

**UNIROYAL, Inc.**Oxford Management & Research Center
Middlebury, Connecticut 06749

203-573-2000

TO: R. L. Knapp
C. D. McCleary

FROM: W. D. Harris, Ph.D.
Industrial Toxicologist
E-G-1

DATE: April 21, 1972

SUBJECT: Vinyl Chloride - MCA Study

The committee met at the MCA conference room in Washington on April 20, 1972. I met Dr. William J. Boyne and Mr. Henry Schmidt of Borden and Mr. Arthur C. Siegel of Tenneco at dinner on April 19. We agreed that it would be desirable to run three levels of acetylene based VC in parallel with the ethylene based VC study. We recognized that the cost would be raised substantially. While it would amount to only a few thousand dollars to each of our companies, the cost to the major producers, Goodrich and Dow, would be increased in the order of \$10,000-\$15,000 each. We could appreciate that these companies might balk.

The attached materials were handed out at the meeting. A Shell v.p. called before the meeting to advise that they would not take part in the study. There have also been minor changes in the protocol changing costs slightly. The PPG representative announced an increase in their capacity of 100,000,000 lbs/yr., thereby increasing their share. Dr. Best will issue a new estimate of each company's share.

I presented the Uniroyal, Tenneco and Borden viewpoint that the exposure should be the same for both types of monomers. The ad hoc planning group had struggled over this a great deal. They agreed that we were 100% correct technically, but that they simply couldn't sell the increased cost to their managements. All agree that the impurities will not likely influence the toxicology. The four agreed that we simply couldn't have our way so asked that Dr. Johnson obtain from Industrial Bio-Test the cost of running the complete study as well as adding just a high and low level for acetylene based VC. It appears that the additional cost might average \$10,000-\$20,000 for each of the three companies.

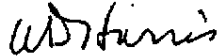
It was brought out that a study is being carried out by Dr. Viola and apparently another study is underway in Europe, sponsored by one or a group of companies. Thus far we have been unable to get any information on this study. If the meeting at Leverkusen materializes, I will keep my ears open for further information.

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No action is required of Uniroyal at this time. When I receive minutes of the meeting, I will send copies if MCA does not. The proposed schedule of payments to MCA will be as follows:

July 1, 1972	= 40%
April 1, 1973	= 40%
January 1, 1974	= 20%

Very truly yours,



W. D. Harris, Ph.D.
Industrial Toxicologist

WDH:ues

Attachments

cc: E. S. Ebers
G. A. Anderson
D. E. Dudrow

URL 20199

Revised Program
proposed by the
Ad Hoc Planning Group for Vinyl Chloride Research
March 22, 1972

Animal Study

Inhalation Exposure Levels: (Tentative, subject to specification
before start of testing)

<u>Set A</u>	<u>or</u>	<u>Set B</u>
Control		Control
10,000 ppm VCM-A		5,000 ppm VCM-A
10,000 ppm VCM-E		5,000 ppm VCM-E
3,000 ppm VCM-E		1,000 ppm VCM-E
1,000 ppm VCM-E		500 ppm VCM-E : TLV

Probable levels.

Test Animals:

Rats, Wistar strain weanlings, equally divided between sexes
Mice, strain not hypersusceptible to tumors, weanlings,
equally divided between sexes
200 animals of each species per test (2,000 total)

Exposure Schedule:

Rats, 7 hours/day, 5 days/week, for 24 months
Mice, 7 hours/day, 5 days/week, for 12 months

Epidemiology Study - None (Deferred for subsequent consideration)

*

VCM-A = Vinyl chloride monomer, acetylene-derived
VCM-E = Vinyl chloride monomer, ethylene-derived

URL 20200

Vinyl Chloride Monomer - Carcinogenicity Project

<u>Contributors</u>	<u>Production Capacity VCM & PVC Million lb/yr</u>	<u>%</u>	<u>Proportionate Share of \$165,000</u>
Air Products & Chemicals	160	2.0	\$ 3,300
Allied Chemical	440	5.3	8,745
Borden Chemical	390*	4.7	7,755
Conoco	830	10.1	16,665
Dow	1,200	14.6	24,090 (1)
Ethyl	450	5.5	9,075 (1)
Firestone	240	2.9	4,785
Goodrich	1,600	19.4	32,010 (2)
Monsanto	150	1.8	2,970
Olin	150	1.8	2,970
PPG	800 <i>q/w</i>	9.7	16,005 16
Shell	600	7.3	12,045 (3)
Standard Oil (N. J.)	-0- (150)	1.8	2,970 (1)
Stauffer	150	1.8	2,970
Tenneco	300	3.6	5,940
Union Carbide	350	4.2	6,930
UNIROYAL	285*	3.5	5,775
	<u>8,245</u>	<u>100.0%</u>	<u>\$165,000</u>

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*Includes Monochem capacity

- (1) Exceeds stipulated limit
- (2) No limit stipulated
- (3) Commitment still pending

4/14/72

Technical Task Group on Toxicology
of Vinyl Chloride Monomer
/Carcinogenicity/

Designations by companies:

Air Products & Chemicals

W. Mayo Smith

Allied Chemical

W. A. Knapp

Borden Chemical

Henry L. Schmidt, Jr.

Conoco

Flynt Kennedy

Dow

T. R. Torkelson

Ethyl

W. E. Reinherb

Firestone

W. W. Madden

Goodrich

W. E. McCormick, Ben Zwickler

Monsanto

Oliver Wheeler
~~M. N. Johnson~~, M.D.

Johnson @ Johnson

Olin

Mac Roy Gasque, M.D.

PPG

Zeb G. Bell, Jr.

~~Shell~~

Standard Oil (N. J.)

N. V. Hendricks

Stauffer

A. B. Lindquist

Tenneco

Marvin Rosen

Union Carbide

R. N. Wheeler, Jr.

UNIROYAL

Walter D. Harris

4/14/72

URL 20202

Manufacturing Chemists Association

MINUTES OF MEETING

Ad Hoc Planning Group for Vinyl Chloride Research

Washington Hilton Hotel

Washington, D. C.

March 22, 1972

MEMBERS PRESENT:

R. N. Wheeler, Jr., Chairman	Union Carbide Corporation
N. V. Hendricks	Standard Oil Company (N. J.)
K. S. Lane, M.D.	Union Carbide Corporation
M. N. Johnson, M.D.	Monsanto Company
R. L. Maycock	Shell Chemical Company
(for N. G. White)	
W. E. McCormick	B. F. Goodrich Chemical Co.
T. R. Torkelson	The Dow Chemical Company
K. D. Johnson, Secretary	MCA Staff

GUEST PRESENT:

Z. G. Bell	PPG Industries
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MEMBERS ABSENT:

M. V. Anthony	Stauffer Chemical Company
B. M. G. Zwicker	B. F. Goodrich Chemical Co.

1.0 Minutes of the Meeting of December 14, 1971

There being no corrections offered to the subject minutes, they were approved as distributed.

2.0 Report of Current Status of Responses to Requests for Support of Research Program

Copies of the summary reproduced in the Appendix to these minutes were distributed to those in attendance. The total (qualified) commitment of funds is now \$165,000.

3.0 Proposed Program Revisions

Dr. Torkelson reported that, on the basis of informal discussions with Industrial Bio-Test, he believed that the

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modification of the initially proposed program, as shown below, could be completed for approximately \$150,000:

Exposure Levels -

Highest Level -

200 rats + 200 mice -- ethylene derived VCM

200 rats + 200 mice -- acetylene derived VCM

Intermediate Level -

200 rats + 200 mice -- ethylene derived VCM only

Lowest Level -

200 rats + 200 mice -- ethylene derived VCM only

Control -

200 rats + 200 mice.

Exposure Schedule -

7 hours per day (or maximum attainable in one shift operation)

5 days per week.

The Planning Group agreed to recommend this program to the industry and to defer a decision on exposure levels until input had been obtained on current results from European on-going studies.

4.0 Proposed Project Budget

The Planning Group recommended a minimum budget as follows:

Industrial Bio-Test Services	\$150,000
Vinyl Chloride Monomer Supply	5,000
Contingency Funds	<u>10,000</u>
	\$165,000

The Secretary was asked to seek written confirmation from Industrial Bio-Test of the cost estimate given by them to Dr. Torkelson for the performance of the reduced scope test program.

Support for this budget level is potentially available in returns already received. Should added support develop, it was recommended that the Board authorization and member support be so stated that some of the widened support might be used to increase available contingency funds, rather than be limited to reducing individual contributions toward a fixed budget.

5.0 Consultation with Current Research

The Secretary reported that Dr. Knoepfel of Solvay American was now in Europe and would be back in the U. S. the first of next week. Upon his return he would be prepared to discuss the current status of European vinyl chloride monomer research. If initial telephone contacts indicate the usefulness of so doing, Dr. K. S. Lane, Mr. N. V. Hendricks, and Dr. K. D. Johnson were asked to arrange for a conference with Dr. Knoepfel at the earliest opportunity.

The value of having Dr. Dinman, who is now in Switzerland on sabbatical leave, visit the European research institutions was discussed at some length. It was agreed that a decision be deferred on this point, but that the project budget be set up to permit the proposed project to finance such a trip from contingency funds if this should prove advantageous.

No decision was reached on the value of an effort to solicit input to, and support for, the project from Japanese manufacturers of vinyl chloride monomers and/or polyvinyl chloride.

6.0 Communications with the Industry

MCA was asked to address a new mailing to companies that have already offered support for the program. Such a letter should detail:

1. Names of companies that have offered support, however qualified.
2. Production capacity data available to MCA, the source of that data, and the pro rata share of that company, calculated on the base of the total production capacity of the companies listed in (1).
3. The dollar value of the support requested of the company.
4. A description of the proposed new research program protocol.
5. An authorization form that will permit the MCA, with the concurrence of the sponsors advisory group, discretionary authority to expend any added funds available

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from subsequent contributions of new sponsors, should such funds be necessary to defray costs in excess of present budget estimates for services within the scope of the proposed study.

6. A schedule for the first meeting of the sponsors advisory group by the middle of April.

7. The proposed membership of the ad hoc task group to serve as project coordinators. These are:

Dr. Z. G. Bell	PPG Industries
Dr. Walter Harris	Uniroyal
W. E. McCormick	B. F. Goodrich Chemical Co.
Dr. G. Rousch <i>E. Reinhardt</i>	Ethyl Corporation
Dr. T. R. Torkelson	The Dow Chemical Company
R. N. Wheeler, Jr.	Union Carbide Corporation

Jon Hendricks - Dr. Lene - Et Officio as rep. from Sec. Health Comm.

MCA was asked to send a separate communication to vinyl chloride monomer and/or polyvinyl chloride companies that had not yet volunteered support for the project, describing the new scope and its reduced cost and stressing the importance of this project to the industry. It is to be made clear that their support may be used to broaden the scope and depth of the work, increasing its value to all concerned. Their support is not sought merely to lessen the burden on those who have already committed themselves.

7.0 Future Meetings

The Planning Group adjourned sine die, subject to call of the chair in the event that such a meeting would be required before the function of that Group is assumed by a Board-designated Ad Hoc Task Group to coordinate a funded program.

Respectfully submitted,


K. D. Johnson
Secretary

Minutes Subject to Approval
April 18, 1972
KDJ:mkb

Proposed Research Program
on the
Carcinogenic Potential of Vinyl Chloride

Status as of March 22, 1972

Support Committed
or Probable

Air Products
Allied Chemical
Borden
Conoco
Dow
Ethyl
Firestone
Goodrich
ICI America
Monsanto
Olin
PPG
Shell
Standard Oil (N. J.)
Stauffer
Union Carbide
UNIROYAL

Support Declined
or Improbable

Ashland
C I L
Diamond Shamrock
Du Pont
FMC
General Tire & Rubber
Goodyear Tire & Rubber
Great Lakes Chemical
Gulf-Canada
Gulf Oil
Phillips Petroleum
P & G
Rohm and Haas
Standard Oil (Calif.)
Standard Oil (Ind.)
Sun Oil
Virginia Chemicals
Vulcan Materials

No Response

Hooker
Kerr-McGee
Marbon
Pantasote
Tenneco

American Chemical*
Atlantic Tubing & Rubber*
Great American Chemical*
Keysor-Century*

Solvay American*

*Non-members of MCA

MCA 3/22/72

URL 20207

Proposed Research Program
on the
Carcinogenic Potential of Vinyl Chloride

Comments Received as of March 22, 1972

Borden (By phone)

Alarmed about any possibility of less than equal consideration of acetylene-derived monomer.

Agree to deferring full-scale epidemiologic study for later consideration.

Dow - See attached.

Ethyl - See attached.

Goodrich

"It may be necessary to reduce the scope of the proposed protocol and budget, in order to get adequate funding.... We would also hope that interaction with others in Europe and Japan would be helpful in finalizing a reduction in scope of the MCA project for the U. S. portion of the work."

Shell

Recommends management level review prior to seeking approval of MCA. "It would appear that significant questions relating to the need, objectives, and effect of such a program need answering."

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Attachments

MCA 3/22/72

URL 20208

Dow

URL 20209

- a) The analytical data of ethylene and acetylene derived vinyl chloride should be reviewed to determine if the difference is significant enough to warrant animal studies on each material. If not, the total costs of the animal exposure study could be reduced by approximately \$90,000, by testing only the ethylene derived material.
- b) Although we will support the \$20,000 feasibility epidemiological investigation, we will not at this time commit to the main epidemiological program costing \$100,000. However, upon completion of the feasibility investigation and a review of the protocol, we will again consider supporting our share of the main epidemiological program.
- c) Since the projected duration of the initial undertaking (animal studies) is three years, we suggest that our share of the funding be paid: Initially - 33 1/3% of share; one year later - 33 1/3% of share; and end of second year - remainder of share. We suggest paying our share of the epidemiological feasibility investigation upon initiation of the study.

Ethyl

1. We have a continuing interest in participation in an industry supported study on the carcinogenic potential of vinyl chloride.

2. We believe the study should be limited to ethylene derived monomer. Acetylene derived monomer represents a very small amount of the total and even this amount is apparently declining.

3. We do not wish to incur any obligation in support of an epidemiology study at this time — nor do we think the industry should commit itself to such a study until the results of the animal studies justify it. Thus, the epidemiology phase should be completely separate.

4. We believe the Planning Group should consider a review of the final protocols with governmental parties who might be interested. The MCA sponsoring group need not be bound from the input of such a review, but at least the benefits of their thoughts on experimental adequacy would be available.

5. Once a revised protocol is developed by the Planning Group, an opportunity should be provided for all interested (sponsoring) companies to submit questions and comments prior to making a final commitment. A group meeting might serve this purpose.

URL 20210

Carcinogenic Potential of Vinyl Chloride
Research Proposal-Review Meeting
MCA Conference Room-April 20, 1972-10 AM

PROSPECTIVE ATTENDANCE

Air Products & Chemicals	W. Mayo Smith	
Allied Chemical Corporation	William A. Knapp	✓
Borden Chemical	William Boyne	✓
	Henry L. Schmidt, Jr.	✓
Dow	T. R. Torkelson	✓
Ethyl Corporation	F. Conrad	
	W. E. Rinehart	✓
Firestone	W. W. Madden	✓
Goodrich	W. E. McCormick	✓
	B. M. G. Zwicker	✓
Monsanto	E. P. Wheeler	✓
PPG	Zeb G. Bell, Jr.	✓
Shell	Brian R. Suthers	<i>Full should have meeting of operations. Withdrawn</i>
Stauffer	A. B. Lindquist (for M. V. Anthony)	
	Ray Asti	
Tenneco	Arthur C. Siegel (for Marvin Rosen)	
Union Carbide	R. N. Wheeler, Jr.	✓
UNIROYAL	W. D. Harris	✓
	*	
Goodyear	C. A. Johnson	
	*	
MCA Staff	George E. Best	✓
	K. D. Johnson	✓

URL 20211

4/19/72

Analysis of material ^{synthesized at this} used in this study

VINYL CHLORIDE MONOMER IMPURITIES (1971)

1. MANUFACTURING PROCESS:

Catalytic reaction of Acetylene with Hydrogen Chloride

2. RAW MATERIALS:

Acetylene: thermal cracking of Hydrocarbon feed stock

Hydrogen Chloride: byproduct HCl from the chlorination of Hydrocarbon feed stock

3. VCM Purity:

Minimum 99.32%
Typical 99.67%
Maximum 99.80%

4. Impurities in the VCM:

Analytical technique: By vapor phase chromatography, detector with flame ionization. Ethyl-Hexyl Sebacate column. Sensitivity 1 ppm.

Impurities Detected:

<u>Substance</u>	<u>Minimum Con- centration ppm</u>	<u>Typical Con- centration ppm</u>	<u>Maximum Con- centration ppm</u>
Light ends (C3H6,C2H2...)	160	450	580
Isopentane	20	340	2300
n-Pentane	70	400	2000
Ethyl Chloride	0	0	Traces
2-Dichloropropene and Vinyl Bromide	10	40	200
Isopropyl Chloride	320	405	670
1-cis-Chloropropene	0	traces	traces
1-1-Dichloroethylene	traces	50	240
1-trans-Chloropropene	15	27	170
tert - Butyl Chloride	traces	2	150
n-Propyl Chloride	traces	5	130
Methylene Chloride	1	57	80
1-2-trans-Dichloroethylene	traces	13	50
1-1-Dichloroethane	100	1240	1500
2-2-Dichloropropane	traces	traces	5
1-2-cis-Dichloroethylene	traces	traces	10
Carbon Tetra Chloride	traces	traces	40
Chloroform	traces	traces	3
1-2 Dichloroethane	50	125	300
Trichloroethylene	traces	traces	150

URL 20212