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 risk 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.[1]

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[1] 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 calculated the 95% UCL are presented in Tables 1 and 2. Additional EAF data not used in these calculations are presented in Table 3[2]. 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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[1] 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

Sample No.	Antimony (mg/kg)
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

Sample	Antimony (mg/kg)
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

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

Table 5
Revised Risk Assessment Calculations for Antimony Exposures

Receptor	*Hazard Index for Receptor Points A1, B1, and C1		
	A1	B1	C1
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[1] x %0.0084%* + 12.5 tpy[1] 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[2]

= 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[2]

= 0.003 lbs/hr

= **0.00038 gm/s**

5) BH "C" Sb Emissions[2]

= 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.

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. 154430T
Report No. D6-02-047
Report Date 02/21/96 15:23

Project EAF Dust

Phone: 214-299-5212 Fax: 214-575-2182

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.	Sample Identification
D6-02-047-01	RC 301625
D6-02-047-02	RC 301769
D6-02-047-03	RC 301646
D6-02-047-04	RC 301727
D6-02-047-05	RC 301762
D6-02-047-06	RC 301673

MAXIM

Reviewed By

William J Gase, Supervisor

TEST RESULTS BY SAMPLE

Sample: 01A RC 301625 Collected: 01/28/96 Category: S

Test Name	Method	Result	Units	Detection Limit	Date Started	Analyst
Antimony	SW846-6010A	64.6	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SW846-7130	0.0608	%	0.01	02/20/96	TAM
Calcium Oxide	SW846-7140	7.09	%	0.01	02/19/96	TAM
Digestion of Dust	SW846-3050A	02/14/96	Date Com			CVM
Iron Oxide	SW846-7380	40.0	%	0.01	02/20/96	TAM
Lead Oxide	SW846-7420	2.35	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.8	%	0.01	02/17/96	NOLI
Magnesium Oxide	SW846-7460	3.12	%	0.01	02/19/96	TAM
Zinc Oxide	SW846-7950	22.9	%	0.01	02/20/96	TAM

Sample: 02A RC 301769 Collected: 02/01/96 Category: S

Test Name	Method	Result	Units	Detection Limit	Date Started	Analyst
Antimony	SW846-6010A	68.0	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SW846-7130	0.0683	%	0.01	02/20/96	TAM
Calcium Oxide	SW846-7140	5.67	%	0.01	02/19/96	TAM
Digestion of Dust	SW846-3050A	02/14/96	Date Com			CVM
Iron Oxide	SW846-7380	34.8	%	0.01	02/20/96	TAM
Lead Oxide	SW846-7420	3.21	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.2	%	0.01	02/17/96	NOLI
Magnesium Oxide	SW846-7460	2.89	%	0.01	02/19/96	TAM
Zinc Oxide	SW846-7950	29.4	%	0.01	02/20/96	TAM

Sample: 03A RC 301646 Collected: 02/03/96 Category: S

Test Name	Method	Result	Units	Detection Limit	Date Started	Analyst
Antimony	SW846-6010A	50.5	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SW846-7130	0.0625	%	0.01	02/20/96	TAM
Calcium Oxide	SW846-7140	4.94	%	0.01	02/19/96	TAM
Digestion of Dust	SW846-3050A	02/14/96	Date Com			CVM
Iron Oxide	SW846-7380	31.9	%	0.01	02/20/96	TAM
Lead Oxide	SW846-7420	2.44	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.8	%	0.01	02/17/96	NOLI
Magnesium Oxide	SW846-7460	2.71	%	0.01	02/19/96	TAM
Zinc Oxide	SW846-7950	32.4	%	0.01	02/20/96	TAM

Sample: 04A RC 301727 Collected: 02/04/96 Category: S

Test Name	Method	Result	Units	Detection Limit	Date Started	Analyst
Antimony	SW846-6010A	54.0	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SW846-7130	0.0682	%	0.01	02/20/96	TAM
Calcium Oxide	SW846-7140	4.10	%	0.01	02/19/96	TAM
Digestion of Dust	SW846-3050A	02/14/96	Date Com			CVM
Iron Oxide	SW846-7380	34.7	%	0.01	02/20/96	TAM
Lead Oxide	SW846-7420	2.65	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.4	%	0.01	02/17/96	ROU
Magnesium Oxide	SW846-7460	2.05	%	0.01	02/19/96	TAM
Zinc Oxide	SW846-7950	32.4	%	0.01	02/20/96	TAM

Sample: 05A RC 301762 Collected: 02/06/96 Category: S

Test Name	Method	Result	Units	Detection Limit	Date Started	Analyst
Antimony	SW846-6010A	50.7	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SW846-7130	0.0612	%	0.01	02/20/96	TAM
Calcium Oxide	SW846-7140	3.67	%	0.01	02/19/96	TAM
Digestion of Dust	SW846-3050A	02/14/96	Date Com			CVM
Iron Oxide	SW846-7380	27.9	%	0.01	02/20/96	TAM
Lead Oxide	SW846-7420	2.24	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.5	%	0.01	02/17/96	ROU
Magnesium Oxide	SW846-7460	2.23	%	0.01	02/19/96	TAM
Zinc Oxide	SW846-7950	38.7	%	0.01	02/20/96	TAM

Sample: 06A RC 301673 Collected: 02/08/96 Category: S

Test Name	Method	Result	Units	Detection Limit	Date Started	Analyst
Antimony	SW846-6010A	81.9	mg/kg	10	02/15/96	TAM
Cadmium Oxide	SW846-7130	0.0732	%	0.01	02/20/96	TAM
Calcium Oxide	SW846-7140	4.14	%	0.01	02/19/96	TAM
Digestion of Dust	SW846-3050A	02/14/96	Date Com			CVM
Iron Oxide	SW846-7380	34.1	%	0.01	02/20/96	TAM
Lead Oxide	SW846-7420	2.77	%	0.01	02/20/96	TAM
Loss on Ignition	EPA 160.4	3.5	%	0.01	02/17/96	ROU
Magnesium Oxide	SW846-7460	2.24	%	0.01	02/19/96	TAM
Zinc Oxide	SW846-7950	31.1	%	0.01	02/20/96	TAM

QUALITY ASSURANCE / QUALITY CONTROL TOTAL METALS

Report No. D602047

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 Calibretion Verification + or - 10%
ICS =Interference Check Standard ICP ONLY + or - 20%
LCS =Laboratory Control Standard + or - 20% and + or - 30% Silver and Antimony
ICC = Initial Calibration Check ICP ONLY + or - 5%
Blank = < Detection Limit RPD = Relative Percent Difference <20%

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

METCO
ENVIRONMENTAL
P.O. Box 598
Addison, TX 75001
(214) 931-7127

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 2-16-96

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	267	128,000
C Baghouse Dust	107	134	735	1,710	2,700	213,000	26,100	24,800	1.4	33.5	172	228,000

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

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

	Sample Description	Lab Number	Sample Description
	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 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

ber	Sample Description	Lab Number	Sample Description
	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 7471A. 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.

ork Order # 96-02-036 Ross Analytical Services, Inc Reported: 02/15/96

mple volume

ab No.	Sample Description	Result	Units	EQL
AD	HNO3 FW B Baghouse Run 1	110	Total mL	5
AE	Imps. BH B Baghouse Run 1	463	Total mL	5
BD	HNO3 FW B Baghouse Run 2	113	Total mL	5
BE	Imps. BH B Baghouse Run 2	455	Total mL	5
CD	HNO3 FW B Baghouse Run 3	105	Total mL	5
CE	Imps. BH B Baghouse Run 3	445	Total mL	5
DD	HNO3 FW B Baghouse Blank	110	Total mL	5
DE	Imps. BH B Baghouse Blank	295	Total mL	5
ED	HNO3 FW C Baghouse Run 1	108	Total mL	5
EE	Imps. BH C Baghouse Run 1	445	Total mL	5
FD	HNO3 FW C Baghouse Run 2	88	Total mL	5
FE	Imps. BH C Baghouse Run 2	445	Total mL	5
GD	HNO3 FW C Baghouse Run 3	107	Total mL	5
GE	Imps. BH C Baghouse Run 3	480	Total mL	5
HD	HNO3 FW C Baghouse Blk	95	Total mL	5
HE	Imps. BH C Baghouse Blank	390	Total mL	5

>rk Order # 96-02-037 Ross Analytical Services, Inc Reported: 02/15/96

mple volume

b No.	Sample Description	Result	Units	EQL
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

lame: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

:ode: ROSS__ Case No.: _____ SAS No.: _____ SDG No.:BAGHOU

lo.: 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_

:nts:

'tify that this data package is in compliance with the terms and .tions of the contract, both technically and for completeness, for than the conditions detailed above. Release of the data contained is hardcopy data package and in the computer-readable data submitted oppy diskette has been authorized by the Laboratory Manager or the er's designee, as verified by the following signature.

.ture: _____ Name: Peggy J. Schuler

2/15/96 Title: Quality Control Chemist

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

ABAGDUST

Name: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

Code: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU

:ix (soil/water): SOIL_ Lab Sample ID: 02-036-10A

:l (low/med): LOW__ Date Received: 02/08/96

)lids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	89.2	B	N	P
7440-38-2	Arsenic	146	B	N	P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-69-9	Bismuth				NR
7440-43-9	Cadmium	734			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	795			P
7440-48-4	Cobalt				NR
7440-50-8	Copper	1720			P
7439-89-6	Iron	154000			P
7439-92-1	Lead	22500			P
7439-93-2	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese	20300			P
7439-97-6	Mercury	13.9			CV
7439-98-7	Molybdenu	27.9	U		P
7440-02-0	Nickel	299			P
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-31-5	Tin				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	163000			P

: Before: _____ Clarity Before: _____ Texture: _____

: After: _____ Clarity After: _____ Artifacts: _____

:nts:

FORM I - IN ILM02.1

U.S. EPA - CLP

1

INORGANIC ANALYSES DATA SHEET

EPA SAMPLE NO.

CBAGDUST

Name: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____
Code: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU
Matrix (soil/water): SOIL_ Lab Sample ID: 02-036-12A
Level (low/med): LOW__ Date Received: 02/08/96
Solids: 100.0

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

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum				NR
7440-36-0	Antimony	107	B	N	P
7440-38-2	Arsenic	134	B	N	P
7440-39-3	Barium				NR
7440-41-7	Beryllium				NR
7440-69-9	Bismuth				NR
7440-43-9	Cadmium	735			P
7440-70-2	Calcium				NR
7440-47-3	Chromium	1710			P
7440-48-4	Cobalt				NR
7440-50-8	Copper	2700			P
7439-89-6	Iron	213000			P
7439-92-1	Lead	26100			P
7439-93-2	Lithium				NR
7439-95-4	Magnesium				NR
7439-96-5	Manganese	24800			P
7439-97-6	Mercury	1.4			CV
7439-98-7	Molybdenu	33.5	B		P
7440-02-0	Nickel	172			P
7440-09-7	Potassium				NR
7782-49-2	Selenium				NR
7440-22-4	Silver				NR
7440-23-5	Sodium				NR
7440-28-0	Thallium				NR
7440-31-5	Tin				NR
7440-62-2	Vanadium				NR
7440-66-6	Zinc	228000			P

Color Before: _____ Clarity Before: _____ Texture: _____
Color After: _____ Clarity After: _____ Artifacts: _____

Comments:

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

yte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	M
inum									NR
mony	5000.0	5342.31	106.8	10000.0	10376.39	103.8	10205.13	102.1	P
nic	5000.0	4965.36	99.3	10000.0	9686.68	96.9	10158.67	101.6	P
um									NR
llium									NR
uth									NR
ium	500.0	520.22	104.0	1000.0	1011.54	101.2	995.47	99.5	P
ium									NR
mium	1000.0	1037.39	103.7	2000.0	2029.89	101.5	1992.91	99.6	P
lt									NR
er	1000.0	1030.90	103.1	2000.0	2012.97	100.6	1965.08	98.3	P
	10000.0	10586.94	105.9	20000.0	21065.06	105.3	20531.04	102.7	P
	5000.0	5177.05	103.5	10000.0	10051.36	100.5	9870.73	98.7	P
ium									NR
esium									NR
anese	500.0	512.81	102.6	1000.0	1005.27	100.5	981.08	98.1	P
ury	2.0	2.06	103.0	5.0	5.37	107.4	5.53	110.6	CV
bdenu	1000.0	1049.38	104.9	2000.0	2091.87	104.6	2044.09	102.2	P
el	1000.0	1052.30	105.2	2000.0	2040.16	102.0	1990.92	99.5	P
ssium									NR
nium									NR
er									NR
m									NR
lium									NR
									NR
lium									NR
	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

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2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

ıme: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

›de: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU

ıl Calibration Source: PLASMA CHEM_

ıuing Calibration Source: PLASMA CHEM_

Concentration Units: ug/L

yte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	M
inum_									NR
nony_				10000.0	10237.21	102.4			P
nic__				10000.0	9963.17	99.6	9512.26	95.1	P
um___									NR
llium									NR
uth__									NR
ium__				1000.0	994.67	99.5			P
ium__									NR
mium_				2000.0	2009.29	100.5			P
lt___									NR
er___				2000.0	1979.97	99.0			P
				20000.0	20714.26	103.6			P
				10000.0	9889.37	98.9			P
									NR
ium__									NR
esium									P
anese				1000.0	984.00	98.4			CV
ury__	2.0	2.10	105.0	5.0	5.17	103.4	5.31	106.2	P
bdenu				2000.0	2053.87	102.7			P
el___				2000.0	1998.19	99.9			NR
ssium									NR
nium_									NR
er___									NR
um___									NR
lium_									NR
									NR
idium_									P
:_____				2000.0	1991.80	99.6	1938.85	96.9	

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

FORM II (PART 1) - IN ILM02.1

2A
INITIAL AND CONTINUING CALIBRATION VERIFICATION

ame: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

ode: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU

al Calibration Source: PLASMA CHEM_

nuing Calibration Source: PLASMA CHEM_

Concentration Units: ug/L

yte	Initial Calibration True	Found	%R(1)	Continuing Calibration True	Found	%R(1)	Found	%R(1)	M
inum_									NR
mony_				10000.0	10230.05	102.3	9784.14	97.8	P
nic__	5000.0	5108.13	102.2	10000.0	10138.76	101.4	10171.42	101.7	P
um___									NR
llium									NR
uth__									NR
ium__				1000.0	1003.44	100.3	964.56	96.5	P
ium__									NR
mium_				2000.0	2034.91	101.7	1963.83	98.2	P
lt___									NR
er___				2000.0	1988.26	99.4	1940.48	97.0	P
_____				20000.0	20502.72	102.5	19755.65	98.8	P
				10000.0	10005.96	100.1	9679.01	96.8	P
ium__									NR
esium									NR
anese				1000.0	992.21	99.2	954.91	95.5	P
ury__				5.0	5.12	102.4	5.27	105.4	CV
odenu				2000.0	2013.21	100.7	1925.84	96.3	P
el___				2000.0	2023.12	101.2	1956.85	97.8	P
ssium									NR
nium_									NR
er___									NR
um___									NR
lium_									NR
									NR
lium_									NR
_____	1000.0	1028.51	102.9	2000.0	2035.07	101.8	2155.58	107.8	P
_____									
_____									
_____									
_____									
_____									
_____									

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

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

RDL Standard Source: _____

CRDL Standard Source: SOLUTIONS PL

Concentration Units: ug/L

lyte	CRDL Standard for AA True	Found	%R	CRDL Standard for ICP Initial True	Found	%R	Final Found	%R
minum								
imony				200.0	213.32	106.7		
enic								
ium								
yllium								
muth								
mium				10.0	12.23	122.3		
cium								
omium				20.0	20.15	100.8		
alt								
per				40.0	40.46	101.2		
n				200.0	264.35	132.2		
d				100.0	90.30	90.3		
hium								
nesium								
ganese				10.0	13.98	139.8		
cury								
ybdenu				20.0	14.39	72.0		
kel				40.0	41.91	104.8		
assium								
enium								
ver								
ium								
llium								
adium								
c								

FORM II (PART 2) - IN ILM02.1

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

lyte	CRDL Standard for AA True	Found	%R	CRDL Standard for ICP True	Initial Found	%R	Final Found	%R
minum								
imony				200.0	181.97	91.0		
enic				400.0	393.44	98.4		
ium								
yllium								
nuth								
nium				10.0	10.61	106.1		
cium								
omium				20.0	20.33	101.6		
alt								
per				40.0	52.43	131.1		
n				200.0	225.62	112.8		
i				100.0	114.84	114.8		
ium								
nesium								
anese				10.0	10.79	107.9		
cury								
bdenu				20.0	22.02	110.1		
el				40.0	44.68	111.7		
ssium								
nium								
er								
um								
lium								
dium								
				40.0	54.03	135.1		

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

Analyte	CRDL Standard for AA			CRDL Standard for ICP				
	True	Found	%R	True	Initial Found	%R	Final Found	%R
Aluminum								
Antimony								
Arsenic				400.0	408.41	102.1		
Barium								
Beryllium								
Cadmium								
Calcium								
Chromium								
Cobalt								
Copper								
Iron								
Lead								
Magnesium								
Manganese								
Mercury								
Molybdenum								
Nickel								
Potassium								
Selenium								
Silver								
Sodium								
Thallium								
Tin								
Vanadium				40.0	42.89	107.2		
Zinc								

3
BLANKS

ame: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

ode: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU

ration Blank Matrix (soil/water): SOIL_

ration Blank Concentration Units (ug/L or mg/kg): MG/KG

te	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
num											
ony	8.5	U	8.5	U	8.5	U	8.5	U	0.850	U	NR
ic	18.8	U	39.9	B	18.8	U	18.8	U	1.880	U	P
n											P
lium											NR
th											NR
um	0.6	U	0.6	U	0.6	U	0.6	U	0.060	U	NR
um											P
ium	-3.1	B	-4.3	B	2.6	U	2.6	U	0.260	U	NR
	14.0	U	14.0	U	14.0	U	14.0	U			P
	71.7	U	71.7	U	71.7	U	71.7	U	1.400	U	NR
	-9.2	B	-10.5	B	8.0	U	8.0	U	7.170	U	P
im									0.800	U	P
ium											NR
ese	0.8	U	0.8	U	0.8	U	0.8	U			NR
y	0.07	U	0.07	U	0.07	U			0.080	U	P
enu	5.8	U	5.8	U	5.8	U	5.8	U	0.015	U	CV
	2.8	U	2.8	U	2.8	U	2.8	U	-0.921	B	P
ium									0.280	U	P
um											NR
											NR
											NR
um											NR
											NR
um											NR
	2.2	U	3.5	B	2.2	U	2.2	U	0.220	U	NR
											P

GM
2/15/96

FORM III - IN

ILM02.1

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_

rte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
.num											NR
ıony	11.5	B	8.5	U	14.4	B	10.3	B	8.500	U	P
ıic			18.8	U	18.8	U	-24.6	B	18.800	U	P
ım											NR
.lium											NR
ıth											NR
.um	0.8	B	1.1	B	0.9	B	1.0	B	0.600	U	P
.um											NR
ium	2.6	U	2.6	U	2.6	U	4.9	B	2.600	U	P
t											NR
r	14.0	U	14.0	U	14.0	U	14.0	U	14.000	U	P
	71.7	U	75.8	B	71.7	U	71.7	U	71.700	U	P
	18.0	B	12.2	B	8.0	U	8.0	U	8.000	U	P
um											NR
sium											NR
nese	-1.0	B	0.8	U	0.8	U	0.8	U	0.800	U	P
ry	0.04	U	0.07	U	0.07	B	0.07	U	0.130	B	CV
denu	5.8	U	5.8	U	5.8	U	5.8	U	5.800	U	P
l	2.8	U	5.5	B	7.2	B	2.8	U	2.800	U	P
sium											NR
ium											NR
r											NR
n											NR
ium											NR
											NR
ium											NR
			2.2	U	2.2	U	2.2	U	4.460	B	P

Com 2/15/94

Name: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

Code: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU

aration Blank Matrix (soil/water): WATER

aration Blank Concentration Units (ug/L or mg/kg): UG/L_

lyte	Initial Calib. Blank (ug/L)	C	Continuing Calibration Blank (ug/L) 1	C	2	C	3	C	Prepa-ration Blank	C	M
minum											NR
imony			9.9	B	14.0	B	11.5	B	34.200	B	P
enic	18.8	U	28.2	B	18.8	U	28.6	B	29.110	B	P
ium											NR
yllium											NR
nuth											NR
nium			1.2	B	1.6	B	0.6	U	0.750	B	P
cium											NR
omium			-2.8	B	-3.5	B	3.2	B	2.600	U	P
alt											NR
per			14.0	U	14.0	U	14.0	U	14.000	U	P
n			71.7	U	71.7	U	92.6	B	71.700	U	P
d			13.5	B	15.0	B	9.2	B	15.030	B	P
ium											NR
nesium											NR
anese			0.8	U	0.8	U	0.8	U	0.800	U	P
cury			0.07	U	0.07	U	0.07	U	0.152	B	CV
bdenu			5.8	U	5.8	U	5.8	U	5.870	B	P
el			4.1	B	2.8	U	3.8	B	5.090	B	P
ssium											NR
nium											NR
er											NR
um											NR
lium											NR
											NR
dium											NR
	2.2	U	2.2	U	2.6	B	4.3	B	2.530	B	P

CM 2/14/96

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4

ICP INTERFERENCE CHECK SAMPLE

ne: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

de: ROSS__ Case No.: _____ SAS No: _____ SDG No.: BAGHOU

Number: TJA 36_____ ICS Source: CPI_____

Concentration Units: ug/L

alyte	True Sol. A	True Sol. AB	Initial Found Sol. A	Initial Found Sol. AB	Initial Found %R	Final Found Sol. A	Final Found Sol. AB	Final Found %R
minum_	500000	_500000	_493094	_495089.8	99.0	_466533	_473708.2	94.7
imony_		___1000		___1080.4	108.0		___1005.0	100.5
enic__		___1000		___1067.2	106.7		___1193.1	119.3
ium___								
yllium								
muth__								
mium__		___1000		____916.5	_91.6		____883.7	_88.4
cium__	500000	_500000	_486237	_478063.0	_95.6	_468600	_459935.0	_92.0
omium_		____500		____441.3	_88.3		____430.6	_86.1
alt___								
per___		____500		____480.1	_96.0		____447.4	_89.5
n_____	200000	_200000	_181054	_177549.3	_88.8	_174242	_172159.0	_86.1
d_____		___1000		____897.6	_89.8		____867.3	_86.7
hium__								
nesium	500000	_500000	_486757	_489750.2	_98.0	_464458	_469789.6	_94.0
ganese		____500		____484.3	_96.9		____468.3	_93.7
cury__								
ybdenu		___1000		____903.8	_90.4		____857.6	_85.8
kel___		___1000		____850.4	_85.0		____826.3	_82.6
assium								
enium_								
ver___								
ium___								
llium_								
_____								
adium_								
c_____		___1000		____909.3	_90.9		____890.1	_89.0
_____								
_____								
_____								
_____								
_____								

FORM IV - IN ILM02.1

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

ABAGDUSTS

ame: ROSS_ANALYTICAL_SERVICES_ Contract:METCO_____

ode: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU
x: SOIL Level (low/med): LOW
ids for Sample: 100.0

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

lyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
inum									NR
nony	80-120	234.3204	B	89.1827	B	194.17	74.7	N	P
nic	80-120	372.5728	B	146.4423	B	194.17	116.5		P
um									NR
llium									NR
ith									NR
ium	80-120	954.3204		734.0385		194.17	113.4		P
ium									NR
nium		1012.5728		795.1442		194.17	112.0		P
lt									NR
er		1853.6893		1724.4231		194.17	66.6		P
		159021.5048		153704.9038		3883.50	136.9		P
		22572.3301		22548.3654		194.17	12.3		P
um									NR
sium									NR
nese		20183.7864		20344.2788		194.17	-82.7		P
ry		15.1538		13.8824		0.77	165.1		CV
denu	80-120	181.6019		27.8846	U	194.17	93.5		P
l	80-120	487.0388		299.0865		194.17	96.8		P
sium									NR
ium									NR
r									NR
m									NR
ium									NR
									NR
ium									NR
		163908.1068		163409.6154		194.17	256.7		P

ts:

U.S. EPA - CLP

5A
SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

ABAGDUSTSD

Name: ROSS_ANALYTICAL_SERVICES_ Contract:METCO_____

Code: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU
ix: _SOIL_____ Level (low/med): _LOW____
lids for Sample: 100.0

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

lyte	Control Limit %R	Spiked Sample Result (SSR)	C	Sample Result (SR)	C	Spike Added (SA)	%R	Q	M
inum									NR
mony	80-120	272.0588	B	89.1827	B	196.08	93.3		P
nic	80-120	410.5392	B	146.4423	B	196.08	134.7	N	P
um									NR
llium									NR
uth									NR
ium	80-120	926.7647		734.0385		196.08	98.3		P
ium									NR
mium		963.6275		795.1442		196.08	85.9		P
lt									NR
er		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
ium									NR
esium									NR
anese		19310.0000		20344.2788		196.08	-527.5		P
ury		15.2941		13.8824		0.78	181.0		CV
bdenu	80-120	194.6569		27.8846	U	196.08	99.3		P
el	80-120	462.3529		299.0865		196.08	83.3		P
ssium									NR
nium									NR
er									NR
um									NR
lium									NR
									NR
lium									NR
		156362.4020		163409.6154		196.08	-3594.1		P

ts:

U.S. EPA - CLP

5B

POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

ABAGDUSTA

Name: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

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
									NR
minum_				927.50	B	100,000	83.5		P
imony_		84461.50		1523.00	B	200,000	96.3		P
enic__		194191.50							NR
ium___									NR
yllium									NR
muth__						6m			NR
mium__						2/15/96			NR
cium__									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
_____									NR
adium_									NR
c_____									

ents:

2.1

U.S. EPA - CLP

5B
POST DIGEST SPIKE SAMPLE RECOVERY

EPA SAMPLE NO.

ABAGDUSTAD

Name: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

Code: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU

Matrix: ____SOIL_____ Level (low/med): LOW_____

Concentration Units: ug/L

Analyte	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
Arsenic		193341.50		1523.00	B	200.000	95.9		P
Barium									NR
Beryllium									NR
Cadmium						1000			NR
Calcium						3/15/96			NR
Chromium									NR
Cobalt									NR
Copper									NR
Iron									NR
Lead									NR
Magnesium									NR
Manganese									NR
Mercury									NR
Molybdenum									NR
Nickel									NR
Potassium									NR
Selenium									NR
Silver									NR
Sodium									NR
Strontium									NR
Thallium									NR
Tin									NR
Vanadium									NR
Zinc									NR

Comments:

U.S. EPA - CLP

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__

lids 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		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
Molybdenu		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
Tin								NR
Vanadium								NR
Zinc		163409.6154		156582.8431		4.3		P

FORM VI - IN ILM02.1

U.S. EPA - CLP

6
SPIKE DUPLICATES

EPA SAMPLE NO.

ABAGDUSTSD

Name: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

Code: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU

Matrix (soil/water): SOIL_ Level (low/med): _LOW___

Solids 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
Molybdenu		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
Vanadium								NR
Zinc		163908.1068		156362.4020		4.7		P

FORM VI - IN ILM02.1

U.S. EPA - CLP

POST SPIKE 6 DUPLICATES

EPA SAMPLE NO.

ABAGDUSTAD

Name: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

Code: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU

ix (soil/water): SOIL_ Level (low/med): _LOW__

lids 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		84.4615		100.9655		17.8		P
Arsenic		194.1915		193.3415		0.4		P
Barium								NR
Beryllium								NR
Bismuth								NR
Cadmium								NR
Calcium								NR
Chromium								NR
Cobalt								NR
Copper								NR
Iron								NR
Lead								NR
Lithium								NR
Magnesium								NR
Manganese								NR
Mercury								NR
Molybdenu								NR
Nickel								NR
Potassium								NR
Selenium								NR
Silver								NR
Sodium								NR
Thallium								NR
Tin								NR
Vanadium								NR
Zinc								NR

FORM VI - IN ILM02.1

7

LABORATORY CONTROL SAMPLE

ame: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

ode: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU

LCS Source: ERA_____

us LCS Source: SOLUTIONS PL

yte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
inum									
nony	1000.0	966.06	96.6	116.0	96.2		23.2	316.0	82.9
nic	1000.0	1040.47	104.0	95.3	100.7		46.7	146.0	105.7
um									
llium									
ith									
lum	1000.0	1031.09	103.1	106.0	106.2		62.5	148.0	100.2
lum									
nium	1000.0	1050.11	105.0	82.3	81.4		48.6	114.0	98.9
lt									
er	1000.0	950.34	95.0	94.9	102.6		57.9	134.0	108.1
	20000.0	21267.69	106.3	6490.0	4371.1		4350.0	8700.0	67.4
	1000.0	1043.37	104.3	91.7	86.3		49.5	128.0	94.1
lum									
esium									
anese	1000.0	1049.84	105.0	138.0	129.2		95.2	186.0	93.6
ury	2.0	1.82	91.0	10.0	11.0		5.2	15.6	110.0
bdenu	1000.0	1013.21	101.3	94.4	97.4		53.8	149.0	103.2
el	1000.0	1021.52	102.2	99.5	101.2		58.7	142.0	101.7
esium									
nium									
er									
um									
ium									
lium									
	1000.0	1028.30	102.8	98.6	100.2		56.2	150.0	101.6

FORM VII - IN

ILM02.1

7

LABORATORY CONTROL SAMPLE

Name: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____

Code: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU

d LCS Source: _____

ous LCS Source: SOLUTIONS PL

lyte	Aqueous (ug/L) True	Found	%R	Solid (mg/kg) True	Found	C	Limits		%R
ninum									
imony	1000.0	1120.01	112.0						
enic	1000.0	1020.24	102.0						
ium									
llium									
uth									
nium	1000.0	1040.94	104.1						
ium									
mium	1000.0	1066.57	106.7						
lt									
er	1000.0	996.16	99.6						
	20000.0	21568.57	107.8						
	1000.0	1049.75	105.0						
ium									
esium									
anese	1000.0	1060.31	106.0						
ury	2.0	1.37	68.5						
bdenu	1000.0	1033.77	103.4						
el	1000.0	1038.61	103.9						
ssium									
nium									
er									
um									
lium									
dium									
	1000.0	1015.91	101.6						

FORM VII - IN

ILM02.1

10
Instrument Detection Limits (Quarterly)

Name: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____
Code: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU
ID Number: TJA_36_____ Date: 01/03/96
e AA ID Number : _____
ice AA ID Number : _____

Conn 2/15/96 Conn 2/15/96

Analyte	Wavelength (nm)	Background	~~CRDL~~ EQL (ug/L)	~~IDL~~ MDL (ug/L)	M
Aluminum	308.22		100	27.2	P
Antimony	206.84		100	8.5	P
Arsenic	193.70		200	18.8	P
Barium			2		NR
Beryllium			1		NR
Bismuth			10		NR
Cadmium	226.50		5	0.6	P
Calcium	315.89		200	148.0	P
Chromium	267.72		10	2.6	P
Cobalt			5		NR
Copper	324.75		20	14.0	P
Iron	259.94		100	71.7	P
Lead	220.35		50	8.0	P
Lithium			100		NR
Magnesium	279.08		100	23.0	P
Manganese	257.61		5	0.8	P
Mercury			0.2		NR
Molybdenu	202.00		10	5.8	P
Nickel	231.60		20	2.8	P
Potassium			200		NR
Selenium			5		NR
Silver			5		NR
Sodium			500		NR
Thallium			5		NR
Tin			10		NR
Vanadium			10		NR
Zinc	213.86		20	2.2	P

ts:

10

Instrument Detection Limits (Quarterly)

Name: ROSS_ANALYTICAL_SERVICES_ Contract: METCO_____
Code: ROSS__ Case No.: _____ SAS No.: _____ SDG No.: BAGHOU
ID Number:
ne AA ID Number : LEEMAN_PS200
ıace AA ID Number : _____ Date: 12/16/95

Analyte	Wave-length (nm)	Back-ground	EQL ~~CRDL~~ (ug/L)	MDL ~~IDL~~ (ug/L)	M
Aluminum			100		NR
Antimony			100		NR
Arsenic			200		NR
Barium			2		NR
Beryllium			1		NR
Bismuth			10		NR
Cadmium			5		NR
Calcium			200		NR
Chromium			10		NR
Cobalt			5		NR
Copper			20		NR
Iron			100		NR
Lead			50		NR
Lithium			100		NR
Magnesium			100		NR
Manganese			5		NR
Mercury	253.70		0.2	0.04 ~~0.0~~	CV
Molybdenu			10	cm 2/15/96	NR
Nickel			20		NR
Potassium			200		NR
Selenium			5		NR
Silver			5		NR
Sodium			500		NR
Thallium			5		NR
Tin			10		NR
Vanadium			10		NR
Zinc			20		NR

cm 2/15/96 cm 2/15/96

nts:

ROSS Ross Analytical Services, Inc.
16433 Foltz Industrial Parkway • Strongsville, Ohio 44136
(216) 572-3200 • Fax (216) 572-7630 • 1-800-325-7717

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: Chapparal Steel/96-15

SAMPLE IDENTIFICATION

Lab Number	Sample Description	Lab Number	Sample Description
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

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

ork Order # 96-02-151 Ross Analytical Services, Inc Reported: 03/04/96

ample Description: B Baghouse Dust Lab No.: 01

nalyte Description	Result	Units	EQL
ntimony by ICP	<EQL	mg/Kg	500
rsenic by ICP	<EQL	mg/Kg	500
admium by ICP	556	mg/Kg	25
hromium by ICP	861	mg/Kg	50
opper by ICP	1530	mg/Kg	100
ron by ICP	133,000	mg/Kg	1000
ead by ICP	18,200	mg/Kg	250
anganese by ICP	19,500	mg/Kg	25
olybdenum by ICP	48	mg/Kg	50
ickel by ICP	287	mg/Kg	100
inc by ICP	128,000	mg/Kg	100