	Q	M
Aluminum						NR
Antimony		234.3204 B	272.0588 B	14.9		P
Arsenic		372.5728 B	410.5392 B	9.7		P
Barium						NR
Beryllium						NR
Bismuth						NR
Cadmium		954.3204	926.7647	2.9		P
Calcium						NR
Chromium		1012.5728	963.6275	5.0		P
Cobalt						NR
Copper		1853.6893	1772.3039	4.5		P
Iron		159021.5048	147620.5392	7.4		P
Lead		22572.3301	21915.0980	3.0		P
Lithium						NR
Magnesium						NR
Manganese		20183.7864	19310.0000	4.4		P
Mercury		15.1538	15.2941	0.9		CV
Molybdenum		181.6019	194.6569	6.9		P
Nickel		487.0388	462.3529	5.2		P
Potassium						NR
Selenium						NR
Silver						NR
Sodium						NR
Thallium						NR
Tin						NR
Tanadium						NR
Zinc		163908.1068	156362.4020	4.7		P



LABORATORY CONTROL SAMPLE

Name: ROSS\_ANALYTICAL\_SERVICES Contract: METCO  
 Code: ROSS Case No.: SAS No.: SDG No.: BAGHOU  
 LCS Source: ERA  
 Original LCS Source: SOLUTIONS PL

Element	Aqueous (ug/L)			Solid (mg/kg)				
	True	Found	%R	True	Found	C	Limits	%R
Aluminum	1000.0	966.06	96.6	116.0	96.2	23.2	316.0	82.9
Barium	1000.0	1040.47	104.0	95.3	100.7	46.7	146.0	105.7
Bismuth								
Chromium	1000.0	1031.09	103.1	106.0	106.2	62.5	148.0	100.2
Cadmium	1000.0	1050.11	105.0	82.3	81.4	48.6	114.0	98.9
Copper	1000.0	950.34	95.0	94.9	102.6	57.9	134.0	108.1
Lead	20000.0	21267.69	106.3	6490.0	4371.1	4350.0	8700.0	67.4
Manganese	1000.0	1043.37	104.3	91.7	86.3	49.5	128.0	94.1
Mercury	1000.0	1049.84	105.0	138.0	129.2	95.2	186.0	93.6
Nickel	2.0	1.82	91.0	10.0	11.0	5.2	15.6	110.0
Selenium	1000.0	1013.21	101.3	94.4	97.4	53.8	149.0	103.2
Silver	1000.0	1021.52	102.2	99.5	101.2	58.7	142.0	101.7
Sulfur								
Titanium								
Zinc	1000.0	1028.30	102.8	98.6	100.2	56.2	150.0	101.6

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LABORATORY CONTROL SAMPLE

Name: ROSS\_ANALYTICAL\_SERVICES Contract: METCO  
 Code: ROSS Case No.: SAS No.: SDG No.: BAGHDU  
 d LCS Source:  
 ous LCS Source: SOLUTIONS PL

Element	Aqueous (ug/L)			Solid (mg/kg)				
	True	Found	%R	True	Found	C	Limits	%R
Antimony	1000.0	1120.01	112.0					
Barium	1000.0	1020.24	102.0					
Bismuth								
Cadmium								
Calcium	1000.0	1040.94	104.1					
Chromium	1000.0	1066.57	106.7					
Copper	1000.0	996.16	99.6					
Lead	20000.0	21568.57	107.8					
Manganese	1000.0	1049.75	105.0					
Mercury	1000.0							
Nickel	1000.0	1060.31	106.0					
Nitrogen	2.0	1.37	68.5					
Phosphorus	1000.0	1033.77	103.4					
Potassium	1000.0	1038.61	103.9					
Selenium								
Silver								
Sodium								
Zinc	1000.0	1015.91	101.6					





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Ross Analytical Services, Inc.  
16433 Foltz Industrial Parkway - Strongsville, Ohio 44136  
(216) 572-3200 • Fax (216) 572-7420 • 1-800-325-7227

CERTIFICATE OF ANALYSIS

Client:

Metco Environmental  
16115 Dooley Road  
Dallas, TX 75244

Attn: Hanoch Toren

Work Order #: 96-02-151  
Client Code: METCO  
Report Date: 03/04/96  
Work ID: Dust for reanalysis  
Date Received: 02/08/96

Purchase Order: Chapparral Steel/96-15

SAMPLE IDENTIFICATION

<u>Lab</u> <u>Number</u>	<u>Sample</u> <u>Description</u>	<u>Lab</u> <u>Number</u>	<u>Sample</u> <u>Description</u>
01	B Baghouse Dust		

Data are reported on an as-received basis unless stated otherwise. Estimated Quantitation Limits (EQL's) are listed for most analytes. EQL's are the lowest concentrations that can be reliably measured under routine laboratory conditions. Unless otherwise noted, method blanks had no targets found above their EQL's and results were not corrected for blanks.

  
Certificate approved by  
Carol L. Turner

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Work Order # 96-02-151

Ross Analytical Services, Inc

Reported: 03/04/96

REPORT COMMENTS

Target hits were found for arsenic and antimony but these results were below the reported EQL and reported as <EQL on the results page. The results for these metals are summarized below and flagged with a "B":

Metal	Lab No.	Result (mg/Kg)	EQL (mg/Kg)
-----	-----	-----	---
Antimony	01	55.7 B	500
Arsenic	01	108 B	500

A duplicate of this sample was analyzed. Results are summarized below:

Metal	Result (mg/Kg)
Antimony	60.0 B
Arsenic	93.3 B
Cadmium	544
Chromium	882
Copper	1510
Iron	134,000
Lead	17,900
Manganese	19,000
Molybdenum	35.7 B
Nickel	285
Zinc	126,000

Laboratory Control Sample

Metal	% Recovery
Antimony	131
Arsenic	111
Cadmium	110
Chromium	108
Copper	120
Iron	79
Manganese	99
Molybdenum	116
Nickel	109
Zinc	107

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ork Order # 96-02-151

Ross Analytical Services, Inc

Reported: 03/04/96

Sample Description: B Baghouse Dust

Lab No.: 01

<u>Analyte Description</u>	<u>Result</u>	<u>Units</u>	<u>EQL</u>
Antimony by ICP	<EQL	mg/Kg	500
Arsenic by ICP	<EQL	mg/Kg	500
Barium by ICP	556	mg/Kg	25
Bromine by ICP	861	mg/Kg	50
Copper by ICP	1530	mg/Kg	100
Iron by ICP	133,000	mg/Kg	1000
Lead by ICP	18,200	mg/Kg	250
Manganese by ICP	19,500	mg/Kg	25
Niobium by ICP	48	mg/Kg	50
Nickel by ICP	287	mg/Kg	100
Zinc by ICP	128,000	mg/Kg	100