Monsanto

FROM (NAME & LOCATION) E. E. Stewart, W. G. Krummrich Plant

DATE : September 6, 1972

cc G. L. Bratsch
J. R. Savage - B2SL

SUBJECT : POLYCHLORINATED BIPHENYLS
WGK STRATEGY

REFERENCE

TO :
W. C. Engman
P. E. Heisler
G. A. Hippe
P. B. Hodges - E1SF
A. E. Leisy
W. B. Papageorge - B2NA

CONFIDENTIAL

Our objective at WGK is to continue Aroclor production indefinitely in such a manner to restrict knowing discharges of PCB's from the manufacturing department and the incinerator area to the lowest achievable level. Expected guidelines from the EPA will limit PCB discharges to an amount that should not be more than an amount that will result in 0.01 ppb in the receiving water.

Current PCB control data have been collected and reviewed to determine how we comply with the expected guidelines.

Graphs are attached.

Figure I - "PCB Knowing Loss Control - Aroclor & Incinerator Departments". Calculated PCB concentrations in the Mississippi River and based on data from continuous sewer samplers are below 0.003 ppb during the past 15 months when samples were obtained. Current "knowing losses" from the Aroclor and Incinerator departments are <0.001 ppb as calculated in terms of river concentration. This amount is less than 10% of the guideline.

Figure II - Same as Figure I except losses are expressed in terms of #/day rather than calculated river concentrations. Current "knowing losses" are less than 1 #/day.

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POLYCHLORINATED BIPHENYLS
WGK STRATEGY

Figure III - "PCB Loss Control - Waste Treatment Effluent" These data reflect not only the "knowing losses" from the Aroclor and Incinerator departments but also background losses from the entire plant and village sewer system. A significant downward trend as calculated in terms of river concentration is evident during the past 15 months. Current calculated river concentrations and based on the entire Waste Treatment Effluent at < 0.005 ppb are less than 50% of the guideline.

Figure IV - Same as Figure III except losses are expressed in terms of #/day rather than calculated river concentrations. Current losses for the most part are < 5 #/day.

Graphs will be periodically updated with data from the Aroclor and Incinerator continuous sampling stations.

E E Stewart

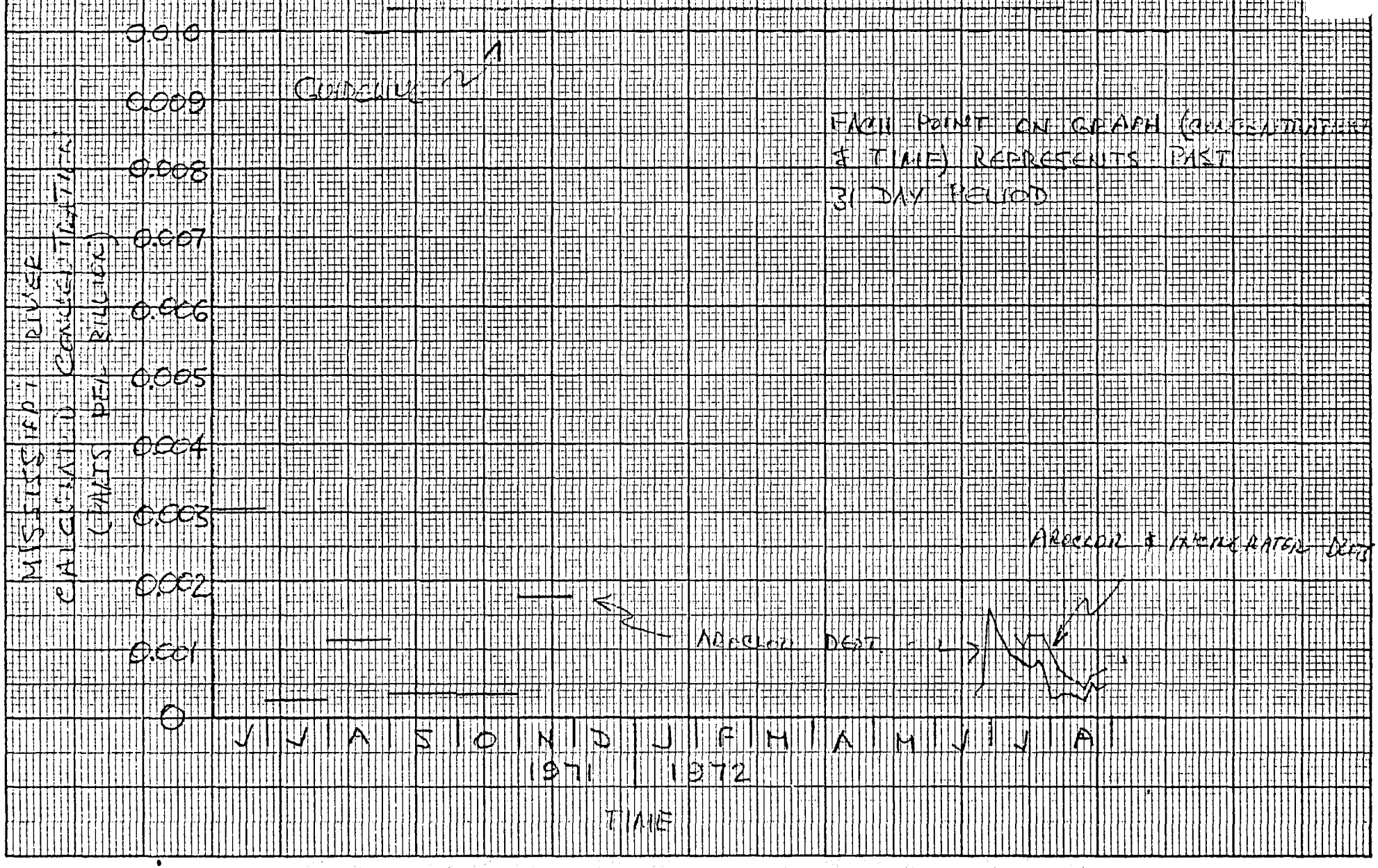
Edward E. Stewart
Technical Services Department

/tm
att.

DSW 310860

K+E 20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

FIGURE I
PCB "KNOWING LOSS" CONTROL
AROCLOR & INCINERATOR DEPARTMENTS



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K&E 20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

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STLCOPCB4070848

FIGURE II

FOR KNOWING LEVEL "CENTRAL AROCLOR & INCINERATOR DEPARTMENTS"

EACH POINT ON GRAPH (AMOUNT & TIME) REPRESENTS PAST 30 DAY PERIOD

AMOUNT (#/DAY)

5.0
4.0
3.0
2.0
1.0
0

AROCLOR & INCINERATOR DEPTS.

AROCLOR DEPT.

J J A S O N D J F M A M J J A

1971 1972

TIME

K-E 20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

DSW 310863

STLCOPCB4070849

FIGURE III

PCB LOSS CONTROL

WHITE TREATMENT PLANT EFFLUENT

EACH POINT ON GRAPH (CONCENTRATION & TIME) REPRESENTS PAST 31 DAY PERIOD

CALCULATED CONCENTRATION (PARTS PER BILLION) MISSISSIPPI RIVER

0.05
0.04
0.03
0.02
0.01
0

CONCLUDE

J J A S O N D J F M A M J J A

1971 1972

TIME

K&E 20 X 20 TO THE INCH 46 1240
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

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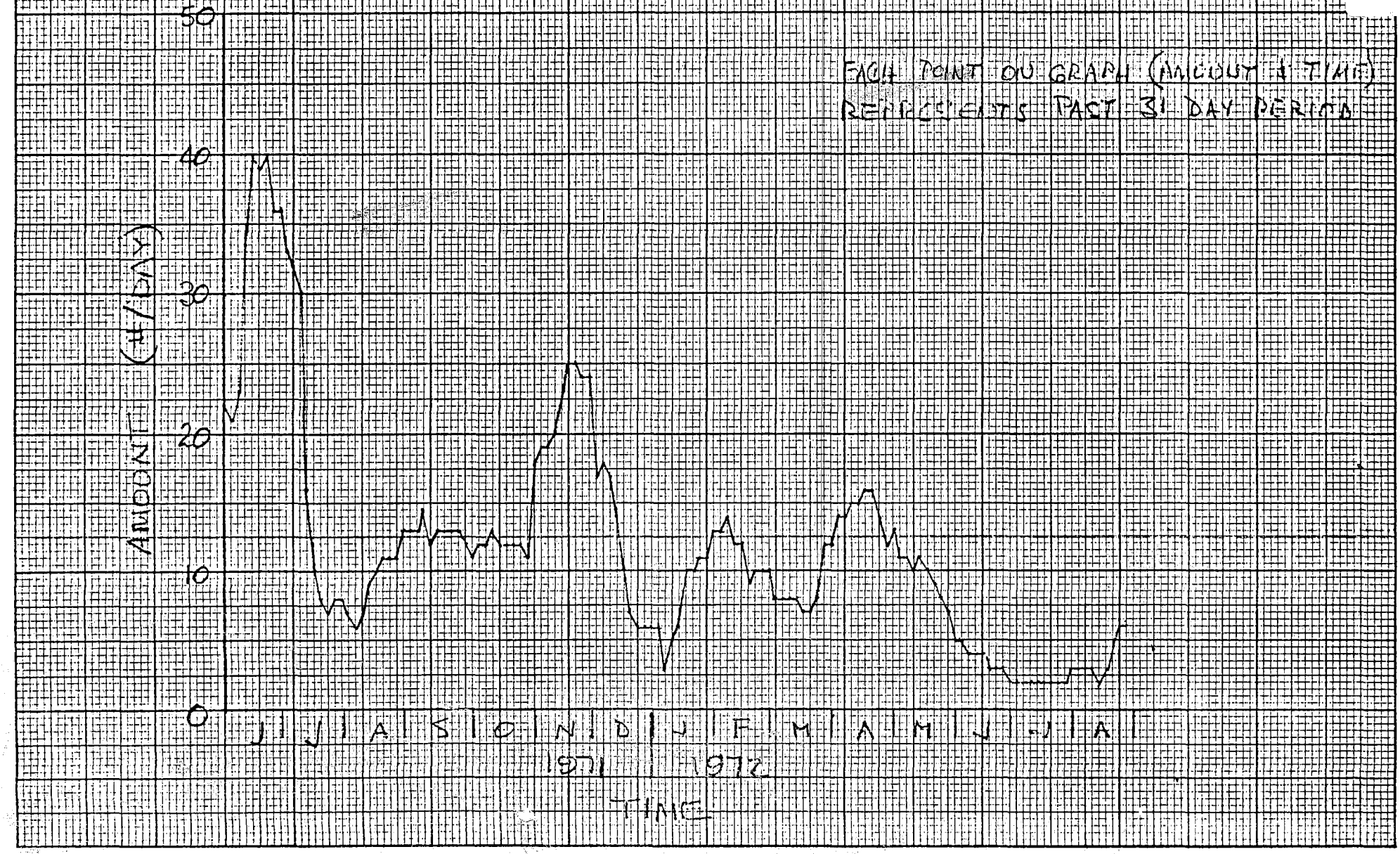
STLCOPCB4070850

FIGURE IV

PCB LOSS CONTROL

WASTE TREATMENT PLANT EFFLUENT

EACH POINT ON GRAPH (AMOUNT & TIME) REFLECTS PAST 31 DAY PERIOD



Monsanto

FROM (NAME & LOCATION) E. E. Stewart, W. G. Krummrich Plant

DATE July 31, 1972

SUBJECT POLYCHLORINATED BIPHENYLS AND THE ENVIRONMENT

REFERENCE

TO Mr. Paul Heisler
Director of Environmental
Control at W.G.K.

CC: G. L. Bratsch
W. C. Engman
G. A. Hippe
P. B. Hodges - G.O. (E1SF)
A. E. Leisy
W. B. Papageorge - G.O. (B2NA)
J. R. Savage - G.O. (B2SL)

During the past three years, varied actions have been implemented at the W.G. Krummrich manufacturing facilities to restrict and reduce Polychlorinated Biphenyls (PCB) entrance into the environment.

Major activities can be summarized as follows. More details related to the specified areas are attached.

I. The total production of Aroclors at the W.G.K. Plant reached a peak in 1970 and has since decreased by 16%.

II. Production of the higher chlorinated homologues, (Aroclor 1248 and above) has decreased about 60% since 1969.

III. Manufacturing facilities were installed to produce a more biodegradable homologue in the chlorinated biphenyl series, Aroclor 1016. Expect about 60% of the 1972 total production to be Aroclor 1016. ($970,000)

IV. Container alterations made (heavier metal drums).

V. Product labeling changes were made to reflect possibilities of environmental contaminant, restrictions for use of therminol and opportunities for waste disposal by incineration.

VI. Installation of facilities to permit reworking and/or incinerating PCB's returned from the customer as a means of waste disposal. ($790,000)

VII. Have replaced all Therminol units and hydraulic systems outside the manufacturing department which had contained polychlorinated biphenyls with non PCB type fluids. ($80,000)

DSW 310865

VIII. Equipment modifications and installations were made to restrict and contain knowing losses of PCB's to the lowest technical achievable level within the manufacturing department. ($170,000)

IX. An educational program is being directed to the operating personnel related to good housekeeping and the need for care to control and contain Aroclor wastes in the manufacturing areas.

X. Developed and implemented automatic stream sampling stations to closely monitor the PCB content in effluent streams from the manufacturing facilities and the incinerator area.

XI. Laboratory equipment was purchased and plant expertise was developed to analyze streams for PCB's in the parts per billion range.

Needless to say, such activities as listed above to control and contain PCB losses, require a dynamic action control program. Many people are involved from the operators, first line supervision and superintendents at the operating level to the technicians, chemists and engineers in the laboratory, environmental control and engineering departments. Total manpower requirements related specifically to the loss control program of containment and control are conservatively estimated at 20 man-years since 1969 ($400,000).

Edward E. Stewart
Technical Services Department

/tm
att.

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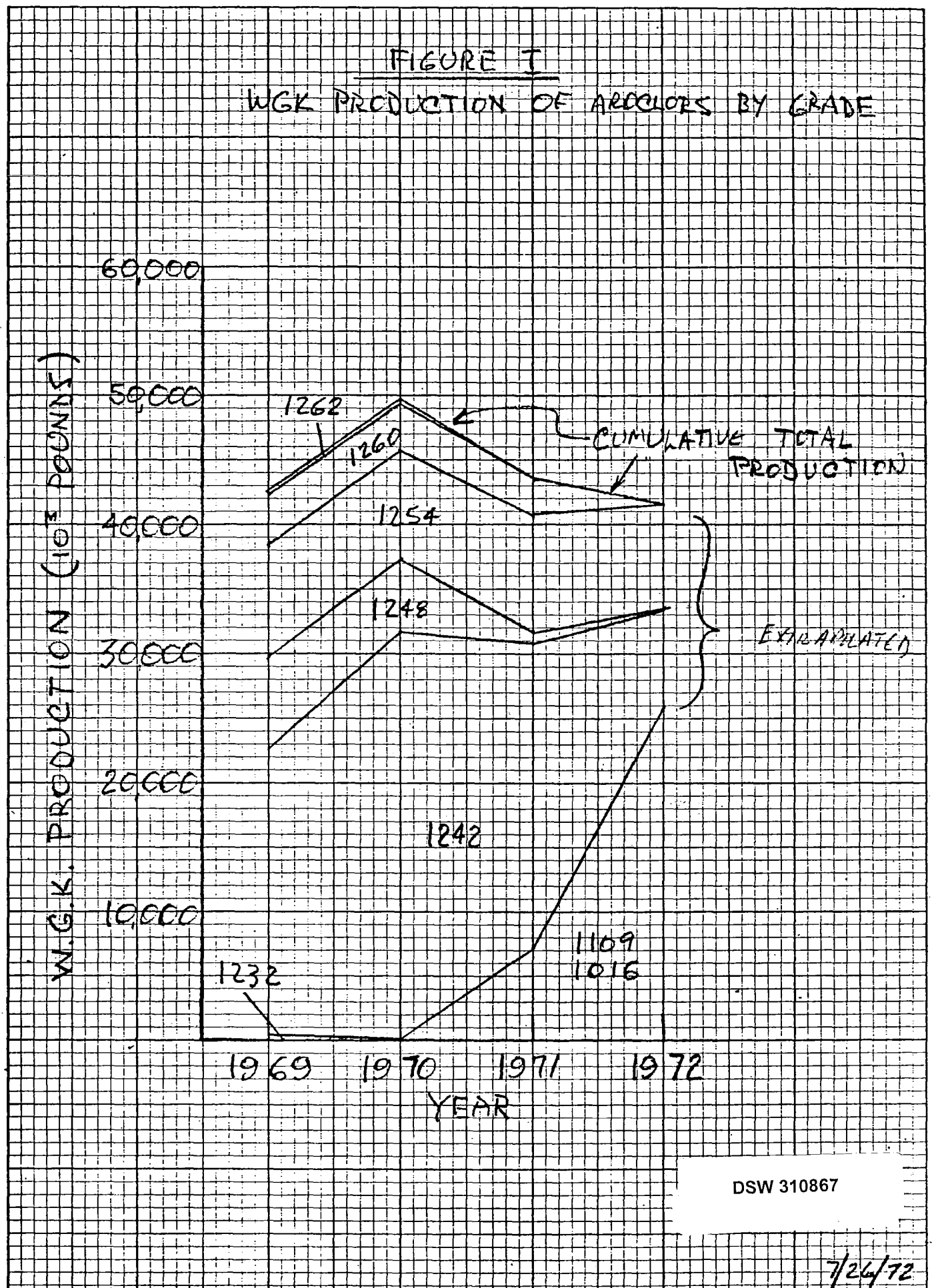
FIGURE T

WGK PRODUCTION OF AROCLORS BY GRADE



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7/26/72

K+E 10 X 10 TO THE INCH 46 0782
7 X 10 INCHES MADE IN U.S.A.
KEUFFEL & ESSER CO.

CONTAINER ALTERATIONS MADE

During this period a heavier metal drum was substituted for a lighter weight drum. The metal thickness was increased by 26% when the 18 gage drums were replaced with 16 gage drums. Both side walls and heads were increased in thickness. Double chimes are provided on the heads for added strength.

The heavier gage drum affords more protection against possible leakage due to damage in handling and transporting.

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STLCOPCB4070854

LABELING CHANGES

The following additions were added to various labels:

"This product contains polychlorinated biphenyls, which some studies have shown may be persistent, air environmental contaminant and, possibly, injurious to certain forms of bird, aquatic and animal life. Extreme care should be taken to prevent any entry into the environment through spills, leakage, use, disposal, vaporization or otherwise."

"WASTE DISPOSAL Used polychlorinated biphenyl fluids may be returned freight prepaid for proper incineration at 3¢ per pound. Ship to: Supervisor, Dept. A-246, MONSANTO COMPANY, SAUGET, ILLINOIS 62201"

"ATTENTION - DO NOT USE IN ANY SYSTEM INVOLVING PROCESSING OR HANDLING OF: Food or food related products; Food wrapping or container materials; Pharmaceuticals or animal feed stuff. ANY CONTACT MAY CONTAMINATE THESE ITEMS TO THE EXTENT THEY MUST BE DESTROYED."

"IN CASE OF LEAK OR SPILL, CALL COLLECT 618-271-5835."

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INSTALLATION OF FACILITIES TO PERMIT REWORKING AND/OR INCINERATING PCB's RETURNED FROM THE CUSTOMER

Equipment was installed to permit the incineration of liquid waste Aroclors. Complete incineration of the liquid waste is affected by incineration at 2000°F. Facilities are available for handling waste Aroclors from tank cars, tank trucks and drums.

Effluent streams from the disposal facilities are closely monitored to assure that knowing losses are controlled.

An installation permit has been received from the Illinois EPA for the Aroclor incinerator. The unit meets all requirements specified by the EPA, and the operations are monitored on a routine basis and reports sent to the EPA.

DSW 310870

EQUIPMENT MODIFICATIONS AND INSTALLATIONS WITHIN THE MANUFACTURING DEPARTMENT FROM 1969 TO 1972

Numerous projects were completed to eliminate atmospheric discharges, to eliminate discharges to the sewer and to contain PCB's within the manufacturing department that may have resulted from accidental spills or equipment failures.

A. Atmospheric vents and rupture disc lines were rerouted through catch tanks and/or redirected to settling basin areas.

B. Nitrogen blanketing provided on storage tanks.

C. Mist eliminators installed in gas lines.

D. Settling basins were installed in sewer system.

E. Areas were paved, curbed and sewer trenches directed flow to settling basins.

F. Underground sewers were mounted above ground or repaired to eliminate build-up and cross flows of underground PCB contaminated waters.

In addition all Therminol heating units in the plant were converted to non-PCB type fluids.

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DEVELOPED AND IMPLEMENTED AUTOMATIC STREAM SAMPLING STATIONS

During the past three years the sampling technique to monitor effluent streams for PCB's has been under constant study and change. It is extremely difficult to obtain a continuous representative sample unless special facilities are installed.

Efforts in the past have been related to:

A. Obtaining data profiles along lengths of sewer mains.

B. Obtaining data traverses at cross sectional areas in sewer lines and sewer boxes.

C. Effect of sampler speeds on data.

D. Isokinetic velocity studies in sampler lines and stream flows.

E. Sewer sampling facilities and flow instrumentation provided.

DSW 310872