



Diamond Shamrock

bcc: W. R. Bailey - Delaware City
S. Brouillard
D. E. Frey
~~V. Hebler~~ W. L. Hutton - Pasadena
R. Henderson - Independence
D. L. Lull
R. J. Sutch - Cleveland
J. E. Zimmerman - Cleveland
D. P. Tech. File 16.17.(b)
File 712L

May 24, 1978

Mr. Richard Miller
Industrial Hygienist
Occupational Safety and Health Adm.
2320 LaBranch Street
Houston, Texas 77004

Dear Mr. Miller:

Attached is the additional information you requested during your inspection of our Deer Park PVC Plant on May 18 and May 22, 1978. Exhibit numbers have been included for each reference:

- Exhibit I - Complete report of May 18, 1978, VCM spill.
- Exhibit II - VCM releases for last nine (9) months involving personnel exposure.
- Exhibit III - Description of VCM monitoring system.
- Exhibit IV - Corrective action for missing valve handles.
- Exhibit V - Personnel sampling data for last six (6) months in general area where spill occurred.

Also, you asked about the source of our monitoring equipment. The vendor who supplied the equipment for our continuous monitoring system is Arcas, Inc., 8500 Commerce Park Drive, Suite 110, Houston, Texas 77036, and their phone number is (713) 777-2392.

If you have any additional questions or comments, please do not hesitate to contact us.

Sincerely,

Rodney P. Becker

Rodney P. Becker
Plastics Plant Manager

RPB:lmr

Enclosures

OCC 11097

EXHIBIT I

INTRODUCTION

Polyvinyl chloride is made by polymerizing vinyl chloride monomer. In the initial charging operation, water, catalyst, suspending agents and vinyl chloride monomer are manually charged through meters to an agitated pressure vessel where they are then heated to initiate the reaction process under controlled conditions.

LOCATION

The #4 Plant process area where the spill occurred contains ten (10) 2000 gal. reactors and allied equipment such as charge pumps, instruments, piping, and compressors.

The #3 Plant process area just South of #4 Plant and adjacent to #4 Plant contains the same inventory of equipment. The manpower required to operate these process areas include a total of nine (9) men. These men are engaged in the charging, dropping, cleaning of the reactors and for the drying of the finished product. The personnel responsible for the drying area are also required to monitor the operation of the charge pumps, compressors, and other equipment located in the ground level area since the charging operation takes place on the second level.

INCIDENT

On the morning of May 18, 1978, an operator who was in the process of charging #44 reactor had completed the addition of all of the raw materials except the vinyl chloride monomer and was pulling a vacuum on the reactor prior to the addition of the VCM. (The reactor evacuation process is a standard operating step in the reactor charge procedure.)

When the desired vacuum was reached on #44 reactor, the operator proceeded to open the VCM valve and meter the VCM to the reactor. Standard operating procedure for this step is to close the evacuation valve and then open the VCM valve but for some reason the operator failed to close the evacuation valve.

EVACUATION

Evacuation of the reactor is done via a Nash water sealed compressor that pulls the reactor vapors from the reactor and discharges them to a gasholder collection system where they are later condensed and returned to the process. The seal water for this compressor is recycled through a small tank which is an allied part on the Nash compressor. Since the VCM vapors that are being removed from the reactor are laden with water, a level controlled dump valve is installed on the seal water pot to control the water level. When the water level gets high, the dump valve opens and discharges this water to a process sewer.

SPILL

When the operator failed to close the evacuation valve on the #44 reactor, the liquid VCM that was being charged was carried into the evacuation compressor and compressor seal water pot. The automatic dump valve then opened up to reduce the seal water pot liquid level and discharged the liquid VCM to the open process sewer.

SPILL (Cont'd)

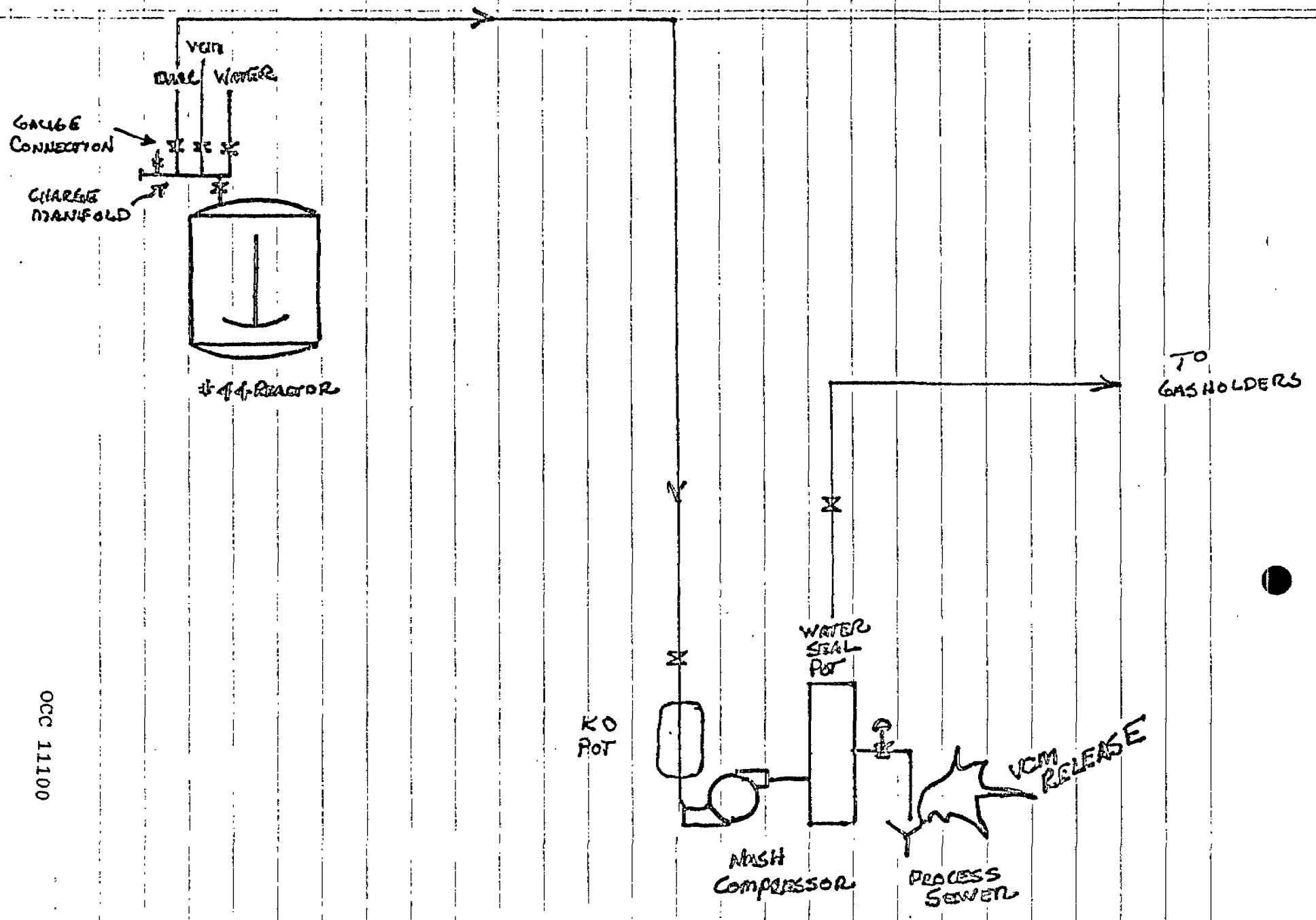
Operating personnel in the Number 3 and 4 process areas immediately rushed to the compressor area to isolate the spill by closing the suction and discharge valves at the compressor.

A diagram of the poly evacuation process is attached to this report.

Ted Guth
Ted Guth

TMG:lmr

5/19/78



OCC 11100



Diamond Shamrock

bcc: L. G. Davison

N. F. Fahnoe

T. O. Isbell

COPY FOR ~~D~~ P. Tech. File 16.03.b(1)

November 29, 1977

Mr. Ronald McCann
Safety and Health Director
U. S. Department of Labor (OSHA)
2320 LaBranch Street
Houston, Texas 77004

Dear Mr. McCann:

At 11:51 A.M. on November 26, 1977, a VCM release occurred at our Deer Park Poly Vinyl Chloride Plant as a result of metal fatigue to a screen pot stud bolt which allowed the screen pot lid to blow off and discharge water, PVC and residual amounts of VCM vapors to the atmosphere.

The total time of the emergency was estimated to be 30 seconds and the highest reading recorded on the Personnel Monitoring System was 861 ppm of VCM.

There were two (2) operating personnel who stated that they had smelled VCM during the release and they were sent to First Aid for medical examination. Neither one of the operators were wearing respiratory protection. Operators involved were Rudy Ybarra and Mike Mulkey.

The VCM release amounted to 184 lbs./VCM.

Events leading up to the release are as follows:

An operator, Rudy Ybarra was in the process of discharging a finished batch of PVC slurry from #51 poly (which is located in our #4 Plant Expansion Area) through the screen pot and into the blowdown tank. The screen pot lid blew off releasing water, PVC and VCM vapors to the atmosphere. Mike Mulkey who heard the noise caused by the release immediately rushed over and closed the drop valve on the poly. A VCM sensor located approximately six (6) feet from the screen pot detected a concentration of VCM and sounded an alarm located in the Poly Control Room.

Corrective action to prevent personnel exposure from releases occurring at the screen pots will include the isolation or closing of the drop valve and the evacuation of the affected area by all personnel.

Sincerely,

DIAMOND SHAMROCK CORPORATION

Rodney P. Becker

Rodney P. Becker
Plant Manager

OCC 11101

RPB:lmr



Diamond Shamrock

CC: L. G. Davidson

D. E. Frey

D. Lull

R. J. Sutch

CONFIDENTIAL D. P. Tech. File 16.03.b(1)

May 18, 1978

Mr. Richard Miller
Industrial Hygienist
Occupational Safety and Health Adm.
2320 LaBranch Street
Houston, Texas 77004

Dear Mr. Miller:

At 0511 A.M. on May 18, 1978, a VCM release occurred at our Deer Park Polyvinyl Chloride Plant and seven (7) of our employees were exposed to VCM. The highest level recorded by our monitoring system during the release was 971.3 ppm/VCM. All of the employees exposed to VCM were examined by our First Aid Department and no ill effects were reported. The names of the employees exposed are as follows:

L. Singleton	B. Byous
J. Davis	E. Lujan
L. Verrette	J. Jonas
R. Corpus	

The total amount of the release is estimated to be 380 lbs./VCM and was a result of an operator error. The operator involved was in the process of charging a reactor in our #4 process plant. During the charging operation he failed to close an evacuation valve on the reactor before commencing to charge the liquid VCM.

The liquid VCM escaped through the open evacuation valve to the water sealed Nash compressor. The dump valve on the Nash seal water pot then discharged the liquid VCM to the process sewer.

In their haste to isolate the spill, none of the employees wore respiratory protection although each employee is provided with approved respiratory equipment.

Sincerely,

Rodney P. Becker
Plant Manager

RPB:lmr

OCC 11102



Diamond Shamrock

October 21, 1977

Mr. Ronald McCann
Occupational and Health Administration
Room 2118
2320 LaBranch Street
Houston, Texas 77004

Dear Mr. McCann:

On October 21, 1977, at 0920 hours a VCM release occurred at our East Polyvinyl Chloride Plant in the monomer recovery area when a safety valve blew on an accumulator.

The VCM release was caused by a mechanical failure of the high level alarm on the reclaimed monomer pump-back-tank normally referred to as the accumulator.

Two operators, Mr. Lonnie Follis and Mr. Melvin Eudy, who were near the scene, immediately shut down the reclaim compressor, but were exposed to an undetermined amount of VCM during the process. Neither one of the operators were wearing respiratory protection.

Both of the employees reported to First Aid for medical examination with no ill effects reported.

The VCM release was calculated to be 658 lbs./VCM and total time of the emergency was two (2) minutes. The highest concentration of VCM recorded by our continuous monitoring system was 38.9 ppm.

The accumulator level alarm was repaired before the recovery system was put back in operation. The relief valve discharge stacks will be elevated to avoid future employee exposures in case of an emergency relief valve discharge.

Sincerely,

DIAMOND SHAMROCK CORPORATION

E. Zinn
Plant Manager

EZ:lmr

bcc: L. G. Davison
N. F. Fahnoe
W. C. Hutton
T. O. Isbell
S. A. Metelko

✓ P. P. Tech. File 16.03b(i)

OCC 11103



Diamond Shamrock

August 23, 1977

Mr. Roy Piggee
Occupational and Health Administration
Room 2118
2320 LaBranch
Houston, Texas 77004

Dear Mr. Piggee:

On August 22, 1977, at 2347 hours, VCM vapors were released to the atmosphere when a 3/4" plug blew out of a monomer recovery compressor.

The monomer recovery compressor is operated in intermittent service and had just been put on-stream. The operator who was at the scene, immediately shut down the compressor, but was exposed to an undetermined amount of VCM during the process as he was not wearing respiratory protection.

No ill effects to the employee occurred as a result of the exposure and the employee reported to first-aid for medical examination.

The VCM vapor release was estimated to be 5 lbs./VCM and the total time of the emergency was two (2) minutes. An L.E.L. (Lower Explosive Limit) sensor detected the VCM vapors and tripped our recovery area sprinkler system as added protection.

No high VCM readings were recorded on our continuous monitoring system during the time of this emergency.

The plug was replaced in the compressor and normal operations were resumed.

Sincerely,

DIAMOND SHAMROCK CORPORATION

E. Zinn
Plant Manager

EZ:lmr

bcc: L. G. Davison
N. F. Fahnoe
W. C. Hutton
T. O. Isbell
D. P. Tech File 16.03.b(1)

COPY FOR

OCC 11104

ARCAS VCM MONITORING SYSTEM

The Arcas System is basically a communications system. It sequentially analyzes 80 designated sample points strategically located throughout the Plant on five separate G.C. Units. The most recent analyses from the five systems (No. 1, 2, 3, 4 & 5 Plants) are stored in the multiplexer. The multiplexer scans all data sending out the most recent information to the Environmental Head Operators decwriter and to the remote warning stations if an exposure is imminent. Each time the next higher level is exceeded, a visual light is displayed. The primary function that the system serves is to feed back VCM concentrations and designate respiratory protection to be used by way of the remote exposure warning stations the operating areas and the personnel in those areas. Action levels displayed at the designated warning stations are 5 ppm (white), 25 ppm (blue), 1000 ppm (yellow), and 3600 ppm (red).

If a warning light is displayed and respiratory protection is not available, you must IMMEDIATELY LEAVE THE AREA.



Ted M. Guth

TMG:lmr

5/11/78

OCC 11105



ANALYTICAL EQUIPMENT

ARCAS INC.

8500 COMMERCE PARK DR., SUITE 110

HOUSTON, TEXAS

(713) 77

PROGRAMMER DATA SHEETCustomer Diamond Shamrock Date December 1975Address Deer Park, TexasJob # 511054 P.O. # H95368-7 Model # 505D FIDType of Mount: ☐ Panel ☐ Rack ☒ FieldElectrical Classification: ☐ General Purpose☒ Explosion ProofCycle Time: 1 minutes 0 secondsTimer: ☒ S. M. DigitalCount Rate one secondNo. of functions (slots) 7Function slots not used 2☐ Cramer Cam

Motor Speed _____ Gear Rack _____

No. of Cams _____

No. of Cams Not Used _____

☐ Other _____Number of Streams 16 ☐ Manual Switching☒ Automatic Switching

Detector Current _____ ma. (T.C. units only)

No. of Attenuators 1 ☐ Dual Range

Notes: _____ OCC 11106



ANALYTICAL EQUIPMENT

ARCAS INC.
8500 COMMERCE PARK DR., SUITE 110HOUSTON, TEXAS
77057

Job # 511054

Timer Functions	Time		Time
1A End of cycle - inject	060	1B Sample block	057
2A Auto zero	024	2B	
3A Column switch	058	3B	020
4A Peak One	027	4B	039
5A		5B	
6A		6B	
7A		7B	
8A		8B	
9A		9B	
10A		10B	
11A		11B	
12A		12B	
13A		13B	
14A		14B	
15A		15B	
16A		16B	
17A		17B	
18A		18B	
19A		19B	
20A		20B	

Components	Attenuator #	Streams	Range %/ppm
Vinyl Chloride	1	1-16	0-3.6%

Notes _____

OCC 11107

A DIVISION OF ANACON, INC.

VALVE #1Sample valve type 6 port s.s.-1/8"-Arcas sliderSample loop External Length 6" x 1/8" Volume Carrier gas Helium Bottle regulator 50 PSICarrier pressure Reg 1 30 PSI Reg 2 23 PSIColumn configuration Precut with backflush to ventPrecut column 1' chromosorb 102 80/100Analytical column 2' chromosorb 102 80/100Other Flows: measured with bubble tubeReference cc/m Column cc/m Backflush 45 cc/mVALVE #2Sample valve type Sample loop Length Volume Carrier gas Bottle regulator PSICarrier pressure Reg 1 PSI Reg 2 PSIColumn configuration Precut column Analytical column Other Flows: measured with bubble tubeReference cc/m Column cc/m Backflush cc/mNOTES:

Model # 905 F

Job # 511054

Separation of vinyl chloride from air

Oven type Air Bath

Field electronics ☒ Purged
(check one) ☐ Condulet

Detector type FID

F.I.D. Units only - Bottle regulators supplied by customer.

Zero hydrogen bottle:

Pressure setting 40 PSI Flow 60 cc/m

Restrictor type fixed capillary

Zero air bottle:

Pressure setting 40 PSI Flow 300 cc/m

Restrictor type variable needle valve

Instrument air pressure:

Source 50 PSI Oven air pressure 40 PSI
setting

Operating temperature 230 °F °C

Temperature controller zero crossing

Check one ☐ Plug Card ☒ Gup Mounted

Temperature probe thermistor 1 meg @ 250 C

High Temp. Cut-off Switch standard on all units/set at 300°F

Carrier Protection standard on all thermal cond. units

Power Switch ☐ yes ☒ no

EXHIBIT IV

PRIORITY	DATE OF ORDER	DATE REQUIRED	DIV.	PLT.	MAIN	SUB.	CAT.	AUX.	
A	5-22-78	5-22-78	06	20	243	564	301		33716
DESCRIPTION OF WORK-NAME OR NUMBER OF EQUIPMENT-REASON FOR WORK									EQUIP. READY FOR REPAIR
PLEASE INSTALL HANDLES ON VALVES PER ATTACHED LIST.									A.M.
									P.M.
									OUTAGE REQUIRED ☐
SAFETY									SAFETY PERMIT REQUIRED
									RED ☐ YELLOW ☐
									BLUE ☐ GREEN ☐
REQUESTED BY-SIGNATURE									NONE ☐
APPROVED BY-SIGNATURE					APPROVED FOR CONTRACT				
ESTIMATED		ACTUAL		MATERIALS REQUESTED		REQ'D NO.		DATE	
SKILL	NO.	HOURS	NO.	HOURS					
FF									
MW									
W									
E									
I									
TOTALS									
SPECIAL EQUIPMENT REQUIRED					DATE WORK COMPLETED		BY		
					5-22-78				
D-881-2					MAINTENANCE WORK ORDER				CENTRAL CONTROL

DAGO 267

MEMORANDUM

To TED GUTH Date 5-23-78

Subject VALVE HANDLES

THIS IS TO CONFIRM THAT EVERY VALVE ON
EVERY POLY IN 3-4-4X HAS A HANDLE
ON IT.

I PERSONALLY MADE THIS INSPECTION
MYSELF.

OCC 11110

FRANK FOLLS

MAY 23, 1978

TO: TED GUTH

FROM: FRANK FOLLIS

SUBJECT: VALVE HANDLE INSPECTION (3-4-4x)

BEGINNING IN JUNE, A VALVE HANDLE
INSPECTION WILL BE INCORPORATED IN THE
MONTHLY LEAK PATROL INSPECTION.

CC: RAY STELLENBERG

Frank

ENVIRONMENTAL H.D. OPER. (4)

RICH CASKEY

DEER PARK PLASTICS VCM CEILING EXPOSURE

DATE	JOB	NAME	TIME	DESCRIPTION	VCM	MASK
1/21/77	3-4 DRYING	J. VALENZUELA	15	OPER. DRYER	0.49	
2/14/77	3-4 DRYING	D. HERNANDEZ	15	SWITCHED BINS	0.63	
11/04/78	3-4 DRYING	R. MURPHY	15	ROUTINE DUTIES	0.74	
12/09/78	3-4 DRYING	T. CASKEY	320	WASHED DOWN	0.28	
13/02/78	3-4 DRYING	R. MURPHY	15	ROUTINE DRY.	1.53	
14/03/78	3-4 DRYING	D. HERNANDEZ	15	SAMPLED TOWER #3	0.54	

DEER PARK PLASTICS VCM TWA EXPOSURE

DATE	JOB	NAME	TIME	DESCRIPTION	VCM	MASK
1/08/77	3-4 DRYING	R. MURPHY	320	NORMAL OPER.	0.60	
1/30/77	3-4 DRYING	J. NARVAEZ	320	SAMPLE VCM	0.02	
11/19/78	3-4 DRYING	D. WILLIAMS	320	SAMPLING & DRY.	0.33	
12/09/78	3-4 DRYING	T. CASKEY	320	WASHED DOWN	0.28	
13/15/78	3-4 DRYING	J. VALENZUELA	320	OPER. DRYER	0.99	
14/19/78	3-4 DRYING	J. NARVAEZ	320	CATCH SAMPLE	0.26	

OCC 11112