U. S. ATOMIC ENERGY COMMISSION
DOCKET 50-3
EXHIBIT L-7

PRE-OPERATIONAL ENVIRONMENTAL SURVEY OF RADIOACTIVITY IN THE VICINITY OF INDIAN POINT POWER PLANT

1958

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

PRE-OPERATIONAL ENVIRONMENTAL SURVEY OF RADIOACTIVITY IN THE VICINITY OF INDIAN POINT NUCLEAR POWER PLANT 1958

This report covers the extent and results to date of a pre-operational environmental radioactivity survey in the vicinity of the Indian Point Nuclear Power Plant.

The determination of whether hazardous conditions will result from the operation of a reactor is, of course, a major aspect of the general problem of reactor safety. Relevant to this determination is the question of whether the operation of a reactor has raised the level of radioactivity of the air and water in the vicinity of the reactor beyond specified tolerances. It is thus necessary to know the level of radioactivity existing prior to the operation of the reactor, and it is for this reason that the pre-operational environmental survey was started in 1958. It will be continued until the reactor goes critical. The measurements will therefore cover a period of about 2 years, which should show the variation in activity that may be expected from natural sources, fallout from bomb tests, or other sources in the vicinity.

This survey got into full swing about the middle of the year. Some 25 points within 10 miles of the plant site were selected as sampling locations. In addition to air and water, samples of vegetation, soil, and a limited number of biological specimens were collected. A total of 400 samples of all media was obtained and checked for radioactivity.

All samples were checked for both gross alpha and gross beta activity. The beta activity is the most significant, since all fission products are beta emitters and any gradual build-up due to the reactor operation could best be determined by a beta count. There seemed to be no need for gamma measurements on these samples, since some important fission products are not gamma emitters, and therefore these measurements might lead to a misinterpretation of data.

The survey included the period of intensive bomb testing by both the United States and Russia which occurred in October and the fallout from these tests was reflected in marked increases in the gross beta activity of the air, water and vegetation. This increase, however, did not exceed the tolerances set up by the Atomic Energy Commission for gross activity of air and water established for the general population.

The results of the survey show the activity in the vicinity of Indian Point to be low, and comparable to that existing at other locations in the country. The data obtained will of course be preserved as will be raw samples of soil and vegetation, for comparison with data obtained after the reactor goes into operation.

Complete results of the tests, together with descriptions of sampling locations, sampling methods, sample preparation, and counting techniques are given in the attached Sections I to V.

It is planned to continue the survey during 1959 on substantially the same basis as in 1958.

A. K. Joecks
Test Engineer

eab.rr

SECTION I

SAMPLING LOCATIONS

SAMPLING LOCATIONS

Plate 1 shows the locations selected for sampling air, water, vegetation and soil. It will be noted that the preponderance of locations are north and south of the plant site along the Hudson River, and east of the site through Peekskill. Prevailing winds and population concentrations were the deciding factors in selecting these sites. No samples were taken on the west side of the Hudson River, but this area will be included in the 1959 survey.

Table 1 lists the geographic locations of the sampling points which are shown on the map. The list also includes the medium sampled periodically at each location.

TABLE I

SAMPLING LOCATIONS

SAMPLING STATION NO.	GEOGRAPHIC LOCATION	SAMPLES COLLECTED
	WESTCHESTER COUNTY	
1	Indian Point Plant Site Bleakley Ave, Buchanan	Air, soil, veg., crabs, Water from Hudson River, pond and drinking tap.
2	Peekskill Fuel Co. 6 St & Hudson River, Verplanck	Air, soil, veg., crabs, water from Hudson River.
3	Floodgate Dock Kings Ferry Rd & Lake Meahagh, Verplanck	Air, soil, veg., crabs, water from Meahagh Lake & Hudson River.
4	Cruger Unit Substation Rt. 9 & Railroad Ave, Crugers Park, Cortlandt	Air, soil, veg., water from pond.
5	Chimney Corner Restaurant Rt 9 & Furnace Dock Rd, Cortlandt	Air, soil, veg., water from Furnace Dock Pond.
6	Valeria Home Furnace Dock Rd & Furnace Woods Rd, Furnace Woods	Air, soil, veg., water from Dickerson Pond.
7	Hunterbrook Unit Substation Old Crompond Rd & Hunterbrook Rd, Yorktown	Air, soil, veg., water from Hunterbrook.
8	Mohegan Unit Substation Lexington Ave, Mohegan Lake	Air, soil, veg., water from Mohegan Lake.

TABLE I (CONT'D)

SAMPLING LOCATIONS (CONT'D)

SAMPLING STATION NO.	GEOGRAPHIC LOCATION	SAMPLES COLLECTED
9	Algonquin Gas Metering Station, Crompond Rd & Croton Ave, Crompond	Air, soil, veg.
10	Citron Upholstery Co. Crompond Rd & Lafayette Ave, Cortlandt	Air, soil, veg.
11	Peekskill Garage, Main St & Hamilton Ave, Peekskill	Air, soil, veg., water from Peekskill Reservoir.
12	Peekskill Gas Holder, Pemart Ave & Water St, Peekskill	Air, soil, veg., water from Hudson River.
13	Esso Gas Co. Roa Hook Rd & Hudson River, Cortlandt	Air, soil, veg., water from Hudson River.
14	Camp Smith, Rt. 6, Cortlandt	Air, soil, veg., water from pond and drinking tap.
15	National Guard Armory Washington St & Welcher Ave, Peekskill	Air, soil, veg., water from Loundsbury Pond.
16	Mt. Kisco Gas Holder Suttons Row & Bedford Rd, Mt. Kisco	Air, soil, veg.

TABLE I (CONT'D)

SAMPLING LOCATIONS (CONT'D)

SAMPLING STATION NO.	GEOGRAPHIC LOCATION	SAMPLES COLLECTED
20	Millwood Substation, Quaker St & Millwood Rd, Millwood	Air, soil, veg., water from Still Lake.
21	Ossining Substation Market St & Hill St, Ossining	Air, soil, veg., water from Hudson River and from drinking tap.
23	Croton Unit Substation, Route 9, Croton-on-Hudson	Air, soil, veg., water from Hudson River, from pond, and from drinking tap.
24	Yorktown Substation, Taconic Pkway & Croton Dam Rd, Cortlandt	Air, soil, veg., water from new Croton Reservoir.
	PUTNAM COUNTY	
40	Mom's Restaurant Rt 9D, Manitou	Air, soil, veg., drinking water from well, and Hudson River water.
41	Highland Country Club, Rt 9D, Garrison	Air, soil, veg., water from pond, Hudson River, and drinking water from well.
42	Tony's Garage, Rt 301, Nelsonville	Air, soil, veg., water from Hudson River and drinking water from well.
44	Adams Corner Substation Peekskill Hollow Rd, Adams Corner	Air, soil, veg., water from Lake Peekskill, and drinking water from well.

SECTION II

RESULTS OF TESTS

RESULTS OF MEASUREMENTS

AIR PARTICULATE

The gross beta activity of air particulate filtered from the air at the Indian Point site and at the various sampling locations is given on Plates 2 and 3, respectively. The samples were counted 48 hours after collection to allow short-lived radon progeny to decay. The activity of the Indian Point samples was again measured 60 days after collection. These results are shown on Plate 2.

The relatively higher activity in October and early November is probably due to the nuclear bomb tests conducted by both the United States and Russia during October.

Plate 4 shows the alpha and beta decay of a typical sample over the first 4 hours after collection. This indicates that the alpha activity at the end of this period is not measurable. All samples of all media were checked for alpha, but no measurable amount was noted after the 48-hour decay period. The small alpha activity occurring immediately after collection is probably caused by the naturally occurring radon daughters.

Plate 5 shows the decay of the beta activity of two air samples collected at Indian Point October 22 and November 3, 1958, both days when the activity was relatively high. The composite half life of these samples is 23 and 17 days, respectively. Also shown is the decay of the beta activity of two samples taken in February and March, 1958 when the activity was relatively low. The composite half life of these samples is approximately twice as long as that of the higher activity samples. The greater decay rate of the October 22 and November 3 samples may be an indication of fresh fission products.

Plate 6 shows the record of short-lived activity, a phenomenon noted quite frequently. It will be seen that the activity starts to build up about 7 p.m. and continues to rise until about 8 a.m., after which it starts to fall off. It was found that these periods invariably coincided with periods of no wind. It seems safe to conclude that temperature inversions occur during these periods which prevent the normal upward air movement, and thus concentrates the naturally occurring radon and radon daughters emanating from the earth. The relatively rapid decay shown on the plate also indicates radon daughters.

WATER

The gross beta activity of Hudson River water, drinking water, and surface waters are given on Plates 7, 8, and 9, respectively. Surface waters and drinking water, other than from deep wells, again reflect the bomb tests by showing higher activity in late October and early November. The Hudson River showed no appreciable increase. The rather large salt content of the Hudson River caused some difficulty in obtaining accurate counts of the activity. At two locations in Putnam County, the activities were below a measurable value for drinking water samples taken from wells.

SUMMARY OF MEASURED GROSS BETA ACTIVITY

MEDIUM	NO. OF SAMPLES	UNITS	GROSS ACTIVITY MINIMUM	GROSS ACTIVITY MAXIMUM	AVERAGE
Hudson River	49	Microcuries Per Milliliter X 10^{-9}	Less Than 1	126 ± 20	29 ± 12
Drinking Water	44	Microcuries Per Milliliter X 10^{-9}	Less Than 1	75 ± 5	10 ± 3 20 by calculation
Surface Water	62	Microcuries Per Milliliter X 10^{-9}	Less Than 1	600 ± 10	56 ± 8

VEGETATION

Plate 10 shows the results of the gross beta measurements on samples of vegetation collected at the various sampling locations. This vegetation consisted of grasses and weeds growing in the vicinity of the test locations.

The effects of the bomb tests are very noticeable in the activity of this medium. It is believed that this measured activity is due to fallout collecting on the foliage, rather than uptake from the soil.

SUMMARY OF GROSS BETA ACTIVITY MEASURED FROM VEGETATION

NO. OF SAMPLES	UNITS	MINIMUM	MAXIMUM	AVERAGE
47	Micro-Microcuries Per Gram of Fixed Solids	430 ± 20	$24,400 \pm 185$	$5,435 \pm 75$

SOIL

Plate 11 shows the gross beta activity of soil from the various sampling locations.

According to the Public Health Service, the activity of soil is mostly attributable to naturally occurring radio nuclides such as thorium 232, uranium 238, potassium 40 and carbon 14 which will account for more than 99 per cent of the activity. It will therefore be seen that the activity due to fission products will be masked by the much higher naturally occurring activity. Consideration is now being given to chemically separating the fission products from the soil.

SUMMARY OF GROSS BETA ACTIVITY MEASURED IN SOIL

NO. OF SAMPLES	UNITS	MINIMUM	MAXIMUM	AVERAGE
26	Micro-Microcuries Per Gram	10±10	155±15	40±10
26	Curies/Square Mile	2± 2	35± 5	7± 2

BIOLOGICAL MATTER

Table II below shows the results of radioactivity measurements on fish and crabs removed from the Hudson River at Indian Point. Comparatively few specimens were checked, but they exhibit radioactivity attributable to naturally occurring radio nuclides. These data may possibly be of use after the reactor goes critical in case a claim is made that effluents are causing radioactivity in fish and crabs.

TABLE II

COLLECTION DATE	TYPE	LIVE WEIGHT GRAMS	MICRO-MICROCURIES PER GRAM OF FIXED SOLIDS
8-28-58	Crab	61	103±13
8-28-58	Crab	47	115±13
9-10-58	Crab	99	173±16
9-10-58	Crab	95	165±14
9-10-58	Crab	63	233±22
9-18-58	Crab	116	171±14
9-18-58	Crab	132	151±14
9-19-58	Eel	55	145±14
9-25-58	Eel	94	126±14
9-25-58	Crab	93	115±15
9-25-58	Str. Bass	76	88±12
10- 8-58	Crab	108	56±12
10-16-58	Crab	95	83±12
10-30-58	Perch	33	179±15
		Minimum	55±10
		Average	135±15
		Maximum	230±20

FALLOUT

A fallout collector was installed toward the end of the year and only 3 months of data were obtained. These results are given in Table III below:

TABLE III

MONTH COLLECTED	FRACTION	MICRO-MICROCURIES PER MONTH		CURIES PER SQUARE MILE PER MONTH X10^{-3}
Oct. 58	Suspended Solids	1680±20	3680	60±1
	Dissolved Solids	1000± 8		40±1
Nov. 58	Suspended Solids	12100±180	13200	430±7
	Dissolved Solids	1100± 70		40±3
Dec. 58	Suspended Solids	2200± 90	2420	80±3
	Dissolved Solids	220± 25		8±1

GAMMA EMISSION SURVEY

At each test location, a gamma sensitive survey meter was used to check for any gamma emission due to concentrated radio nuclides in the earth. None of the locations exhibited any higher concentration than the normal background of 15 to 50 counts per second.

SECTION III

SAMPLING EQUIPMENT

SAMPLING EQUIPMENT USED

A mobile monitor survey unit was fitted out to provide a mobile air sampling laboratory. This consists of a Ford Model P-300 truck chassis equipped with a special body containing the necessary air sampling and monitoring equipment, wind velocity and direction recorder and a gasoline engine-driven generator to supply power in remote locations. A photograph of this unit is shown on Plate 12 and an interior view showing the instrumentation is shown on Plate 13. The unit is located periodically at the various sampling sites and allowed to run for periods of 1 to 7 days.

The air monitor is a Nuclear Measurements Corp., Type AM-2 consisting of a Count Rate Meter Type CRM-10, Roots-Connersville Blower, Esterline Angus Recorder and a Nuclear Measurements Corp. Type PC-3A alpha-beta-gamma proportional counter which is used to check the activity of the samples collected.

The blower pulls a continuously measured air sample through a Hollingsworth and Vose No. H-70 filter paper on which any particulate is deposited. This filter paper surrounds a Geiger Muller tube, the output of which is amplified and recorded. Thus, as any radioactive particulate is collected on the filter paper, a record of the relative activity in counts per minute is obtained.

The wind velocity and direction are obtained from a Bendix-Friez Model 141 aerovane wind recorder. The aerovane can be seen on Plate 12. It is arranged so that it can be lowered during transit.

To obtain an absolute measure of radioactivity, the filter paper is sent to the laboratory after it is removed, and the gross beta activity in microcuries per milliliter of air is obtained.

In addition to the mobile monitor survey unit, a permanent air sampling site was established at Indian Point. This sampling equipment, shown on Plate 14, consists merely of a vacuum pump which pulls a measured amount of air through a millipore filter paper. The filter paper is removed at intervals from one to four days and sent to the laboratory for counting.

WATER SAMPLING

Water samples are collected in two-liter polyethylene bottles from lakes, ponds, drinking water supplies and from the Hudson River. Each location is sampled about once a month with the exception of the Indian Point site which is done on a weekly basis. Drinking water samples have been collected from existing reservoirs, and from taps supplied by wells and municipal water supplies. The samples are sent to the laboratory for preparation and counting.

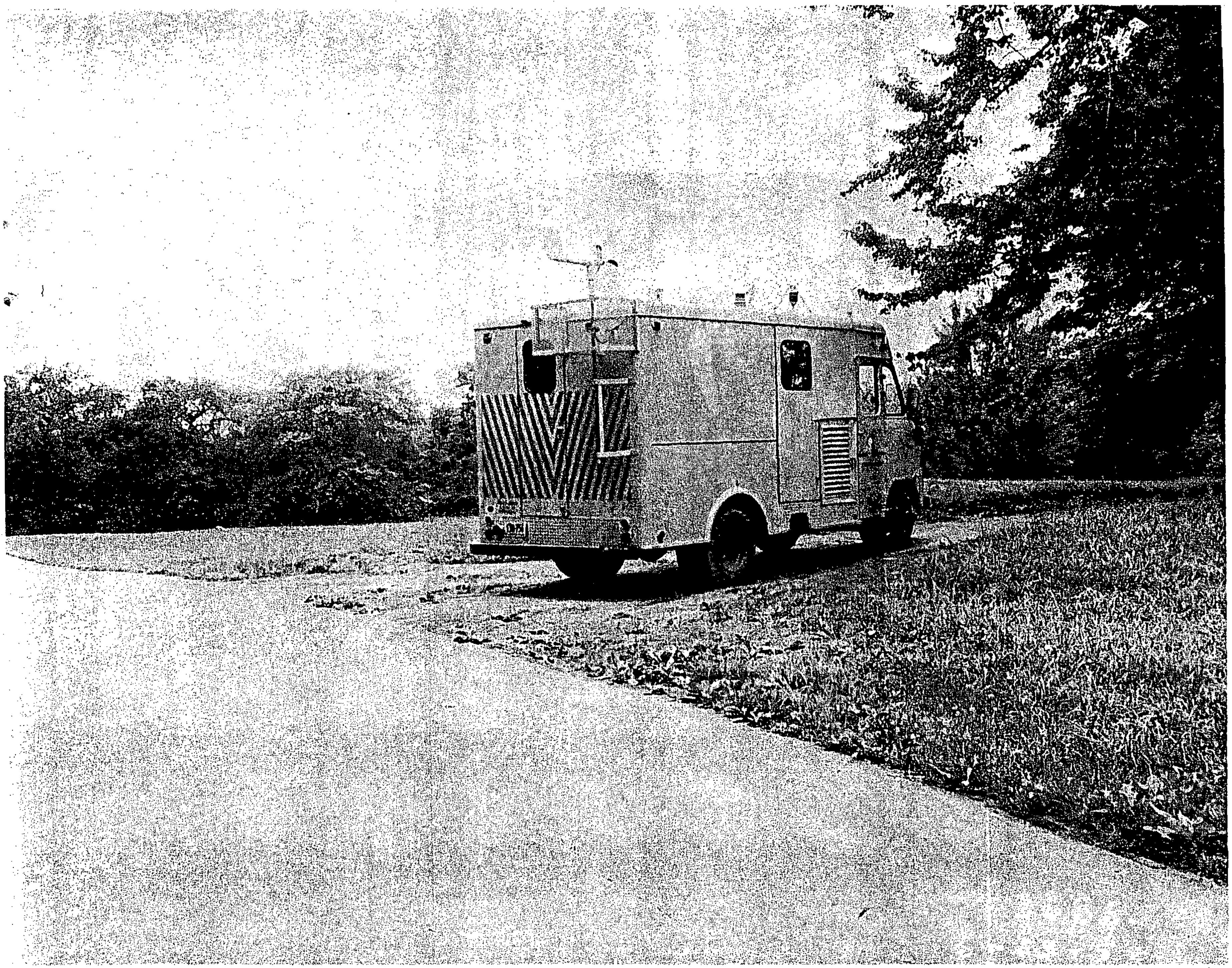


PLATE 12
Mobile Monitor Survey Unit Parked for Operation at Typical Sampling Site.

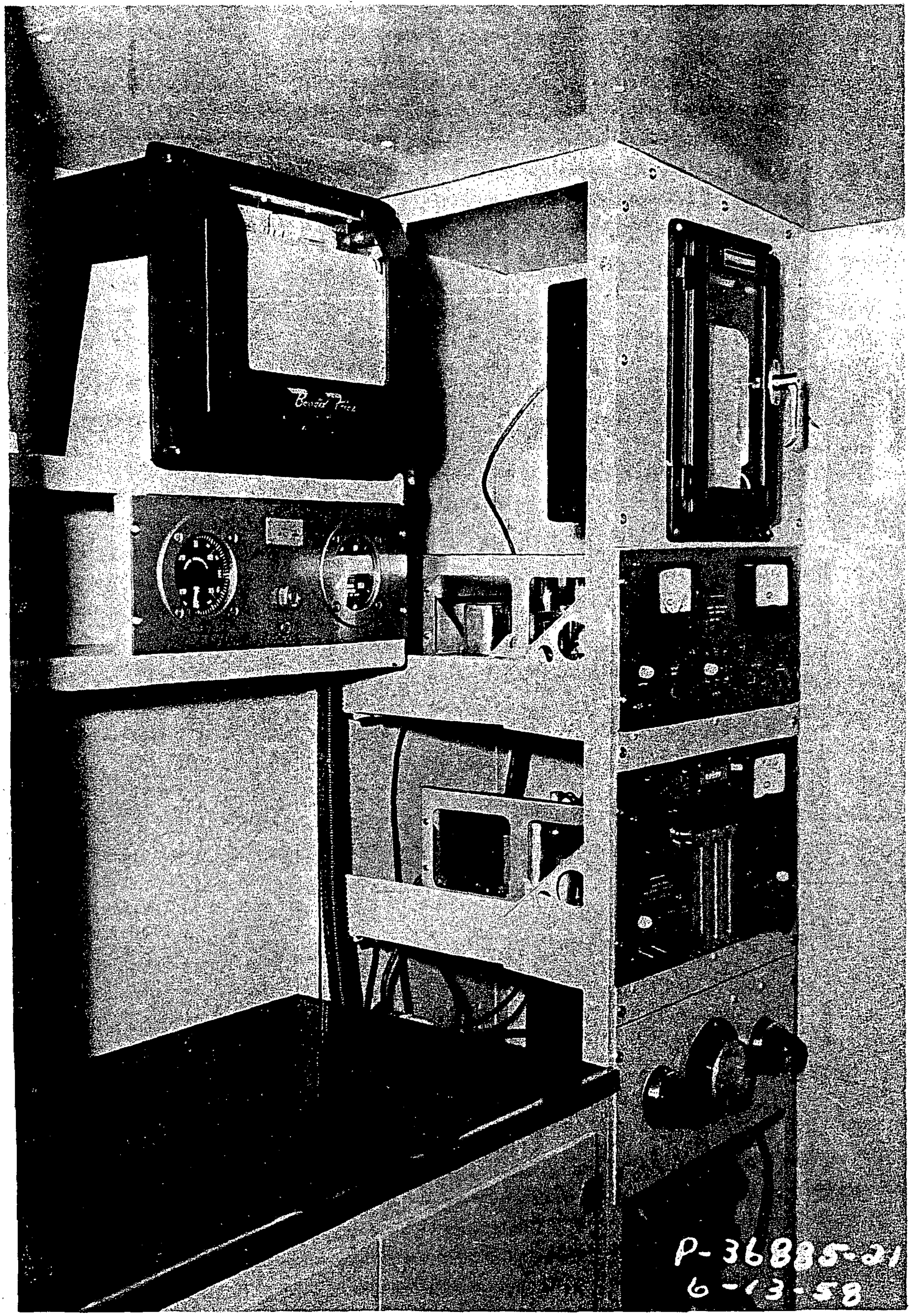


PLATE 13
Internal View of Mobile Unit Showing Top to Bottom Right Panel.
1, Count Rate Recorder, 2, Count Rate Meter, 3, Internal Proportional Counter,
4, Alarm Panel and Air Flow Indicator, 5, Blower Motor.
On Left Panel are Mounted Wind Velocity and Direction Instruments

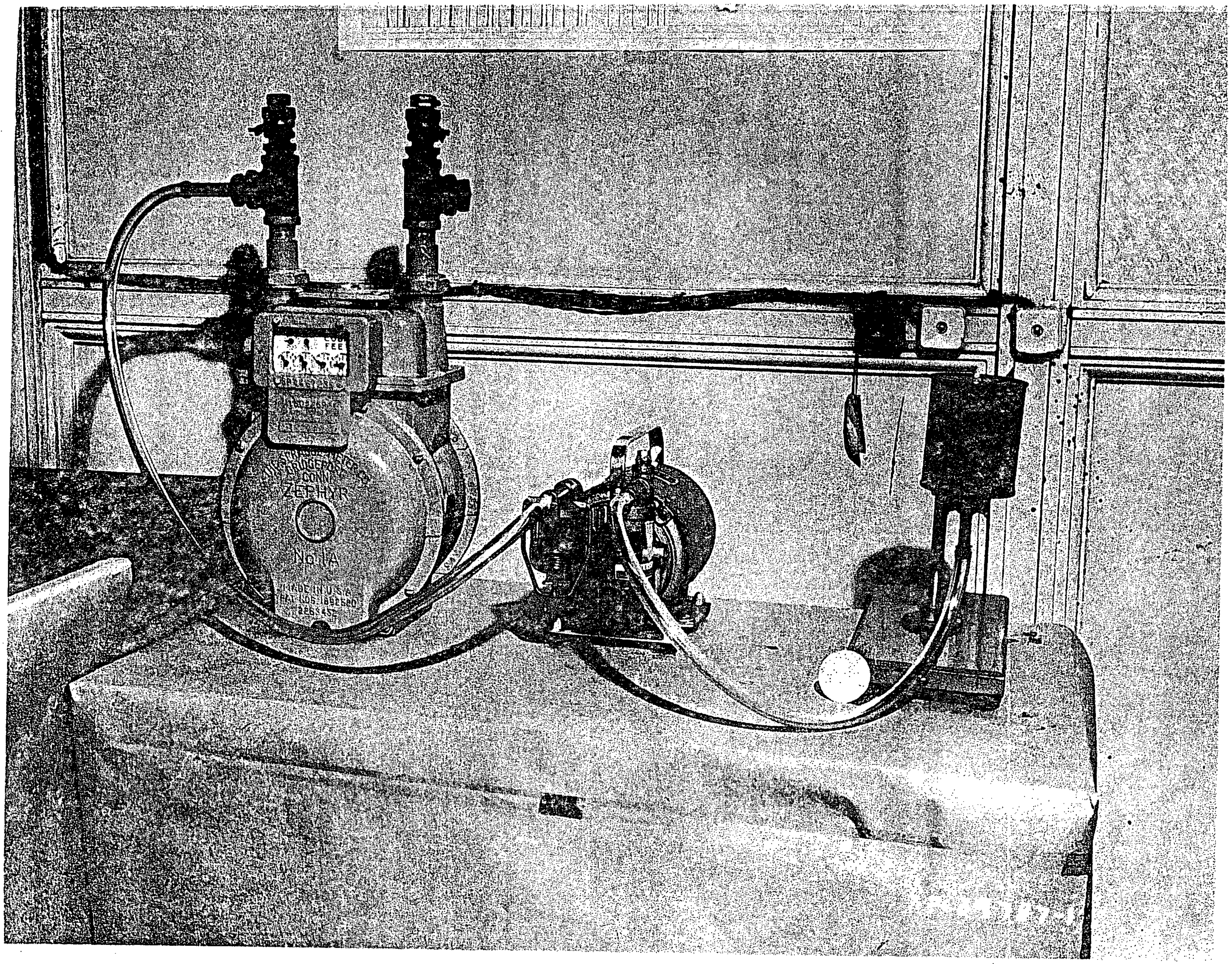


PLATE 14
Air Sampling Equipment Millipore Filter is in Housing at Right, Air Pump Center, and Meter for Measuring Air Pulled Through the Filter at left.

VEGETATION SAMPLING

Vegetation samples consisting of grass, weeds, ferns, etc., are collected at each sampling site in a paper bag. Enough vegetation is picked to insure an adequate sample. In general, two sets of samples were taken - one during the summer and one in the fall. These samples are taken to the laboratory for processing.

SOIL SAMPLING

One soil sample was obtained at each location. The sampling was done in accordance with AEC Report HASL-33, dated April 7, 1958.

Twenty plugs of soil, 2 inches in diameter and 2-inches deep were taken over an area of about 100 square feet. These plugs were thoroughly mixed as described in section on sample preparation. An aliquot of about 700 grams of each sample was placed in a one quart jar and will be preserved indefinitely. Another aliquot of 300 milligrams was prepared for the proportional counter.

BIOLOGICAL SAMPLING

A few small fish and a number of crabs were obtained from the Hudson River at Indian Point. No periodic program was followed.

FALLOUT SAMPLING

Plate 15 shows the fallout collection system being used. Both the funnel and the collecting bottle are made of polyethylene. The funnel is 12 inches in diameter, and the capacity of the bottle is 4 liters. Collection is on a monthly basis. During dry periods, the funnel is rinsed weekly with distilled water; it is rinsed again at the end of the collection period to collect all air particulate deposited on the funnel. This is one of the systems being used by the A. E. C. for beta activity. The 4-liter bottle is sent to the laboratory where the total volume is measured, mixed thoroughly, and about 1 liter filtered through a millipore filter to separate the suspended solids from the dissolved solids.

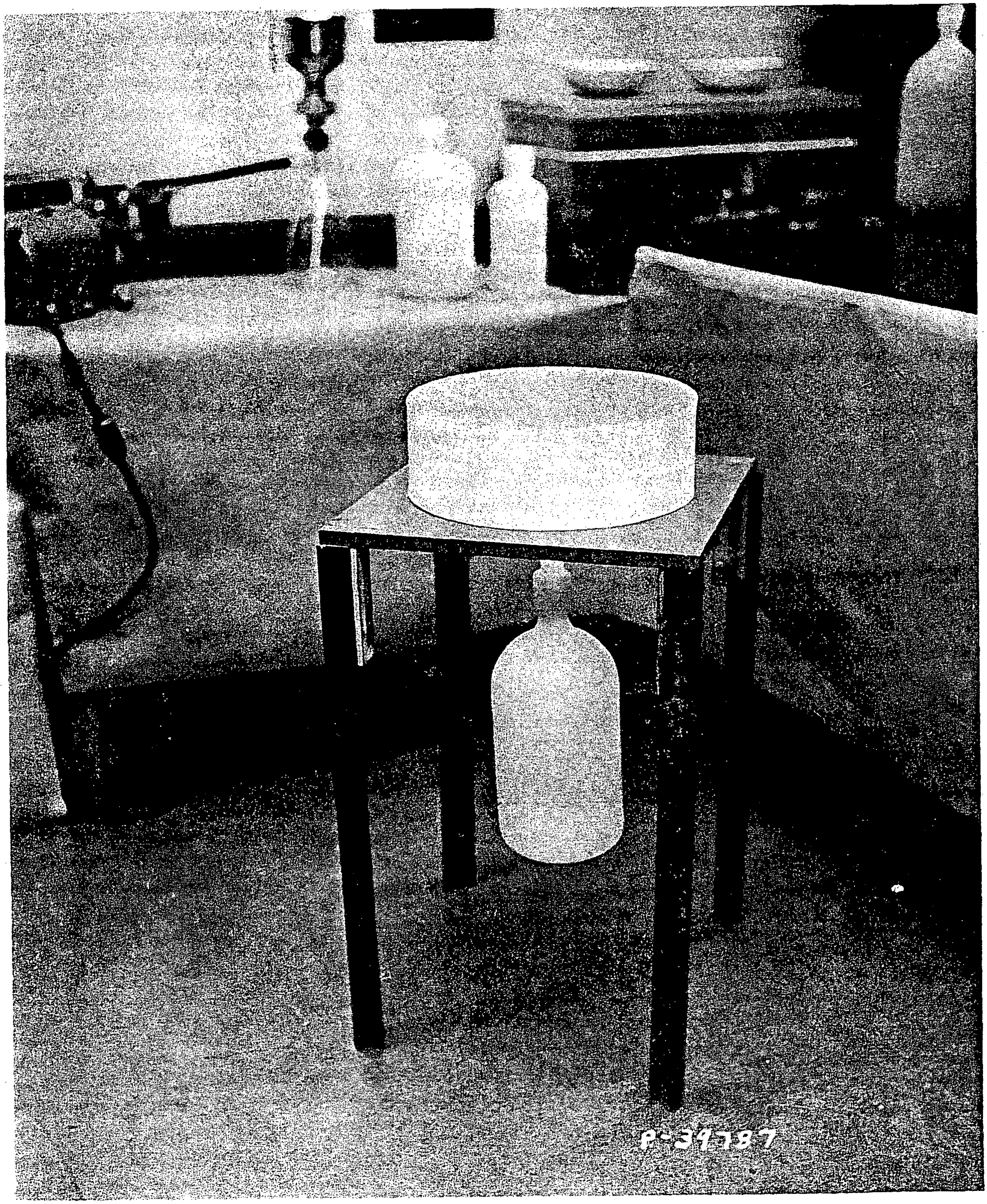


PLATE 15 - FALLOUT COLLECTOR
Twelve-inch diameter polyethylene funnel connected to a 4-liter bottle.

SECTION IV

SAMPLE PREPARATIONS

PREPARATIONS OF SAMPLES FOR COUNTING

All samples of air particulate, water, vegetation, soil and fish were prepared in accordance with techniques developed by the AEC and U. S. Public Health Service. Following is a brief description of the preparations of the different media.

AIR PARTICULATE

In the case of the millipore samples, the filter is placed in a aluminum planchet of approximately 2 inches in diameter and then ignited with alcohol to burn the filter. The planchet with the remaining particulate is placed in the counter to check the activity. A different sample preparation is used for the AM-2 Hollingsworth and Vose No. H-70 filter paper. The paper is cut in a circular pattern using a 2-inch arch punch and then placed in a steel planchet for counting.

WATER

All water samples, with the exception of drinking water, are evaporated to dryness in porcelain dishes on a hot plate. The drinking water is passed through a Type HA, 48 mm diameter membrane filter. The filtrate containing the dissolved solids is evaporated to dryness. The suspended solids which are retained by the millipore filter are then treated in the same manner as explained above for the air particulate. The residue from the filtrate is acidified with IN HNO_3 and transferred to an aluminum planchet with the aid of distilled water. The sample is then allowed to dry before counting in the proportional counter.

VEGETATION

Approximately 40 grams of vegetation is chopped and dried at 103 degrees centigrade. An aliquot is placed in a small porcelain dish and ashed in a muffle furnace at 600 degrees centigrade. The ash is transferred to an aluminum planchet and acidified with 1N nitric acid. Upon drying, a paste forms which is uniform in deposition and suitable for the counter. All above operations are preceded by weighing to determine the percentages of dry and fixed solids. The sample is then ready to be counted in the usual manner. Plate 16 shows some of the equipment used to prepare samples.

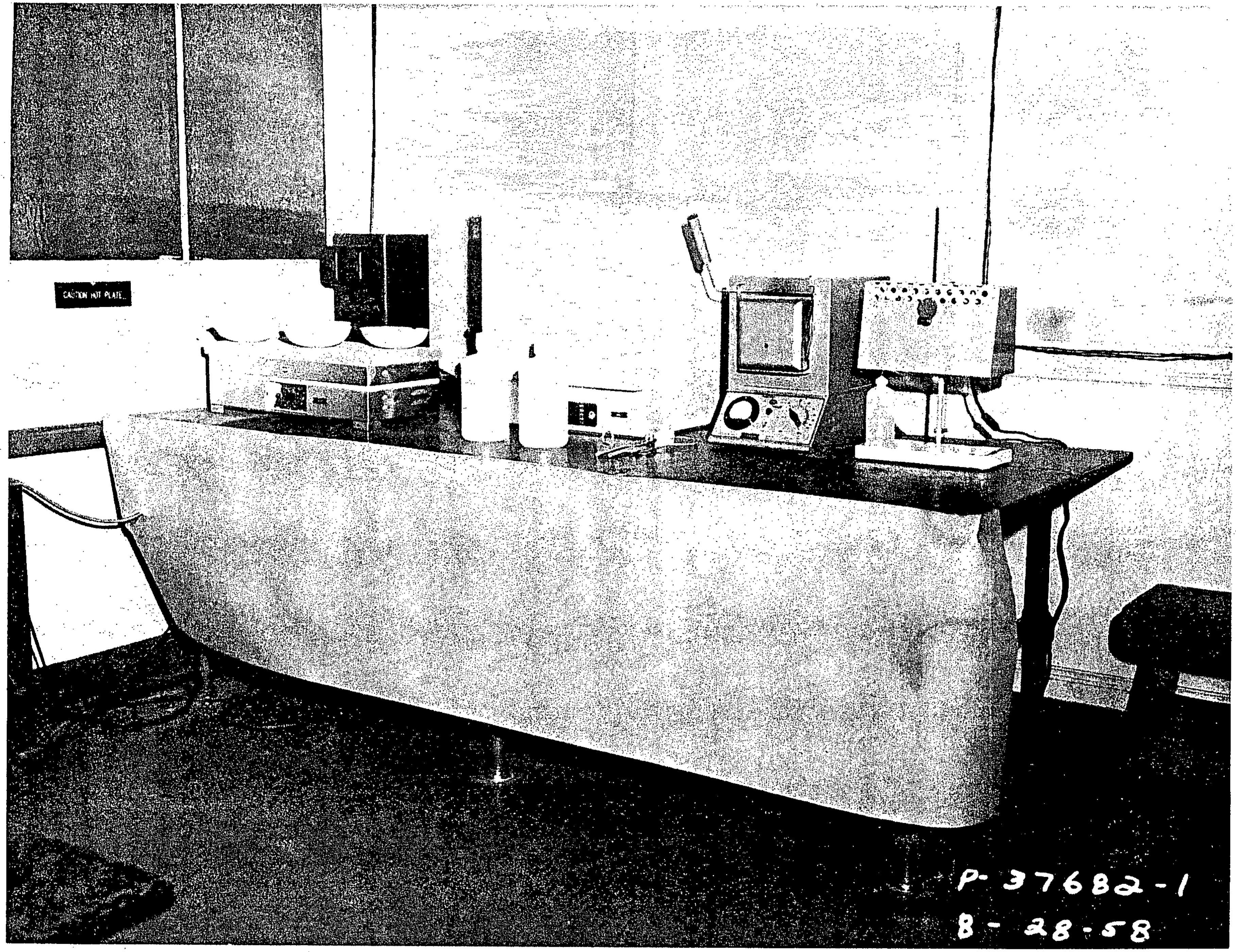


PLATE 16
Some of the Equipment Necessary for Sample Preparation - Hot Plate, Oven, Muffle Furnace and Infra-Radiation Drier.

SOIL

The original soil sample of 20 plugs, 2 inches in diameter and 2 inches deep is weighed. The whole sample is oven dried at 100°C and the large aggregates are broken up by rolling. The soil is sifted with a No. 8 sieve and blended. An aliquot is ground to a fine powder using a mortar and pestle. Three-hundred milligrams is transferred to an aluminum planchet where distilled water is used to form a fine cream which upon drying gives an even sample thickness. The sample is placed in the counter.

BIOLOGICAL

The flesh from biological samples consisting of fish and crabs is ashed at 600°C. Three-hundred milligrams of the ash is placed in an aluminum planchet. It is then acidified with 1N HNO_3, and a paste formed which upon drying, forms a uniform sample thickness. Each operation described is preceded by weighing to determine the percentage of dry and fixed solids. The sample is then counted in the proportional counter.

FALLOUT

The fallout sample contained in the 4 liter collecting bottle is mixed thoroughly, the total volume measured and about 1 liter is filtered through an HA membrane filter to separate the suspended solids from the dissolved solids. The samples are then treated the same as drinking water. The total volume is measured to calculate the total activity corresponding to the full collecting period. This is reported in micro-microcuries (uuc) per month, and curies (c) per square mile per month.

SECTION V

COUNTING

COUNTING

The gross alpha and beta activity was measured by means of a Nuclear Measurements Corporation, Type PC-3A, internal proportional counter shown on Plate 17. In this instrument, the specimen to be counted is placed in a 2-inch diameter planchet which in turn is placed within the ionization chamber of the instrument. A purging and quenching gas is then passed through the chamber. A voltage is applied to an electrode within the chamber which collects the charges caused by ionization produced by the alpha and beta particles emanating from the sample. At voltages from 900 to 1200 volts, known as the alpha plateau, the alpha activity alone is counted. At voltages from 1700 to 2000 volts both alpha and beta activity is counted. To get the beta activity alone, it is necessary to subtract the previously counted alpha from the combined activity. Plate 18 shows the plateaus for a typical sample. The instrument is relatively insensitive to gamma radiation.

An automatic timer is provided to allow countings for a predetermined time without supervision.

The counting efficiency of the proportional counter was determined using alpha and beta sources of known activity as calibrated by the Bureau of Standards. The alpha source consisted of uranium oxide (U_3O_8) deposited by evaporating a solution of uranium acetate on approximately 0.1 mm of platinum foil. The beta source consisted of a solution of thallium 204. This thallium was selected since the energy of its beta particles approximate that of mixed fission products.

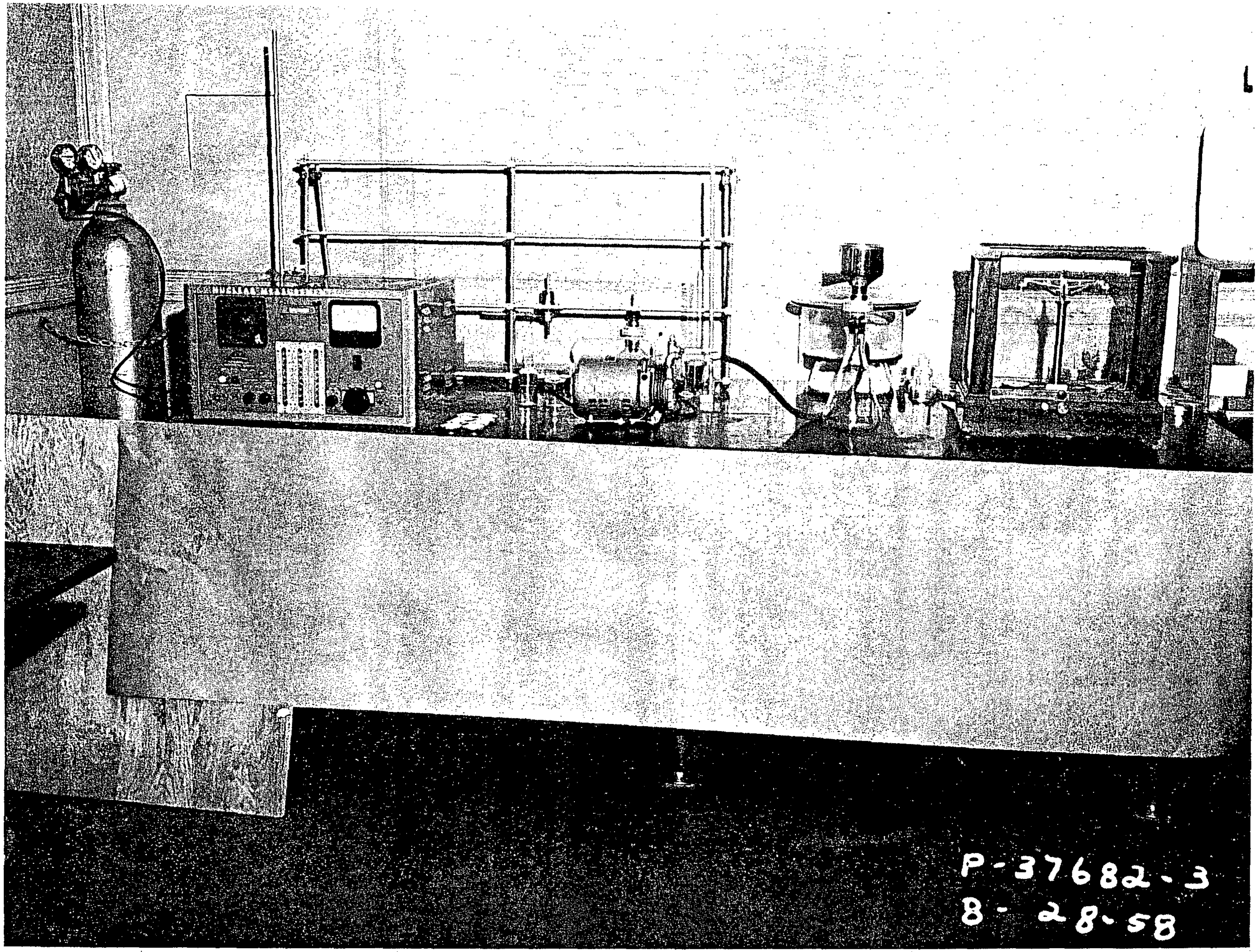
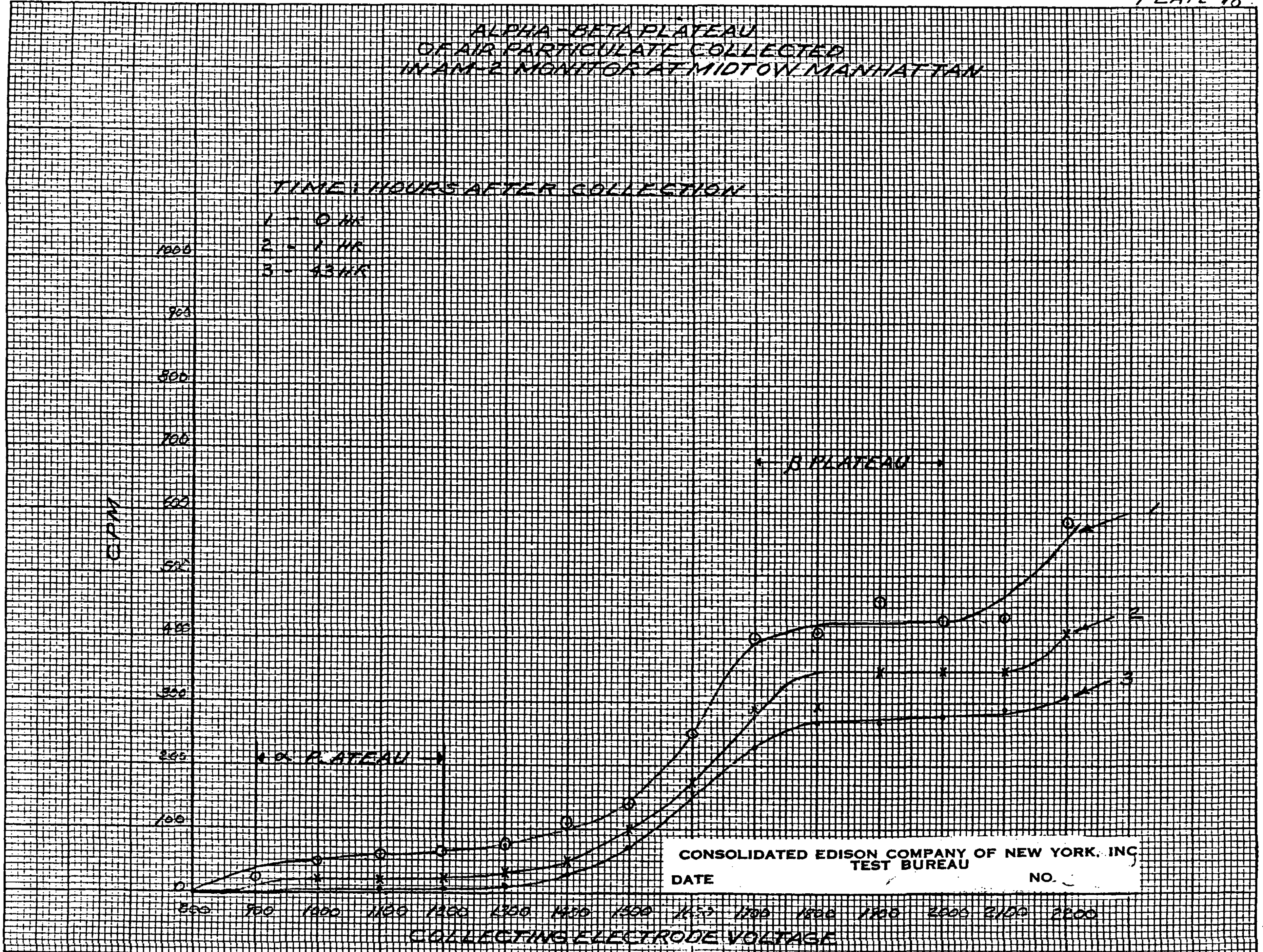


PLATE 17
Photograph Showing Nuclear Measurements Co. PC-3A Proportional Counter, the Methane-Argon Gas for the Counter, a Water Filtering System, and the Chemical Balance for Weighing.


ALPHA-BETA PLATEAU
OF AIR PARTICULATE COLLECTED
IN AM-2 MONITOR AT MIDTOWN MANHATTAN
TIME: HOURS AFTER COLLECTION
1 - 0 HR
2 - 1 HR
3 - 43 HR
β PLATEAU
α PLATEAU
CPM
COLLECTING ELECTRODE VOLTAGE
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC
TEST BUREAU
DATE
NO.

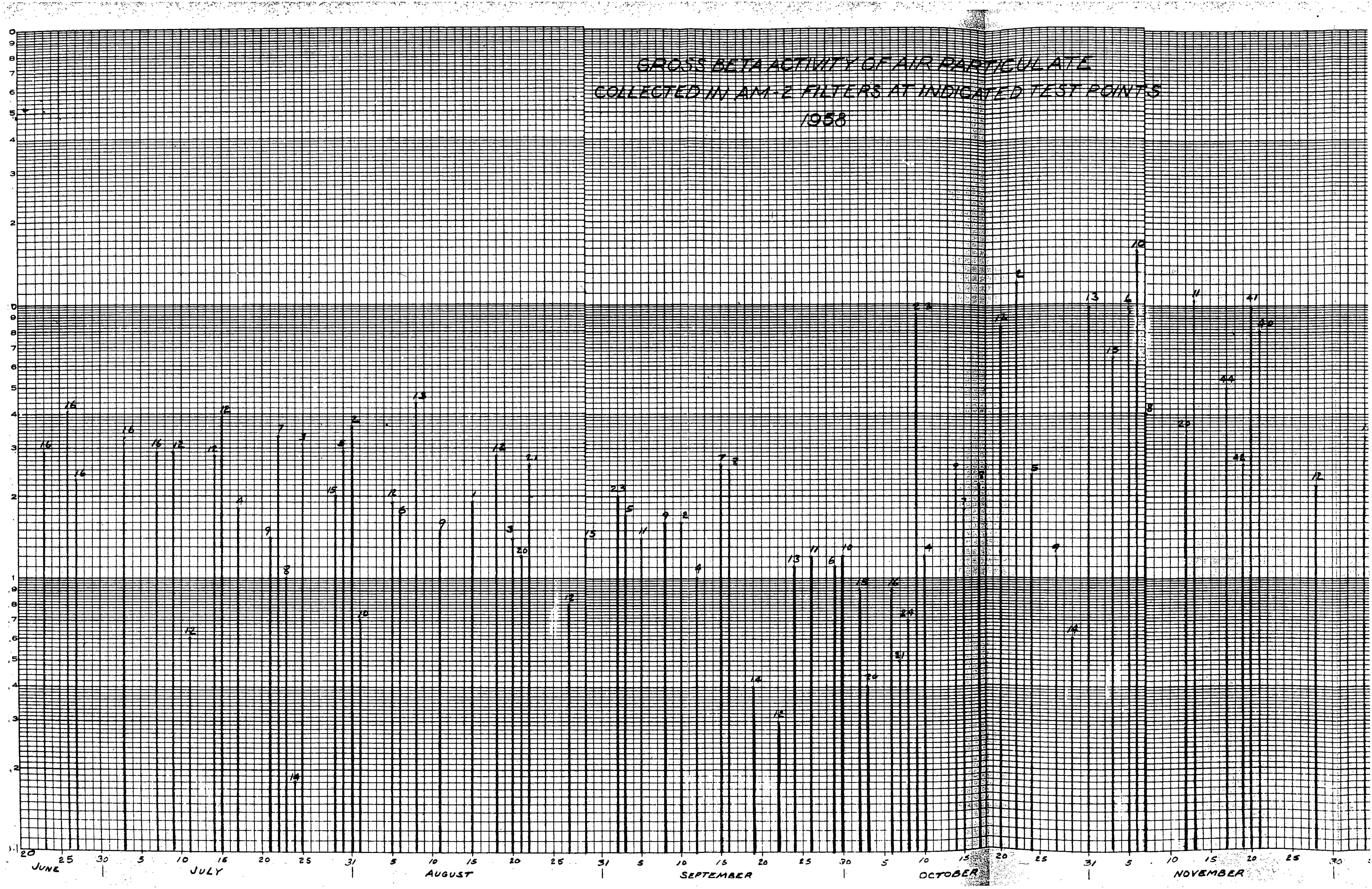
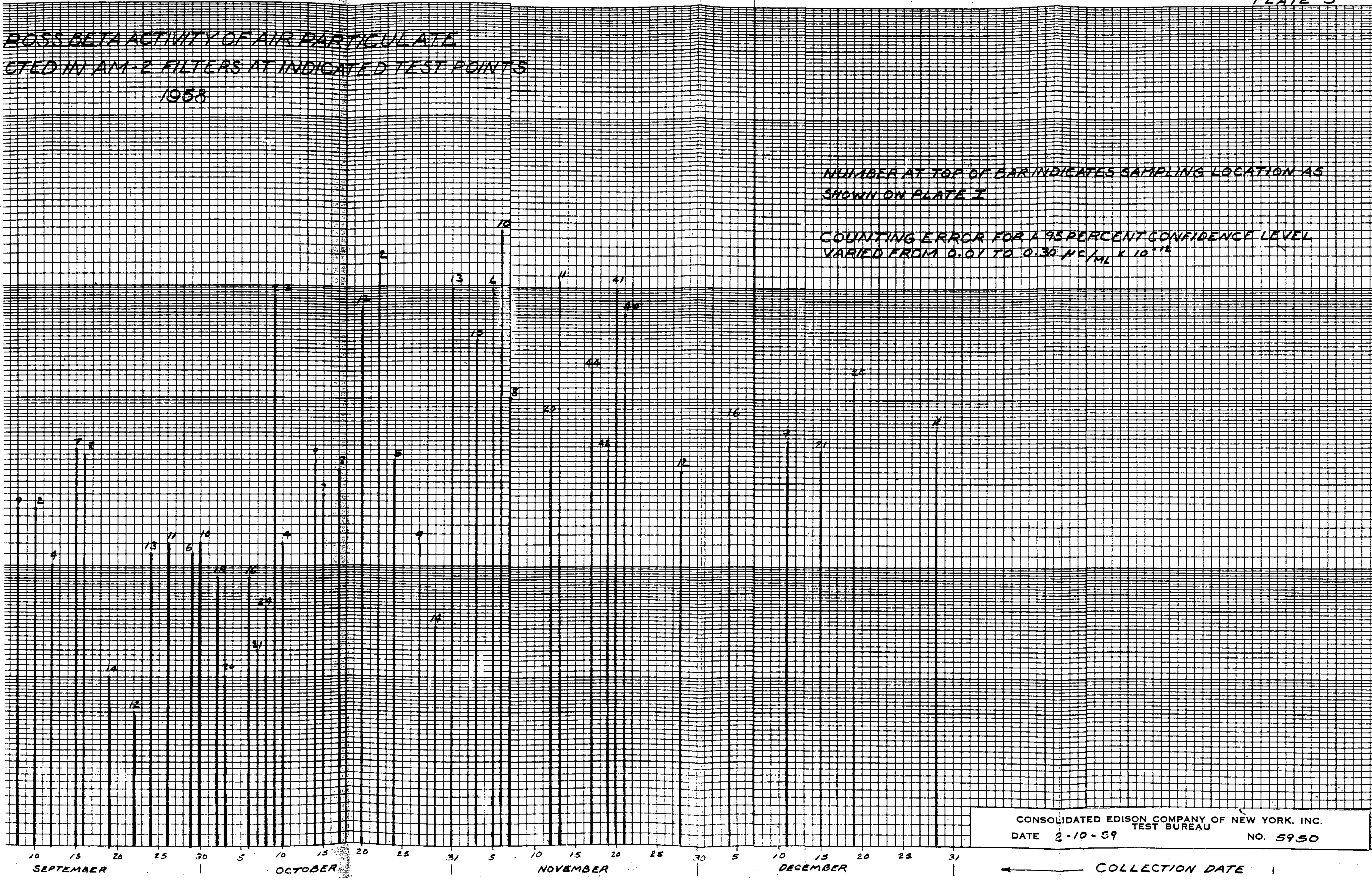
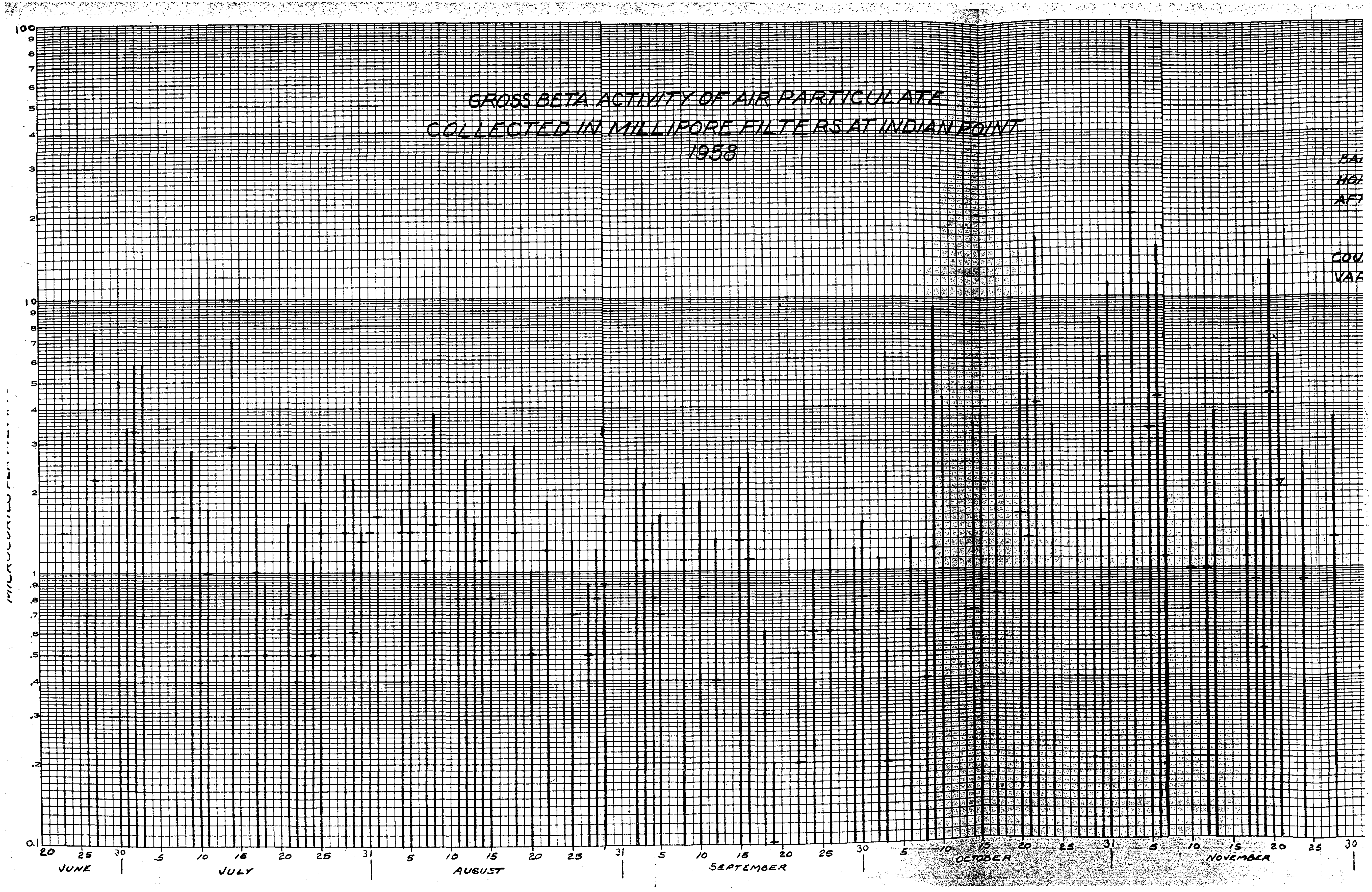

GROSS BETA ACTIVITY OF AIR PARTICULATE
COLLECTED IN AM-2 FILTERS AT INDICATED TEST POINTS
1958
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER

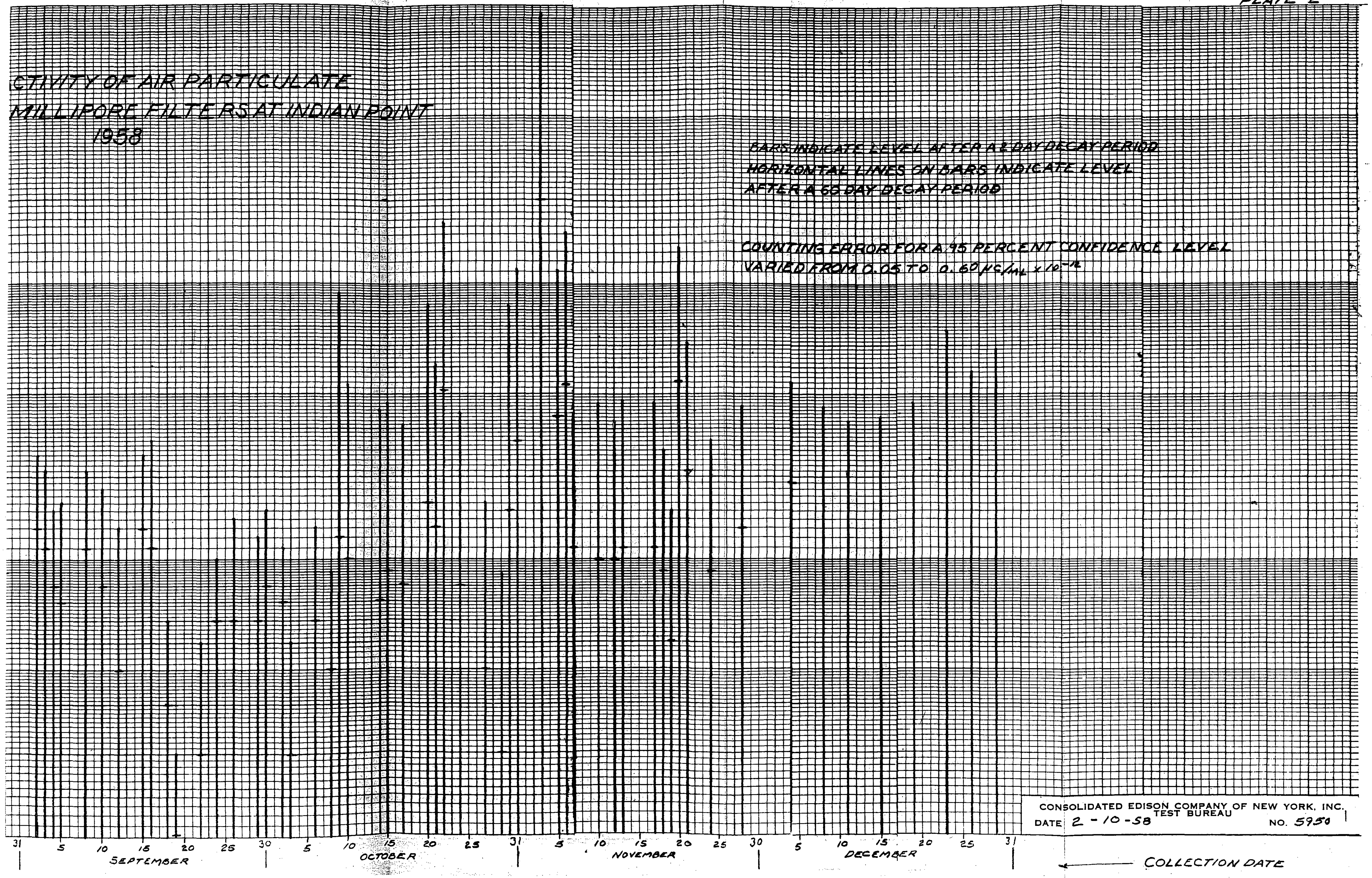
PLATE 3


ROSS BETA ACTIVITY OF AIR PARTICULATE
CTED IN AM-2 FILTERS AT INDICATED TEST POINTS
1958
NUMBER AT TOP OF BAR INDICATES SAMPLING LOCATION AS
SHOWN ON PLATE I
COUNTING ERROR FOR A 95 PERCENT CONFIDENCE LEVEL
VARIED FROM 0.01 TO 0.30 $\mu c/_{ml} \times 10^{-12}$
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
COLLECTION DATE
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU
DATE 2-10-59
NO. 5950



GROSS BETA ACTIVITY OF AIR PARTICULATE
COLLECTED IN MILLIPORE FILTERS AT INDIAN POINT
1958
100
10
1
0.1
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER

PLATE 2


CTIVITY OF AIR PARTICULATE
MILLIPORE FILTERS AT INDIAN POINT
1958
BARS INDICATE LEVEL AFTER A 2 DAY DECAY PERIOD
HORIZONTAL LINES ON BARS INDICATE LEVEL
AFTER A 60 DAY DECAY PERIOD
COUNTING ERROR FOR A 95 PERCENT CONFIDENCE LEVEL
VARIED FROM 0.05 TO 0.60 μc/ml × 10⁻¹²
31 5 10 15 20 25 30
SEPTEMBER
5 10 15 20 25 31
OCTOBER
5 10 15 20 25 30
NOVEMBER
5 10 15 20 25 31
DECEMBER
COLLECTION DATE
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU
DATE 2-10-58
NO. 5950

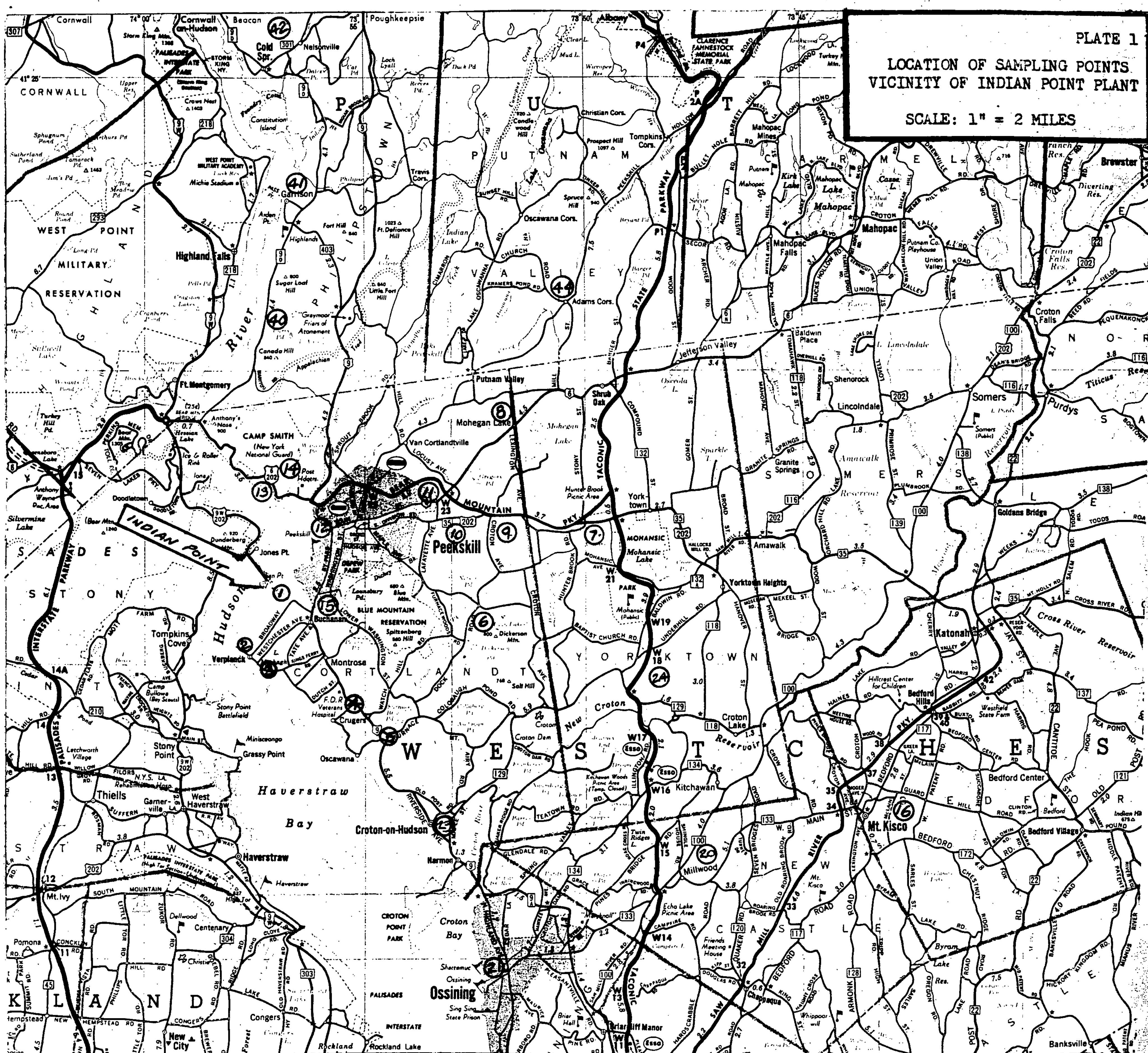


PLATE 1

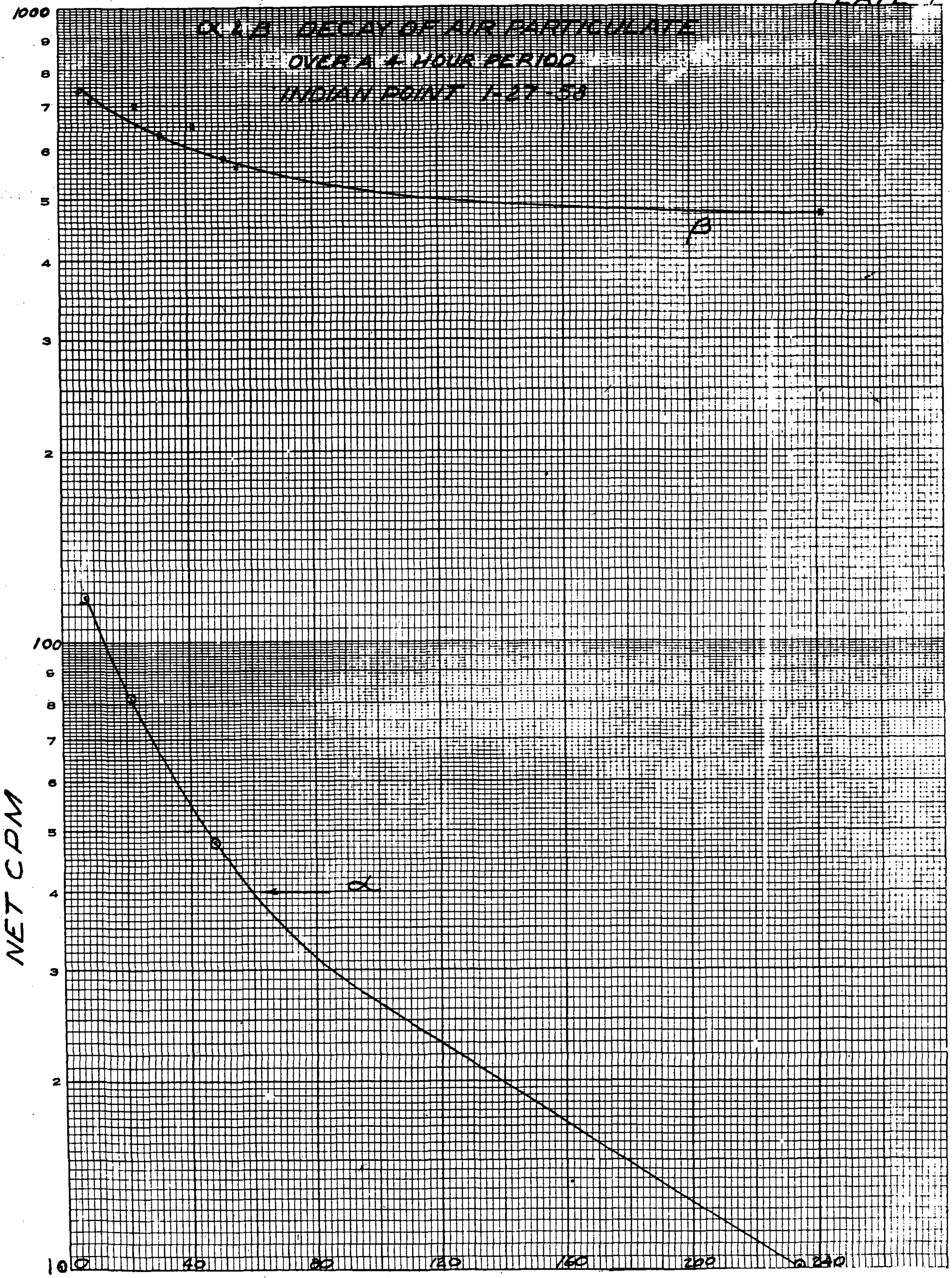
LOCATION OF SAMPLING POINTS VICINITY OF INDIAN POINT PLANT

SCALE: 1" = 2 MILES

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU

DATE 2-10-59 NO. 5950

PLATE 4



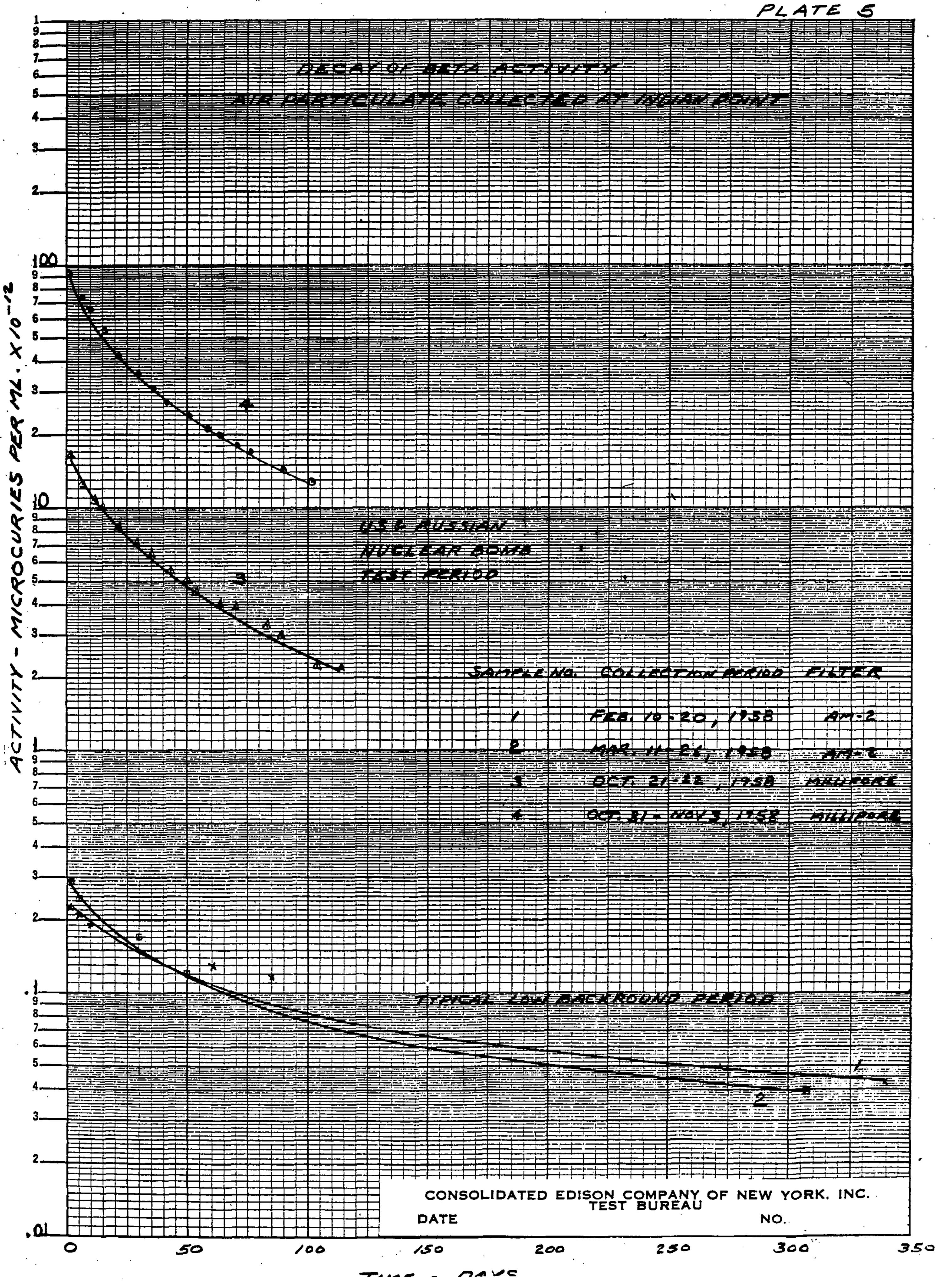
TIME-MINUTES

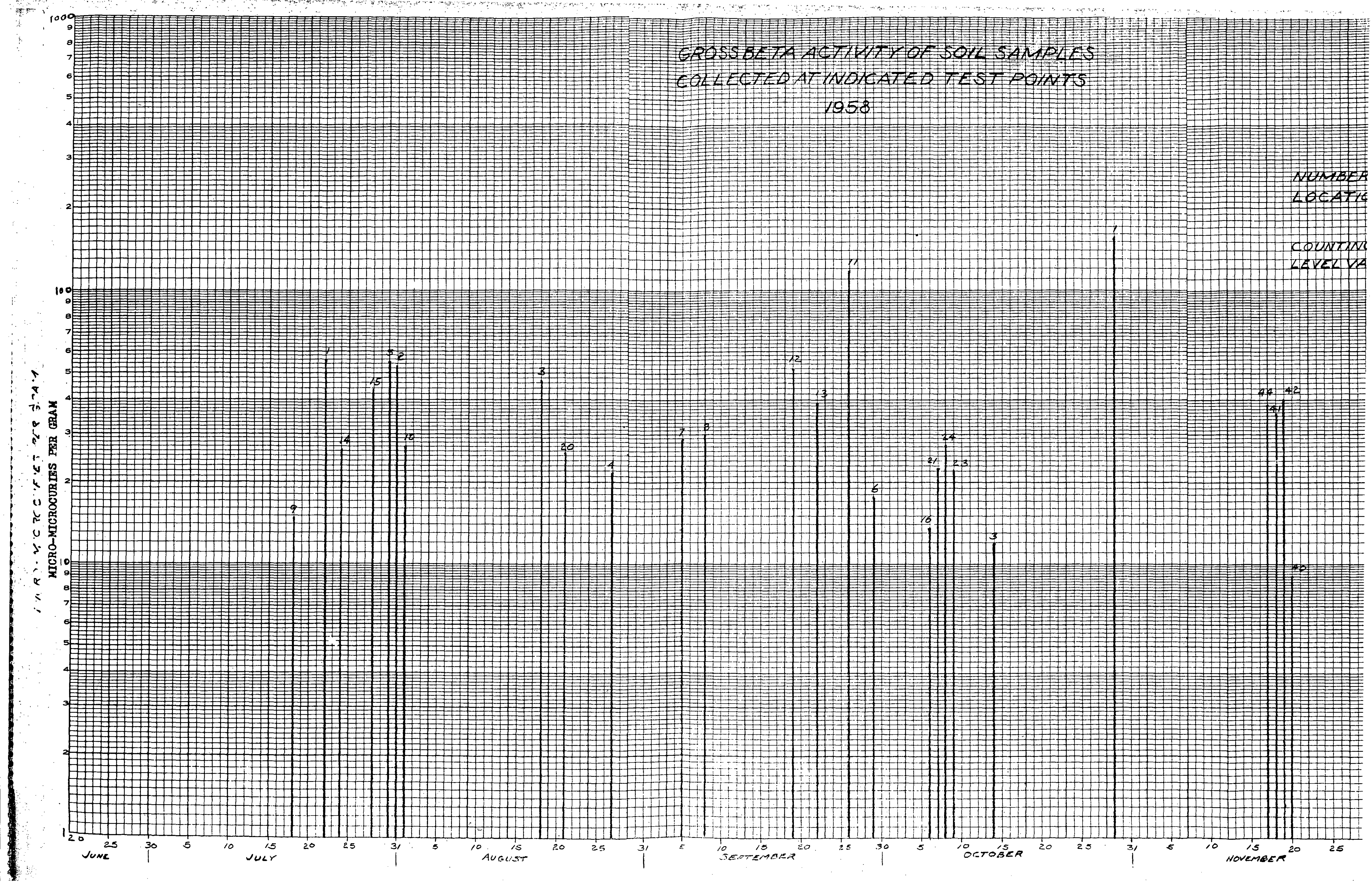
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU

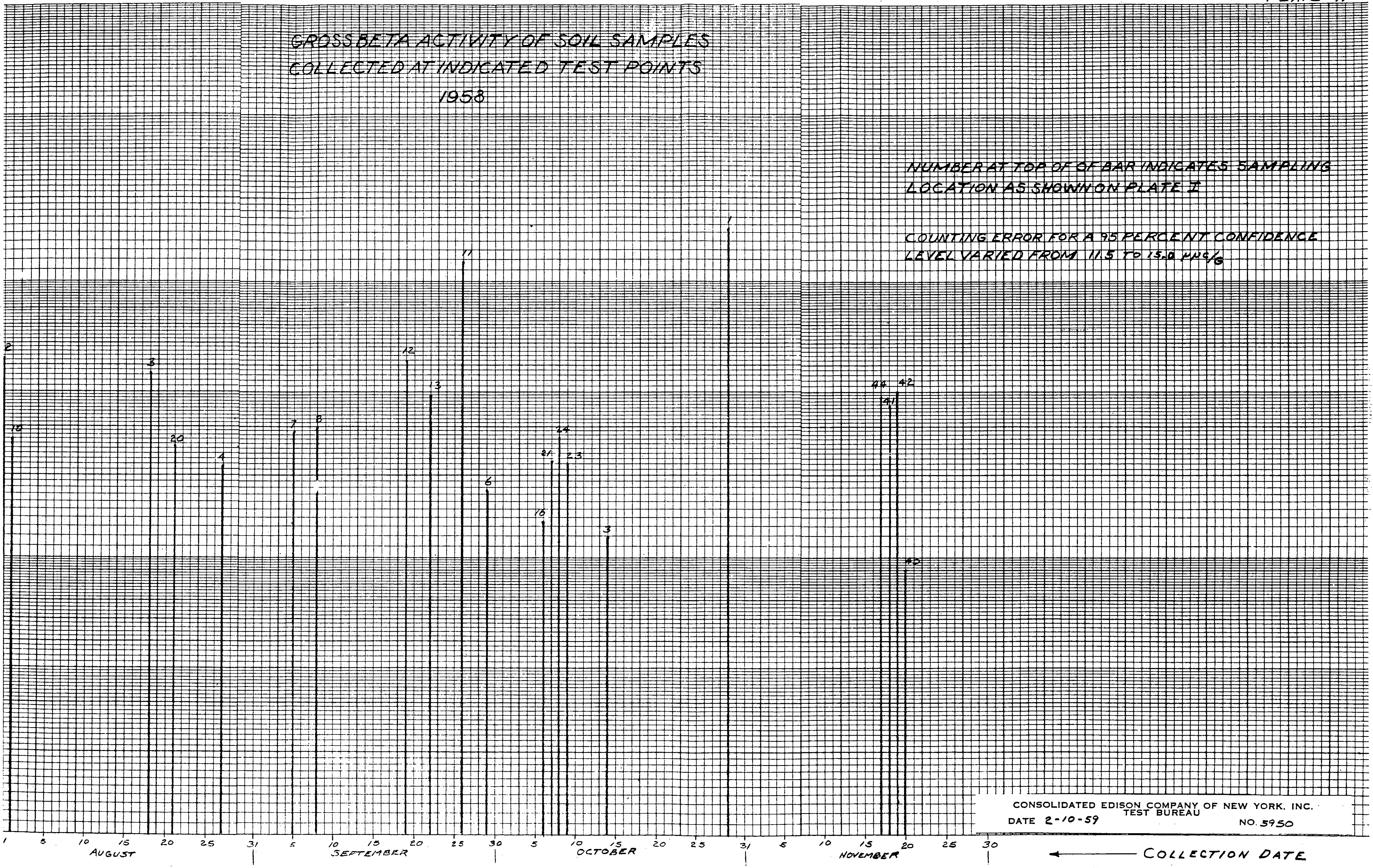
DATE 1-27-59

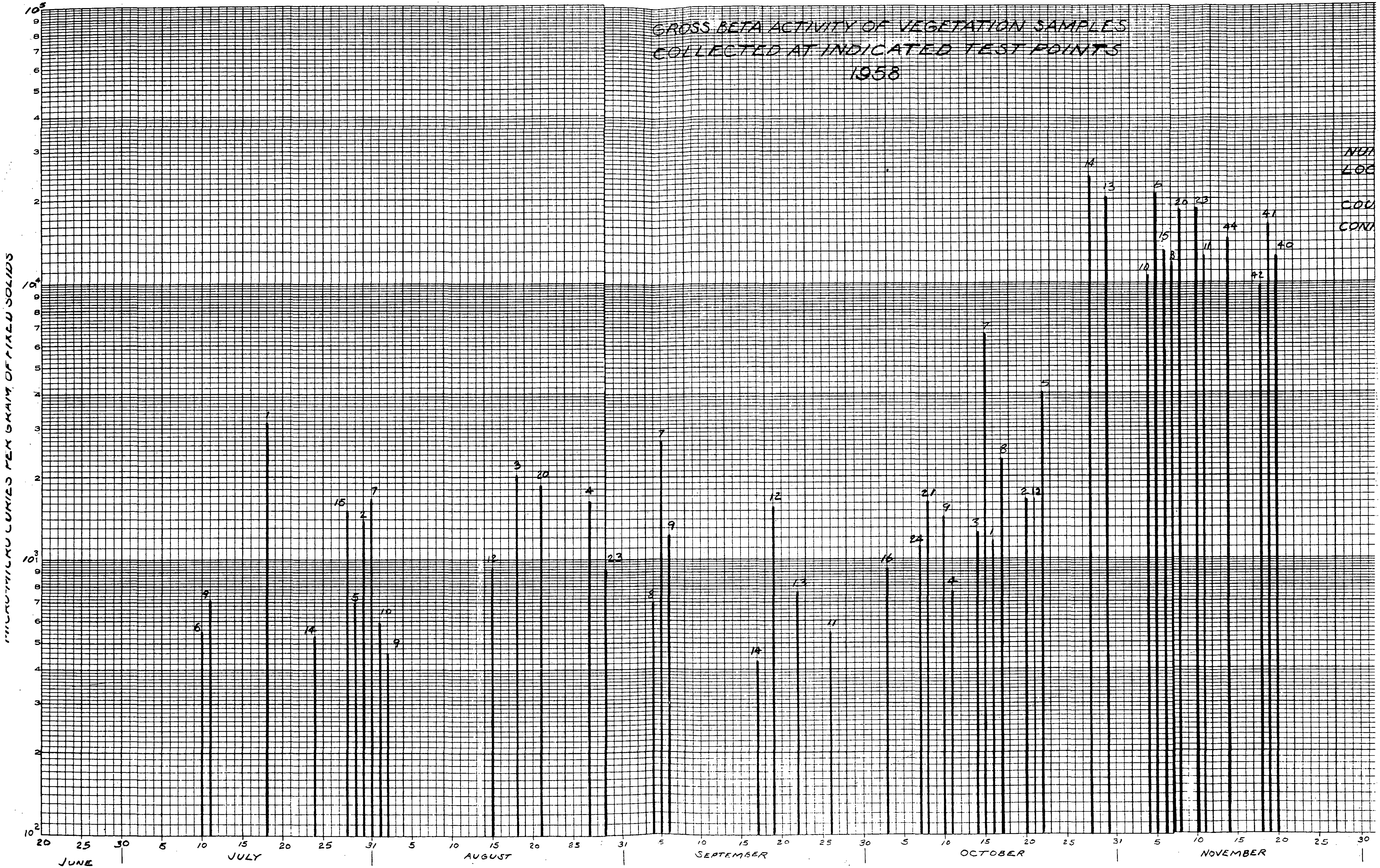
NO. 5950

PLATE 5


DECAY OF BETA ACTIVITY
AIR PARTICULATE COLLECTED AT INDIAN POINT
ACTIVITY - MICROCURIES PER ML. X 10^-12
TIME - DAYS
U.S. & RUSSIAN NUCLEAR BOMB TEST PERIOD
TYPICAL LOW BACKROUND PERIOD
SAMPLE NO. COLLECTION PERIOD FILTER
1 FEB. 10-20, 1958 AM-2
2 MAR. 11-21, 1958 AM-2
3 OCT. 21-22, 1958 MILLIPORE
4 OCT. 31 - NOV 3, 1958 MILLIPORE
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU
DATE
NO.

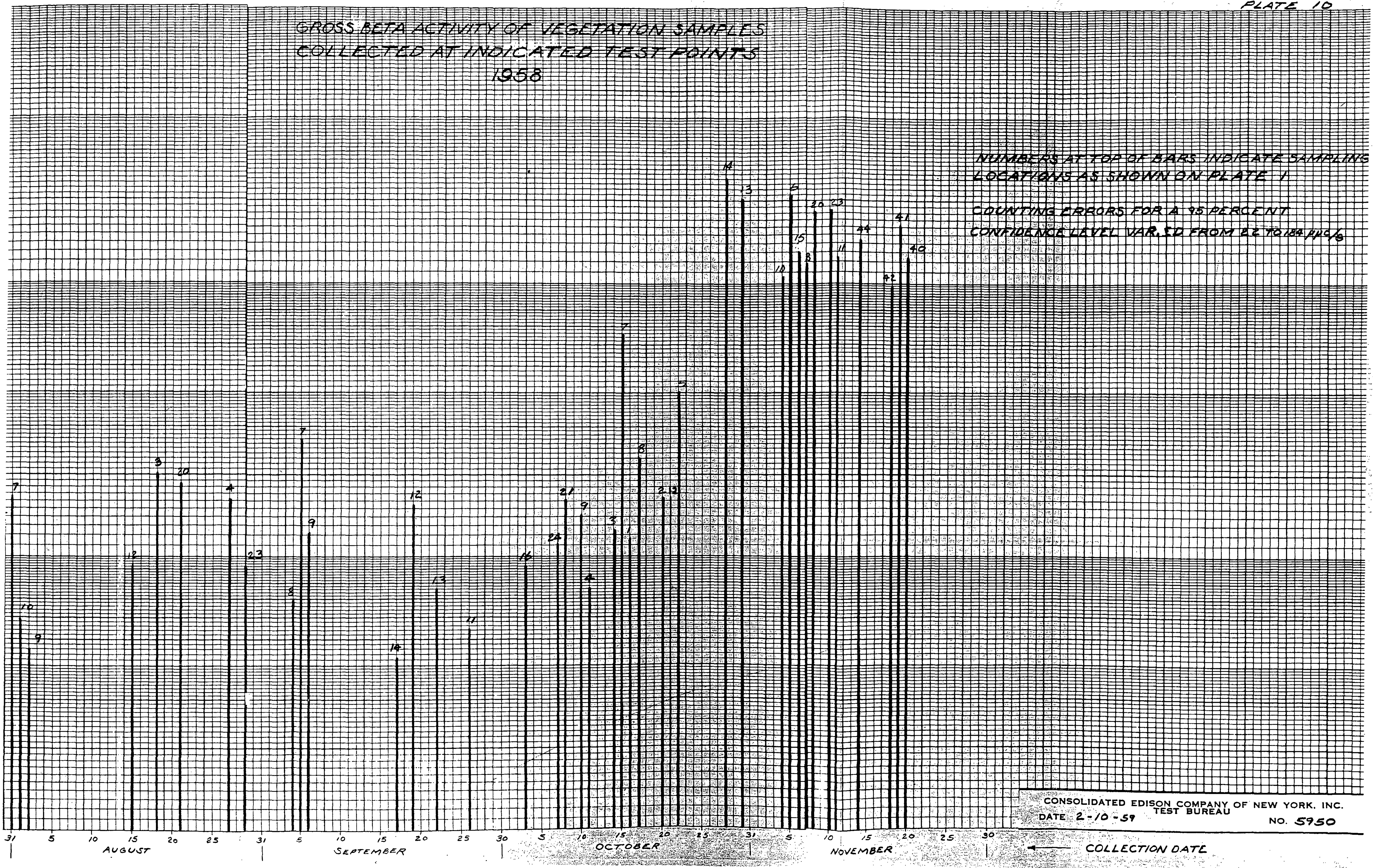

GROSS BETA ACTIVITY OF SOIL SAMPLES
COLLECTED AT INDICATED TEST POINTS
1958
MICRO-MICROCURIES PER GRAM
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER


GROSS BETA ACTIVITY OF SOIL SAMPLES
COLLECTED AT INDICATED TEST POINTS
1958
NUMBER AT TOP OF OF BAR INDICATES SAMPLING
LOCATION AS SHOWN ON PLATE I
COUNTING ERROR FOR A 95 PERCENT CONFIDENCE
LEVEL VARIED FROM 11.5 TO 15.0 μμc/g
2
18
3
20
4
7
8
12
13
11
6
16
21
24
23
3
1
44
41
42
40
1
5
10
15
20
25
31
AUGUST
SEPTEMBER
30
OCTOBER
NOVEMBER
COLLECTION DATE
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU
DATE 2-10-59
NO. 5950



GROSS BETA ACTIVITY OF VEGETATION SAMPLES
COLLECTED AT INDICATED TEST POINTS
1958
MICRO-MICRO CURIES PER GRAM OF FIXED SOLIDS
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER

PLATE 10


GROSS BETA ACTIVITY OF VEGETATION SAMPLES
COLLECTED AT INDICATED TEST POINTS
1958
NUMBERS AT TOP OF BARS INDICATE SAMPLING LOCATIONS AS SHOWN ON PLATE 1
COUNTING ERRORS FOR A 95 PERCENT CONFIDENCE LEVEL VARIED FROM 22 TO 184 μμc/g
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER
← COLLECTION DATE
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU
DATE 2-10-59
NO. 5950

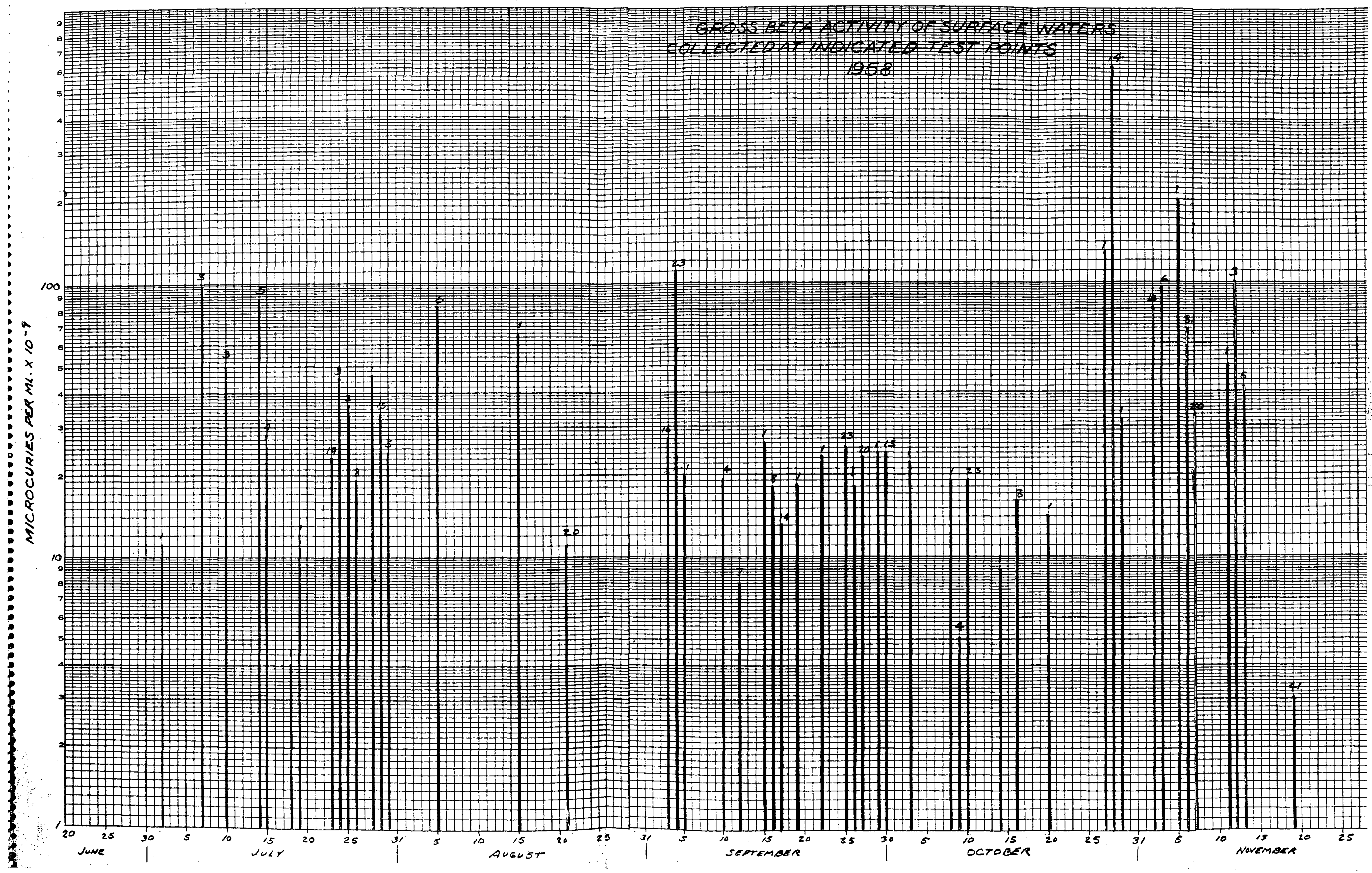
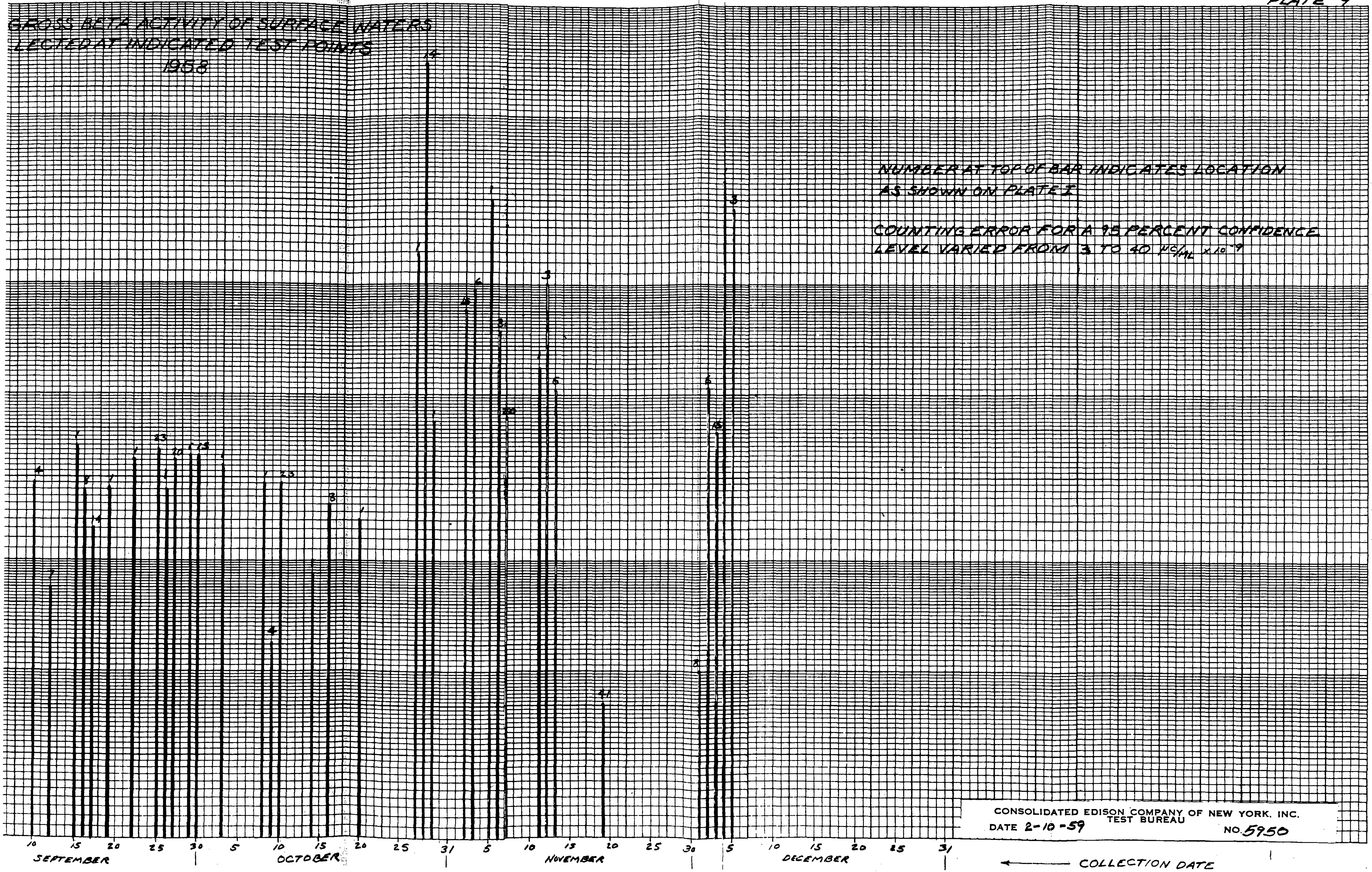
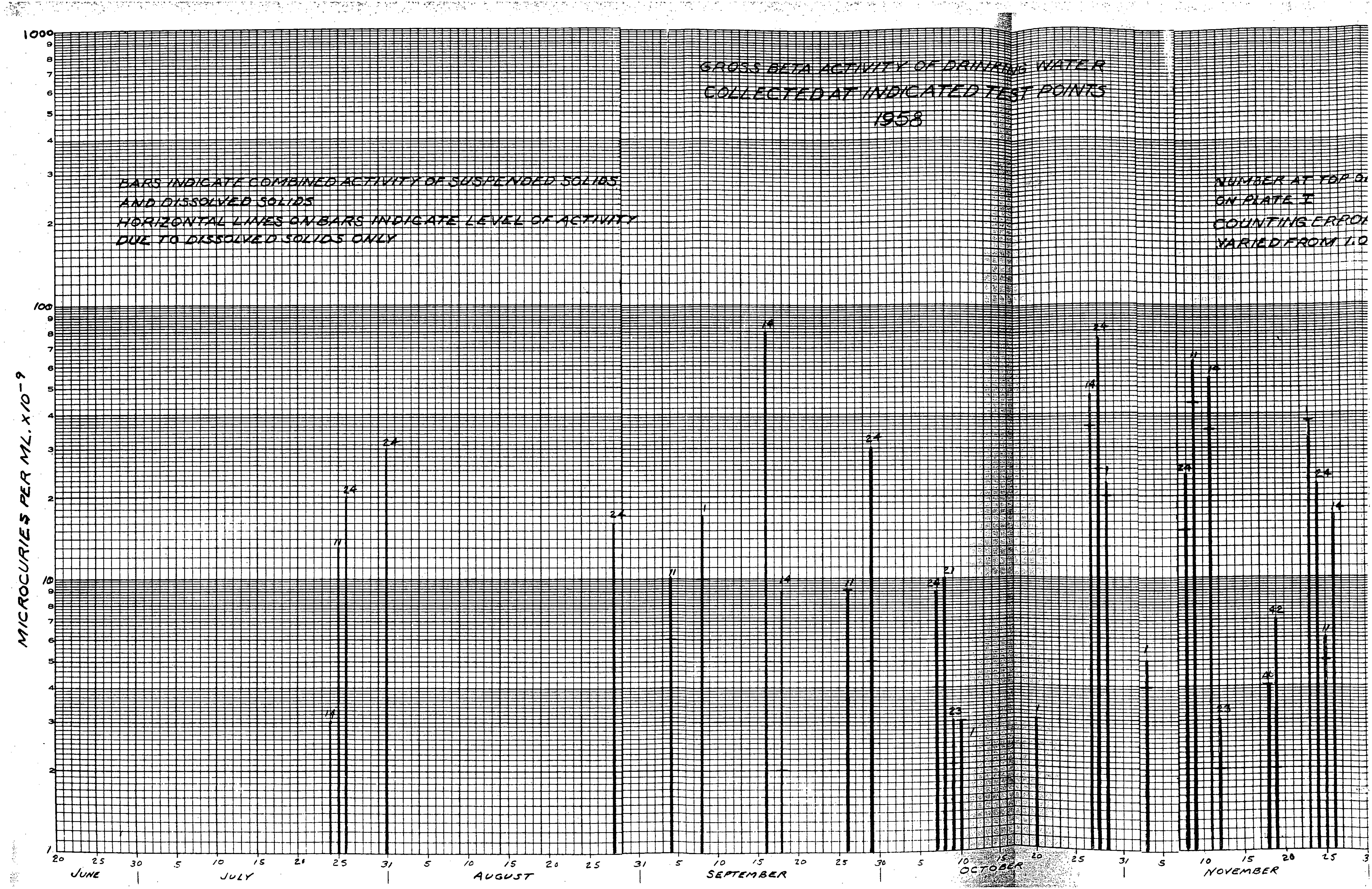

GROSS BETA ACTIVITY OF SURFACE WATERS
COLLECTED AT INDICATED TEST POINTS
1958
MICROCURIES PER ML X 10^{-9}
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER

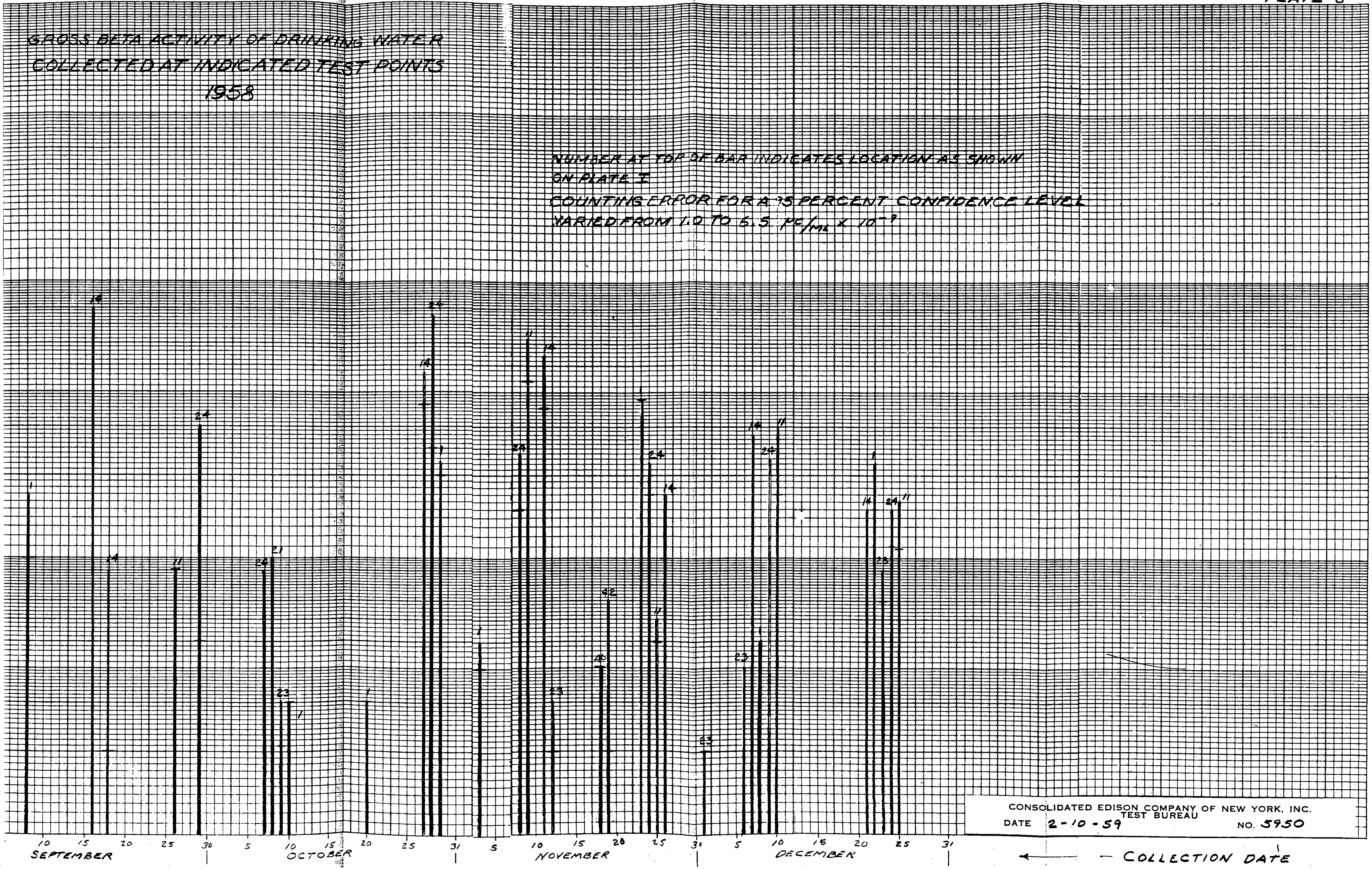
PLATE 9


GROSS BETA ACTIVITY OF SURFACE WATERS
LECTED AT INDICATED TEST POINTS
1958
NUMBER AT TOP OF BAR INDICATES LOCATION
AS SHOWN ON PLATE I
COUNTING ERROR FOR A 95 PERCENT CONFIDENCE
LEVEL VARIED FROM 3 TO 40 µc/ML x 10⁻⁹
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
COLLECTION DATE
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU
DATE 2-10-59
NO. 5950



GROSS BETA ACTIVITY OF DRINKING WATER
COLLECTED AT INDICATED TEST POINTS
1958
BARS INDICATE COMBINED ACTIVITY OF SUSPENDED SOLIDS
AND DISSOLVED SOLIDS
HORIZONTAL LINES ON BARS INDICATE LEVEL OF ACTIVITY
DUE TO DISSOLVED SOLIDS ONLY
NUMBER AT TOP O
ON PLATE I
COUNTING ERRO
VARIED FROM 1.0
MICROCURIES PER ML. X10⁻⁹
1000
100
10
1
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER

PLATE 8


GROSS BETA ACTIVITY OF DRINKING WATER
COLLECTED AT INDICATED TEST POINTS
1958
NUMBER AT TOP OF BAR INDICATES LOCATION AS SHOWN ON PLATE I
COUNTING ERROR FOR A 95 PERCENT CONFIDENCE LEVEL VARIED FROM 1.0 TO 6.5 pc/ml x 10⁻⁹
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
← COLLECTION DATE
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU
DATE 2-10-59
NO. 5950

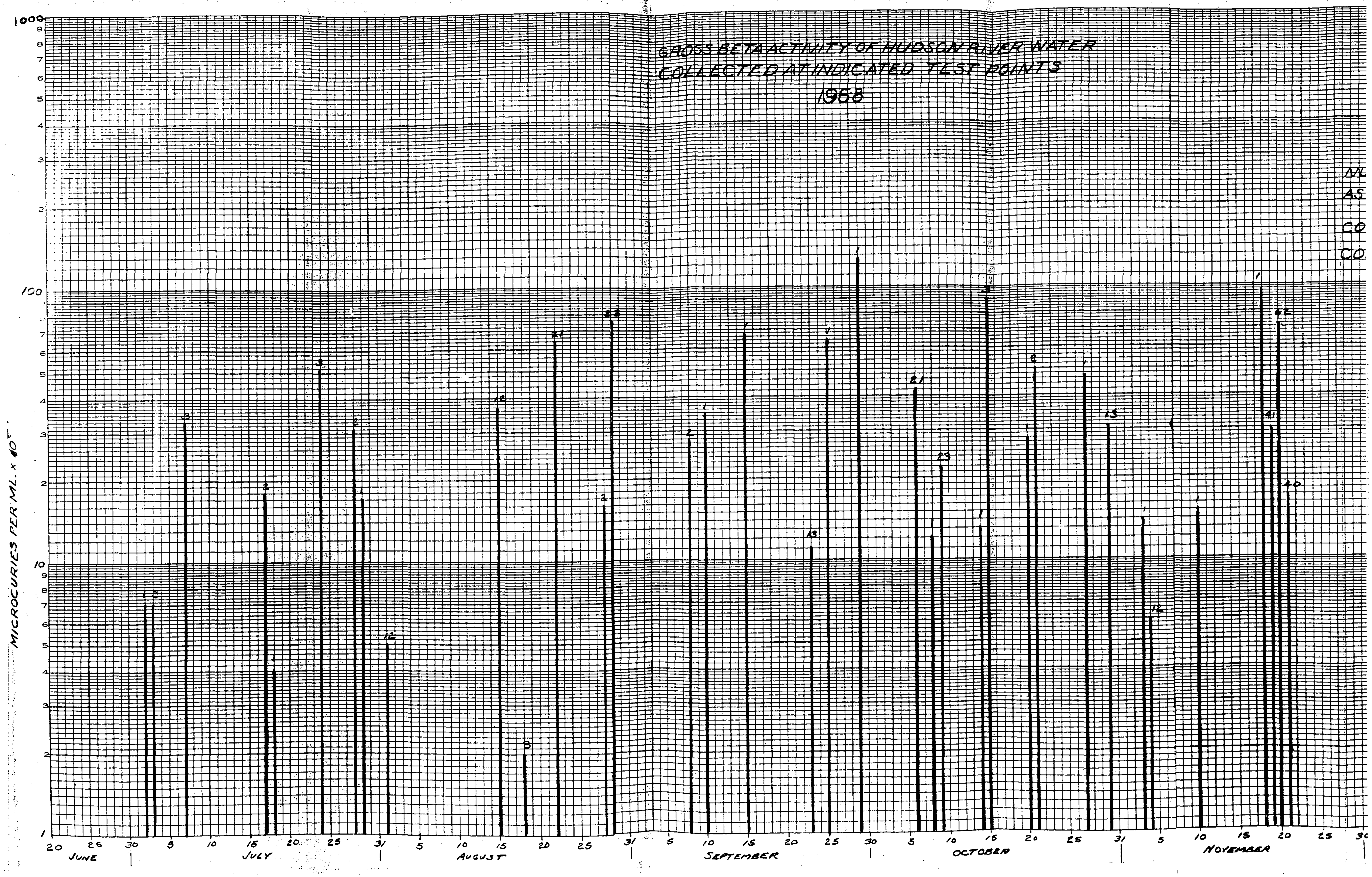
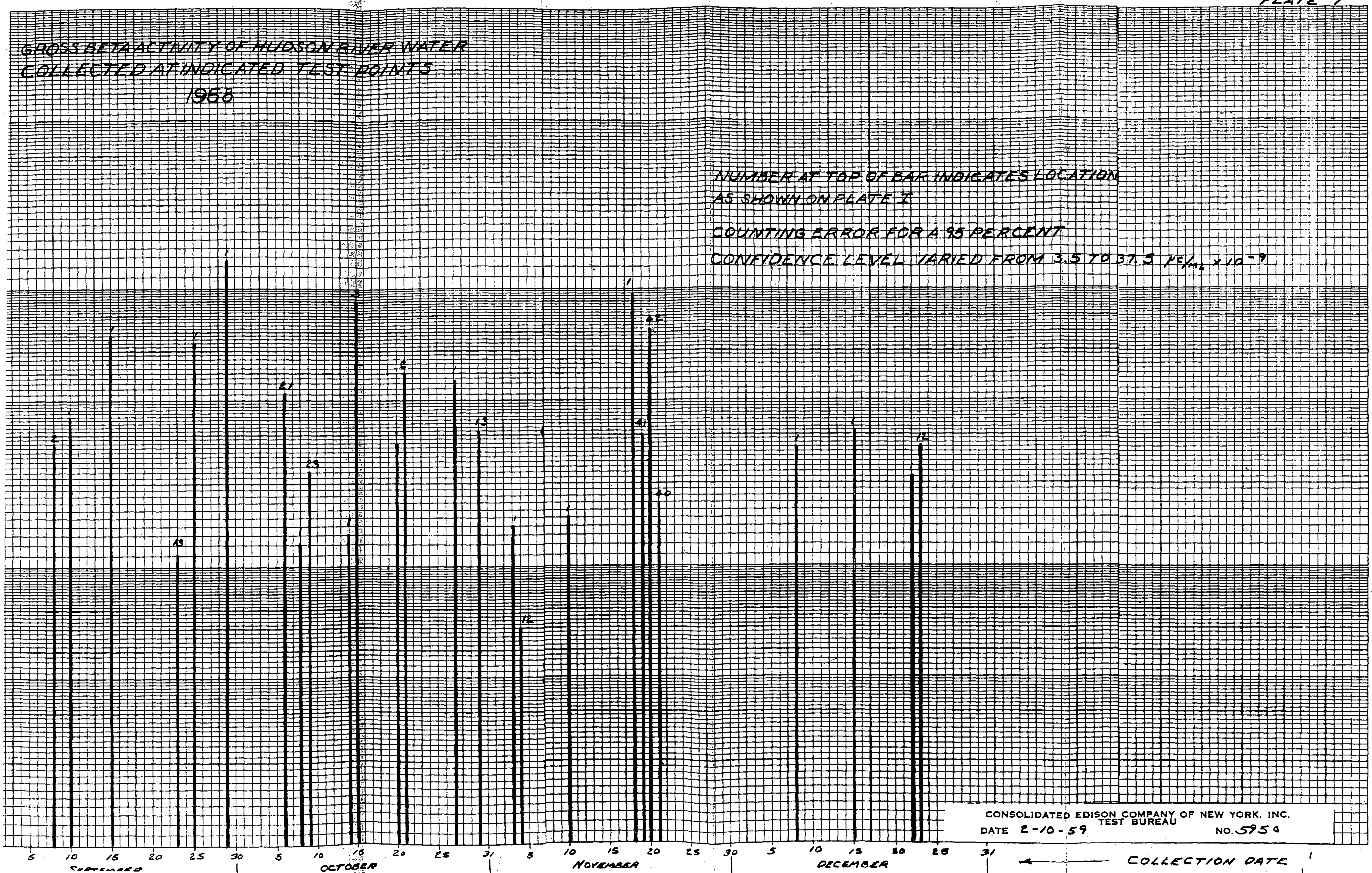
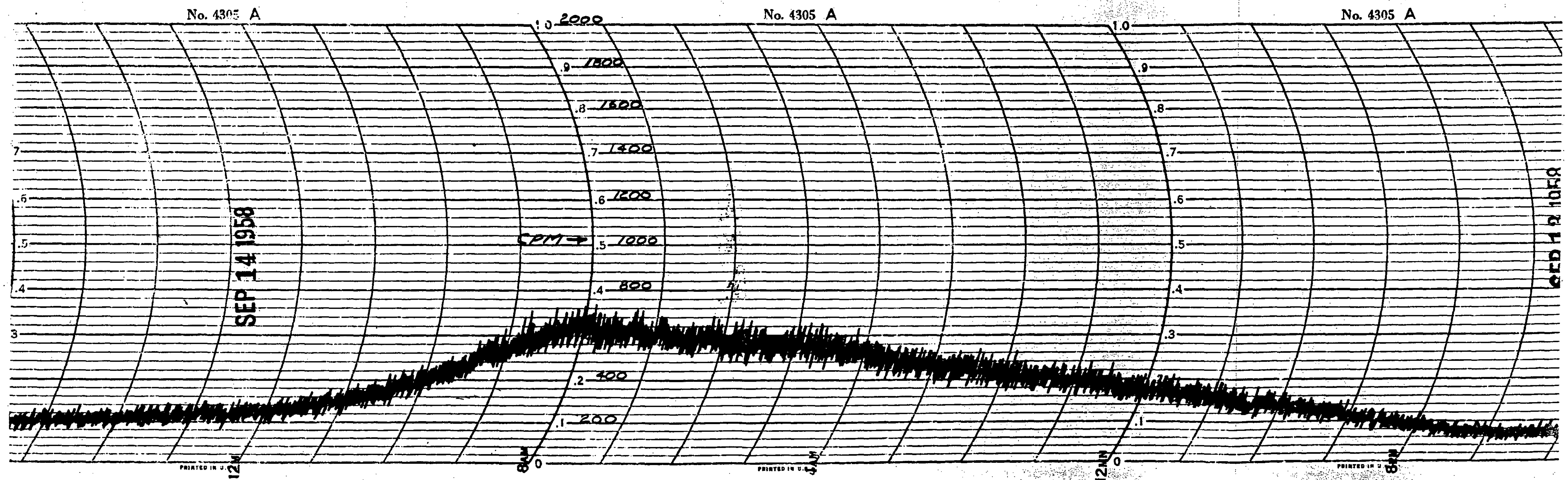

GROSS BETA ACTIVITY OF HUDSON RIVER WATER
COLLECTED AT INDICATED TEST POINTS
1958
MICROCURIES PER ML. x 10
JUNE
JULY
AUGUST
SEPTEMBER
OCTOBER
NOVEMBER

PLATE 7


GROSS BETA ACTIVITY OF HUDSON RIVER WATER
COLLECTED AT INDICATED TEST POINTS
1958
NUMBER AT TOP OF BAR INDICATES LOCATION
AS SHOWN ON PLATE I
COUNTING ERROR FOR A 95 PERCENT
CONFIDENCE LEVEL VARIED FROM 3.5 TO 37.5 μc/ml x 10⁻⁹
SEPTEMBER
OCTOBER
NOVEMBER
DECEMBER
COLLECTION DATE
CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU
DATE 2-10-59
NO. 595a

RADIOACTIVE RECORD OF AIR PARTICULATE
SAMPLED WITH A NUCLEAR MEASUREMENTS CORP. TYPE AM-2 AIR MONITOR

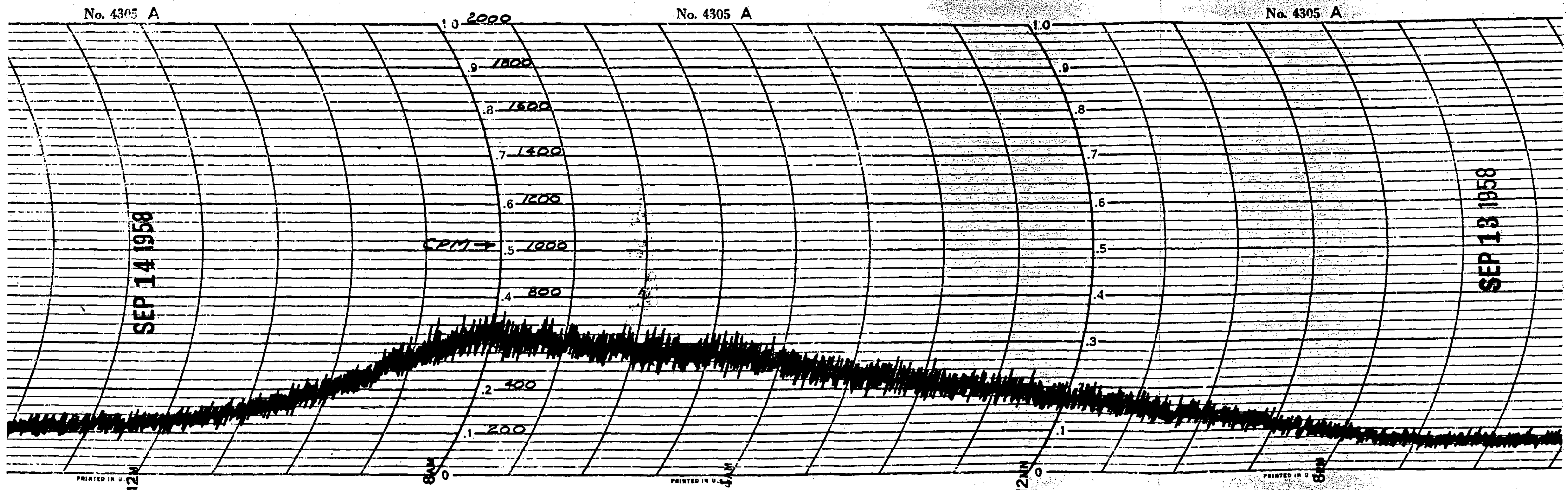
SAMPLE SITE: HUNTERBROOK UNIT SUB. STA. - LOCATION NO. 7



CONSOLIDATED EDISON COMPANY OF NEW YORK.
TEST BUREAU
DATE 2-10-59 NO. 59.

RADIOACTIVE RECORD OF AIR PARTICULATE
SAMPLED WITH A NUCLEAR MEASUREMENTS CORP. TYPE AM-2 AIR MONITOR

SAMPLE SITE: HUNTERBROOK UNIT SUB. STA. - LOCATION NO. 7



CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.
TEST BUREAU
DATE 2-10-59 NO. 5950