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# INTER-COMPANY CORRESPONDENCE

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Document #784

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS COMPANY LOCATION Post Office Box P OAK RIDGE, TENN.

UNCLASSIFIED

TO K. M. Jones

LOCATION

DATE July 28, 1955

ANSWERING LETTER DATE

ATTENTION

COPY TO

Anthony, L. L.
Barton, J. C.
Fowlkes, C. C.
Kuehn, P. R.
Kwasnoski, T.
Lang, D. M.
Largy, J. R., (Paducah)
Mahoney, C. H.
Montillon, G. H.
Parsons, J. A.
Rhees, R. C.
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Schwenn, M. F.
Smiley, S. H.
Snyder, H. G. P.
Technical Division K-1005 Files (K25RC) (4)
Technical Division K-1401 Files (K25RC)

SUBJECT K-25 Area Water Survey

KLI - 3552

## APPROVAL FOR RELEASE

Document: # KLI-3552 ; Date 7/28/55

Title/Subject K-25 AREA WATER SURVEY, 9-page document, TKwasnoski to KM Jones.

Approval for unrestricted release of this document is authorized by the Oak Ridge K-25 Site Classification and Information Control Office, Martin Marietta Energy Systems, Inc., PO Box 2003, Oak Ridge, TN 37831-7307.

Virginia Barton for Arvin Quist 2/3/93

K-25 Classification & Information Control Officer Date

A survey for mercury and manganese in Poplar Creek and Clinch River water has been made for a period of nine days in July to determine trends and daily variations in concentration. Additional chemical and spectrographic analyses have been made on the waters to show other contaminants.

Table I presents the results of the mercury analyses on Poplar Creek and Clinch River water.

Table II presents the results of the manganese analyses on the same samples.

Table III shows the mercury and manganese contents of miscellaneous samples submitted to the laboratory.

Table IV lists the control results obtained on the mercury method during the survey period.

Table V presents a complete analysis of Ohio River, Scioto River and Poplar Creek waters.

RESTRICTED DATA

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WCK-163 (3-51) THIS FORM FOR INTER-COMPANY CORRESPONDENCE ONLY

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KLI-3552

by authority of: Arvin S. Quist, 1/29/93
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(Authorized Declassifier's name and organization)

or (Official declassification notice memo, TIC notice, etc.) 2/3/93

(Person making change) (Date) 2/3/93

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K-25 Area Water Survey July 28, 1955

Table VI presents the complete spectrographic analyses of the Poplar Creek samples taken on July 10, 1955.

Table VII lists the spectrographic analyses of miscellaneous water and solid samples taken in connection with the water sampling program.

T. Kwasnoski
Special Analysis Department
Works Laboratory

TK:gmu

TABLE I

MERCURY CONTENT (PPB.) OF K-25 AREA WATERS

| Location | 7/6 | 7/7 | 7/8 | 7/9 | 7/10 | 7/11 | 7/12 | 7/13 | 7/14 | 7/15 | 7/18 | 7/19 | 7/20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East Fork of Poplar Creek | 156 | 128 | 56 | 86 | 264 | 800 | 34 | ---- | 82 | 0 | ---- | ---- | ---- |
| Poplar Creek Above East Fork Junction | 0 | 49 | 68 | 32 | 46 | 52 | 4 | ---- | 48 | 2 | ---- | ---- | ---- |
| Raw Water at K-891 | 64 | 172 | 204 | 60 | 86 | 180 | 36 | ---- | 70 | 3 | ---- | ---- | ---- |
| K-891 Effluent Treated Water | 52 | 112 | 232 | 60 | 86 | 198 | 32 | ---- | 78 | 18 | ---- | ---- | ---- |
| G Loop Supply | 68 | 112 | 124 | 52 | 60 | 164 | 18 | ---- | 66 | 26 | ---- | ---- | ---- |
| G Loop Return | 68 | 118 | 120 | 48 | 50 | 144 | 96 | ---- | 12 | 22 | ---- | ---- | ---- |
| Clinch River Below Poplar Creek Junction | 0 | 49 | 44 | 32 | 46 | 124 | 104 | ---- | 60 | 22 | ---- | ---- | ---- |
| Raw Water at K-1513 | 0 | 70 | 68 | 52 | 46 | 56 | 96 | ---- | 18 | 22 | ---- | ---- | ---- |
| East End Y-12 | --- | 132* | 82* | -- | 248 | 264 | 118 | 618 | ---- | --- | 294 | 4360 | 324 |
| West End Y-12 | ---- | 528* | 780* | -- | 41 | 39 | 46 | 176 | ---- | --- | 50 | 32 | 42 |

*East end and West end samples are probably reversed.

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TABLE II

MANGANESE CONTENT (PPM.) OF K-25 AREA WATERS

| Location | 7/6 | 7/7 | 7/8 | 7/9 | 7/10 | 7/11 | 7/12 | 7/13 | 7/14 | 7/15 | 7/18 | 7/19 | 7/20 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| East Fork of Poplar Creek | 0.12 | 0.12 | 0.11 | 0.18 | 0.15 | 0.08 | 0.11 | ---- | 0.15 | 0.18 | ---- | ---- | ---- |
| Poplar Creek Above East Fork Junction | 0.10 | 0.04 | 0.18 | 0.25 | 0.24 | 0.24 | 0.18 | ---- | 0.20 | 0.24 | ---- | ---- | ---- |
| Raw Water at K-891 | 0.22 | 0.19 | 0.08 | 0.20 | 0.24 | 0.16 | 0.14 | ---- | 0.09 | 0.08 | ---- | ---- | ---- |
| K-891 Effluent Treated Water | 0.18 | 0.19 | < 0.05 | 0.14 | 0.18 | 0.24 | 0.25 | ---- | 0.08 | 0.12 | ---- | ---- | ---- |
| G Loop Supply | 0.40 | 0.38 | 0.35 | 0.38 | 0.47 | 0.68 | 0.41 | ---- | 0.46 | 0.43 | ---- | ---- | ---- |
| G Loop Return | 0.40 | 0.38 | 0.35 | 0.39 | 0.40 | 0.66 | 0.42 | ---- | 0.46 | 0.37 | ---- | ---- | ---- |
| Clinch River Below Poplar Creek Junction | 0.12 | 0.09 | < 0.05 | 0.08 | 0.11 | 0.19 | 0.05 | ---- | 0.04 | 0.03 | ---- | ---- | ---- |
| Raw Water at K-1513 | 0.10 | 0.10 | 0.30 | 0.28 | 0.16 | 0.06 | 0.25 | ---- | 0.25 | 0.05 | ---- | ---- | ---- |
| East End Y-12 | ---- | 0.10* | 1.06* | ---- | 0.12 | 0.09 | ---- | 0.10 | ---- | ---- | 0.05 | 0.08 | 0.11 |
| West End Y-12 | ---- | 0.12* | 0.28* | ---- | 0.12 | 0.09 | ---- | 0.14 | ---- | ---- | 12.1 | 11.9 | 12.25 |

*East end and West end samples are probably reversed.

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TABLE III

MISCELLANEOUS WATER SAMPLES ANALYZED FOR MERCURY AND MANGANESE

| Location | Date | ppb. Hg | ppm. Mn |
|---|---|---|---|
| Drainage by A Tower | 7/12 | 120 | 0.14 |
| K-25 Drainage | 7/12 | 88 | 0.26 |
| K-1410 Drainage | 7/12 | 80 | 0.18 |
| K-131 Drainage | 7/12 | 104 | 0.06 |
| K-631 Chem. Pit | 7/12 | 88 | 2.75 |
| C Tower West Drain | 7/12 | 112 | 0.28 |
| K-27 Sewage Drain | 7/12 | 76 | 0.11 |
| Dilution of Drainage Before Clinch Dilution | 7/12 | 68 | 0.08 |
| K-1131 | 7/12 | 168 | 0.42 |
| 1300 Holding Pond | 7/12 | 184 | 0.22 |
| Zeolite Wash Water G Loop | 7/12 | 304 | 5.9 |
| Clinch River at Flying Saucer | * | 10 | |
| Blank | 7/12 | 10 | |
| Blank + 200 micrograms Cu + 500 micrograms Pb | 7/12 | 10 | |
| Spike (50 micrograms Hg) + 200 micrograms Cu + 500 micrograms Pb | 7/12 | 52 | |
| Sample 301 (J. C. Barton) | 7/11 | 40<br>38 | |
| Sample 302 (J. C. Barton) | 7/18 | 12<br>12 | |
| Sample 303 (J. C. Barton) | 7/20 | 0<br>0 | |
| Sanitary Water K-1004-D | 7/12 | 18 | |

*Approximately January 1955.

TABLE IV

MERCURY CONTROLS (50 PPB. Hg)

| Date | ppb. Hg |
|---|---|
| 7/11 | 50 |
| 7/12 | 52 |
| 7/14 | 56 |
| 7/18 | 50 |
| 7/19 | 52<br>56 |
| 7/20 | 56<br>58 |
| 7/21 | 59<br>56 |

# INTER-COMPANY CORRESPONDENCE

(INSERT NAME) COMPANY CARBIDE AND CARBON CHEMICALS COMPANY LOCATION Post Office Box P OAK RIDGE, TENN.

TO K. M. Jones
LOCATION K-1101

DATE August 10, 1955

ANSWERING LETTER DATE

ATTENTION

COPY TO Anthony, L. L.
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Technical Division K-1005 Files (K25RC) (4)
Technical Division K-1401 Files (K25RC)

SUBJECT K-25 Area Water Survey

KLI-3552 (Correction)

The following correction should be made in "K-25 Area Water Survey" report KLI-3552:

Page 7, the third item in the fifth column, ppm. Mn in Poplar Creek Water, 7/18/55, should read 0.16 instead of 16.

T. Kwasnoski
T. Kwasnoski

TK:jd

TABLE V

ANALYSES OF WATER FROM THREE DIFFUSION PLANT AREAS

| Analysis | Units | Ohio River 7/12/55 | Scioto River 7/15/55 | Poplar Creek 7/18/55 |
|---|---|---|---|---|
| pH | | 7.4 | 7.4 | 7.5 |
| Conductivity | micromho | 265 | 468 | 298 |
| Manganese | ppm. | 0.15 | 0.12 | 0.16* |
| Mercury | ppb. | 48 | 20 | 97** |
| Iron | ppm. | 0.16 | 0.4 | 0.19 |
| Silica - Total | ppm. | 0.8 | 11 | 11 |
| Dissolved | ppm. | 0.4 | | |
| Calcium | ppm. | 31 | 52 | 27 |
| Magnesium | ppm. | 10 | 25 | 10 |
| Hardness | ppm. as $CaCO_3$ | 118 | 232 | 108 |
| Alkalinity: P | ppm. as $CaCO_3$ | 0 | 0 | 0 |
| Alkalinity: M | ppm. as $CaCO_3$ | 62 | 158 | 72 |
| Suspended Solids | ppm. | 54 | 91 | 17 |
| Dissolved Solids | ppm. | 132 | 339 | 188 |
| Chloride | ppm. as NaCl | 13 | 44 | 32 |
| Sulfate | ppm. | 39 | 51 | 54 |

* Nine day average of K-891 Raw Water Samples from Table II

** Nine day average of K-891 Raw Water Samples from Table I

TABLE VI

SPECTROGRAPHIC ANALYSES OF POPLAR CREEK SAMPLES TAKEN JULY 10, 1955
(Results Reported in Parts Per Million)

| Element | East Fork of Poplar Creek | Poplar Creek above East Fork | Raw Water at K-891 | K-891 Effluent Treated Water | G Loop Supply | G Loop Return | Clinch River Below Poplar Creek Junction | Raw Water at K-1513 |
|---|---|---|---|---|---|---|---|---|
| Al | 2 | 10 | 10 | 1 | 1 | 2 | 0.6 | 1 |
| Ca | 100 | 20 | 60 | 40 | 160 | 200 | 20 | 60 |
| Cr | ---- | --- | ---- | ---- | ---- | 1 | ---- | ---- |
| Cu | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.6 | 0.2 | 0.1 |
| Fe | 2 | 10 | 10 | 2 | 6 | 10 | 1 | 2 |
| Li | 6 | ---- | 6 | 2 | 20 | 20 | ---- | ---- |
| Mg | 20 | 20 | 20 | 20 | 100 | 100 | 10 | 15 |
| Mn | ---- | 0.8 | 0.4 | 0.2 | 1 | 2 | ---- | 0.2 |
| Na | 40 | ---- | 20 | 10 | 60 | 60 | ---- | ---- |
| Si | 6 | 40 | 20 | 2 | 20 | 20 | 2 | 6 |
| Ti | ---- | 1 | 1 | ---- | ---- | ---- | ---- | ---- |

TABLE VII

SPECTROGRAPHIC ANALYSES OF MISCELLANEOUS WATER AND SOLID SAMPLES
(Results Reported in Parts Per Million on Water)

| | East Fork Junction of Poplar Creek | | | | | Coal Creek | |
|---|---|---|---|---|---|---|---|
| | | | | | | Water | Dust, % |
| Element | 7/1 | 7/2 | 7/3 | 7/4 | 7/6 | 7/5 | 7/5 |
| Al | 3 | 2 | 3 | 3 | 1 | 50 | 1 |
| B | | | | | | | 0.01 |
| Ca | 50 | 50 | 50 | 50 | 20 | 125 | 0.3 |
| Cu | 0.1 | 0.1 | 0.1 | 0.05 | 0.04 | 0.3 | 0.006 |
| Fe | 1 | 1 | 1 | 0.5 | 0.5 | 50 | 1 |
| Li | 2 | 1 | 2 | 10 | 1 | ---- | |
| Mg | 5 | 5 | 5 | 5 | 6 | 50 | 0.2 |
| Mn | 0.5 | 0.4 | 0.4 | 0.2 | 0.2 | 25 | 0.02 |
| Na | 5 | 3 | 5 | 30 | 5 | 20 | ---- |
| Ni | 0.5 | 0.3 | ---- | 0.2 | ---- | 2 | ---- |
| Pb | 2 | 2 | 1 | 3 | ---- | ---- | ---- |
| Si | 5 | 5 | 5 | 5 | 2 | 20 | 2 |
| Ti | 0.1 | 0.1 | 0.1 | 0.1 | 0.04 | ---- | 0.2 |
| V | ---- | ---- | ---- | ---- | ---- | ---- | 0.02 |