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INVESTIGATION OF APPARENT INCREASED PREVALENCE OF BRAIN TUMORS IN A
U.S. CHEMICAL PLANT

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Presentation to WORKSHOP ON BRAIN TUMORS IN THE CHEMICAL INDUSTRY
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Table 1.

WORK HISTORY DATA FOR 18 PRIMARY BRAIN
CANCER CASES IN A TEXAS PETROCHEMICAL PLANT

<u>Case</u>	<u>Date of Hire</u>	<u>Date of Death</u>	<u>Age at Death</u>	<u>Length of Employment</u> (years-months)	<u>Job Title</u>	<u>Department</u>
1	Leisz 12/16/40	05/15/64	51	3-6	Operator	Production
2	Edler 05/18/41	02/19/66	56	24-8	Operator	Production
3	Liles 07/29/41	05/18/76	66	31-8	Foreman	Maintenance
4	Coburn 11/30/41	12/13/65	55	20-4	Operator	Production
5	Barros 07/09/44	10/28/79	59	35-0	Boilermaker	Structural Shop
6	DeGroot 09/18/44	05/21/74	55	0-1	Operator	Production
7	Malone 09/18/46	03/07/79	55	32-3	Laborer/Oiler	Maintenance
8	Wurzel 09/26/46	03/22/73	63	26-6	Operator	Production
9	Crowder 09/21/48	07/02/75	49	2-1	Pipefitter	Maintenance
10	Mitcham 03/02/49	06/05/71	61	22-3	Operator	Production
11	Burck 01/25/50	01/13/68	66	16-7	Equip. Operator	Maintenance
12	Rennel 10/19/50	05/14/74	59	17-1	Operator	Energy Systems
13	Ott 10/23/50	02/18/80	57	28-10	Operator	Production
14	Tuttolim 09/19/51	01/08/74	52	22-3	Machinist	Machine Shop
15	Gibson 04/27/53	10/03/56	33	0-1	Machinist	Maintenance
16	Perkins 08/17/53	04/05/62	30	8-7	Weighmaster	Shipping
17	Pope 08/21/53	05/05/71	44	17-3	Operator	Production
18	Hinson 10/30/53	12/21/78	49	24-8	Weighmaster	Shipping

Lowery
Mitcham

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Answer to Current Force List of 1952

Table II. CURRENT PLANT WORKFORCE BY COUNTY OF RESIDENCE

<u>County of Residence</u>	<u>Type of Employee</u>		<u>Total</u>	<u>Percent</u>
	<u>Hourly</u>	<u>Salaried</u>		
Galveston	1,389	609	1,998	90.0
Harris	44	110	154	6.9
Brazoria	41	15	56	2.5
Other	<u>7</u>	<u>4</u>	<u>11</u>	<u>0.5</u>
Total	1,481	738	2,219	100.0

Source: Data provided by company.

*1952-1953 Pl. Answer
to Current Force List*

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Table III. DEATH CERTIFICATE AND MEDICAL RECORDS DATA FOR 18 PRIMARY BRAIN CANCER CASES IN A TEXAS PETROCHEMICAL PLANT

Case	Race/ Sex	Residence	Place of Birth		Cause of Death	
					Death Certificate	Medical Records
1	WM	Galveston	Texas	3-6	Carcinoma of Brain	(1) Glioblastoma (MR)*
2	WM	Galveston	Missouri		Malignant Brain Tumor	Meningioma (A)
3	WM	Harris	Texas		Brain Tumor	(2) Glioblastoma (A)
4	WM	Galveston	Texas		Brain Tumor-Meningioma	Meningioma (MR)
5	WM	Galveston	Louisiana		Glioblastoma	(3) Glioblastoma (SP)
6	WM	Galveston	Texas	0-1	Brain Tumor-Glial IV†	(4) No Records Available
7	BM	Galveston	Texas		Glioblastoma	(5) Glioblastoma (MR)
8	WM	Galveston	Texas		Glioblastoma	(6) Glioblastoma (SP)
9	WM	Harris	Texas	2-1	Astrocytoma	Astrocytoma-Grade I (SP)
10	WM	Galveston	Texas		Malignant Glioma	(7) Glioblastoma (MR)
11	WM	Galveston	New Mexico		Glioblastoma	(8) Glioblastoma (A)
12	WM	Galveston	Norway		Glioblastoma	(9) Glioblastoma (SP)
13	WM	Galveston	Texas		Glioblastoma	Astrocytoma-Grade IV†(MR)
14	WM	Galveston	Texas		Glioblastoma	(10) Glioblastoma (A)
15	WM	Harris	Texas	0-1	Glioblastoma	(11) No Records Available
16	WM	Galveston	Louisiana		Brain Tumor	(12) Glioblastoma (A)
17	WM	Galveston	Texas		Malignant Glioma	(13) Glioblastoma (SP)
18	WM	Galveston	Texas		Brain Tumor	(14) Glioblastoma (A)

*Source: MR-Medical Records; A-Autopsy; SP-Surgical Pathology.

†Astrocytoma Grade IV and Glial IV are equivalent terms for Glioblastoma multiforme.

Table IV.

BRAIN AND OTHER CNS CANCER MORTALITY, 1950-1969:
AVERAGE ANNUAL AGE ADJUSTED RATES PER 100,000

<u>Location</u>	<u>White Male</u>	<u>White Female</u>	<u>Black Male</u>	<u>Black Female</u>
United States	4.4	2.9	2.3	1.5
Texas	4.3	2.9	1.9	1.5
Galveston County	4.5	2.9	2.5	2.1
Harris County	4.5	3.6	2.0	1.9
Brazoria County	3.1	3.9	1.2*	1.5

*Based on one case.

The range of U.S. rates for white males for states with >10 deaths from 1950-1969 was 3.1-5.4. The range of Texas rates for white males for counties with >10 deaths from 1950-1969 was 2.3-10.8.

Source: U.S. Cancer Mortality by County, 1950-1969, National Cancer Institute, DHEW Pub. No. (NIH) 74-615, Bethesda, Maryland, 1974.

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Table V.

EXPERIMENTAL BRAIN CARCINOGENS

2- Acetylaminofluorene
 ✓ Acrylonitrile
 1-Aryl-3,3-Dialkyltriazenes
 Azoethane*
 Azoxyethane*
 Azoxymethane
 Butylnitrosourea
 Cycasin
 • 1,2-Diethylhydrazine
 Diethylnitrosamine*
 • Diethyl Sulfate*
 Dimethylbenzanthracene*
 Dimethyl Sulfate*

Elaionycin
 Ethyl Methanesulphonate
 Ethylnitrosobiuret*
 Ethylnitrosourea*
 • 1-Methyl-2-Benzyl-Hydrazine*
 Methyl Methanesulphonate
 Methylnitrosourea*
 Methylnitrosourethane (intraplacental)
 Procarbazine*
 Propane Sultone
 Propylene Imine
 Pyrrolizidine Alkaloids
 • Vinyl Chloride

*Transplacental carcinogenesis.

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Table VI.

EPIDEMIOLOGICAL STUDIES:
CLUES TO HUMAN BRAIN CANCER ETIOLOGY

Aluminum Workers	Machinists
Asbestos Insulation Workers	Oil Refinery Workers
Anti-Convulsant Use	Pattern Makers
Farm/Rural Residents	Petrochemical Workers
Geographic Clustering Kentucky, Rhone Valley	Rubber Workers
Halomethanes in Drinking Water	Toxoplasmosis
Lead Smelter Workers	Vinyl Chloride Workers



DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Centers for Disease Control
National Institute for
Occupational Safety & Health
Robert A. Taft Laboratories
4676 Columbia Parkway
Cincinnati, OH 45226
May 3, 1983

Susan Austin, Sc.D.
Corporate Director of Epidemiology
Union Carbide Corporation
Old Ridgebury Road
Danbury, CT 06817

RECEIVED

MAY 10 1983

Dear Dr. Austin:

S. G. AUSTIN, Sc.D.

Enclosed is a copy of the final report of the NIOSH/OSHA case-control study of brain tumors among workers at the Union Carbide Texas City, Texas plant. Please review the paper and advise us if any trade secrets are revealed in the report. We would also welcome other comments which you might wish to make.

After receiving trade secret clearance, we will transmit a copy to the union (present funding shortages make it unlikely we will be able to travel to Texas City, as we had hoped). Submission for publication or other public announcement will not occur before the union has been notified.

Copies of the report are being sent to:

Mr. Foley Provenzano, Texas City Plant Manager
Dr. David Glenn, Gulf Coast Medical Director
Dr. Susan Austin, Corporate Epidemiologist
Dr. William Kemmerer, Director, Galveston County Health Department

Sincerely yours,

Sanford S. Leffingwell, M.D., M.P.H.
Medical Officer
Industrywide Studies Branch
Division of Surveillance, Hazard
Evaluations and Field Studies

enclosure

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UNION CARBIDE CORPORATION P. O. BOX 471, TEXAS CITY, TEXAS 77580

May 18, 1983

TC file

RECEIVED

MAY 23 1983

Sanford S. Leffingwell, M.D., M.P.H.
National Institute for Occupational
Safety and Health
Robert A. Taft Laboratories
4676 Columbia Parkway
Cincinnati, Ohio 45226

S. G. AUSTIN, Sc.D.

Dear Dr. Leffingwell:

I have read your final report of the NIOSH/OSHA case control study of brain tumors among workers at the Union Carbide Texas City, Texas plant. I found no trade secrets in the report and suggest you proceed with your plan of transmitting a copy to the Union.

Thank you for giving us an opportunity to see the report.

Very truly yours,

F. S. Provenzano

F. S. Provenzano
Plant Manager

FSP/k1

cc: Dr. D. H. Glenn
Dr. S. G. Austin ✓
Mr. R. L. Yelton
Mr. J. H. Barrett

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