



## ENERGY AND ENVIRONMENTAL ANALYSIS, INC.

2607A Carver Street  
Durham, North Carolina 27705  
(919) 471-2506

1111 North 19th Street  
Arlington, Virginia 22209  
(703) 528-1900

October 20, 1980

Mr. J.A. DeBernardi, Plant Manager  
Conoco Chemicals  
Continental Oil Company  
Post Office Box 605  
Westlake, LA 70669

Dear Mr. DeBernardi:

I would like to thank you for assisting us in our development of new source performance standards (NSPS) for distillation operations in the synthetic organic chemicals manufacturing industry (SOCMI), by providing information on your ethylene dichloride and vinyl chloride processes. The following information is based on our telephone conversation on October 16, 1980, and a letter from you to Mr. D.R. Goodwin dated May 26, 1978. Could you please review the following information and write to me as to whether or not this is correct?

### Ethylene Dichloride Process:

- Totally, there are four distillation units in this process.
- There are two steam stripping units. These are nonvacuum operations.
- The noncondensables from the steam stripper, mainly  $\text{CO}_2$ , are sent to the incinerator.
- EDC purification consists of the other two distillation units. These are also operated under nonvacuum conditions.
- The noncondensables from both the EDC purification columns are sent to the incinerator.

### Vinyl Chloride Monomer Process:

- There are three nonvacuum distillation operations in this process.
- The quench tower is the first distillation unit. The noncondensables from this are sent to the next distillation unit.

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- The next distillation unit is the HCl removal column. The noncondensables are further processed and are recycled to the oxychlorination reactor.
- The third distillation unit has no noncondensables exiting the accumulator. There is a manual vent which is routed to the incinerator.

The Incinerator:

- The incinerator is designed to treat offgases from (1) direct chlorination, (2) loading, (3) distillation offgases, and (4) liquid by-products.
- The incinerator is followed by a HCl removal scrubber.
- This incinerator system has cost approximately \$13 million.
- The oxychlorination reactor vents are not routed to the incinerator due to the large volume and very low heat content.
- All the noncondensables from various distillation units are routed to the incinerator by natural flow. No devices like compressor, blower, etc., are present for this purpose.

Further Information Requested:

Having found the above information very useful, we would like to request the following information for a better understanding of controls for chlorinated hydrocarbons from distillation units.

- Provide the data on flow and compositions (both organic and inorganic) for the following streams:
  - Offgases from the two steam strippers in the EDC process before they combine with the inlet gases to incinerator.
  - Offgases from EDC purification columns in the EDC process before they combine with the inlet gases to incinerator.
  - Total offgases entering the incinerator.
- What is the material of construction of pipes carrying the noncondensables from distillation units? Does the presence of chlorinated hydrocarbon require any special material?
- Provide a rough sketch of the layout of the EDC plant marking only the distillation units and the incinerator, indicating the distances in between these units.

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- What types of valves are used in the pipeline from distillation units to the incinerator (e.g., flow control valve, flame arrestor, backflow control valve, etc.)?

Note: Questions 3 and 4 will be useful to cost a typical piping system.

Please feel free to contact me if you have any questions.

Sincerely, -

*T. Desai*

Tarun Desai  
Chemical Engineer

cc: Mr. David Beck  
U.S. Environmental Protection Agency  
Research Triangle Park, NC 27711

TD/smt

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Lake Charles VCM Plant

CERTIFIED MAIL #315657  
RETURN RECEIPT REQUESTED

Conoco Chemicals Company  
A Division of Conoco Inc.  
P.O. Box 605  
Westlake, Louisiana 70669  
(318) 491-5211

October 29, 1980

Mr. Gustave VonBodungen  
Acting Technical Secretary  
Department of Natural Resources  
Air Compliance Division  
P. O. Box 60630  
New Orleans, LA 70160

Dear Sir:

Per your letter of October 15, 1980 stating that the Conoco VCM Plant permit (No. 1424T) request has been approved by the Assistant Secretary of the Louisiana Environmental Control Commission, we would like to point out an error in the emissions allowable total for hydrocarbons. The Environmental Protection Agency is requesting that we send them a letter of approval from the State of Louisiana with correct emissions allowable totals, therefore, we ask that you re-issue the letter of approval using the corrected numbers.

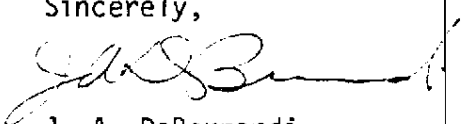
The following maximum emissions allowables would apply for the permit:

|                  |        |
|------------------|--------|
| Particulates     | 86.83  |
| Hydrocarbons     | 23.39  |
| Sulfur Dioxide   | 68.45  |
| Carbon Monoxide  | 17.73  |
| Nitrogen Dioxide | 244.97 |
| HCl & Cl         | 434.69 |

On Page 3 of the revised Emission Inventory Questionnaire issued to your office on August 21, 1980, the emission rates for alkanes/paraffins should be 1.19 lbs./hr. and 4.89 tons/yr. instead of 1.98 lbs./hr. and 8.12 tons/yr. A mistake was made when totaling the emission rates from the individual point sources. (See attached sheet)

We ask that you make these revisions as soon as possible since the EPA is delaying action on our PSD application until we send a letter of permit approval from the State. If there are any questions concerning these modifications, please contact Gary Foshee at (318) 491-5062.

Sincerely,

  
J. A. DeBernardi  
Plant Manager

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is

BCC: REL-CRH-HJN-VAM-GLF-PLF-DLD-JWW-JCL

## ITEM 3 . . . MATERIALS USED, PRODUCED, STORED, OR TRANSPORTED BY TOTAL PLANT

| A. Raw materials or materials being transported | Quantity used or transported   |                         |                         | How stored<br>(Be specific - floating roof tank, fixed roof, etc.) | How moved<br>(Pipeline, tanktruck, etc.) |
|-------------------------------------------------|--------------------------------|-------------------------|-------------------------|--------------------------------------------------------------------|------------------------------------------|
|                                                 | Annual average<br>(give units) | Hourly average<br>lb/hr | Hourly maximum<br>lb/hr |                                                                    |                                          |
| Name of material                                |                                |                         |                         |                                                                    |                                          |
| Ethylene                                        | 492 MM Lb.                     | 59.767                  | 62,682                  | Not stored                                                         | Pipeline                                 |
| Chlorine                                        | 750 MM Lb.                     | 91.108                  | 95,552                  | Pressure Tank                                                      | Pipeline/Railcar                         |
| Oxygen                                          | 13.125 MM Lb.                  | 1,709                   | 1,792                   | Not stored                                                         | Pipeline                                 |
|                                                 |                                |                         |                         |                                                                    |                                          |
|                                                 |                                |                         |                         |                                                                    |                                          |
| B. Products or byproducts                       |                                |                         |                         |                                                                    |                                          |
| Intermediate Products:                          |                                |                         |                         |                                                                    |                                          |
| 1. Hydrogen Chloride                            | 528 MM Lb.                     | 64.140                  | 67,269                  | Pressure Tank                                                      | Pipeline                                 |
| 2. 1,2 Dichloroethane                           | 1.663 MM Lb.                   | 202.038                 | 211,894                 | Nitrogen Padded                                                    | Ship and                                 |
|                                                 |                                |                         |                         | Fixed Roof Tanks                                                   | Railcar.                                 |
| Final Product                                   |                                |                         |                         |                                                                    |                                          |
| 1. Vinyl Chloride                               | 1.000 MM Lb.                   | 121,477                 | 127,403                 | Pressure Spheres                                                   | Ship, rail-car, or pipeline              |

ITEM 4 . . . EMISSION INFORMATION ON THE ENTIRE PLANT AS A WHOLE The rates given should correspond, in most cases, to the sum of the individual average rates of the point sources listed in the Item 5 pages for each type of air pollutant.

| A. PARTICULATE SOLIDS OR LIQUIDS            | Material name<br>(if must specify) | Emission rate<br>lbs/hr | Emission rate<br>tons/yr |
|---------------------------------------------|------------------------------------|-------------------------|--------------------------|
| soot from combustion                        |                                    | 20.33                   | 86.83                    |
| mineral dust                                |                                    |                         |                          |
| other, specify:                             |                                    |                         |                          |
| other, specify:                             |                                    |                         |                          |
| other, specify:                             |                                    |                         |                          |
| B. ORGANIC GASES OR VAPORS                  |                                    |                         |                          |
| alkanes/ paraffins                          | Methane and Ethane                 | 1.19                    | 4.89                     |
| alkenes/ olefins, specify:                  |                                    |                         |                          |
| alkynes/ acetylenes                         |                                    |                         |                          |
| aromatics, specify:                         |                                    |                         |                          |
| alcohols, specify:                          |                                    |                         |                          |
| other, specify: Halogenated                 | 1,2 Dichloroethane                 | 1.61                    | 7.05                     |
| other, specify: Halogenated                 | Vinyl Chloride                     | 2.55                    | 11.18                    |
| other, specify: Other Halogenated Materials |                                    | 0.06                    | 0.28                     |
| C. INORGANIC GASES OR VAPORS                |                                    |                         |                          |
| sulfur dioxide                              | SO <sub>2</sub>                    | 17.01                   | 68.45                    |
| hydrogen sulfide                            |                                    |                         |                          |
| carbon monoxide                             | CO                                 | 6.52                    | 17.73                    |
| nitrogen oxides                             | NO <sub>2</sub>                    | 58.05                   | 244.97                   |
| ammonia                                     |                                    |                         |                          |
| halogens, specify:                          | HCl and Cl <sub>2</sub>            | 99.19                   | 434.69                   |
| organic sulfides (except H <sub>2</sub> S)  |                                    |                         |                          |
| other, specify:                             |                                    |                         |                          |

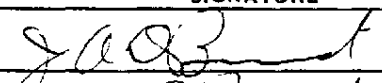
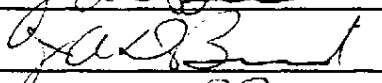
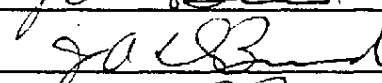
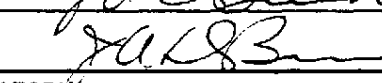
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OCT 16 1980

Form Approved OMB No. 158-R0155

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |                                                                                          |  |           |  |                   |  |  |  |  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|------------------------------------------------------------------------------------------|--|-----------|--|-------------------|--|--|--|--|--|
|                                                                                                                                                                                                                                                                                                                                                                                                 |                      | US ENVIRONMENTAL PROTECTION AGENCY                                                       |  | STUDY NO. |  | PERMIT CODE       |  |  |  |  |  |
| NPDES LABORATORY PERFORMANCE EVALUATION                                                                                                                                                                                                                                                                                                                                                                                                                                          |                      | (This data is collected under the authority of the Federal Water Pollution Control Act.) |  | N 0 1     |  | L A 0 0 0 3 4 7 6 |  |  |  |  |  |
| INTERNAL REVIEW RECORD                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                      |                                                                                          |  |           |  |                   |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | NAME (type or print) | SIGNATURE                                                                                |  |           |  | DATE              |  |  |  |  |  |
| LOCAL COORDINATOR<br>(engr., plant super.)                                                                                                                                                                                                                                                                                                                                                                                                                                       | Mr. J. A. DeBernardi |        |  |           |  | 10/15/80          |  |  |  |  |  |
| STATE COORDINATOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Mr. J. A. DeBernardi |        |  |           |  | 10/15/80          |  |  |  |  |  |
| REGIONAL COORDINATOR                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Mr. J. A. DeBernardi |        |  |           |  | 10/15/80          |  |  |  |  |  |
| EPA COORDINATOR                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Mr. J. A. DeBernardi |        |  |           |  | 10/15/80          |  |  |  |  |  |
| LABORATORY                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                      |                                                                                          |  |           |  |                   |  |  |  |  |  |
| NAME                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                      | ADDRESS                                                                                  |  |           |  | DATE              |  |  |  |  |  |
| Conoco Chemicals<br>A Division of Conoco<br>Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      | P. O. Box 605<br>Westlake, LA 70669                                                      |  |           |  | 10-13-80          |  |  |  |  |  |
| MARK 'X' FOR TYPE OF LABORATORY                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                      |                                                                                          |  |           |  |                   |  |  |  |  |  |
| <input type="checkbox"/> STATE <input type="checkbox"/> EPA <input type="checkbox"/> MUNICIPAL <input checked="" type="checkbox"/> INDUSTRIAL <input type="checkbox"/> COMMERCIAL <input type="checkbox"/> OTHER                                                                                                                                                                                                                                                                 |                      |                                                                                          |  |           |  |                   |  |  |  |  |  |
| CERTIFICATION<br>(By permit holder or authorized representative as per 40 CFR Part 122. See instructions.)                                                                                                                                                                                                                                                                                                                                                                       |                      |                                                                                          |  |           |  |                   |  |  |  |  |  |
| PERMITTEE NAME                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      | ADDRESS (street no., city, state, & zip code)                                            |  |           |  |                   |  |  |  |  |  |
| Conoco Chemicals<br>A Division of Conoco<br>Inc.                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      | P. O. Box 605<br>Westlake, LA 70669                                                      |  |           |  |                   |  |  |  |  |  |
| I the undersigned, certify under penalty of law that I have personally examined and am familiar with the information submitted in this and the attached document; and based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. |                      |                                                                                          |  |           |  |                   |  |  |  |  |  |
| NAME OF CERTIFYING OFFICIAL<br>(type or print)                                                                                                                                                                                                                                                                                                                                                                                                                                   |                      | SIGNATURE                                                                                |  |           |  | DATE SIGNED       |  |  |  |  |  |
| J. A. DeBernardi                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                      |      |  |           |  | 10/15/80          |  |  |  |  |  |

EPA Form 7500-55 (8-80)

PAGE 1 OF 2

CONTINUE ON PAGE 2

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| STUDY NO.                          |  | PERMIT CODE |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
|------------------------------------|--|-------------|--|-------------------------------------------|-----|-----|----------|-----------------------------------|-----|-----|----------|-------------------|-----|-----|----------|
| 01LA0003476                        |  |             |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
| TRACE METALS (recovery in µg/l)    |  |             |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
| STUDY NO. AND PERMIT CODE          |  | CARD NO.    |  | ALUMINUM                                  |     |     |          | ARSENIC                           |     |     |          | BERYLLIUM         |     |     |          |
|                                    |  |             |  | VP                                        | MC  | </> | QUANTITY | VP                                | MC  | </> | QUANTITY | VP                | MC  | </> | QUANTITY |
| DUPLICATE                          |  | 1           |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
|                                    |  |             |  | 20                                        | 21  | 22  | 23       | 24                                | 25  | 26  | 27       | 28                | 29  | 30  | 31       |
|                                    |  |             |  | 32                                        | 33  | 34  | 35       | 36                                | 37  | 38  | 39       | 40                | 41  | 42  | 43       |
|                                    |  |             |  | 44                                        | 45  | 46  | 47       | 48                                | 49  | 50  | 51       | 52                | 53  | 54  | 55       |
| STUDY NO. AND PERMIT CODE          |  | CARD NO.    |  | CADMIUM                                   |     |     |          | CHROMIUM                          |     |     |          | COBALT            |     |     |          |
|                                    |  |             |  | VP                                        | MC  | </> | QUANTITY | VP                                | MC  | </> | QUANTITY | VP                | MC  | </> | QUANTITY |
|                                    |  |             |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
|                                    |  |             |  | 56                                        | 57  | 58  | 59       | 60                                | 61  | 62  | 63       | 64                | 65  | 66  | 67       |
|                                    |  |             |  | 68                                        | 69  | 70  | 71       | 72                                | 73  | 74  | 75       | 76                | 77  | 78  | 79       |
| STUDY NO. AND PERMIT CODE          |  | CARD NO.    |  | COPPER                                    |     |     |          | IRON                              |     |     |          | LEAD              |     |     |          |
|                                    |  |             |  | VP                                        | MC  | </> | QUANTITY | VP                                | MC  | </> | QUANTITY | VP                | MC  | </> | QUANTITY |
| DUPLICATE                          |  | 2           |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
|                                    |  |             |  | 80                                        | 81  | 82  | 83       | 84                                | 85  | 86  | 87       | 88                | 89  | 90  | 91       |
|                                    |  |             |  | 92                                        | 93  | 94  | 95       | 96                                | 97  | 98  | 99       | 100               | 101 | 102 | 103      |
| STUDY NO. AND PERMIT CODE          |  | CARD NO.    |  | MANGANESE                                 |     |     |          | MERCURY                           |     |     |          | NICKEL            |     |     |          |
|                                    |  |             |  | VP                                        | MC  | </> | QUANTITY | VP                                | MC  | </> | QUANTITY | VP                | MC  | </> | QUANTITY |
|                                    |  |             |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
|                                    |  |             |  | 104                                       | 105 | 106 | 107      | 108                               | 109 | 110 | 111      | 112               | 113 | 114 | 115      |
|                                    |  |             |  | 116                                       | 117 | 118 | 119      | 120                               | 121 | 122 | 123      | 124               | 125 | 126 | 127      |
| STUDY NO. AND PERMIT CODE          |  | CARD NO.    |  | SELENIUM                                  |     |     |          | VANADIUM                          |     |     |          | ZINC              |     |     |          |
|                                    |  |             |  | VP                                        | MC  | </> | QUANTITY | VP                                | MC  | </> | QUANTITY | VP                | MC  | </> | QUANTITY |
| DUPLICATE                          |  | 3           |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
|                                    |  |             |  | 128                                       | 129 | 130 | 131      | 132                               | 133 | 134 | 135      | 136               | 137 | 138 | 139      |
|                                    |  |             |  | 140                                       | 141 | 142 | 143      | 144                               | 145 | 146 | 147      | 148               | 149 | 150 | 151      |
|                                    |  |             |  | pH ANALYSIS (standard units)              |     |     |          |                                   |     |     |          |                   |     |     |          |
|                                    |  |             |  | VP                                        | MC  | </> | QUANTITY |                                   |     |     |          |                   |     |     |          |
|                                    |  |             |  | 99                                        |     |     |          | 6.89                              |     |     |          |                   |     |     |          |
|                                    |  |             |  | 152                                       | 153 | 154 | 155      | 156                               | 157 | 158 | 159      | 160               | 161 | 162 | 163      |
| NUTRIENTS (recovery in mg/l)       |  |             |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
| STUDY NO. AND PERMIT CODE          |  | CARD NO.    |  | AMMONIA-NITROGEN                          |     |     |          | NITRATE-NITROGEN                  |     |     |          | KJELDAHL-NITROGEN |     |     |          |
|                                    |  |             |  | VP                                        | MC  | </> | QUANTITY | VP                                | MC  | </> | QUANTITY | VP                | MC  | </> | QUANTITY |
| DUPLICATE                          |  | 4           |  | 99                                        |     |     |          | 12.6                              |     |     |          |                   |     |     |          |
|                                    |  |             |  | 164                                       | 165 | 166 | 167      | 168                               | 169 | 170 | 171      | 172               | 173 | 174 | 175      |
|                                    |  |             |  | 176                                       | 177 | 178 | 179      | 180                               | 181 | 182 | 183      | 184               | 185 | 186 | 187      |
|                                    |  |             |  | TOTAL PHOSPHORUS                          |     |     |          | ORTHOPHOSPHATE                    |     |     |          |                   |     |     |          |
|                                    |  |             |  | VP                                        | MC  | </> | QUANTITY | VP                                | MC  | </> | QUANTITY |                   |     |     |          |
|                                    |  |             |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
|                                    |  |             |  | 188                                       | 189 | 190 | 191      | 192                               | 193 | 194 | 195      | 196               | 197 | 198 | 199      |
|                                    |  |             |  | 200                                       | 201 | 202 | 203      | 204                               | 205 | 206 | 207      | 208               | 209 | 210 | 211      |
| DEMAND ANALYSES (recovery in mg/l) |  |             |  |                                           |     |     |          |                                   |     |     |          |                   |     |     |          |
| STUDY NO. AND PERMIT CODE          |  | CARD NO.    |  | COD                                       |     |     |          | TOC                               |     |     |          | 5-DAY BOD         |     |     |          |
|                                    |  |             |  | VP                                        | MC  | </> | QUANTITY | VP                                | MC  | </> | QUANTITY | VP                | MC  | </> | QUANTITY |
| DUPLICATE                          |  | 5           |  | 99                                        |     |     |          | 63.7                              |     |     |          | 99                |     |     |          |
|                                    |  |             |  | 212                                       | 213 | 214 | 215      | 216                               | 217 | 218 | 219      | 220               | 221 | 222 | 223      |
|                                    |  |             |  | 224                                       | 225 | 226 | 227      | 228                               | 229 | 230 | 231      | 232               | 233 | 234 | 235      |
|                                    |  |             |  | TOTAL SUSPENDED SOLIDS (recovery in mg/l) |     |     |          | OIL AND GREASE (recovery in mg/l) |     |     |          |                   |     |     |          |
|                                    |  |             |  | VP                                        | MC  | </> | QUANTITY | VP                                | MC  | </> | QUANTITY |                   |     |     |          |
|                                    |  |             |  | 236                                       | 237 | 238 | 239      | 240                               | 241 | 242 | 243      |                   |     |     |          |
|                                    |  |             |  | 244                                       | 245 | 246 | 247      | 248                               | 249 | 250 | 251      |                   |     |     |          |
|                                    |  |             |  | 252                                       | 253 | 254 | 255      | 256                               | 257 | 258 | 259      |                   |     |     |          |
|                                    |  |             |  | 260                                       | 261 | 262 | 263      | 264                               | 265 | 266 | 267      |                   |     |     |          |

VVC 000012883

The methods used in this laboratory for the specific analyses requested are referenced as shown below. These particular references are not listed as a reference method under the individual parameter but are shown on the Methods Reference List, attachment.

(1) Ammonia-Nitrogen shown as Code (99)

This sample is tested in accordance to the direction in reference (12) except the final analysis is completed using a specific ion electrode as referenced in "Methods for Chemical Analysis of Water and Wastes," 1979.\*

(2) pH shown as Code (99)

This sample was analyzed in accordance to the directions as outlined in reference (2).

(3) Chemical Oxygen Demand shown as Code (99)

This sample was analyzed according to the method as listed in reference (2).

(4) Biochemical Oxygen Demand (5 day BOD) shown as Code (99)

This sample was analyzed according to the method as listed in reference (2).

\* Available from the U.S. Environmental Protection Agency, 26 W. St. Clair St., Cincinnati, OH 45268.

VVC 000012884

#### METHOD REFERENCES

1. "Methods for Chemical Analysis of Water and Wastes", 1974. Available from the U.S. Environmental Protection Agency, 26 W. St. Clair St., Cincinnati, OH 45268.
2. "Standard Methods for the Examination of Water and Wastewater," 13th ed., 1971. Available from the American Public Health Association, 1015 18th Street, N.W., Washington, DC 20036.
3. "Standard Methods for the Examination of Water and Wastewater," 14th ed., 1976. Available from the American Public Health Association, 1015 18th Street, N.W., Washington, DC 20036.
4. "Annual Book of Standards, Part 31, Water," 1975. Available from the American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.
5. Brown, E., Skougstad, M.W. and Fishman, M.J., "Methods for Collection and Analysis of Water Samples for Dissolved Minerals and Gases," U.S. Geological Survey Techniques of Water-Resources Inv., Book 5, Ch. A1.
6. Fishman, M. J. and Brown, E., "Selected Methods of the U.S. Geological Survey for Analysis of Wastewaters," open file report 76-177, 1976.
7. "Official Methods of Analysis of the Association of Official Analytical Chemists," Methods Manual, 12th ed., 1975.
8. American National Standards on Photographic Processing Effluents, April 2, 1975. Available from ANSI, 1430 Broadway, New York, NY 10018.
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