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DAS

Interoffice Communication

RECEIVED

To A. H. Sather

JUL 10 1978

From J. V. Uptain

MEDICAL DIV.

Date June 27, 1978

Subject CHEMICAL EXPOSURE MONITORING SUMMARY
SECOND QUARTER, 1978

I. COLOR WEIGH ROOM

The results of high-volume air sampling in the color weigh room are shown in Table I (Attached). Major points revealed were:

- A. Excessive airborne concentrations of Antimony, Barium, Cadmium, and Lead were found.
- B. Five (5) of the thirteen (13) samples were above the OSHA Standard for total particulates. Four (4) others were greater than 50% of the Standard.
- C. All but two (2) of the thirteen samples were above the OSHA "Equivalent Exposure" Standard (See Table I for a definition of this term).

Following sampling, the color weigh hood was connected to the compound ventilation system to improve exhaust rates.

At present, more samples are being taken to assess the effect of the hood change. No sample analyses are available at writing, but gross particulate concentrations are 1,340; 9,270; 14,500; and 16,100 micrograms per cubic meter of air.

II. DRY BLEND HIGH-VOLUME AIR SAMPLING

Nine (9) samples from the Dry Blend area have been analyzed (See Table II). Six (6) other samples have been taken, but not yet analyzed.

The results are very encouraging. No materials were found to exceed limits. Tin, the major concern, was found to be at very low levels. The OSHA "Equivalent Exposures" were nil except for one (1) sample (#78-20), which also indicated an excursion above the total particulate limit.

Pending further results, it is concluded that no significant exposures are evident in the Dry Blend area.

III. COMPOUND AREA HIGH-VOLUME AIR SAMPLING

A total of 21 samples have been taken in the Compound area. Analyses is now underway and the results will be shown in the 3rd quarter report.

Approximately 15 more samples are needed to adequately define the use of Barium/Cadmium material and two (2) lead compounds (a phosphite and a stearate). Sampling is limited by the availability of production runs involving these materials.

IV. SULFURIC ACID

A method for sampling airborne concentrations of sulfuric acid was developed by the Lab. The procedure was to collect 0.1 - 0.4 M³ of air, using a Bendix air pump and a "midget" liquid impinger containing 20 ml of distilled water. The solution was then treated with barium chloride and a turbidity comparison made against standard solutions. The sensitivity of the analysis was ± 0.02 milligrams of sulfuric acid.

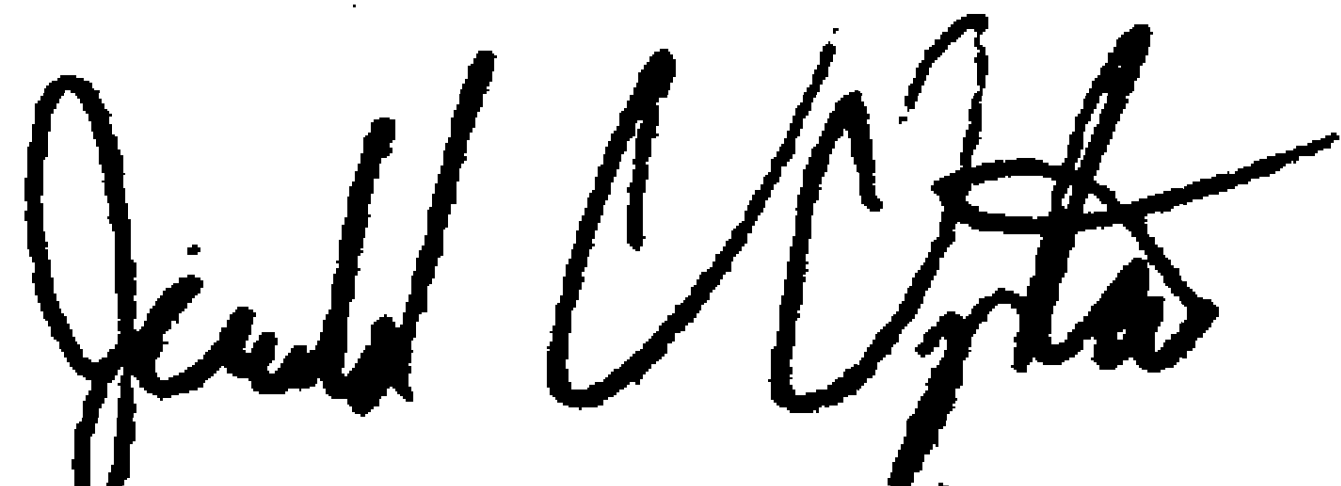
Six (6) samples were taken at the treatment lagoon area during sulfuric acid addition. The results were well below the 1.0 milligram per cubic meter of air standard, amounting to 0.067, 0.053, 0.17, 0.074, 0.077, and 0.08 milligrams per cubic meter of air.

V. PHTHALIC ANHYDRIDE

A test method for phthalic anhydride was developed by the Lab. Sampling will commence within early July. The technique involves dosimetry and will involve Yard Operators and Plasticizer Operators.

VI. SILICON DIOXIDE

A test method for silicon dioxide was developed by the Lab and a sampling vortex for collecting respirable fractions during dosimetry was obtained. Sampling will begin during early July and will involve Plasticizer Operators.


Jerald V. Uptain

jf

Attachments

c: GGD, DWF, Department Heads, DSC, B. Lloyd
DAK, JJH, QDS

TABLE I
COLOR WEIGH ROOM HIGH-VOLUME AIR SAMPLING

1/31/78 - 2/27/78

SAMPLE NO:	78-1	78-2	78-3	78-4	78-5	78-6	78-7	
CHEMICALS BEING SAMPLED:	Tribasic Lead Sulfate	Barium/Cadmium	Dibasic Lead Phthalate, Tribasic Lead Sulfate	Tribasic Lead Sulfate	Calcium Stearate	Dibasic Lead Phthalate, Tribasic Lead Sulfate	Barium/Cadmium	
ELEMENT	CONCENTRATION, MICROGRAMS PER CUBIC METER OF AIR							TOXIC LIMIT VALUE (TLV)
Antimony	3.6	13.7	9.5	6.3	8.2	0	15.6	500
Barium	16.8	492.1	82.7	20.5	253.4	22.8	187.6	500
Cadmium	36.3	423.4	59.1	18.2	31.3	16.7	760.9	200
Chromium	<0.2	<1.4	2.5	<0.5	0.4	<0.3	<1.9	54.7 (As Cr in CrO ₃)
Copper	0.3	<1.4	<0.8	* <0.5	0.4	<0.3	<1.9	1,000
Lead	* <0.5	217.4	390.0	170.4	171.4	>327.3	291.9	200
Manganese	<0.1	* <1.4	<0.8	<0.5	<0.3	<0.3	* <1.9	500
TOTAL PARTICULATES	2,260	21,200	9,200	5,700	8,300	4,300	29,300	15,000
** Equivalent Exposure (Mixture)	0.23	4.25	2.48	1.01	1.55	1.77	5.71	1.00

* No emission line observed for this element. All < or > values were outside calibration range.

** $Em = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$, where: Em is the equivalent exposure of the mixture, C is the concentration of a particular contaminant, L is the exposure limit for that contaminant.

TABLE I (Cont.)
COLOR WEIGH ROOM HIGH-VOLUME AIR SAMPLING

1/31/78 - 2/27/78

SAMPLE NO:	78-8	78-9	78-10	78-11	78-12	78-13	
CHEMICALS BEING SAMPLED:	Barium/Cadmium	Calcium Stearate	Antimony Complex	Antimony Trioxide	Tribasic Lead Sulfate (Non- Dusting)	Antimony Trioxide	
ELEMENT	CONCENTRATION, MICROGRAMS PER CUBIC METER OF AIR						TOXIC LIMIT VALUE (TLV)
Antimony	7.3	0	0	7815.3	59.3	> 1729.4	500
Barium	< 0.9	20.9	74.0	2.4	0.7	1.9	500
Cadmium	> 867.1	8.6	32.1	5.7	42.6	3.2	200
Chromium	< 0.9	< 0.7	< 2.5	1.7	0.7	< 1.7	54.7 (As Cr in CrO ₃)
Copper	< 0.9	< 0.7	< 2.5	< 0.8	0.6	< 1.7	1,000
Lead	162.6	70.0	575.3	34.8	> 516.9	26.4	200
Manganese	* < 0.9	0.7	< 2.5	< 0.8	* < 0.5	* < 1.7	500
TOTAL PARTICULATES	19,600	14,700	39,300	11,400	5,700	44,900	15,000
** Equivalent Exposure (Mixture)	5.18	0.45	3.24	1.87	2.93	3.65	1.00

* No emission line observed for this element. All < or > values were outside calibration range.

** $E_m = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$, where: E_m is the equivalent exposure of the mixture, C is the concentration of a particular contaminant, L is the exposure limit for that contaminant.

DRY BLEND HIGH-VOLUME AIR SAMPLING

3/10/78 - 3/21/78

-CHEMICAL BEING SAMPLED: ALKYTIN MERCAPTIDE-

SAMPLE NO:	<u>78-20</u>	<u>78-21</u>	<u>78-25</u>	<u>78-51</u>	<u>78-52</u>	
SAMPLING LOCATION:	Mezzanine Above 2nd Floor	Mezzanine Above 2nd Floor	Mezzanine Above 2nd Floor	Mezzanine Between 1st & 2nd Floor	Mezzanine Between 1st & 2nd Floor	
<u>ELEMENT</u>	<u>CONCENTRATION, MICROGRAMS PER CUBIC METER OF AIR</u>					<u>TOXIC LIMIT VALUE (TLV)</u>
Antimony	* ≤ 10.7	* ≤ 29.9	* ≤ 9.8	0.11	0.34	500
Barium	≤ 1.1	≤ 0.6	≤ 1.0	0.09	0.21	500
Chromium	≤ 1.1	≤ 0.6	≤ 1.0	0.02	0.07	54.7 (As Cr in CrO ₃)
Copper	≤ 1.1	≤ 0.6	≤ 1.0	0.02	0.04	1,000
Lead	27.9	2.1	3.7	2.11	3.73	200
Manganese	1.4	0.7	1.4	0.06	0.13	500
Tin	1.4	1.1	1.0	0.48	1.64	100
TOTAL PARTICULATES	16,000	10,000	13,500	750	250	15,000
** Equivalent Exposure (Mixture)	0.20	0.10	0.08	0.02	0.04	1.00

* No emission line observed for this element. All $\leq$ or $\geq$ values were outside calibration range.

** $Em = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$, where: Em is the equivalent exposure of the mixture, C is the concentration of a particular contaminant, L is the exposure limit for that contaminant.

TABLE 11 (CONT.)
DRY BLEND HIGH-VOLUME AIR SAMPLING

3/10/78 - 3/21/78

-CHEMICAL BEING SAMPLED: ALKYTIN MERCAPTIDE-

SAMPLE NO:	<u>78-53</u>	<u>78-54</u>	<u>78-55</u>	<u>78-56</u>
SAMPLING LOCATION:	Mezzanine Between 1st & 2nd Floor	Basement, Blender Platform	Basement, Blender Platform	Basement, Blender Platform

<u>ELEMENT</u>	<u>CONCENTRATION, MICROGRAMS PER CUBIC METER OF AIR</u>				<u>TOXIC LIMIT VALUE (TLV)</u>
Antimony	0.09	0.47	0.33	* < 0.44	500
Barium	0.06	0.14	0.17	0.19	500
Chromium	0.01	< 0.07	0.03	0.06	54.7 (As Cr in CrO ₃)
Copper	0.27	< 0.07	0.07	0.10	1,000
Lead	3.04	4.05	9.03	8.10	200
Manganese	0.05	0.10	0.11	0.22	500
Tin	0.67	10.12	0.57	2.29	100
TOTAL PARTICULATES	860	3,400	1,200	3,600	15,000
 ** Equivalent Exposure (Mixture)	 0.02	 0.12	 0.05	 0.07	

* No emission line observed for this element. All < or > values were outside calibration range.

** $Em = \frac{C_1}{L_1} + \frac{C_2}{L_2} + \dots + \frac{C_n}{L_n}$, where: Em is the equivalent exposure of the mixture, C is the concentration of a particular contaminant, L is the exposure limit for that contaminant.

Oran D. Steffey



To

Date 10/17/78

Aberdeen Monitoring Results

COMMENTS:

- 1) Chemical Exposure Monitoring appears good.
- 2) Continuous monitoring in tank farm area for:
#5 process control should be questioned,
#7 respirator air inlet should be questioned.

Called Sather Re: above 10/24/78

PLEASE CIRCULATE TO ALL DOCTORS

~~Dr. Lombke~~
Dr. Whetstone X
~~Dr. Drumwright~~ X
Dr. Massad
~~Dr. Jones~~

Return to Dr. Steffey.



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