

|                                                   |                                                                           |                            |
|---------------------------------------------------|---------------------------------------------------------------------------|----------------------------|
| TO<br>L. B. Crider                                | FIELD POINT OR AKRON DEPARTMENT & BLDG. NO.<br>Avon Lake Technical Center | DATE YOUR LETTER           |
| FROM<br>P. M. Zakriski<br>H. S. Haller (HSH-2-75) | FIELD POINT OR AKRON DEPARTMENT & BLDG. NO.<br>Avon Lake Technical Center | DATE THIS LETTER<br>1-9-75 |
| SUBJECT                                           |                                                                           |                            |

## BFG TECHNICAL DOCUMENT

ACCURACY OF CARBON TUBE METHOD OF VCM MEASUREMENTIntroduction:

In order to determine the accuracy of the carbon tube method of VCM measurement an experimental program was set up at ALTC and ALGCP where several carbon tubes would be exposed to the same ambient air at different VCM concentrations. All tubes were tested at BRC.

Summary:

1. The accuracy of the "carbon tube method"\* of VCM measurement is summarized below. Accuracy used in this report means

"How close the test results are to the correct value."

Carbon Tube Accuracy8 hr. TWA

| <u>VCM Range</u><br><u>(ppm)</u> | <u>Required OSHA</u><br><u>Monitoring Accuracy</u><br><u>(95% confidence)</u> | <u>Actual BFG</u><br><u>Carbon Tube Accuracy</u><br><u>(95% confidence)</u> |
|----------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 0.25-0.50                        | $\pm 50\%$                                                                    | $\pm 20\%$                                                                  |
| 0.50-1.00                        | $\pm 35\%$                                                                    | $\pm 20\%$                                                                  |
| 1.00-4.00                        | $\pm 25\%$                                                                    | $\pm 20\%$                                                                  |

15 min. TWA

| <u>VCM Range</u><br><u>(ppm)</u> | <u>Required OSHA</u><br><u>Monitoring Accuracy</u><br><u>(95% confidence)</u> | <u>Actual BFG</u><br><u>Carbon Tube Accuracy</u><br><u>(95% confidence)</u> |
|----------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1.5-130.                         | $\pm 25\%$                                                                    | $\pm 20\%$                                                                  |

2. The carbon tube method referred to here is at least as accurate as the OSHA specifications for 8 hour and 15 minute TWA's.

\*VCM is desorbed from the charcoal by placing the charcoal in carbon disulfide.

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Discussion:

1. M. M. O'Mara at ALTC exposed carbon tubes to different concentrations of VCM in air. Ten tubes were exposed to air containing about 4 ppm VCM, ten tubes to air containing 23 ppm VCM, and ten tubes to air containing 195 ppm VCM. In addition, at ALGCP, four carbon tubes were exposed to air containing about 0.1 ppm VCM, 4 tubes to air containing 0.4 ppm VCM, and 4 tubes to air containing 4.8 ppm VCM. At ALGCP four different pumps were used.
2. There was no variability in measuring VCM in these experiments due to different pumps.

HSB/PMZ/sp

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H. S. Haller

P. M. Zakriski  
P. M. Zakriski

cc: ALTC

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Akron

E. B. Katzenmeyer, Jr.

NGC 15504

File

|                           |                         |        |
|---------------------------|-------------------------|--------|
| PLANT OSHA ADMINISTRATORS | VARIOUS                 |        |
| R. L. TOOLE               | CLEVELAND OFFICE D/5450 | 8/4/75 |

VCM PERSONAL MONITORING ACCURACY

All of us have had some misgivings with regard to being able to prove the accuracy of our overall procedure for personal monitoring in order to comply with the OSHA regulations. Many of us have felt that the real "proof of the pudding" would be the comparison of our data with parallel results from OSHA sampling--thinking that no documentation would overcome differences that showed up between our results and OSHA's data.

The first rough test of this comparison is provided by the recently furnished data from OSHA covering the sixteen personal samples jointly taken during their inspection of 6-18-75 at Avon Lake General Chemical. This comparison is attached for your information. The agreement seems to be quite as close as we could expect and, based on this limited data, one might expect agreement within 10-12%, with OSHA data generally being higher.

In the case of future inspections at any plant, it should be standard procedure to use our equipment to obtain duplicate samples in order to provide comparison with OSHA data.

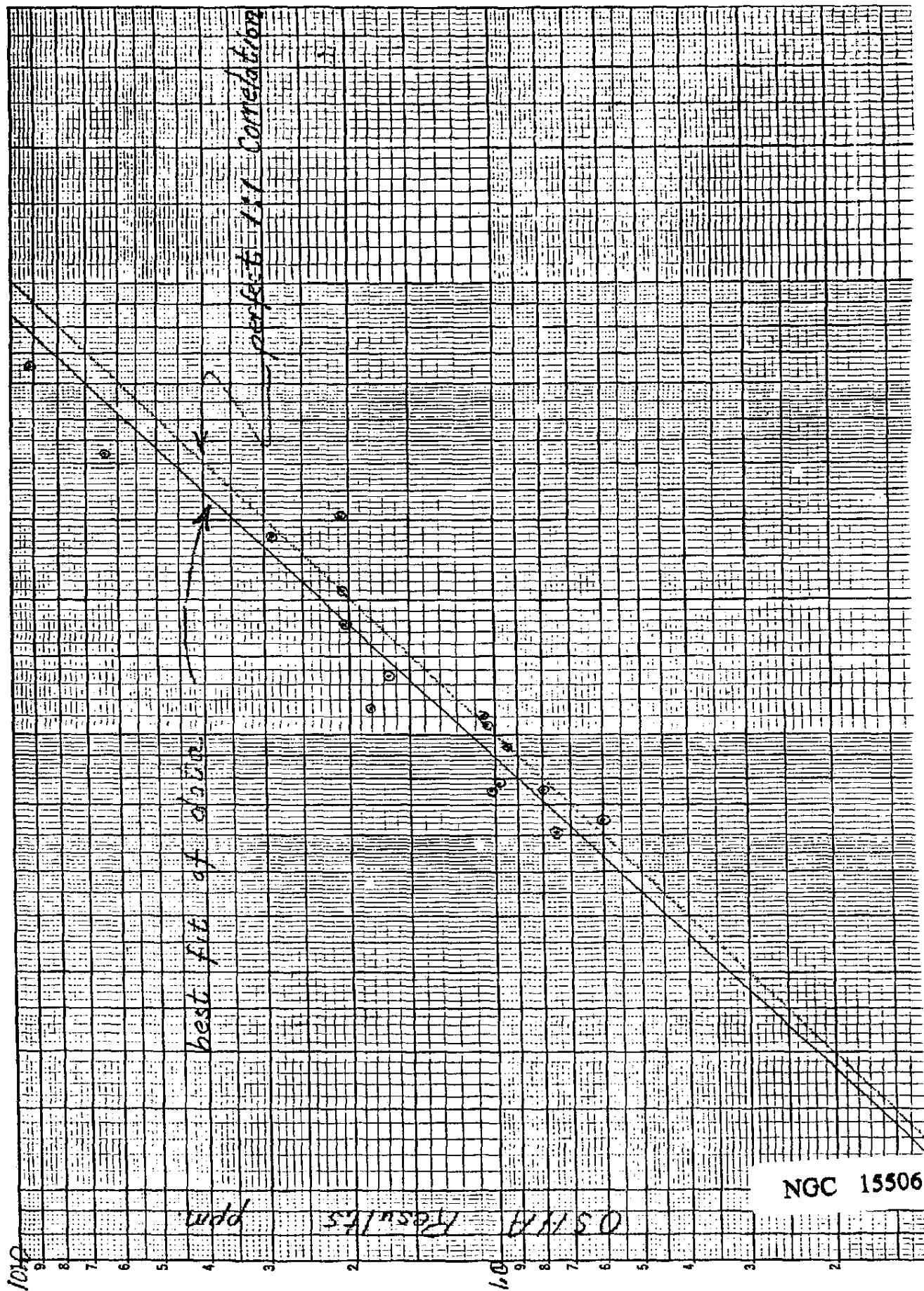
*R. L. Toole*  
R. L. Toole

RLT:jmh

- cc: E. W. Harrington  
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[REDACTED]  
J. M. Whitney  
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NGC 15505

K&E LOGARITHMIC 359-111  
KEUFFEL & ESSER CO. MAKING U.S.A.  
2 X 2.7 CYCLES



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Form 8506-2 5/9/75

PERSONAL MONITORING DATA

PLANT ALGC  
DATE 6-18-75  
SAMPLED BY Wallis

TYPE OF PUMP Mission II  
COLLECTOR TUBE: ☐ POLYETHYLENE  
☐ MSA ☒ BENDIX ☐

NAME OF POLLUTANTS COLLECTED

| Sample No.<br>and<br>Date Taken | Sampling<br>Location<br>(Bldg., etc.) | Name<br>of<br>Employee | Job<br>Class   | Specific<br>Operations | Expos.<br>Time<br>(min) | Flowrator<br>Airflow Rate<br>(liters/min) | Remarks | ANALYSIS & CALCULATIONS |                              |                                      |                |
|---------------------------------|---------------------------------------|------------------------|----------------|------------------------|-------------------------|-------------------------------------------|---------|-------------------------|------------------------------|--------------------------------------|----------------|
|                                 |                                       |                        |                |                        |                         |                                           |         | Sample<br>Time<br>(min) | Sample<br>Volume<br>(liters) | Pollutant Concent'<br>TOTAL<br>(ppm) | PPM*<br>IN AIR |
| 01                              | 464                                   | REDACTED               | Fore-<br>man   |                        |                         | 55cc                                      |         | 21 min<br>15 sec        | 1170                         | ASHA<br>Results<br>1.8               | 1.15           |
| 02                              | 464                                   |                        | Charge<br>op.  |                        |                         | 55cc                                      |         | 18 min<br>20 sec        | 990                          | 2.08                                 | 3.09           |
| 03                              | 463                                   |                        | op             |                        |                         | 55cc                                      |         | 19 min<br>45 sec        | 1085                         | 1.68                                 | 1.36           |
| 04                              | 464                                   |                        | Safety<br>Eng. |                        |                         | 55cc                                      |         | 15 min                  | 825                          | 1.07                                 | 1.10           |
| 05                              | 464                                   |                        | Gen<br>Foreman |                        |                         | 55cc                                      |         | 13 min<br>45 sec        | 755                          | .8                                   | 0.76           |
| 06                              | 463                                   |                        | Loading<br>op  |                        |                         | 55cc                                      |         | 20 min<br>45 sec        | 1140                         | 1.01                                 | 0.76           |
|                                 |                                       |                        | 1st Pl         |                        |                         |                                           |         |                         |                              |                                      |                |

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| Sample No.<br>and<br>Date Taken | Sampling<br>Location<br>(Bldg., etc.) | Name<br>of<br>Employee | Job<br>Class | Specific<br>Operations | Expos.<br>Time<br>(min) | Flowrate<br>Airflow Rate<br>(liters/min) | Remarks | ANALYSIS & CALCULATIONS |                              |                                                        |
|---------------------------------|---------------------------------------|------------------------|--------------|------------------------|-------------------------|------------------------------------------|---------|-------------------------|------------------------------|--------------------------------------------------------|
|                                 |                                       |                        |              |                        |                         |                                          |         | Sample<br>Time<br>(min) | Sample<br>Volume<br>(liters) | Pollutant Concent'n<br>TOTAL<br>(mg)<br>PPM*<br>IN AIR |
| 08                              | 461                                   | REDACTED               | change<br>of |                        | 55cc                    | 55cc                                     |         | 16<br>min               | 880                          | 0.10<br>1.04                                           |
| 09                              | 461                                   |                        | Re-ent<br>of |                        |                         | 55cc                                     |         | 17<br>min               | 935                          | 0.94<br>0.95                                           |
| 010                             | 461                                   |                        | Blow<br>Down |                        |                         | 55cc                                     |         | 20<br>min               | 1100                         | .76<br>0.61                                            |
| 011                             | 451                                   |                        | Helper       |                        |                         | 55cc                                     |         | 16<br>min               | 880                          | 6.4<br>4.20                                            |
| 012                             | 451                                   |                        | change<br>of |                        |                         | 55cc                                     |         | 16<br>min               | 880                          | 2.07<br>2.10                                           |
| 013                             | 451                                   |                        | change<br>of |                        |                         | 55cc                                     |         | 20<br>min               | 1100                         | 2.07<br>1.79                                           |
| 014                             | 451                                   |                        | Helper       |                        |                         | 55cc                                     |         | 22<br>min               | 1210                         | 2.89<br>2.77                                           |

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ANALYZED BY \_\_\_\_\_

LOG NO. \_\_\_\_\_ DATE RECEIVED \_\_\_\_\_

DATE REPORTED \_\_\_\_\_

APPROVED BY \_\_\_\_\_

\*The ppm value is not an 8-hour time-weighted average. It is based on the specific air volume which was sampled.

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## PERSONAL MONITORING DATA

 PLANT \_\_\_\_\_  
 DATE \_\_\_\_\_  
 SAMPLED BY \_\_\_\_\_

 TYPE OF PUMP \_\_\_\_\_  
 COLLECTOR TUBE: ☐ POLYETHYLENE  
☐ MSA ☐ BENDIX ☐ \_\_\_\_\_

NAME OF POLLUTANTS COLLECTED \_\_\_\_\_

| Sample No.<br>and<br>Date Taken | Sampling<br>Location<br>(Bldg., etc.) | Name<br>of<br>Employee | Job<br>Class | Specific<br>Operations              | Expos.<br>Time<br>(min) | Flowrator<br>Airflow Rate<br>(liters/min) | Remarks | ANALYSIS & CALCULATIONS |                              |                                         |                 |
|---------------------------------|---------------------------------------|------------------------|--------------|-------------------------------------|-------------------------|-------------------------------------------|---------|-------------------------|------------------------------|-----------------------------------------|-----------------|
|                                 |                                       |                        |              |                                     |                         |                                           |         | Sample<br>Time<br>(min) | Sample<br>Volume<br>(liters) | Pollutant<br>Concent'n<br>TOTAL<br>(mg) | PPM*<br>IN AIR  |
| 015                             | 463<br>Latex                          | REDACTED               | OP           | No respirator<br>changing<br>Premix |                         | 55cc                                      |         | 17<br>min               | 935                          | 9.17                                    | <del>6.58</del> |
| 016                             | 463                                   |                        | OP           |                                     |                         | 55cc                                      |         | 16 min<br>15 sec        | 895                          | .60                                     | <del>0.65</del> |
|                                 |                                       |                        |              |                                     |                         |                                           |         |                         |                              |                                         |                 |
|                                 |                                       |                        |              |                                     |                         |                                           |         |                         |                              |                                         |                 |
|                                 |                                       |                        |              |                                     |                         |                                           |         |                         |                              |                                         |                 |
|                                 |                                       |                        |              |                                     |                         |                                           |         |                         |                              |                                         |                 |
|                                 |                                       |                        |              |                                     |                         |                                           |         |                         |                              |                                         |                 |
|                                 |                                       |                        |              |                                     |                         |                                           |         |                         |                              |                                         |                 |
|                                 |                                       |                        |              |                                     |                         |                                           |         |                         |                              |                                         |                 |
|                                 |                                       |                        |              |                                     |                         |                                           |         |                         |                              |                                         |                 |

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LOG NO.

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