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Chicago, Illinois 60690

April 2, 1975

Mr. R. J. Silver
Operating Reactors - Branch 2
Office of Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden Station Units 2 and 3
Quad-Cities Station Units 1 and 2
Reactor Water Chemistry Data
NRC Dkts. 50-237, 50-249, 50-254, and 50-265

Dear Mr. Silver:

Attached is the subject data summarized in graphic form for an 11-month period of 1973. The data shown is representative of the normal water chemistry during the operating history of the subject reactors. Additional data is available for NRC review at the respective stations.

Also attached are excerpts from the General Electric, Sargent & Lundy, and Graver chemistry specification applicable to the subject units.

With respect to dissolved oxygen specifically, we have only scant data for reactor water. The data we have, however, gives no indication that our BWR's are any different than any others. That is, the dissolved oxygen values are less than 0.3 ppm at operating conditions. Such values were verified and are documented in the General Electric startup test reports.

One (1) signed original and 39 copies of this data are provided for your information.

Very truly yours,

J. S. Abel
Nuclear Licensing Administrator
Boiling Water Reactors

3784

22A1036, Rev. 1 CH NO. 3 PAGE 4 CONT ON SHEET

TITLE WATER QUALITY

Revised as/Ltr Dated 4-2-75

4.2.3 The design basis for water leaving the condensate demineralizers shall be the following:

Specific Conductivity at 25°C	$\leq$ 0.1 micromho/cm
pH at 25°C	Neutral (6-8)
Total Iron (as Fe)	$\leq$ 8 ppb
Total Copper (as Cu)	$\leq$ 8 ppb
Total Nickel (as Ni)	$\leq$ 5 ppb
Silica (as SiO_2)	$\leq$10 ppb
Chloride (as Cl)	$\leq$10 ppb (see note)

Note: Although 20 ppb is limit of analysis, 10 ppb is a design basis.

18. GUARANTEE (FOR EACH UNIT)

A. Contractor shall guarantee that, under conditions of "normal" operation, the condensate demineralizer system will deliver effluent with not more

than the following concentrations of impurities:

Item	Limit
Specific Conductivity at 25°C	< 0.1 micromho/cm
pH at 25°C	Neutral
Total Iron (as Fe)	< 5 ppb (mg/m^3)
Total Copper (as Cu)	< 2 ppb (mg/m^3)
Total Nickel (as Ni)	< 2 ppb (mg/m^3)
Silica (as SiO_2)	< 5 ppb (mg/m^3)
Chloride (as Cl)	<10 ppb (mg/m^3)

*This is below the limit of detectability; however, concentrations are measurable in the nuclear boiler where the concentration limit is 100 ppb.

B. Contractor shall guarantee that, during initial and subsequent start-ups, the condensate polishing equipment will reduce suspended solids to 10% of the influent concentration or 20 ppb, whichever is greater, and will reduce dissolved solids to 5% of the influent concentration or 25 ppb, whichever is greater.

C. Contractor shall guarantee that, during periods of condenser leakage (10 gpm), the condensate polishing equipment will reduce total dissolved solids to not more than 50 ppb and will reduce suspended iron and copper to 10% of the influent concentration or 16 ppb, whichever is greater.

D. Contractor shall guarantee that the above results will be produced with a pressure loss from inlet header to outlet header not exceeding 65 psig with dirty resins when the condensate temperature is not less than 75 F.

E. The pressure drop and 10 gpm condenser leakage requirements shall apply up to one year's operation.

TECHNICAL DATA

3.) EFFLUENT QUALITY GUARANTEE

Based on normal condensate influent water conditions with no condensate leakage, Graver would guarantee the following effluent:

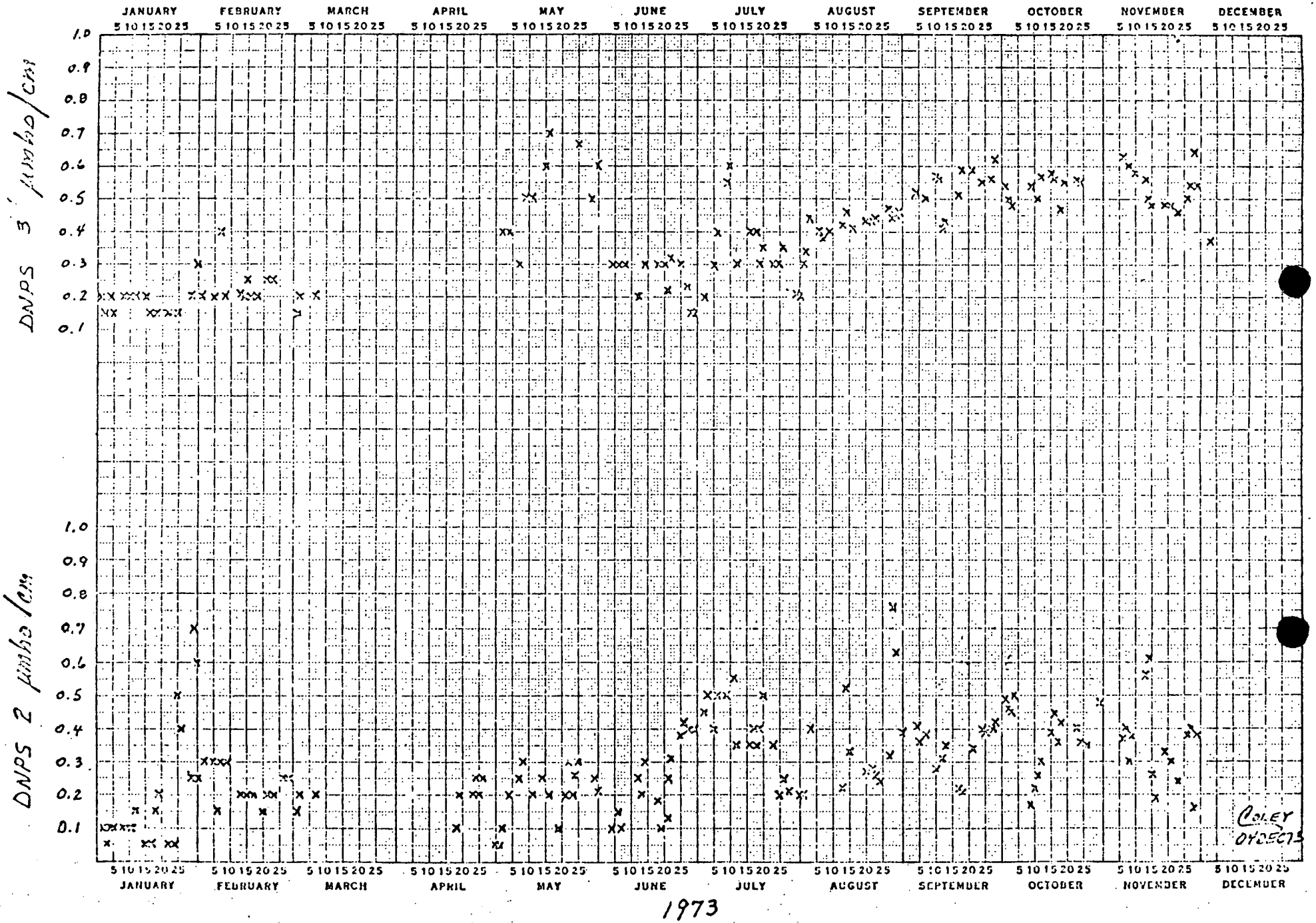
Loading	Effluent Guarantee
Total Dissolved Solids	<.1 mmho
pH @ 25° C	6-8
Dissolved Silica	<5 ppb
Suspended Solids	<5 ppb
Total Iron	<5 ppb
Total Copper	<2 ppb
Total Chloride	<10 ppb

Based on normal startup and restart influent water conditions, Graver would guarantee 90% solids removal.

FIGURES

X 250 DIVISIONS
KEUFFEL & ESSER CO.

REACTOR WATER SAMPLED AT CLEAN-UP FILTER INLET — IN-LINE CELL



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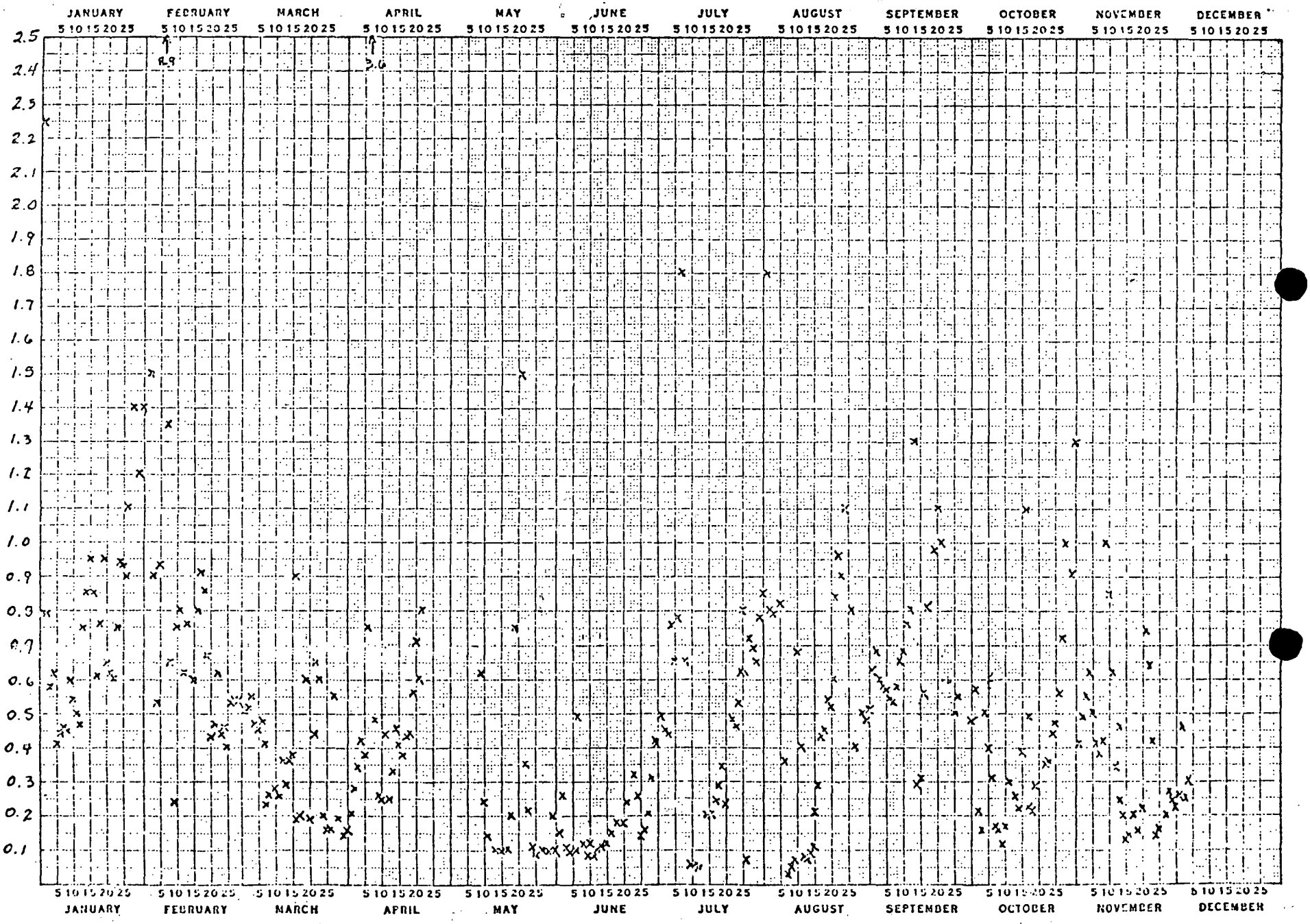
REACTOR WATER SAMPLED AT CLEAN-UP INLET — IN LINE CELL



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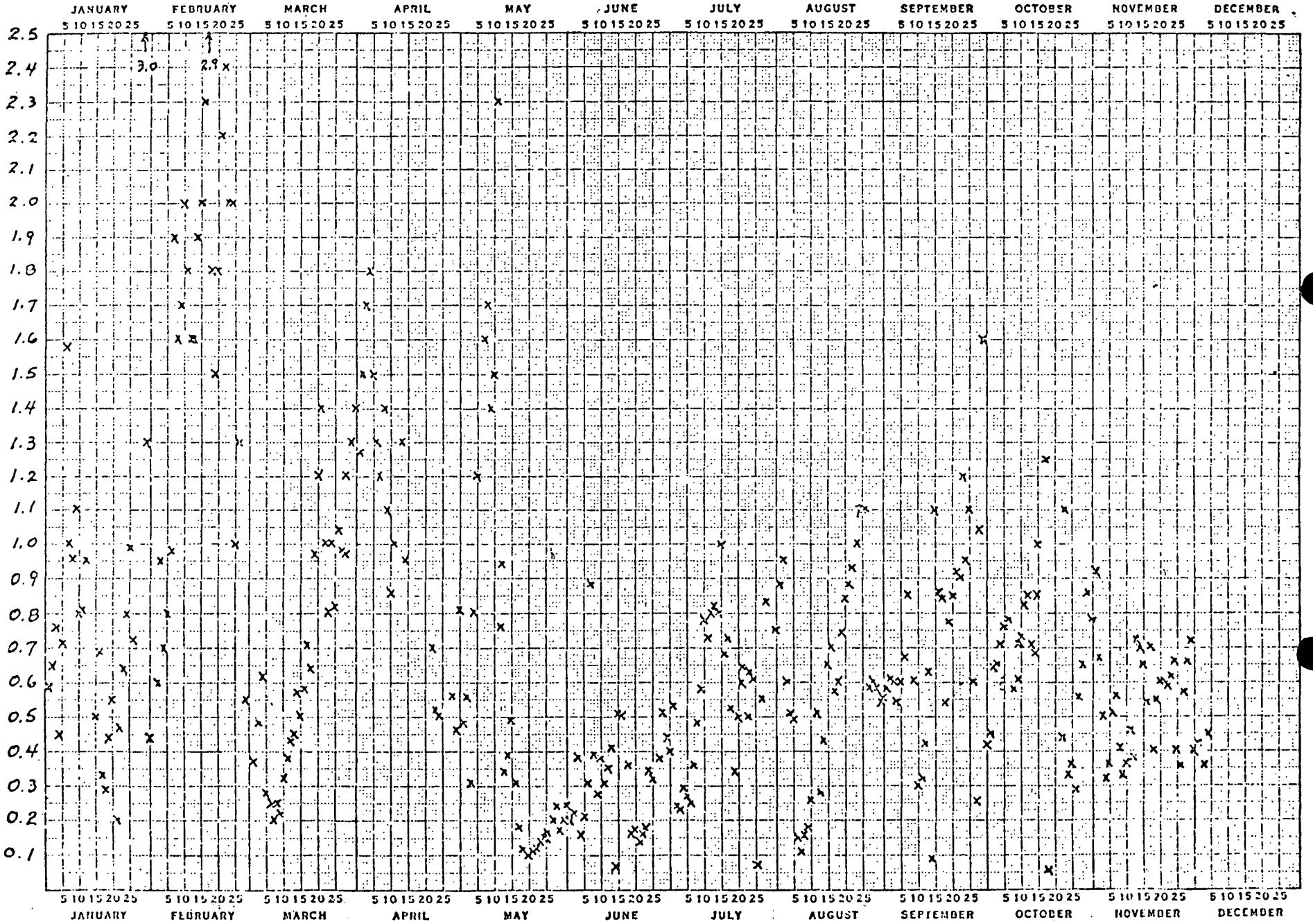
REACTOR WATER SAMPLED AT CLEAN-UP INLET — IN LINE CELL



1973

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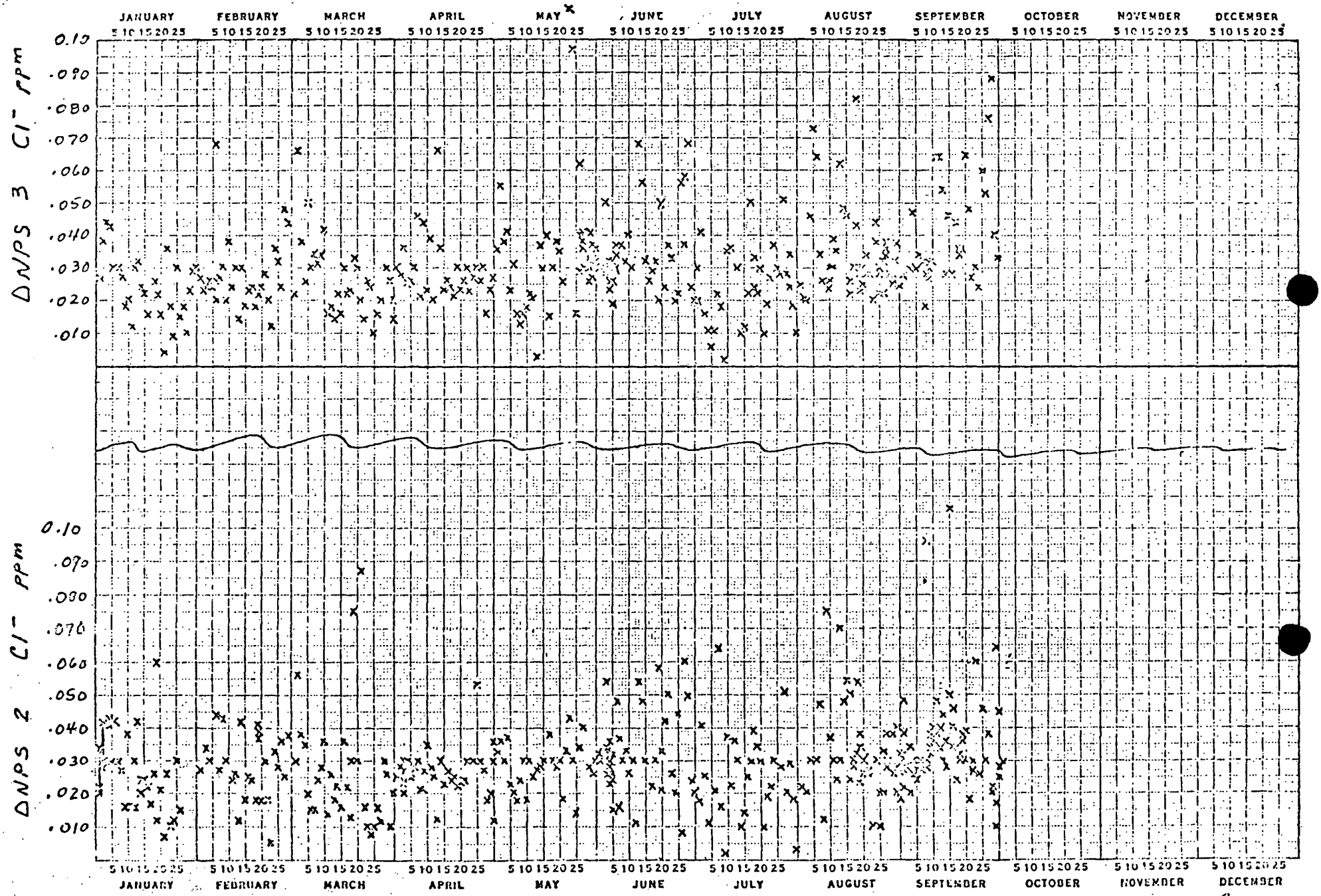
05DEC73

K&E 1 YEAR BY DAYS 46 2898
X 250 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.

REACTOR WATER CHLORIDE - CLEAN-UP FILTER INLET GRAB SAMPLE



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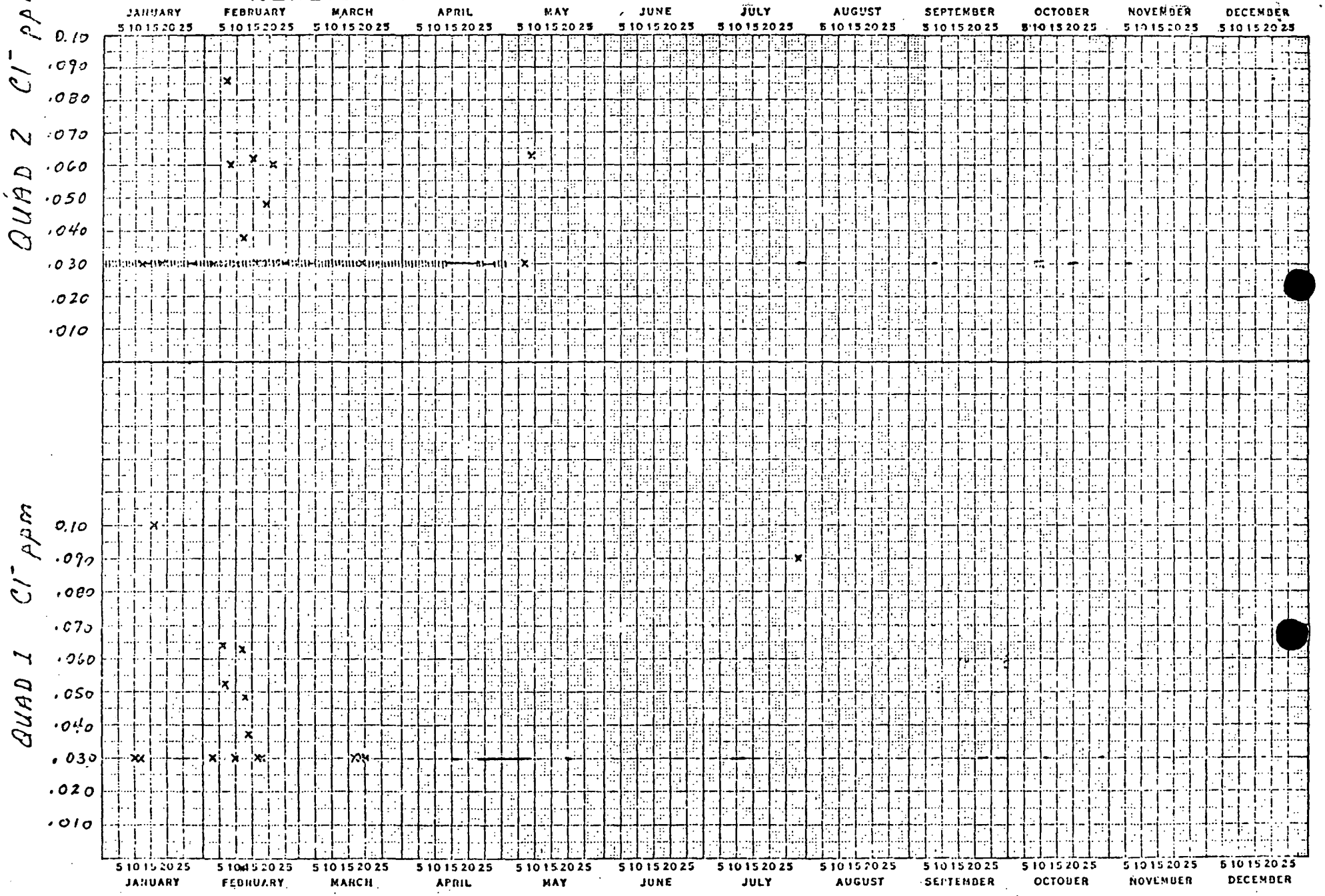
REACTOR WATER CHLORIDE - CLEAN-UP INLET GRAB SAMPLE



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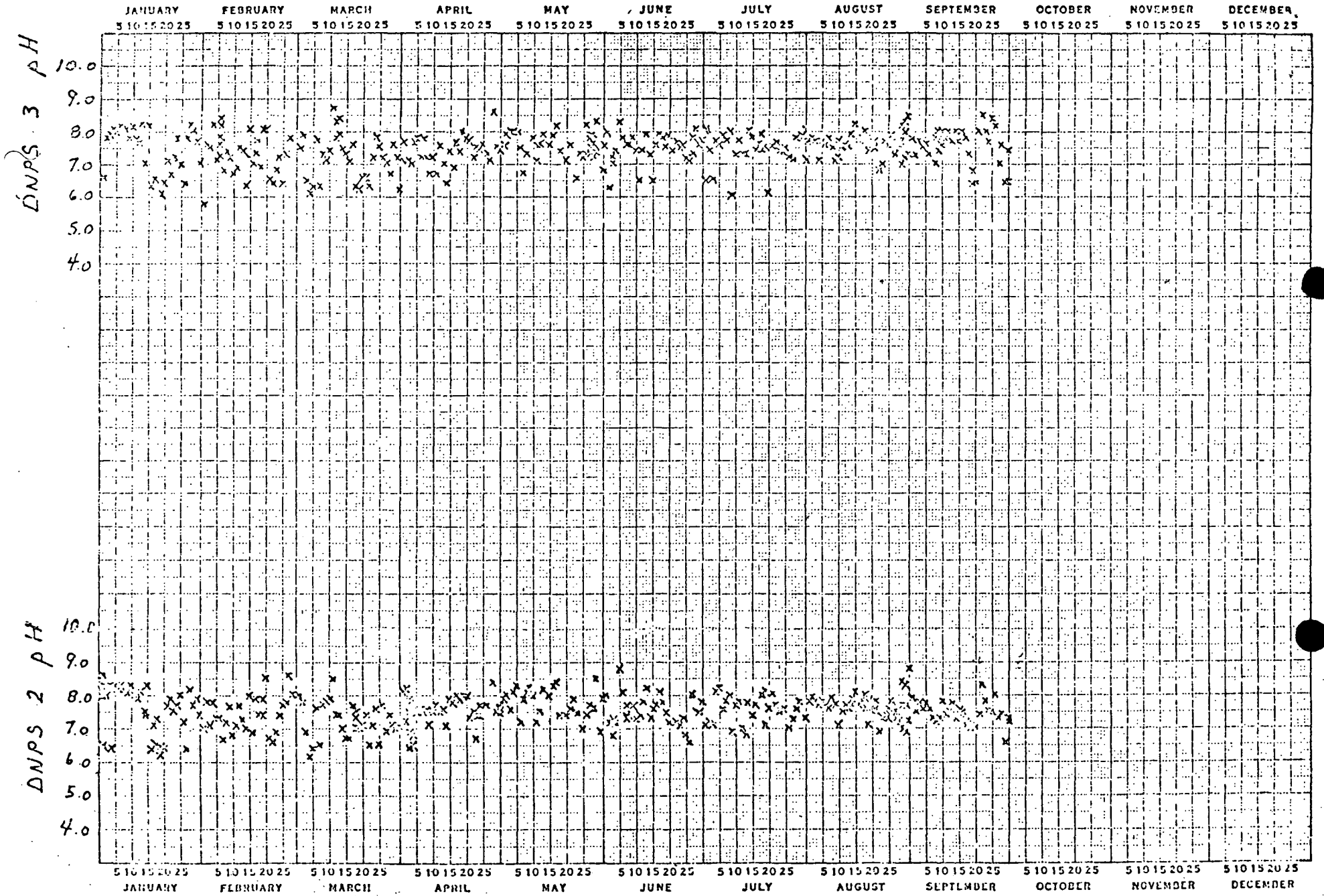
REACTOR WATER pH — CLEAN-UP FILTER INLET GRAB SAMPLE



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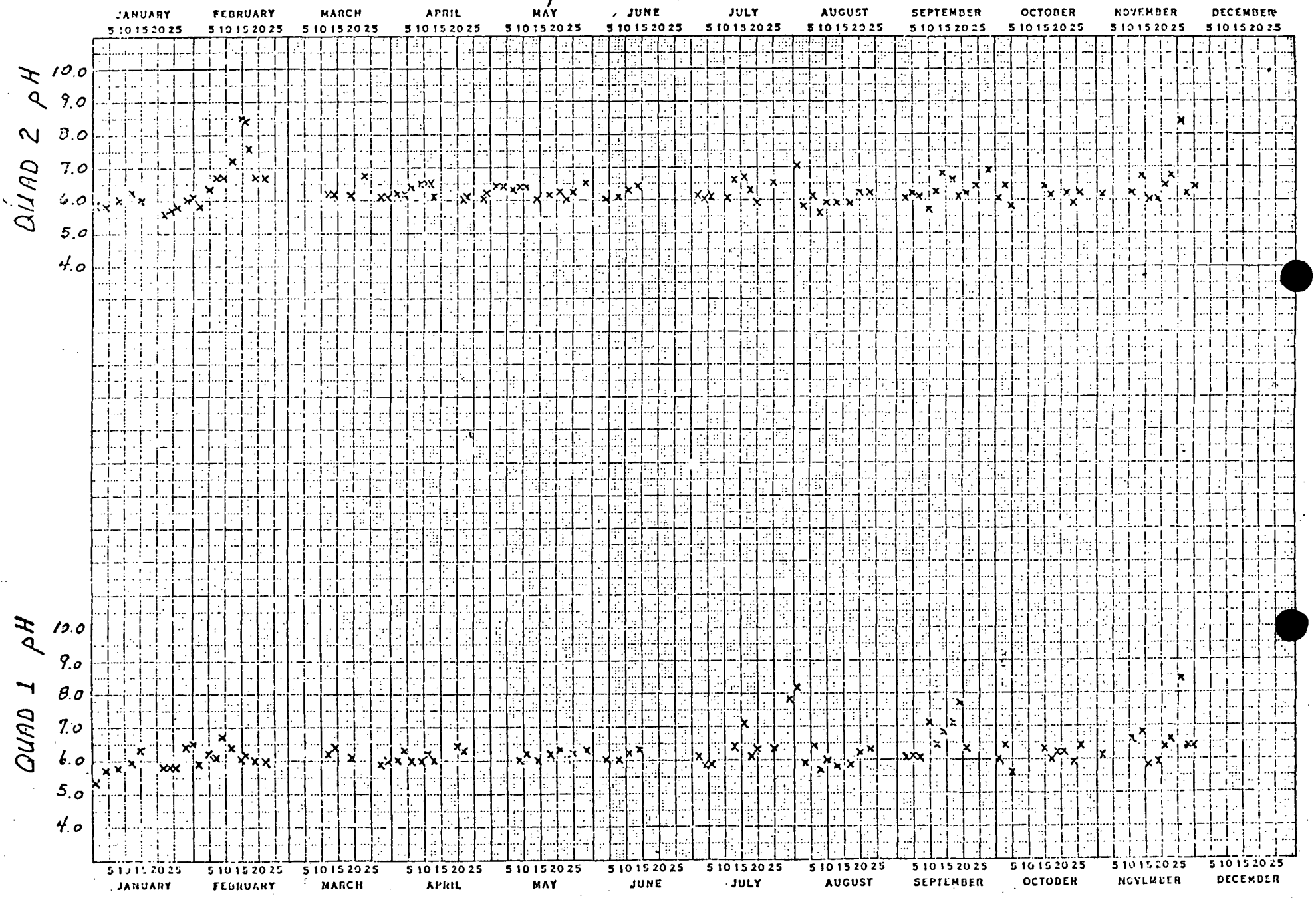
K&E 1 YEAR BY DAYS 46 2690
X 250 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.

REACTOR WATER pH CLEAN-UP INLET GRAB SAMPLE



COLEY
05 DEC 73

DISSOLVED OXYGEN SAMPLED AT CONDENSATE DEMIN. EFFLUENT

JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

5 10 15 20 25

DNPS 3 PPb

100 90 80 70 60 50 40 30 20 10 0

× METER READING

□ LABORATORY RESULT

DNPS 2 PPb

100 90 80 70 60 50 40 30 20 10 0

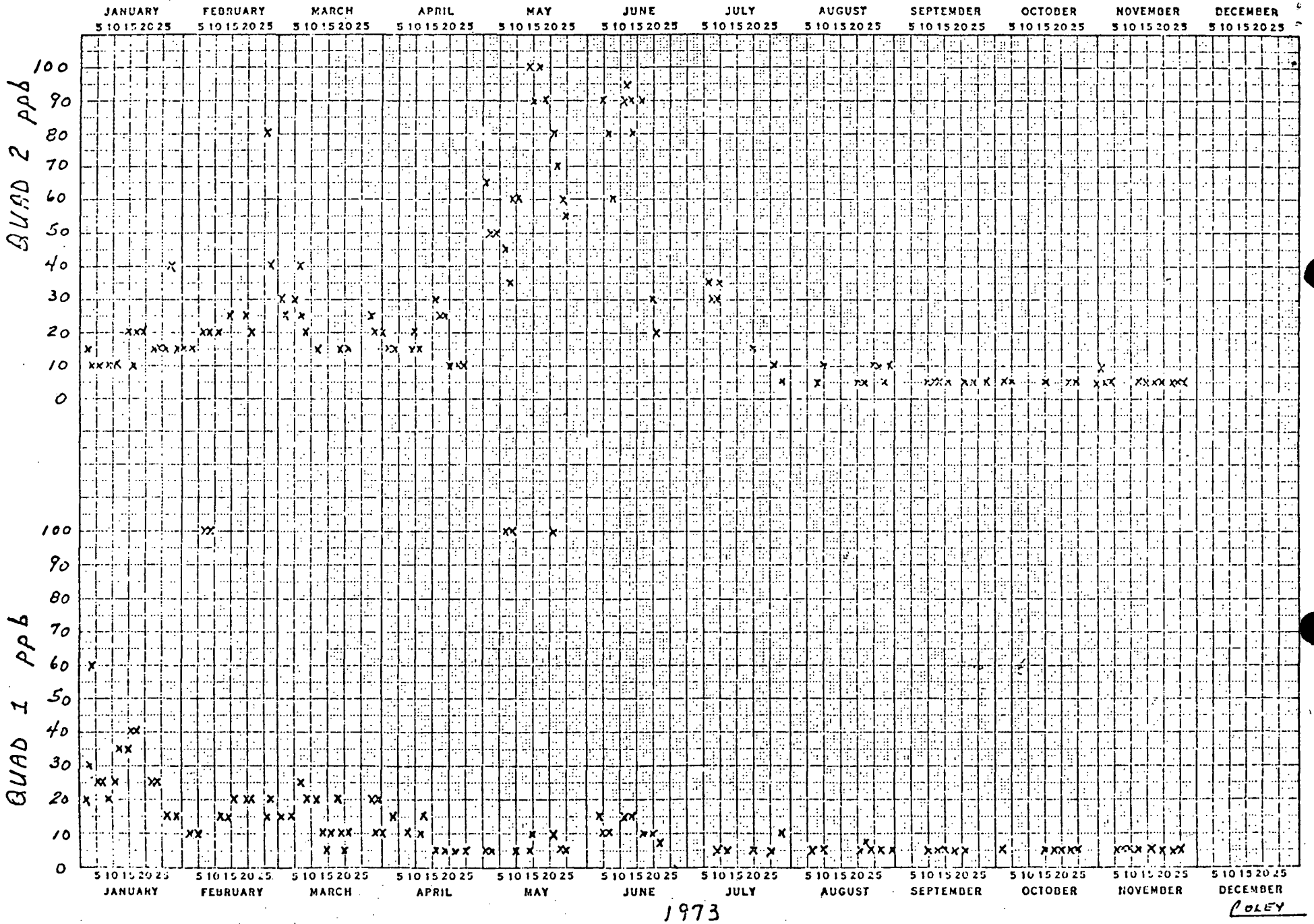
COLEY 04DEC73

JANUARY FEBRUARY MARCH APRIL MAY JUNE JULY AUGUST SEPTEMBER OCTOBER NOVEMBER DECEMBER

1973

K&E 1 YEAR BY DAYS 46 2880
X 250 DIVISIONS MADE IN U.S.A.
KEUFFEL & ESSER CO.

DISSOLVED OXYGEN SAMPLED AT CONDENSATE DEMIN. EFFLUENT



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