

CHEMICALS



INTEROFFICE / LAKE CHARLES

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*This Bud's for you —
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TO Distribution DATE January 31, 1991
FROM Max Hekmat *MA* SUBJECT 1991 I.H. Monitoring Plan

Enclosed is a copy of the 1991 Industrial Hygiene Monitoring Plan. This Plan has changed from that of 1990. Some of the changes are as follows:

1. Modification of chlorine sampling. Chlorine samples needs to be performed in both TWA & STEL.
2. Reduction in number of samples taken in shipping.
3. Modification and correction of several job titles.
4. Adjustment of the number of noise samples for 1991.

These changes also follow the change in the APM System, the computer program that is currently used for entering the sampling results into the PC and later uploading them to the Mainframe in the General Office.

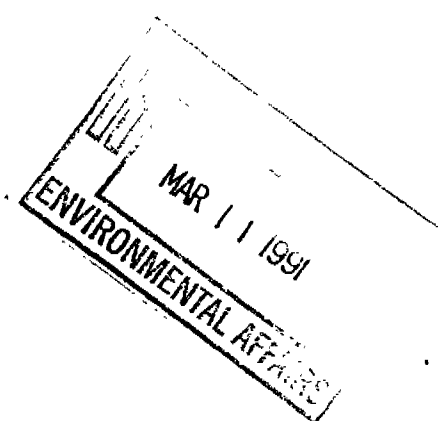
Some people are receiving this copy for information purposes only. Others may need to rearrange some activities based on the 1991 plan.

MH:cg

Enclosure

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SL 042950

PPG INDUSTRIES, INC.
Lake Charles, LA

Industrial Hygiene
1991 Monitoring Strategy

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Introduction and Organization

This document sets forth the minimum acceptable level of monitoring to be conducted during 1991. Any changes made are to be documented and may be made only after the prior joint approval of the Industrial Hygienist and the Manager of Environmental Programs.

There are five parts to this strategy. Each shall be given equal priority. Each has a separate timetable for determining progress. Each lists the specific accountabilities for completion.

Additional information on the Lake Charles Industrial Hygiene Monitoring Program regarding program accountabilities, results reporting, etc., may be found in Safety Bulletin # 26.

I. CORE Program

Purpose

This activity insures that the air monitoring requirements of OSHA 1910.1001 (Asbestos - General Industry), 1926.58 (Asbestos - Construction) and 1910.1017 (Vinyl Chloride) are met.

Program Accountability

The Environmental Lab Group will be responsible for conducting all sampling, conducting or arranging for all analyses, cooperating with Industrial Hygiene on any special project(s) for conducting extra samples and entering the data into the A/P System. The Industrial Hygiene group will be responsible for developing the monitoring strategy, altering the strategy throughout the year as the need arises and arranging the schedule(s) with Environmental Lab, back shift sampling, coordinating any necessary remedial actions, and reporting on progress to the Manager of Employee Health and Industrial Hygiene.

Timetable

The program year (1991) will be divided into two segments ending June 30 and November 30. Each cycle must be completed by these dates. Progress towards completion will be reported quarterly to Industrial Hygiene.

Follow-up Samples

In the event that any sample taken shows an exposure level in excess of the Action level, a second, follow-up sample will be collected within 6 months from receipt of the analysis. And in case any sample shows an exposure level above the IPEL, a second, follow-up sample will be collected within 7 working days of receipt of the analysis. Such follow-up samples shall not count towards the satisfaction of the required monitoring activity levels. Instead, they shall be considered special investigative samples. If the second sample verifies an exposure problem or potential problem, the respective Area Supervisor will be contacted to implement immediate corrective actions. Exceptions to this are known exposure problem areas where engineering controls are not feasible and use of personal protective equipment is already mandated.

Samples to be Collected

ASBESTOS (using OSHA Reference Method)

A. Chlor/Alkali - Plant "A" Operations

1. Personnel monitoring, by job title and task - all to be 8 TWA samples
- Cell Renewalman, working in processing room 2 per segment
- Cell Renewalman, clng/water blasting old elements 2 per segment
- Cell Renewalman, depositing new diaphragms 1 per segment
- Cell Renewalman, reassembling cells 1 per segment
- Cell Tenders, mixing slurries and "doping cells" 1 per segment
- Cell Renewal Foreman, daily tasks 2 per segment

2. Area Monitoring - High Volume Samplers, 8 hour sample

- | | |
|---|---------------|
| - Processing Rooms, between glove boxes, during use | 2 per segment |
| - Processing Rooms, at dust collector return air plenum | 2 per segment |
| - Manual wash stations, during element cleaning | 1 per segment |
| - Exterior balancing air discharge of dust collectors | 1 per segment |

Total Plant "A" Operations Samples	15 per segment
------------------------------------	----------------------

B. Chlor/Alkali Plant "A" Maintenance - Cell Related

1. Personnel Monitoring - 8 hour TWA samples

- | | |
|--|-----------------|
| - Machinists, repairing cell elements | 3 per segment |
| - Welders, repairing cell elements | 2 per segment |
| - Janitors, while cleaning cell maintenance areas | 1 per segment |
| - Any skill, performing maintenance on processing room or depositing equipment | each work order |

2. Area Monitoring - High Volume Samplers - 8 hour

- | | |
|--|-----------------|
| - General Maintenance Shop areas | 3 per segment |
| - Any area, during maintenance work on asbestos contaminated equipment | each work order |

Total Plant "A" Maint. - Cell Related Samples	9+ per segment
---	----------------------

C. Chlor/Alkali Plant "C" Operations

1. Personnel monitoring, by job title and task - all to be 8 hour TWA samples

- | | |
|---|---------------|
| - Cell Renewalman, working in processing room | 2 per segment |
| - Cell Renewalman, clng/water blasting old elements | 2 per segment |
| - Cell Renewalman, depositing new diaphragms | 1 per segment |
| - Cell Renewalman, reassembling cells | 1 per segment |
| - Cell Tenders, mixing slurries and "doping cells" | 1 per segment |
| - Cell Renewal Foreman, daily tasks | 2 per segment |

2. Area Monitoring - High Volume Samplers, 8 hour sample

- | | |
|---|---------------|
| - Processing Rooms, between the glove boxes, during use | 2 per segment |
| - Processing Rooms, at dust collector return air plenum | 2 per segment |
| - Manual wash stations, during element cleaning | 1 per segment |
| - Exterior balancing air discharge of dust collectors | 1 per segment |

Total Plant "C" Operations Samples	15 per segment
------------------------------------	----------------------

D. Chlor/Alkali Plant "C" Maintenance - Cell related

1. Personnel Monitoring - 8 hour TWA samples.

- | | |
|--|---------------|
| - Machinists, repairing cell elements | 3 per segment |
| - Welders, repairing cell elements | 2 per segment |
| - Janitors, while cleaning cell maintenance areas | 1 per segment |
| - any skill, performing maintenance on processing room or depositing equipment | |

2. Area Monitoring - High Volume Samplers - 8 hour TWAs

- | | |
|--|-----------------|
| - General Maintenance Shop areas | 3 per segment |
| - any area, during maintenance work on asbestos contaminated equipment | each work order |

Total Plant "C" Maint.-Cell related samples	9+ per segment
---	----------------

E. Maintenance - Insulation Removal, Minor Jobs

Both personnel and area monitoring are conducted under OSHA 1926.58 (Asbestos-Construction standard). It is reasonable to expect that at least 2 minor jobs per week will occur somewhere within the complex, though that may vary substantially. Each job monitored will require that at least 3 samples are collected (1 personnel and 2 area samples).

Total Maintenance - Removal Samples	78 per segment
-------------------------------------	----------------

F. Laboratory - Asbestos Related

1. Personnel Monitoring - 8 hour TWA samples.

- | | |
|---|---------------|
| - Lab Analysts, conducting asbestos slurry Q.C. | 3 per segment |
| - Lab Analysts, conducting asbestos shipment Q.C. using "shaker" at Plant A Processing Room | as performed |

2. Area Monitoring - High Volume Samplers, 8 hour

- | | |
|---|---------------|
| - Asbestos Quality Control Lab Area (Plant A) | 2 per segment |
|---|---------------|

Total Laboratory Samples	5+ per segment
--------------------------	----------------

TOTAL ASBESTOS SAMPLES	131+ per segment
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VINYL CHLORIDE - Personnel monitoring only, by jobtitle and type of sample.

A. Operations - with 60% of samples done on Day Shift, 40% Backshifts.

1. Tri-Ethane II

- Auxillary Operator, TWA	2 per segment
- Auxillary Operator, STEL, catching/analyzing samples	4 per segment
- Furnace Operator, TWA	2 per segment

2. VCM II

- Auxillary Operator, TWA	2 per segment
- Auxillary Operator, STEL, catching/analyzing samples	4 per segment
- Process (Vinyl) Operator, TWA	4 per segment

Total Operations Samples	18 per segment
--------------------------	----------------

B. Maintenance - All TWA samples unless otherwise noted. Note: Work order numbers should be entered on data sheets.

1. T.E. II Shop

- Instrument Mech., w/work order for Furnace Area	1 per segment
- Machinist, w/work order for Furnace Area	1 per segment
- Pipefitter, w/work order for Furnace Area	1 per segment
- Welder, w/work order for Furnace Area	1 per segment
- Yardcrew, dumping Tar Buggy from Furnace Area, TWA	1 per segment
- Yardcrew, dumping Tar Buggy from Furnace Area, STEL	1 per segment

2. VCM II Shop

- Instrument Mech., w/work order for Furnace Area	1 per segment
- Instrument Mech., w/work order for Process Area	2 per segment
- Machinist, w/work order for Furnace Area	1 per segment
- Machinist, w/work order for Process Area	2 per segment
- Pipefitter, w/work order for Furnace Area	1 per segment
- Pipefitter, w/work order for Process Area	2 per segment
- Welder, w/work order for Furnace Area	1 per segment
- Welder, w/work order for Process Area	2 per segment
- Dumping Tar Buggy from Furnace Area, TWA	1 per segment
- Dumping Tar Buggy from Furnace Area, STEL	1 per segment
- Yardcrew, w/work order for Process Area	2 per segment

Total Maintenance Samples	22 per segment
---------------------------	----------------

C. Shipping

1. Vinyl Loading Rack

- | | |
|--|---------------|
| - Tankerman, TWA | 2 per segment |
| - Tankerman, STEL -- disconnecting hoses | 2 per segment |
| - Tankerman's Helper - TWA | 3 per segment |
| - Tankerman's Helper - STEL, disconnecting hoses | 3 per segment |

2. Barge/Ship Loading Dock

- | | |
|--|--------------|
| - Tankerman, STEL | as available |
| - Tankerman, STEL - disconnecting hoses | as available |
| - Tankerman Helper, STEL | as available |
| - Tankerman Helper, STEL - disconnecting hoses | as available |

Total Shipping Samples

10+ per segment

D. Laboratory - All TWA Samples

1. Organics Quality Control Lab

- | | |
|---------------------------------------|---------------|
| - Lab Analyst Performing Q.C. Samples | 2 per segment |
|---------------------------------------|---------------|

2. Vinyl Quality Control Lab

- | | |
|---------------------------------------|---------------|
| - Lab Analyst Performing Q.C. Samples | 2 per segment |
|---------------------------------------|---------------|

Total Laboratory Samples

4 per segment

TOTAL VINYL CHLORIDE SAMPLES -----54+ per segment

GRAND TOTAL CORE MONITORING SAMPLES

185+ per segment

II. General Monitoring

Purpose

1. Insure that employee exposure profiles remain current.
2. Identify jobs or tasks which require that controls (engineering, administrative or PPE) be implemented to prevent or minimize employee exposure.
3. Document, where respiratory protection is required, that the devices used provide the necessary protection factors.

Program Accountabilities

The Environmental Lab Group will be responsible for conducting all sampling (unless noted otherwise), conducting or arranging for all analyses, cooperating with Industrial Hygiene on any special project(s) for conducting extra samples and entering the data into the A/P System. The Industrial Hygiene group will be responsible for developing the monitoring strategy, altering the strategy throughout the year as the need arises, and arrange the schedule(s) with Environmental Lab, back shift sampling, coordinating any necessary remedial actions, and reporting on progress to the Manager of Employee Health and Industrial Hygiene.

Focus for 1991 Program

The General Monitoring Program for 1991 will focus primarily on those exposure hazards/jobs which received minimal attention during 1988 and 1989.

Derivatives Area sampling, other than the Core Program will receive only that amount of sampling needed to verify and keep current the employee exposure profile.

This approach will enable future monitoring strategies to balance sampling efforts between inorganic and organic hazards.

Timetable

The sampling "year" will end on November 30, 1991. Each targeted chemical (i.e., chlorine, mercury, etc.) must have all sampling completed (and resultant data entered) by that date. Progress towards completion will be reported quarterly to Industrial Hygienist. Satisfactory progress will be considered 25% by 4/1, 60% by 7/1, 80% by 10/1 and complete by 12/1.

Follow-up Samples

In the event that any sample taken shows an exposure level in excess of the Action Level, a second, follow-up sample will be collected within 6 months from receipt of the analysis. And in case any sample shows an exposure level above the IPEL, a second, follow-up, sample will be collected within 7 working days of receipt of the analysis. Such follow-up samples will not count towards satisfaction of the required monitoring activity levels. Instead,

they will be considered special investigative samples. If the second sample verifies an exposure problem or potential problems, the respective Area Supervisor will be contacted to implement immediate corrective actions. Exceptions to this are known exposure problem areas where engineering controls are not feasible and use of personal protective equipment is already mandated.

Samples to be Collected

Note: For any job title listed that works shift - at least 40% of sampling must be done on back-shifts.

A. Chlorine

1. Chlor/Alkali

Electrolyzers

- Cell Tenders - during sampling rounds, 5 STEL/3 TWA-----	8
- Cell Operator (days) - sampling, 3 STEL/3 TWA-----	6
- Renewalman - during all cut-out, 5 STEL/5 TWA-----	10
- Renewal Helper, 5 STEL/5 TWA-----	10
Total Electrolyzer Samples	34

Mercury Cells

- Cell Tenders - during sampling and adjustments, 5 STEL/3 TWA	8
- Cell Room Operator - during rounds, 3 STEL/3 TWA-----	6
- Cell Renewer, during all cut-out, 3 STEL/3 TWA-----	6
- Cell Cut-out Helper, during all cut-out, 3 STEL/3 TWA-----	6
Total Mercury Cell Samples	26

Chlorine "C"

- Glanor Auxillary Operator, during sample rounds, 3 STEL/3 TWA	6
- Glanor Renewal Man, during cut-out, 3 STEL/3 TWA-----	6
- Glanor Renewal Man, during cut-out, 3 STEL/3 TWA-----	6
Total "C" Chlorine Samples	18

2. Shipping

- Tankerman, disconnecting rail cars, 5 STEL/3 TWA-----	8
- Tankerman, disconnecting barges, 5 STEL/3 TWA-----	8
- Tankerman Helper, disconnecting rail cars, 5 STEL/3 TWA-----	8
- Tankerman Helper, disconnecting barges, 5 STEL/3 TWA-----	8
Total Shipping Samples	32

3. Laboratory

- Lab Analysts, catching Cl ₂ samples, STEL-----	5
- Lab Analysts, analyzing Cl ₂ samples, STEL-----	5
Total Lab Samples	10

TOTAL CHLORINE SAMPLES ----- 120

B. CPC - (When Unit is Operating)

Analyze all samples for CPC, DCPC & PvCl.

1. CPC Unit

- CPC Operator, TWA sample	5
- CPC Operator, conducting rounds, STEL	5
- CPC Operator, unloading PvCl Shipments, STEL	4
- Total CPC Unit Samples	14

2. Laboratory

- Lab Analysts doing Q.C., STEL	2
- Lab Analysts doing Q.C., STEL	4
- Total Lab Samples	6

3. Maintenance

- Instrument Mechanic, working in Unit, TWA	3
- Machinist, working in Unit, TWA	3
- Pipefitter, working in Unit, TWA	3
- Welder, working in Unit, TWA	3
- Yard Crew, working in Unit, TWA	3
- Total Maintenance Samples	15

4. Shipping

- Tankerman, loading CPC, STEL	2
- Tankerman, disconnecting loading hoses, STEL	4
- Tankerman Helper, loading CPC, STEL	2
- Tankerman Helper, disconnecting loading hoses, STEL	4
- Total Shipping Samples	12

TOTAL CPC SAMPLES 47

C. Ethylene Dichloride (EDC) - All samples are TWA unless otherwise noted.

1. Shipping

- Loading tank cars, STEL	5
- Loading trucks, STEL	5
- Unloading tank cars, STEL	4
- Connecting barge, STEL	9
- Disconnecting barge, STEL	9
- Loading barge	9
- Total Shipping Samples	41

2.	VCM II	
-	Lead operator	4
-	Auxiliary operator, STEL, TWA	4,2
-	EDC operator	4
-	OHC operator	5
-	VC process operator	5
-	Storage operator	5
-	Maintenance	5
	Total VCM II	34
3.	Tri II	
-	Lead Operator	4
-	OHC operator	4
-	Furnace/Cooling tower operator	4
-	MC/DCE operator	4
-	Auxiliary operator, STEL, TWA	4,2
	Total Tri II	22
4.	Per-Tri	
-	Lead operator	4
-	Still line	4
-	Reactor	4
-	Auxiliary, STEL, TWA	4,2
	Total Per-Tri	18
5.	EDC/VDCM	
-	Lead EDC/VDCM/TRANS operator	4
-	B operator, STEL, TWA	4,2
-	Auxiliary operator, STEL, TWA	4,2
	Total EDC/VDCM	16
6.	EC/HCl	
-	Lead operator	4
-	B operator, STEL, TWA	4,2
	Total EC/HCl	10
7.	WTU	
-	Lead operator	4
-	Incinerator operator	4
-	CPC operator, STEL, TWA	4,2
-	Bat operator	4
-	Tetra operator	4
-	WTU operator	4
-	Auxiliary operator, STEL, TWA	4,2
	Total WTU	32
	TOTAL EDC SAMPLES	173

D. Chlorinated Hydrocarbons (C_1 & C_2 compounds)

All listed job titles to be sampled twice, 1 on Days, and 1 on either Evenings or Graveyards. All samples to be TWAs.

Note: This list does not include job titles covered under the CORE Program.

1. Derivatives - General

- Shift Supervisor

2. EC/HCl

- EC/HCl Operator
- Lead Operator

3. EDC/VDC

- EDC/VDC Operator
- Lead Operator

4. Per/Tri

- Auxiliary Operator
- Lead Operator
- Reactor Operator
- Still Operator

5. Shipping at Solvents Loading Rack

- Tankerman
- Tankerman Helper

6. Tri-Ethane II

- Lead Operator
- MC-DCE Operator
- OHC Operator

7. VCM II

- EDC Operator
- EDC Lead Operator
- OHC Operator
- Storage Operator
- Vinyl Lead Operator

8. WTU

- Lead Operator
- Auxiliary Operator
- CPC Operator
- Incinerator Operator
- Tetra Operator
- WTU Operator

TOTAL DERIVATIVES SAMPLES (25 X 2) ----- 50+

D. Hydrogen Sulfide

Plant A - Mercury Cell

Area Samples - 8 hour, around Sulfide treatment systems ----- 8

Brine/Environmental Operator - TWA ----- 6

Brine/Environmental Operator, during NASH addition, etc., - STEL ----- 8

TOTAL H₂S SAMPLES ----- 22

E. Mercury - all TWA samples

1. Mercury Cell Operations

- Brine/Environmental Operator ----- 3
- Cell/Area Operator ----- 3
- Utility Operator ----- 3
- Cell Room Operator ----- 3
- Cell Tender ----- 5
- Lead Operator ----- 2
- Cell Builder ----- 5
- Cell Cut-out Helper ----- 5
- Cell Renewer ----- 5
- Total Operations Samples ----- 34

2. Mercury Cell Maintenance

- Electrician working in Cell Area ----- 2
- Insulator working in Cell Area ----- 2
- Instrument Mechanic working in Cell Area ----- 2
- Machinist working in Cell Area ----- 2
- Machinist rebuilding pumps ----- 2
- Pipefitter rebuilding pumps ----- 2
- Welder working in Cell Area ----- 2
- Yard Crew working Cell Area ----- 2
- Total Maintenance ----- 16

TOTAL MERCURY SAMPLES ----- 50

F. Silica - Crystalline

Conduct both respirable and total dust sampling.

1. "A" Sandblast Yard

- Area samples at perimeter, downwind	8
- Painter - as "pot watcher" during blasting	<u>8</u>
- Total Samples	16

2. "C" Sandblast Yard

- Area samples at perimeter, downwind	8
- Painter, as "pot watcher", during blasting	<u>8</u>
- Total Samples	16

TOTAL SILICA SAMPLES	32
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G. Synthetic Precipitated Silica (Amorphous)

Conduct both respirable and total dust sampling, all TWA.

1. Dryer Building

- Dryer Auxiliary Operator	16
- Dryer Building Operator	<u>16</u>

2. Silica Shipping

- Packer	25
- Shipper	<u>16</u>

TOTAL SPS SAMPLES	73
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H. Welding Fume

Analyze as total welding fume and the appropriate oxide.

Plant C Welding Shop

- Area samples - in vicinity of ongoing work	10/10
- Welders - TWAs	<u>10/10</u>

TOTAL WELDING FUME AND OXIDES SAMPLES	40
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GRAND TOTAL GENERAL MONITORING	612+
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III. Noise Monitoring

Purpose

The Lake Charles Hearing Conservation Program (HCP) needs to be reviewed and updated annually. The monitoring program will always concentrate on jobs not previously evaluated and insure the status of job classes not previously included in the Audiometric Testing Program. This monitoring will evaluate jobs currently included in the Audiometric Testing Program. The above conditions will be satisfied by taking requisite number of samples for every job classification in each unit.

Program Accountability

The Industrial Hygienist will identify job classes not previously monitored, or monitored and not included in the Program (because the TWA was less than 85dBA. He will provide this information to the Plant Safety Representatives. The Plant Safety Representative will, as a team, devise a schedule for conducting the necessary noise dosimetry. They will conduct the sampling, complete the necessary forms, and return data to the Industrial Hygienist for review, and entry to the A/P System.

Sampling Distribution & Number

A sufficient number of samples will be considered 75% of the number of employees assigned to the job class (or five samples - whichever is less). Job classes which involve shift work will have at least 40% of sampling done on "backshifts".

Total number of determinations complex wide will be approximately as follows:

Total sample of noise monitoring 200 +

IV. Special Projects

Due to the nature of the process, there may be projects that have not been anticipated in the monitoring strategy; this section is reserved for these special projects. It is Industrial Hygiene's responsibility to identify and schedule such projects as necessary.

V. Twelve Hour Shift

1989 was the first year for Lake Charles Plant to operate on a 12-hour shift on a broad basis. The lengthened work shift will impact the monitoring program in several areas as follows:

- 1.) Noise - When noise monitored for a 12 hour shift, the dosimeter will be worn for the entire shift. The "twelve hour shift" samples will be converted to equivalent eight hour readings. This will be done using the formula:

$$(T_t/T_s) \times D_s = D_A \quad (\text{Dose is a linear function})$$

where:

T is the total time

T_t is the total sample time

D_s is dose calculated by the MK-1

D_A is the dose used in the TWA formula.

D_A replaces D in the following formula to calculate TWA.

$$TWA = 16.61 \log(D/100) + 90$$

where:

TWA is the eight hour time weighted average

D is actual accumulated dose in percent exposure.

The threshold for entering an employee's job classification in the Hearing Conservation Program will be a noise dose of 85 dBA or greater.

- 2.) IPEL's For All Other Materials - For the most part exposure monitoring for shift workers is done for substances which exhibit their toxic effects through chronic, low level exposure. Measurement could, from a theoretical standpoint, just as well be measured over a work week or year as it could multiple individual work shifts without regard to whether those shifts are of 8 or 12 hours. Since the time worked (and hence exposed) during a week, month, year or working lifetime is roughly the same under either shift schedule, there is no need to make an adjustment in IPEL's for the 12-hour shift.

For acutely toxic materials it may be necessary to make a downward adjustment in IPEL. Half of the existing IPEL will be considered to accommodate the potentially increased dose and reduced recovery time (time from the end of one shift to the beginning of the next). At this writing, no reductions of IPELs have been undertaken. For chronically toxic materials a substance by substance review may reveal the need for reduced IPELs due to short biological half-life but such reductions are not anticipated at this time.

Finally, the ACGIH-TLV Committee is addressing TLV considerations for novel work schedules including the 12-hour shift. Decisions and recommendations of the Committee are anticipated for incorporation in the next publication of this document.

Until contraindicated, exposure monitoring will continue on an 8-hour basis for 12-hour shift employees. However, some administrative methods will be used to help ensure this monitoring encompasses the representative and worst case exposure conditions for the shift.

3. Monitoring Equipment - Should it become necessary to monitor continuously for 12 hours, some accommodations may be necessary to ensure the equipment used for sample collection functions for this length of time. This may require some administrative modifications and/or acquisition of equipment.

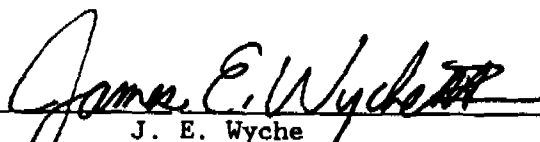
VII. Summary and Approvals of Scheduled Monitoring Activity for the 1991 Program:

<u>Section</u>	<u>Item</u>	<u>Number of Samples</u>
I. Core	Asbestos	262 +
	Vinyl Chloride	108 +
II. General	Chlorine	120
	CPC (and related)	47
	EDC	173
	Chlorinated hydrocarbons	50+
	Hydrogen sulfide	22
	Mercury	50
	Silica - crystalline	32
	Synthetic precip. Silica	73
	Welding Fume	40
III. Noise	Noise Dosimetry	200 +
IV. Special Project		90 +
GRAND TOTAL 1991 MONITORING		1,267 +

Approvals:


R. H. Williams, Manager
Employee Health & Industrial Hygiene

1-25-91
Date


J. E. Wyche
Manager, Environmental Programs

2/15/91
Date


M. J. Hekmat
Industrial Hygienist

2/18/91
Date