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B.F.GOODRICH CHEMICAL COMPANY TECHNICAL REPORT

TITLE		
A VCM Monitoring Downwind From ALGCP		
AUTHOR	LOCATION	DATE
M. M. O'Mara	Avon Lake Technical Center	May 16, 1974
REQUESTED BY	LOCATION	PROJECT NO.
See Distribution		

SUMMARY

Total Hydrocarbon (OVA) and grab analyses (gas chromatography) were obtained downwind (240° - 290°, 10 - 20mph) from our PVC production facility at a distance ranging from 0.36 to 0.40 miles. The purpose of this analysis was to establish the normal steady-state concentration of VCM in the atmosphere at short distances from the plant's boundries.

OVA readings ranged from 50 - 300 ppm while gas chromatographic analyses from VCM ranged from 0.035 to 0.16/.21 ppm.

Analytical studies will continue toward increased sensitivity and specificity.

LOG BOOK REFERENCE:	GROUP FILE ACQ. NO.

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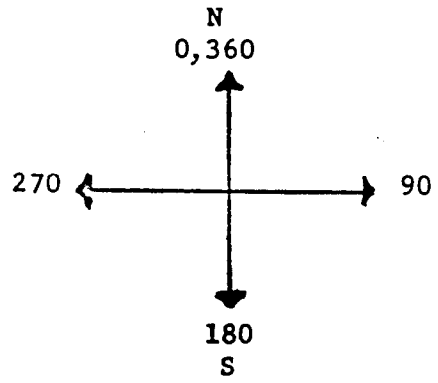
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Introduction

The objective of this initial study was to initiate work on (1) determining the steady state concentration of vinyl chloride monomer (VCM) downwind from our polymerization facilities and (2) describing the need for additional analytical methods for analyzing VCM below 1 ppm. Our initial approach was to monitor VCM approximately $\frac{1}{2}$ mile downwind from the following buildings at ALGCP: 451, 461, 463, and 464.

Location/Method

An aerial map of the ALGCP installation is shown in Figure 1. Sampling locations were along Moore Road and these points are shown on the map (①, ②, ③, ④). The positions chosen were based primarily on the wind direction. At the time of sampling the wind velocity was 10 - 20 mph (time weighted average = 13 mph) and at a direction of ~260° (time weighted average direction).



The deviation in direction ranged from 240° to 290°. The 50° cone created by this variance is also shown in Figure 1. Sampling was carried out at various distances along the base (Moore Road) of the cone (the apex of the cone was taken as the center of the four (4) buildings (see Figure 1). Linear distances from the apex of the cone to various points along the base are also shown in Figure 1. These distances range from 0.34 to .40 miles.

Sampling

Two methods were employed for sampling the atmosphere. Total hydrocarbon was obtained by means of the Century OVA portable analyzer. Grab samples for gas chromatographic analyses were obtained at the four (4) points shown in Figure 1. Analyses were performed between 3:45 - 4:15PM, Wednesday, May 15, 1974.

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Results

The results of the OVA analysis at the time of the grab samples were taken and the gas chromatographic analyses are summarized in Table 1. The gas chromatographic analysis ranged from 0.035 to .16/.21 ppm. It is interesting to note that the lowest value was obtained at point 3 which is outside the cone, while the highest value, .16/.21 ppm was ~180° from the time weighted average wind direction (260°).

It should be emphasized that the significance of the OVA is highly questionable. At the time that the samples were taken there was a detectable odor that is not characteristic of our plant emissions. The odor was more typical of paint and could be from other industrial sources in Avon Lake. An aromatic solvent from a source of this type will give very high OVA readings since the response in the instrument is about eight (8) times higher than for VCM.

Table 1

Results of Downwind Sampling

Sample Position[a]	Total Hydrocarbon[b]	VCM, ppm[c]
1	55	0.16, 0.21
2	125	0.08
3	80	0.035
4	70	0.096

(a) see Figure 1

(b) OVA readings

(c) by gas chromatography

Future Work

While our present chromatographic method is capable of even more sensitivity, I believe a concentrating method is necessary so that the gas chromatographic peaks at these very low concentrations can be tagged

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