

PLAINTIFF'S
EXHIBIT
ASA-341

INDUSTRIAL HYGIENE SURVEY

Corpus Christi Plant

April 21-23, 1971

AMERICAN SMELTING AND REFINING COMPANY
Department of Environmental Sciences
Salt Lake City, Utah

Plant: CORPUS CHRISTI Survey Date: April 21-23, 1971

Field Work: Thomas J. Smith Report Date: August 25, 1971

Industrial Hygiene Survey

1. Operating Conditions: All operations were normal. Construction in the zinc reverberatory furnace area in the Sulfide Plant made noise evaluations difficult.
2. Sampling: One-hour sequential samples of airborne dust and fume were collected in several work areas by means of A.I.S.I. tape samplers. These samples were analyzed for lead and cadmium by atomic absorption spectrophotometry.

Acid mist was sampled in the cell houses by means of membrane filters. However these samples were lost because of a problem with storage containers.

Selected operations were sampled for fumes with personal monitor devices.

Sulfur dioxide samples were collected in acidified hydrogen peroxide using two midjet impingers in series following a membrane prefilter. Total sulfate collected was measured with a modified barium chloranilate technique.

Noise levels were measured with a B and K Sound Level Meter, set on the A weighting network, and using the slow response setting. The meter was calibrated with a standard sound source before each set of measurements.

3. Sampling Results:

- A. Airborne Dust - the average levels of airborne lead and cadmium in the Roaster Building and near the oxide crusher are shown below:

Location	Concentration (mg/m ³)			
	Pb	% >0.2 mg/m ³	Cd	% >0.1 mg/m ³
Roaster Bldg.	.069	7	.014	0
Oxide Crusher	.012	0	.025	0

Personal monitor samples taken in the Cadmium Department are shown below:

<u>Operation</u>	<u>Sampling Time</u>	<u>Cadmium Conc'n. (mg/m³)</u>
1. Casting bars	35 min.	.021
2. Charging kettle	52 min.	.015

B. Sulfur dioxide concentrations on the third floor of the Roaster Building are given below:

<u>Location</u>	<u>Sampling Time</u>	<u>SO₂ Conc'n. (ppm)</u>
1. On guard of #2 dry feed belt	10 min.	7.9
2. Between roasters	12 min.	2.9
3. Outside foreman's office	10 min.	2.0

C. Noise Levels:

<u>Location - Operation</u>	<u>dB(A)</u>	<u>Permissible Exposure *</u>
1. Acid Plant - Near blower Operator's area	87-88 76-78	--- ---
2. Roaster Building - 4 ft. from ball mill Center of ground floor Center ground floor with rapper on Near flush roaster, 2nd floor	89-90 79-81 92-93 89-90	--- --- 5 ---
3. Zinc Dust Furnace - South platform area	89-90	---
4. Cell house - sulfide side - Stripper operation Steam cleaning lance Buffing copper head bars	88-90 105 99	--- 1 2-1/2
5. Cell house - oxide side - Stripping floor	88-90	---

C. Noise Levels (cont.):

<u>Location - Operation</u>	<u>dB(A)</u>	<u>Permissible Exposure *</u>
6. Power House -		
Ground floor (general)	38-90	---
Top floor (general)	92-94	4-1/2
Control room	85	---
7. Oxide Leach Building -		
General	80-90 (average-86)	---
8. Oxide Ball Mills -		
Between #1 and #2 Mills	89-92	7
Leadman's office	71	---
9. Zinc Die Casting Area -		
Stacking bars	95	4
Work area by ladle of casting machine	90-96	5

* Permissible exposure allowed per 8-hour shift under the Occupational Safety and Health Act of 1970.

4. Comments:

Aside from the Roaster Building the overall conditions in the plant were excellent. Housekeeping was very good.

The Roaster Building has some dust and sulfur dioxide problems. The roasters are inadequately sealed which allows dust and sulfur dioxide to permeate the upper floors of the building (See Photo). Although there was visible airborne dust, the sampling results did not indicate any hazardous concentrations of lead or cadmium. Sulfur dioxide was generally not present in excessive concentrations. However, there were localized areas near leaks in the roasters which had very noticeable sulfur dioxide.

A new roaster to take the place of the existing roasters is presently under construction. This should alleviate the major source of industrial hygiene problems in the plant.

Airborne cadmium levels were acceptably low in the Cadmium Department. The kettle for melting cadmium was well hooded and the molten metal surface was covered with molten caustic flux to prevent fuming. Personnel in this area made good use of protective equipment. There have been no recent reports of excessive cadmium excretion by men in this department.

Conditions in the cell houses were generally good but during calm weather conditions there were localized areas with enough acid mist in the air to cause transient eye and nasal irritation (See Photo). Based on the threshold for this type of irritation (N.I.Sax, Dangerous Properties of Industrial Materials), the airborne concentration of sulfuric acid mist was approximately 0.5 to 1.0 mg/m³. These levels approach the Occupational Safety and Health Act standard of 1.0 mg/m³ sulfuric acid mist averaged over an 8-hour shift.

The zinc reverberatory furnace in the Sulfide Plant was releasing considerable amounts of fume into the charge floor. This was attributed to the furnace being too full of metal. Since a great deal of fume escaped from the building through the roof ventilator, there is a definite potential for an air pollution citation for an opacity violation. Closer supervision of furnace operations may be required.

There were only a few areas with noise levels exceeding 90 dB(A). Considering the normal distribution of work activities, it is doubtful that any of the men exceeded the permissible exposures.

5. Recommendations:

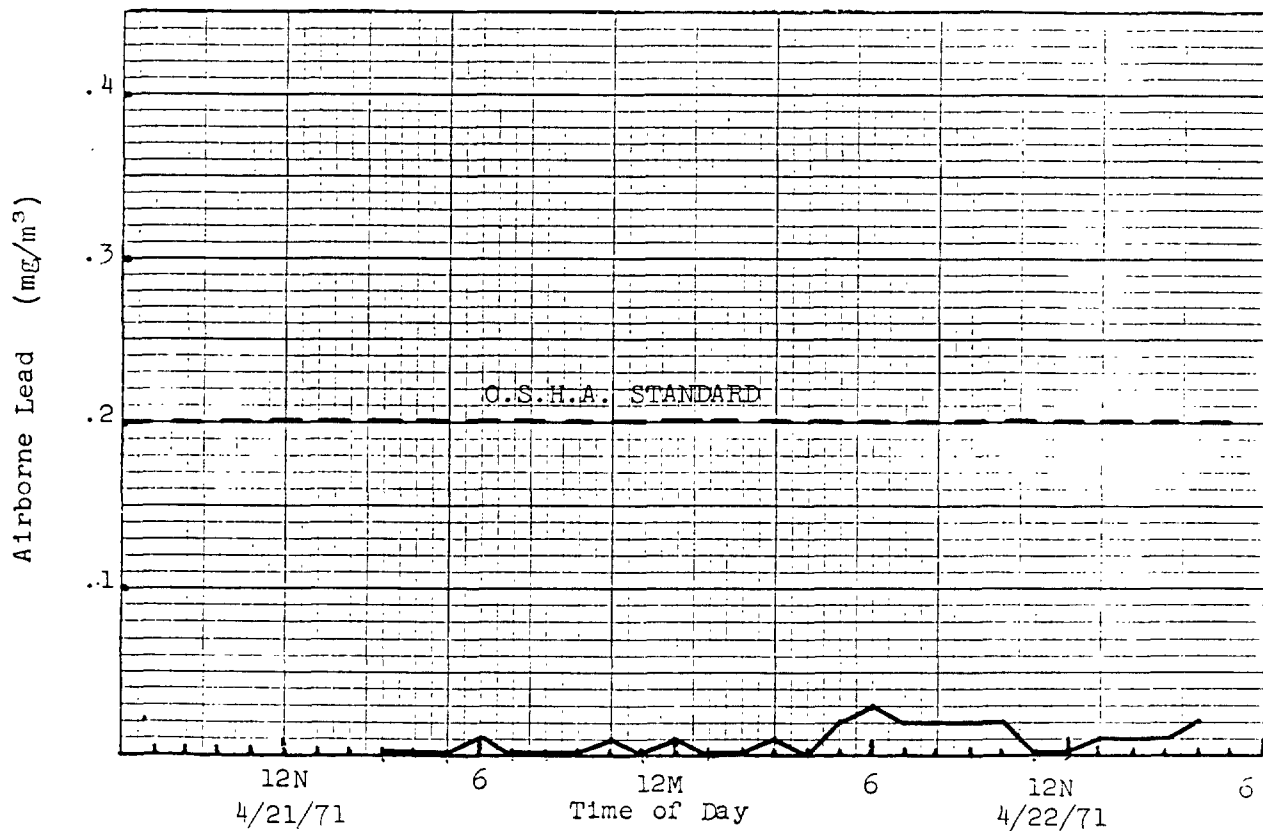
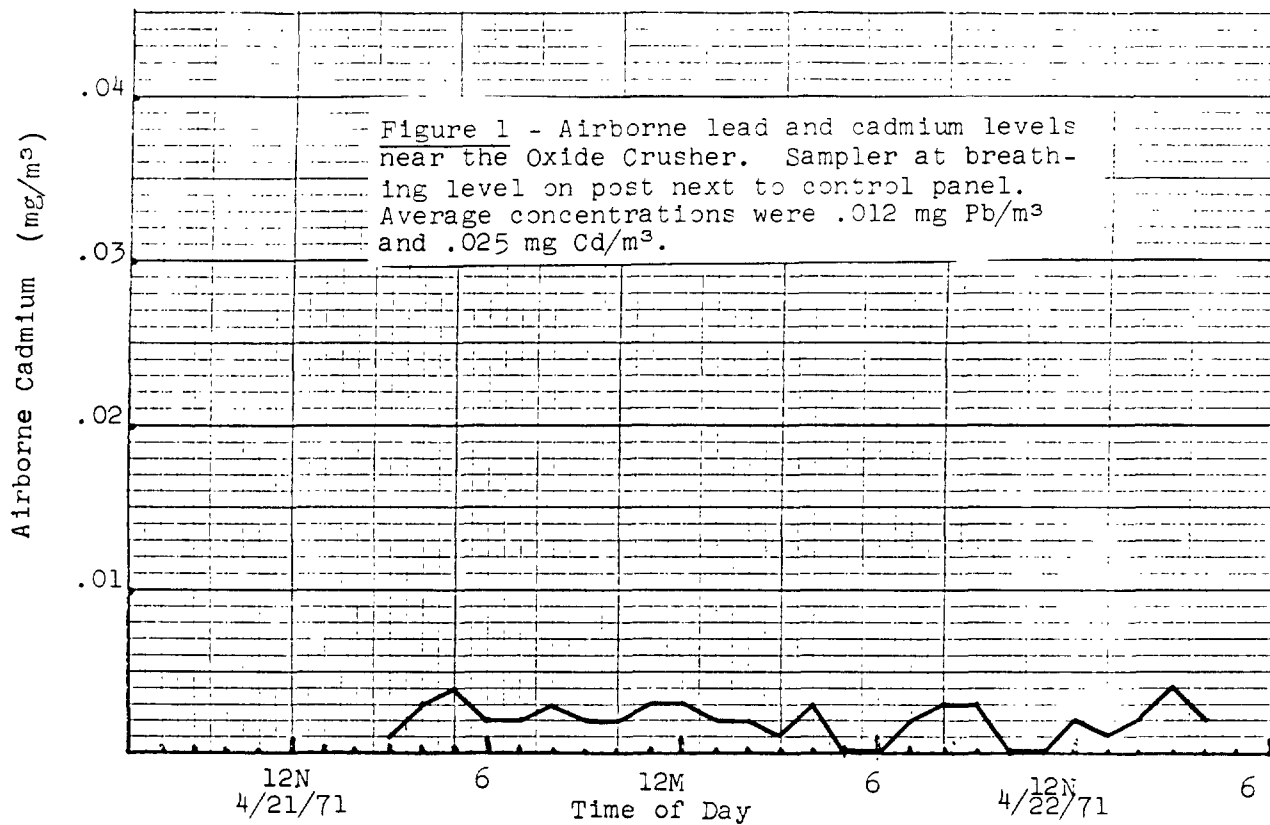
- A. The roasters should be kept as tightly sealed as practicable to control local concentrations of dust and sulfur dioxide.
- B. During calm weather as much ventilation as possible should be provided to the work areas in the cell houses, in order to prevent any accumulation of acid mist.
- C. Noise exposures should be checked by observing work activities in noisy areas to be certain that the limits are not being exceeded.

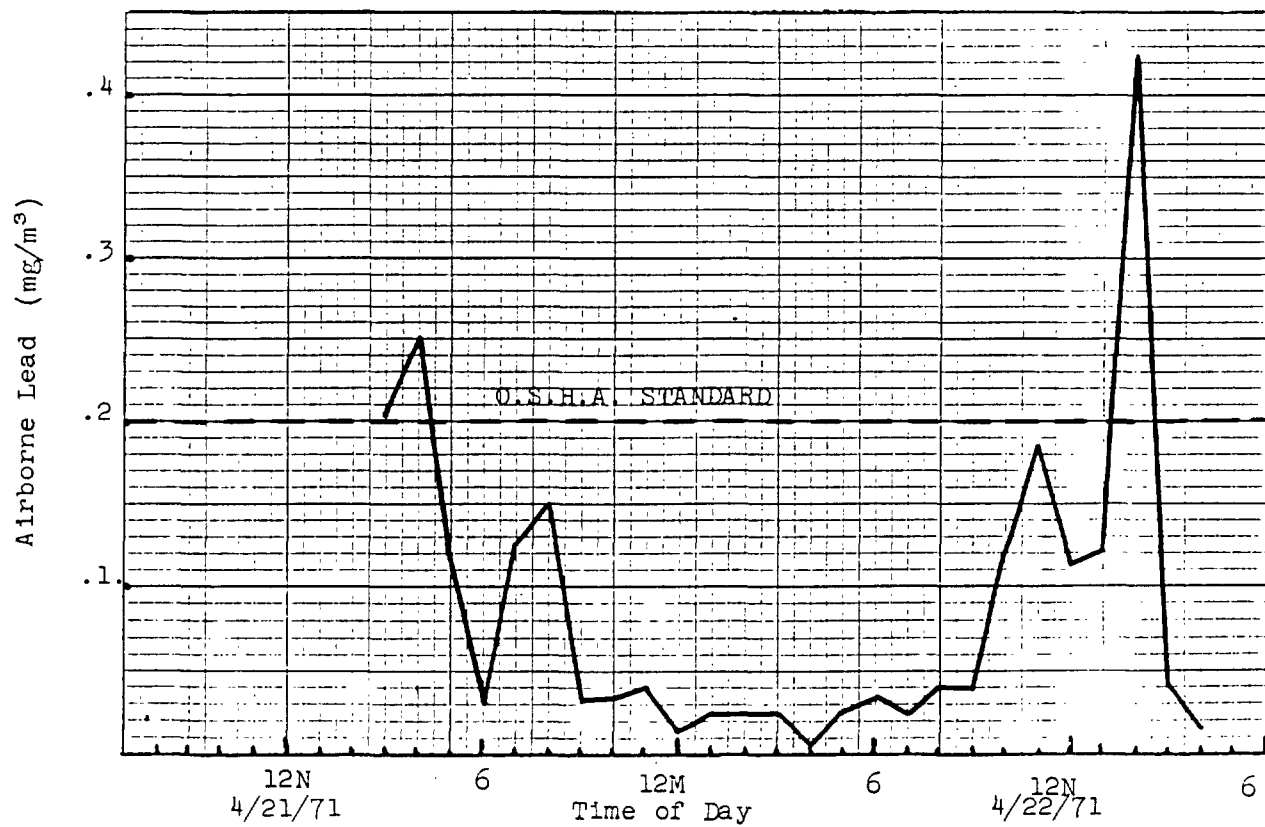
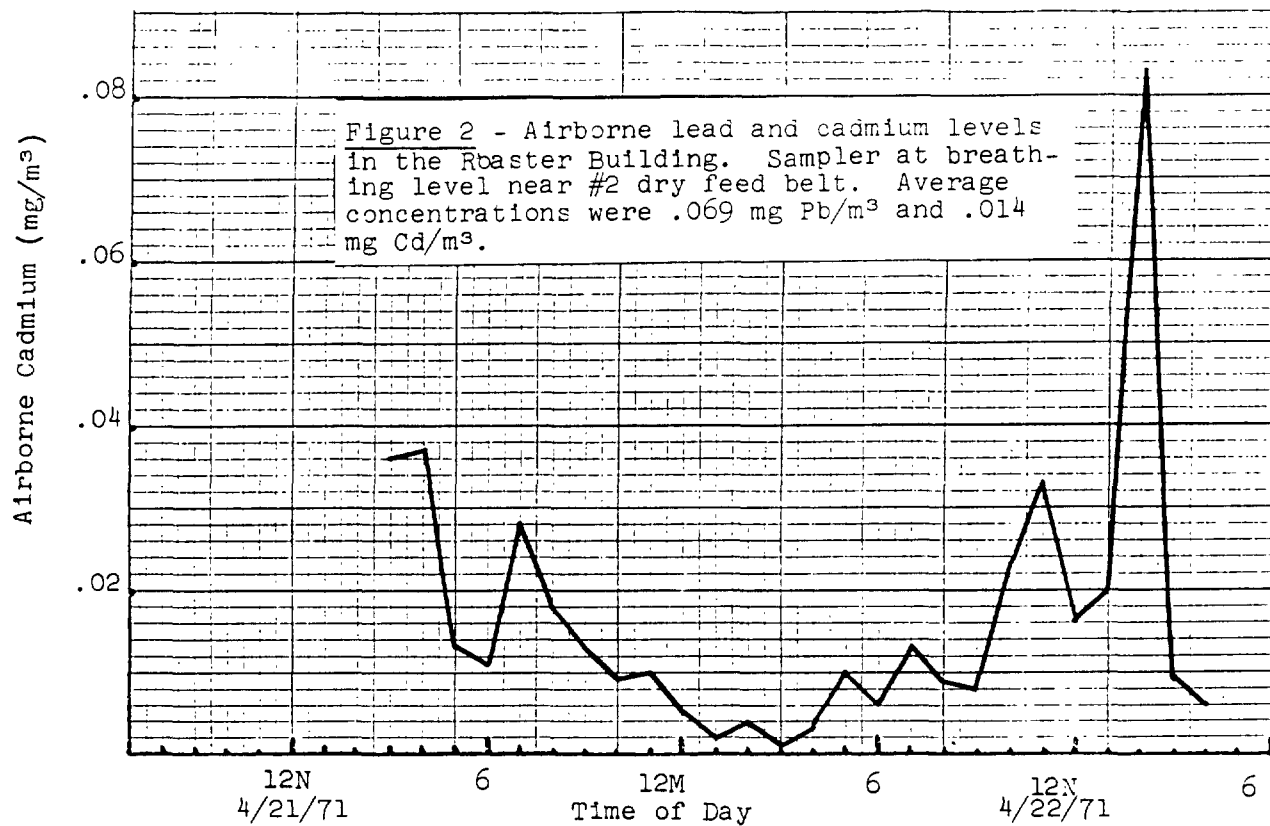


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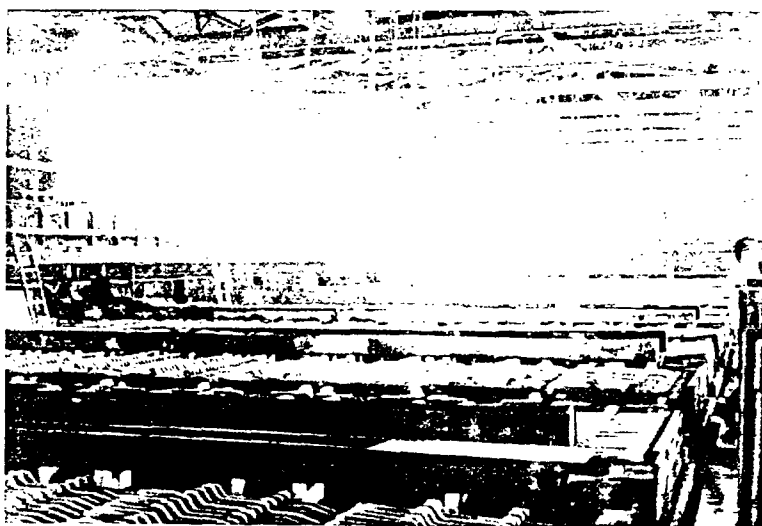
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HLMontague
KDLoughridge
DHSoutar
AJGillespie, Jr.
EHHaug
Dr. SSPinto
RCBeckstead
KWNelson







Roaster Building - third floor -
Noticeable dust and
sulfur dioxide present



Cell House - showing the acid mist
present during calm weather