PLAINTIFF'S EXHIBIT

ASA-493

ENVIRONMENTAL SURVEY

CAPCO

Ragland Plant

February 4-5, 1976

ENVIRONMENTAL SURVEY
CAPCO
Ragland Plant
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EXECUTIVE SUMMARY

A new ventilation system was installed since the last environmental survey. Most employee exposures have been significantly reduced and housekeeping has improved. However, the air samples show that the batch mixing operator is exposed to asbestos concentrations exceeding the current OSHA ceiling concentration (which is never to be exceeded). Ventilation must be improved in this area. Total particulate concentrations exceed the OSHA standard around the pipe machine shot blaster. Plans to enclose and ventilate this area should be made. The employee working around the baghouse and scrap grinder is exposed to asbestos concentrations exceeding the future OSHA 8-hour TWA of 2.0 fibers/cc.

A major process change is recommended. From an industrial hygiene standpoint, the wet mill should be replaced with a dry mill.

Extensive noise measurements show that many employees are exposed to excessive sound levels. A more extensive study of employee noise exposures and related noise sources by D.O.E.S. and/or a noise consultant is needed.

The Ragland Plant should have a full-time safety man.

The existing solid waste dump should be converted to a sanitary landfill operation. Scavenging by local residents should be stopped with appropriate fencing and posting.

Records and file material for a number of environmental topics are requested.

ENVIRONMENTAL SURVEY REPORT
CAPCO
Ragland Plant
February 4-5, 1976

I. OPERATING CONDITIONS

Operating conditions were normal during the survey. This is the first survey since installation of an entirely new ventilation system.

II. SAMPLING PROCEDURES

A. Air:

1. Individual samples for asbestos fiber analysis were collected with M.S.A. personal monitoring pumps equipped with open-face Millipore filters (0.8 micron pore size). The asbestos fibers were counted using a Zeiss phase-contrast microscope, according to methods specified in the NIOSH criteria document.

2. Individual samples for dust and fume analysis were collected with M.S.A. personal monitoring devices equipped with closed-face (plastic cover in place and inlet plug removed) Millipore filters (0.8 micron pore size), and analyzed for lead, cadmium, and iron by atomic absorption spectrophotometry.

   Total particulate content was found by weighing filters before and after exposure.

   Free silica was determined by using the modified Talvitie method, as recommended by NIOSH.

3. Ventilation measurements were made with an Alnor Velometer, Series 6000-P.

B. Noise:

1. Sound level measurements were taken with a B&K 2205 Sound Level Meter using the "A" scale and "slow" response setting. The meter was calibrated with a standard noise source before and after each set of measurements.

2. Personal noise exposure data were collected using DuPont Permissible Audio Dosimeters, Model D-100, which measure noise exposures in terms of the present 90 dBA OSHA standard. A DuPont Audio Dosimeter Readout (Model R150) was utilized to decode each dosimeter memory cell and produce a reading as a percentage of the current 90 dBA standard. The calibration of each dosimeter was checked daily using a DuPont Audio Dosimeter Calibrator.

III. A. Air:

1. Asbestos Samples

a. Employees

Department	Employee Name	Job or Operation	1976 Date	Sampling Time (Min.)	Asbestos Concentration (fibers >5μ long per cc air)
Kollergang Wet Mill	J.Jones (resp.worn when charging)	Batch Mixer	3/4	25	14. (1)
			3/5	69	2.6 (2)
	J.Looney (resp.worn when charging)	Batch Mixer	3/4	83	8. (1)
Pipe Machine	J.Noah (no resp.worn)	Machine Tender	3/4	78	0.3
	J.Woods (no resp.worn)	Tray Loader	3/5	65	0.1
	C.Byers (no resp.worn)	Tray Unloading	3/4	105	0.2
Pipe Finishing Line	A.Gray (no resp.worn)	Pipe Lathe Operator	3/4	104	1.2 (3)
	B.St.John (no resp.worn)	Hydrotester	3/4	101	0.03
	C.Johnson (no resp.worn)	Flextester (used hand-grinder on 2-3 pipes)	3/4	99	0.4
	M.Bunt (no resp.worn)	Load Unitizing	3/4	74	0.3

1. Asbestos Samples - Employees (cont.)

Department	Employee Name	Job or Operation	1976 Date	Sampling Time (Min.)	Asbestos Concentration (fibers >5μ long per cc air)
Lathes	J.Nix (no resp.worn)	MOA Lathe	3/4	98	0.08
	H.Phillips (no resp.worn)	MOA Lathe	3/4	91	0.07
	A.Kay (no resp.worn)	Coupling Cut-off	3/4	100	0.2
	W.Nobles (no resp.worn)	Large Coupling Lathe	3/4	100	0.08
Saw	C.Wolfe (resp.worn)	Cut-off Saw Operator	3/4	89	0.7 (3)
	G.Bollinger (resp.worn)	Cut-off saw Helper	3/4	85	0.3
Scrap Grinding	J.L.Davis (resp.worn)	Scrap Grinder	3/4	30	2.0 (3)
			3/5	74	2.7 (2)

Footnotes:

(1) Exceeds current OSHA standard for asbestos:

8-hour Time-Weighted Average (TWA) = 5 fibers/cc air
Ceiling Concentration = 10 fibers/cc air

(2) Exceeds future OSHA standard for asbestos (effective July 1, 1976):

8-hour TWA = 2.0 fibers/cc
Ceiling Con'n. = 10 fibers/cc

(3) Exceeds proposed OSHA standard for asbestos:

8-hour TWA = 0.5 fibers/cc
Ceiling Conc'n. = 5.0 fibers/cc

1. Asbestos Samples (cont.)

b. Stationary Samples

Location	1976 Date	Sampling Time (Min.)	Asbestos Concentration (fibers > 5 μ long per cc air)
Lab - middle of bench	3/5	254	0.03
Foremens' Office	3/5	225	0.09
Main Office	3/5	710	None Found

2. Dust and Fume Samples - Employees

Employee Name	Job or Operation	1976 Date	Sampling Time (Min.)	Analysis	Conc'n. (mg/m^3)
W.Mostella (resp.worn)	Pipe Machine Shot Blaster	3/4	71	Iron Oxides	4.8
				Total Part.	10. (1)
				Free Silica =	1.9%
				OSHA DUST LIMIT = (based on free silica content)	7.6
V.Baffron (no resp.worn)	Welder (mild steel)	3/5	223	Iron Oxides	0.7
				Total Part.	2.5
				Lead	< 0.02
				Cadmium	< 0.004

Footnote:

(1) Exceeds OSHA 8-hour time-weighted average exposure.

OSHA LIMIT:

Total Particulate (no free silica content) = 15.0 mg/m^3
Total Particulate (based on free silica content) = $\frac{30\ mg/m^3}{\%\ SiO_2 + z}$

Iron Oxide Fume = 10 mg/m^3
Lead = 0.20 mg/m^3
Cadmium (fume) = 0.10 mg/m^3

3. Ventilation Measurements

Location	Average Face Velocity (feet per minute)
Batch Mixing - charging hood	<50
Pipe Finishing Lathe - hood on hydro-testing side	400-600
- top hood on flex testing side	400
- bottom pick-up on flex testing side	200
Cut-off Saw - operator's inspection port	400
- side opening	250

B. Noise Measurements:

1. Sound Level Measurements

Area	Location	Sound Level (dBA)	OSHA Permissible Noise Exposure Duration per Day (Hrs./Min.)
Pipe Machine	Stripping operator's position	88	8/0
	Opposite stripping position	86	8/0
	- with compressed air venting	92-94	6/0-4/36
Pipe Finishing Line	Finishing lathe		
	- lathe off	88	8/0
	- lathe on	96	3/30
	Flextesting area		
	- lathe off	89	8/0
	- lathe on	96	3/30

1. Sound Level Measurements (cont.)

Area	Location	Sound Level (dBA)	OSHA Permissible Noise Exposure Duration per Day (Hrs./Min.)
Lathes	Large coupling lathe		
	- lathe off	88-92	8/0-6/0
	- lathe on	94-98	4/36-2/40
	Small coupling lathe		
	- lathe off	90	8/0
	- lathe on	98-103	2/40-1/20
Baghouse Area	In driveway	90	8/0
	Near screw conveyor	98-100	2/40-2/0
Saws	Wood saw		
	- operating but not cutting	95	4/0
	- cutting	99-102	2/18-1/30
Mobile Equipment	Erickson autoclave charger		
	- idle	74	8/0
	- accelerated in neutral	92-96	6/0-3/30

2. Personal Noise Exposures

Employee Name	Job	1976 Date	Sampling Time (Min.)	Dosimeter[1] Readout (% exposure)	8-Hour[2] Adjusted Readout (% exposure)	Sound[3] Level Exceeded 115 dBA?
J.Jones	Batch Mixer	3/4	213	112	252[4]	Yes
		3/5	260	121	223[4]	Yes
J.Looney	Batch Mixer	3/5	372	16[6]	21[6]	No
L.Tramell	Kollander	3/5	258	45	84[5]	Yes
G.Ford	Machine Tender	3/4	212	52	118[5]	No
		3/5	261	90	166[4]	Yes

2. Personal Noise Exposures (cont.)

Employee Name	Job	1976 Date	Sampling Time (Min.)	Dosimeter[1] Readout (% exposure)	8-Hour[2] Adjusted Readout (% exposure)	Sound[3] Level Exceeded 115 dBA?
J.Noah	Machine Tender	3/4	350	144	197[4]	Yes
N.Edge	Tray Loader Helper	3/5	258	37	69	No
J.R.Davis	Tray Loader Helper	3/5	255	24	45	No
J.Bagwell	Stripper Operator	3/4	197	59	144[4]	Yes
H.Woods	Pipe Finishing Lathe Operator	3/4	203	70	166[4]	Yes
A.Gray	Pipe Finishing Lathe Operator	3/4	344	146	204[4]	Yes
J.Nix	MOA Lathe	3/4	366	65	85	Yes
H.Phillips	MOA Lathe	3/4	363	27	36	No
W.Echols	Large Coupling Lathe	3/4	230	36	75[5]	No
B.Kay	Small Coupling Lathe	3/4	225	62	132[5]	Yes
H.O'Donnell	Cut-off Saw Operator	3/4	216	63	140[4]	Yes
C.Wolfe	Cut-off Saw Operator	3/4	345	45	63	Yes
D.Kay	Wood Saw Operator	3/5	237	73[7]	148[4,7]	Yes
J.Davis	Scrap Grinder	3/4	215	16[6]	36[5]	No
		3/5	269	71	127[5]	No
C.Foreman	Driver of Erickson Autoclave Charger	3/4	369	55	72	No
J.St.John	Hyster Driver Finishing Line	3/4	368	28	37	No

Footnotes for Personal Noise Exposures:

(1) Readout based on elapsed sampling time.

(2) The 8-hour adjusted readout is an extrapolation of the original dosimeter reading. This extrapolation assumes that the employee will be exposed to the same noise level during the remainder of the shift when the dosimeter is not worn.

(3) The OSHA noise standard does not allow employees to be exposed to sound levels greater than 115 dBA. However, experience to date shows that most dosimeter measurements greater than 115 dBA are the result of employee mischief, i.e. shouting into the microphone of the dosimeter. Therefore, these data must be interpreted cautiously.

(4) Dosimeter readouts greater than 100% indicate a violation of the OSHA noise standard. However, the accuracy of the dosimeters (as specified by A.N.S.I. S1.4 - 1971) is $\pm$ 2 dBA which translates to an upper confidence limit of 133%. Therefore, only readings greater than 133% are a positive violation of the OSHA noise standard.

(5) Readings from 75% - 133% fall within the dosimeter calibration limits and may be violations of the OSHA standard.

(6) These samples were taken with a dosimeter that malfunctioned and was repaired at a later date. Thus, the reported readout value is probably erroneous.

(7) The DuPont Model R150 Readout Unit malfunctioned when processing this result. Therefore, the reported value may be lower than the actual value.

IV. COMMENTS

A. OSHA:

1. Asbestos

The plant operated sporadically in 1975, but an entirely new ventilation system was installed. The new system consists of two baghouses operating in parallel. The capacity is 26,000 acfm at 17" H_2O pressure drop with an approximate air-to-cloth ratio of 2:1. Since the last environmental survey (November 1974), most employee exposures have been significantly reduced following installation of the new ventilation system.

The new ventilation system did not include the batch mixing area. Therefore, the asbestos exposures have not been changed and the batch mixers still receive exposures in excess of the OSHA ceiling concentration (10 fibers/cc), which is "never to be exceeded." The air velocity measurements show that the fan for the hood over the bag breaking area is ineffective and should be replaced as soon as possible, or the hood should be connected to the new ventilation system.

The Kollergang wet mill was observed to be quite messy, with wet asbestos covering equipment and the floor. There are plans to replace the wet mill with a dry mill such as that used at Van Buren. From an industrial hygiene standpoint, this replacement would be desirable and should receive a high priority.

The future OSHA standard of 2 fibers/cc (effective July 1, 1976) would be violated in the scrap grinding area. The scrap grinder (J.L.Davis) works around the baghouses (which is in the same area as the batch mixer). One source of exposure was observed to be fugitive emissions caused by allowing asbestos baghouse waste to drop from a screw conveyor into an open skip. The plant manager has plans to attach large plastic bags on the end of the screw conveyor. This idea should be implemented as soon as possible. Fugitive emissions were also observed from cracks in a bin near the baghouses. The maintenance department should repair these leaks.

Respirator use by employees has been much improved since the last survey. The plant uses two respirators:

1. The 3-M No. 8710 Disposable
2. The Welsh No. 7170 Disposable

A summary of OSHA requirements for an acceptable respirator program is included with this report. Plant personnel should review these requirements to assure compliance. More information is available from D.O.E.S., if needed.

The installation of the new ventilation system has also enhanced housekeeping around the plant. Accumulations of asbestos fibers were markedly reduced, especially around the lathes. However, housekeeping is still sub-standard and needs further improvement.

Employees still take their clothing home for laundering. An in-plant laundry should be constructed to prevent any future liability over alleged family exposures.

All hand-operated or power-operated tools should be provided with local exhaust ventilation. This would primarily apply to the hand grinder used on the pipe finishing line.

2. Dust:

The employee working around the pipe machine shot blaster is exposed to an excessive concentration of total particulate matter (based on the free silica content). Plans should be made to enclose and ventilate the shot blasting area, if feasible. Employees in the area should continue to wear respirators until engineering controls are installed.

3. Noise:

The audio dosimeter results show that many employes are exposed to excessive sound levels, specifically:

a. Batch mixer
b. Pipe machine tender
c. Pipe machine stripper
d. Pipe lathe operator
e. Small coupling lathe operator
f. Cut-off saw
g. Wood saw
h. Scrap grinder

These employees should wear hearing protection until suitable engineering controls can be evaluated and installed. Specific information about ear plugs and/or muffs is available from D.O.E.S.

The primary noise sources were not identified during the survey. However, the noise source around the pipe machine is probably compressed air venting. The noise source for lathe operators is probably the sound associated with cutting pipe. Engineering controls for this particular application may not be feasible. The cut-off saw and wood saw could be insulated to reduce noise levels. A more extensive study of employee noise exposures and related noise sources by D.O.E.S. and/or a noise consultant is needed. CAPCO management should consult with D.O.E.S. personnel for more specific information.

The Ragland Plant owns and operates a Beltone manual audiometer and IAC Testing booth. The audiometer is calibrated annually. The noise measurements reinforce the need for pre-employment and annual audiograms for all employees at the Ragland Plant. Since Asarco acquired the CAPCO Plants, audiograms have not been reviewed regularly. This situation should be resolved by contacting the Asarco Medical Director:

Dr. C. H. Hine
P. O. Box 7604
Rincon Annex
San Francisco
California 94120

The present location of the audiometric booth is questionable because the booth is located in the guard room where numerous trucks park or move back and forth outside. The ambient noise levels could exceed the maximum recommended ambient levels for the design of the booth. A consultant should be contacted to evaluate this situation and conduct an electric ear calibration of the booth and audiometer. Relocation of the booth to a quieter area may be necessary.

4. The Laboratory

The lab still uses a kitchen-type hood mounted over the sink. This hood should be replaced with a laboratory-type hood. The Corning Atomic Absorption Instrument is still not vented.

5. Safety

This plant shares a safety man with the Van Buren Plant in Arkansas. This system does not work. The Ragland Plant should employ a full-time safety man.

B. Water Treatment:

The plant succeeded in rebuilding its water pollution control system in the last year. All process waste water is now recirculated.

C. Solid Waste:

Solid waste, such as pipe and waste asbestos, is still disposed of in a large ravine west of the plant site. This operation should be converted to a sanitary landfill. Scavenging by local residents still occurs at the dump. This area must be fenced and posted to keep out unauthorized personnel. The abandoned dumping area north of the employee parking lot still needs to be covered; and the land should be reclaimed, if at all possible.

D. Records and File Information:

This Department does not have a historical file of correspondence and sampling results in relation to the environmental regulations (air, water, solid waste, and occupational health) faced by the Ragland Plant. A request for this information was sent to S.D. Weaver on October 31, 1974. No information has been received to date. Records and file material for the following subjects are requested:

1. State laws and standards.
2. Correspondence from State Departments.
3. Correspondence to State Departments.
4. Correspondence from the Environmental Protection Agency.
5. Correspondence to the Environmental Protection Agency.
6. Correspondence from OSHA.
7. Correspondence to OSHA.
8. OSHA Citations.
9. Plant environmental sampling correspondence.
10. Interoffice memos per environmental subjects.
11. Miscellaneous per environmental subjects.

This Department would also appreciate receiving copies of future correspondence concerning environmental topics.

V. RECOMMENDATIONS

A. The ventilation system for the batch mixing area must be improved to reduce asbestos fiber concentrations, which are currently in excess of the OSHA ceiling concentration.

B. It would be desirable to replace the Kollergang wet mill with a dry mill, as used at Van Buren.

C. Fugitive emissions around the baghouses and scrap grinding area should be eliminated, as discussed in the comments section.

D. The respirator program should be reviewed to assure compliance with OSHA requirements.

E. Housekeeping has improved since 1974 but is still sub-standard. More work is needed.

F. An in-plant laundry should be constructed.

G. The handgrinders used on the finishing line should be ventilated.

H. Plans should be made to enclose and ventilate the shot blasting area, if feasible. Respirators should be worn by employees in this area.

I. Employees working in the noisy areas, as described in the comments section, should wear hearing protection until suitable engineering controls can be evaluated and installed.

J. A more extensive study of employee noise exposures and related noise sources is needed.

K. Employee audiograms should be reviewed regularly. The Asarco Medical Director should be contacted.

L. A consultant should be contacted to evaluate the location of the audiometric testing booth and conduct an electric ear calibration of the equipment.

M. The kitchen-type hood in the laboratory should be replaced.

N. The Ragland Plant should employ a full-time safety man.

O. The dump should be converted to a sanitary landfill.

P. Scavenging in the dump must be stopped by fencing and posting the area.

Q. The abandoned dumping area should be covered, and the land reclaimed, if possible.

R. Historical information about environmental topics is requested.

James P. Sieverson

James P. Sieverson
Environmental Specialist

JPS/bjs
Encl.

SUMMARY OF OSHA REQUIREMENTS

FOR AN ACCEPTABLE RESPIRATOR PROGRAM

1. Written standard operating procedures governing the selection and use of respirators shall be established.

2. Respirators shall be selected on the basis of hazards to which the worker is exposed.

3. The user shall be instructed and trained in the proper use of respirators and their limitations.

4. Where practicable, the respirators should be assigned to individual workers for their exclusive use.

5. Respirators shall be regularly cleaned and disinfected. Those issued for the exclusive use of one worker should be cleaned after each day's use, or more often if necessary. Those used by more than one worker shall be thoroughly cleaned and disinfected after each use.

6. Respirators shall be stored in a convenient, clean, and sanitary location.

7. Respirators used routinely shall be inspected during cleaning. Worn or deteriorated parts shall be replaced. Respirators for emergency use such as self-contained devices shall be thoroughly inspected at least once a month and after each use.

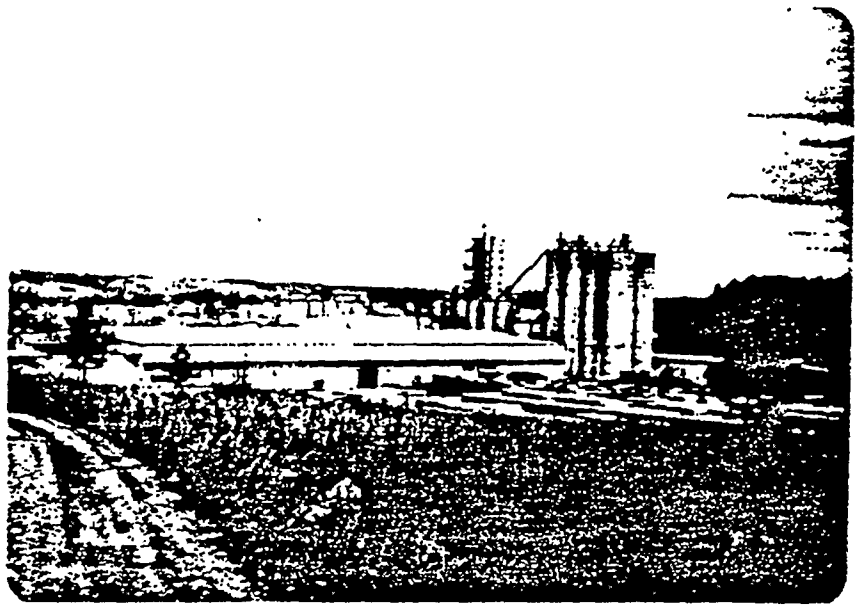
8. Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

9. There shall be regular inspection and evaluation to determine the continued effectiveness of the program.

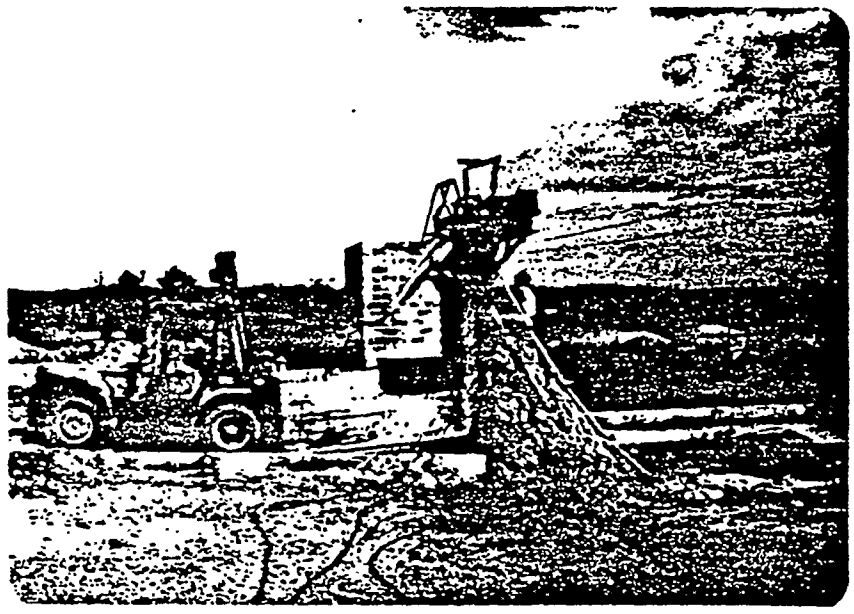
10. Persons should not be assigned to tasks requiring use of respirators unless it has been determined that they are physically able to perform the work and use the equipment. The local physician shall determine what health and physical conditions are pertinent. The respirator user's medical status should be reviewed periodically (for instance, annually).

11. Approved or accepted respirators shall be used when they are available. The respirator furnished shall provide adequate respiratory protection against the particular hazard for which it is designed in accordance with standards established by competent authorities.

FROM: CFR 1910.134 Federal Register
Volume 37 No. 202
Wednesday, October 18, 1972.



Overall view of the Ragland Plant as seen from the waste disposal area. The storage bins in the background belong to an adjoining cement plant.



The drag-out conveyor, part of the water pollution control system, was being repaired after freezing-up during the survey. The Ragland Plant recirculates all process waste water.