LA-3394-MS

LOS ALAMOS SCIENTIFIC LABORATORY
of the
University of California
LOS ALAMOS • NEW MEXICO

Radiation Measurements of the Effluent from the NRX A-2 and NRX A-3 Reactors

UNITED STATES
ATOMIC ENERGY COMMISSION
CONTRACT W-7405-ENG. 36

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LA-3394-MS
UC-41, HEALTH AND SAFETY
TID-4500

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Report written: January 1966

Report distributed: May 20, 1966

Radiation Measurements of the Effluent from the NRX A-2 and NRX A-3 Reactors

Work performed by:

C. J. Boasso
C. L. Cuntz
R. V. Fultyn
R. W. Henderson
H. S. Jordan
O. W. Larson

Report written by:

R. W. Henderson
O. W. Larson

ABSTRACT

Compilation of data resulting from the collection of samples of the effluent clouds from the NRX A-2 and A-3 reactors during full power operation is presented. Data are presented concerning the magnitude and isotopic composition of the airborne and ground deposited material. The environmental impact of these tests has been calculated for hypothetical conditions of land use and occupancy, and these data are included. A brief description of equipment and techniques is also given.

ACKNOWLEDGMENT

The Los Alamos Scientific Laboratory would like to acknowledge the assistance and excellent cooperation of the Radiological Sciences Department of the Reynolds Electrical and Engineering Company, Inc., in all phases of these operations.

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INTRODUCTION

The NRX A-2 reactor was tested at full power (A-2 EP-4) on September 24, 1964. The NRX A-3 reactor was first tested at full power (A-3 EP-4) on April 23, 1965, and restarted (A-3 EP-5) on May 20, 1965. One objective of the work presented here was to obtain data applicable to the study of the behavior of material injected into the atmosphere by the operating reactor. A second objective was to learn the nature of the resultant activity of material released from the operating core.

As a result of analysis of data collected, it is possible to calculate certain health parameters connected with the testing of the reactors. This document presents the results of this first analysis of the data.

To fulfill the objectives listed above, the Los Alamos Scientific Laboratory Field Studies Group (H-8) has developed a highly mobile sampling capability.[1-4] This capability provides for the collection of samples under a variety of meteorological conditions.

Figures 1, 2, and 3 show the location of the established array of sampling stations around Test Cell A at the Nuclear Rocket Development Station, Jackass Flats, Nevada. The figures show locations used on special studies as well as those used for these events. Figure 2 shows the 16,000 ft arc which is used for Test Cell C, and in the body of the report the Test Cell C coordinates are used. A table has been included to give the Test Cell A coordinates for this arc. The extended arcs, shown in Fig. 3, were layed out from the midpoint between Test Cells A and C for use during events at either cell.

A last minute decision to study the effluent from A-3 EP-4 did not allow time to establish as complete a sampling array as was used for the other operations. As a result samples were collected using an array established to provide minimal coverage in the event of a reactor accident. Called the safety array, this is established by H-8 as soon as a reactor arrives at the test cell and is maintained in a state of readiness through the test series until the high power operation of the reactors. During the EP-4 test the safety array was supplemented by trailer placement on the 16,000-, 32,000-, and 64,000-ft arcs.

DESCRIPTION OF SAMPLING EQUIPMENT

Air Sampling Trailer

Each air sampling trailer is equipped with a 3.5-kW generator, a high volume air sampler, and a radio receiver and decoder. This radio equipment allows complete remote operation of the generators and sampling equipment. A majority of the trailers are equipped with a Unico* impactor and a sequential sampler. Figures 4 and 5 show a fully equipped sampling trailer. Figure 6 shows the remote control unit for the radio system.

High Volume Air Sampler

The high volume air sampler is a Staplex unit fitted with a transition piece to accommodate a 6 x 9 in. Whatman No. 41 filter paper. This particulate filter is backed up by a pair of organic vapor-type

*Union Industrial Equipment Corporation

respirator cartridges (activated charcoal) in parallel. Figure 7 shows the various components of this unit, and Fig. 8 shows the assembled unit. This arrangement of sampling media allows for the gross separation of the airborne material into two distinct fractions. The material collected on the filter is assumed to be particulate and that on the charcoal cartridge is assumed to be gaseous at the time of collection. The sampling rate for this system is a nominal cubic meter per minute.

Unico Impactor

Figure 9 shows the impactor being installed on the sampling trailer. The Unico design has been selected by H-8 for field work, based on previous experience with several designs.[3] Nondrying resin-coated plastic slides are used for the impaction stages, and a millipore filter is used for the fifth and last stage. The unit provides an approximation to the size distribution of the airborne particulates as determined by their effective aerodynamic diameters.

Sequential Sampler

The sequential sampler as installed in a sampling trailer is shown in Figs. 4 and 5. The eight sampling heads collect particulate samples to assist in the estimation of relative cloud concentration as a function of time. The sampling sequence is initiated by radio command but is manually preset to sample during the total predicted time of cloud passage. Running times per sample vary from 5 min on the close-in arcs to 30 min on the extended arcs.

Resin-Coated Trays

Samples of ground deposited activity were collected on paired 7 x 10-1/2 in. trays coated with a clear nondrying resin. The trays were placed horizontally on stakes approximately 30 in. above grade, as shown in Fig. 10. Lucite trays were used for A-2 and A-3 EP-5 to avoid neutron activation problems. However, for A-3 EP-4 there was insufficient time to replace the metal trays used in the safety array with lucite trays. This resulted in the loss of all ground deposition data for this run, as the fission product activity on the trays was insignificant compared to the activation activity.

COUNTING EQUIPMENT

Because of the desirability of obtaining gross beta and gamma counts from a large number of individual samples, a system was developed to provide a simultaneous count of both beta and gamma activities. Beta counting is done by means of a 7 x 10-1/2 in. methane gas flow proportional counter located in the top of an iron counting shield. The gamma counting probe consists of a 10-in.-diameter by 5-in.-thick plastic phosphor (Nuclear Enterprises NE 103) coupled to five Dumont 6363 photomultiplier tubes. The probe output is fed into a standard single-channel analyzer.

The mechanical arrangement of the components allows for variation of counting geometries inside the shield. The counting positions are calibrated prior to each operation using Sr-Y-90 for the beta counter and Cs-137 for the gamma counter. Figure 11 shows an interior view of the count shield, and Fig. 12 shows the complete counting station. These systems are used for counting filter papers, charcoal cartridges, and resin-coated trays.

Specially designed systems are used to count samples collected by the cascade impactors and sequential samplers. These systems use only beta proportional counters. The system for the cascade impactor samples is shown in Fig. 13.

Qualitative isotopic information about selected samples is derived by use of a multichannel gamma pulse height analysis. The basic component of the system is a 400-channel analyzer from Radiation Instrument Development Laboratory (RIDL) Model 34-12. The input for the system is from a Harshaw Integral Line, 3 x 3 in., thalium-activated sodium iodide crystal with a Dumont 6363 photomultiplier tube. Readout of the system is by a Mosley Autograph X-Y recorder and a Computer Measurements Corporation printer. Provision is made in the 3-1/2-in.-thick steel shield for varying the counting geometry of the sample. This allows for the highest possible counting rate while at the same time avoiding serious problems with shifts due to saturation of the photomultiplier or analyzer dead time. Figure 14 shows the detector assembly for this system, and Fig. 15 shows the entire system.

PROCEDURES AND RESULTS

Analysis Procedures

Samples were collected from the arcs in the hot line direction predicted by the United States Weather Bureau and by what other data were available. Samples were counted and selected for further analysis according to the procedures described in Reference 2. This analysis showed the expected compliment of volatile fission products. It was noted that the 140 chain (Ba La) was not as prominent in these samples as in samples from similar tests.

Description of Tabulated Data

Tables I, II, and III show the total dosages (μCi sec/M^3) and deposition concentrations (μCi/M^2) measured for the three experiments. The activity reported in these tables has been corrected to estimated time of cloud passage. Airborne particulate dosages are calculated from data generated by the analysis of filter papers, and airborne gaseous dosages from an analysis of the charcoal cartridges. The deposited activity per unit area was determined by making the classical assumption that the ground deposition is the same in composition and magnitude as that collected on the resin-coated trays. No data for deposition are given in Table II owing to the problems encountered with the metal trays mentioned above.

The high value for ground deposition in Table III, Station 16-055 is due to the presence on one of the trays of a single particle of very high specific activity (determined by autoradiography). The effect of this particle may also be seen in Tables V and XIII.

Table IV presents deposition velocity data for A-2 EP-4, and this same information for A-3 EP-5 is presented in Table V. Values are given in these tables for total airborne material and airborne particulate material. The deposition velocity is defined as the ratio of the concentration of the ground-deposited activity to the exposure dosage at the same point and has the units of length per unit time (cm/sec).

Tables VI, VII, and VIII give the apparent zero time composition of the material collected by the various media at various distances. The presence of Xe-135 on the charcoal cartridges is most likely due to the decay of I-135, but the point at which this growth begins is not known for certain. It is probably swept out of the cartridge during sampler operation and is free to diffuse from the cartridge before packaging for counting. Xenon-135 does not appear owing to the biasing of the count system at above 100 KeV. The presence of Te I-132 and Ba La-140 on the cartridges is not well understood, but this has been observed on similar experiments.

No data are presented from the Unico impactors. They did not produce meaningful data for A-2 EP-4, and owing to the short preparation times for NRX A-3 it was decided to omit them.

Calculated Cloud Effects

Tables IX (A-2 EP-4), X (A-3 EP-4), and XI (A-3, EP-5) show the results of calculations based on the analysis of the samples of airborne material collected from the experiments. The whole body dose due to cloud passage is caluclated assuming that the station is in a semi-infinite cloud of uniform concentration equal to that measured at the station and extrapolated to time of cloud passage. The adult inhalation thyroid dose arises from the iodine exposure dosage measured at each station. The following factors for exposure to 1 Ci sec/M^3 were used to calculate the thyroid dose.

Isotope	Thyroid Dose (rads)
I-131	340.
I-132	12.3
I-133	91.5
I-134	5.7
I-135	28.4

Ground-Deposition Effects

Table XII presents the results of calculations based on the analysis of the resin-coated trays exposed during the A-2 EP-4 experiment, and Table XIII gives the same information for A-3 EP-5. The ground deposition dose rate is calculated on the assumption that the station was located on an infinite plane with a uniform deposit of material of the same concentration as that measured on the resin-coated trays extrapolated to time of cloud passage. The 1-year integrated deposition dose is calculated assuming a clean area before the arrival of the cloud and no recontamination during the integration period. The integration is done assuming only the physical decay of the isotopes. One year was selected as the integration period because of leaching and other removal processes.

The data for iodine in milk are hypothetical values, calculated under the assumptions (based almost entirely on Windscale experience in the United Kingdom) that 1 Ci/M^2 of I-131 deposited on the pasture (and represented by the concentration on the resin-coated trays) will result in 1.0×10^{11} pCi/liter of milk as a maximum level of contamination. The child thyroid dose is another hypothetical value, based on the assumption that a child will continue to drink 1 liter per day of milk contaminated as previously described, with no corrective measures until the I-131 has decayed from the pasture and from the milk produced by the cattle grazing on it. These assumptions are somewhat unrealistic, especially when applied to the milk sheds within several hundred miles of the Nevada Test Site where dairy cattle infrequently graze on pasture but are usually fed bailed feed. However, these assumptions are widely employed in hazards evaluations.

Table XIV has been included to give the location of stations on the 16,000 ft arc in reference to Test Cell A.

Description of Figures

Figures 16 through 21 show the isodosage and isoconcentration contours as measured during the testing of the NRX A-2 reactor at full power. The maximum exposure dosage measured on each arc, called the hot line, is shown in Fig. 22 as a function of distance.

Figure 23 shows the ground deposition concentration and deposition velocity along the hot line.

Owing to the paucity of data, no figures are presented for NRX A-3 EP-4. Isodosage, isoconcentration contours, and hot line data for NRX A-3 EP-5 are shown in Figs. 24 to 31.

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3. Ide, H. M., J. W. T. Meadows, H. S. Jordan, and P. K. Lee, "Radiation Measurements of the Effluent from the Kiwi B-1A, B-1B, and B-4A Reactors," Los Alamos Scientific Laboratory Report LAMS-2932, April 1963.
4. Jordan, H. S., "Radiation Measurement of the Effluent from the Kiwi-A Series of Reactors," Los Alamos Scientific Laboratory Report-2588, June 1961.

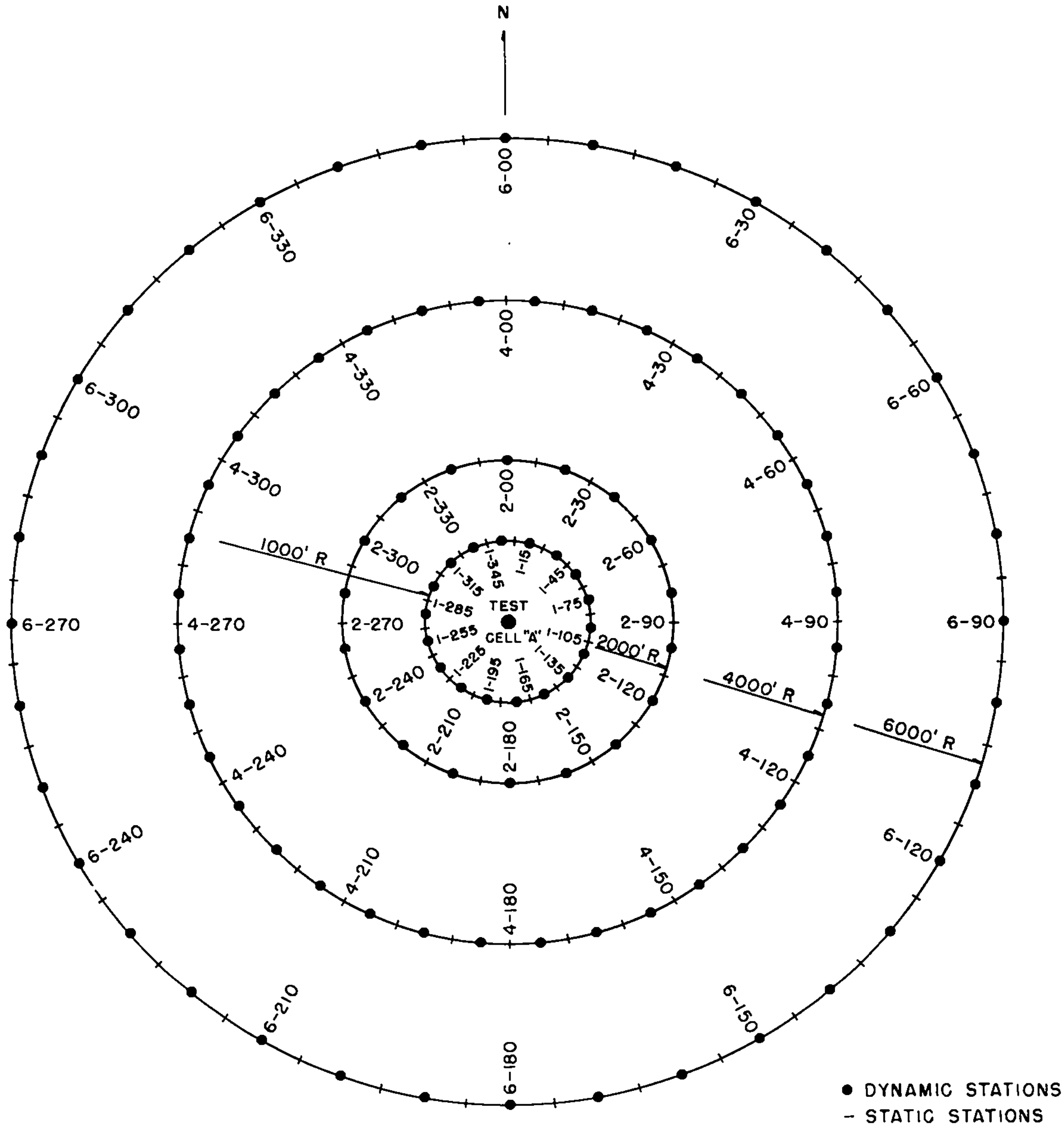

Fig. 1. Close-in placement map showing 2,000, 4,000, 6,000 foot arcs.

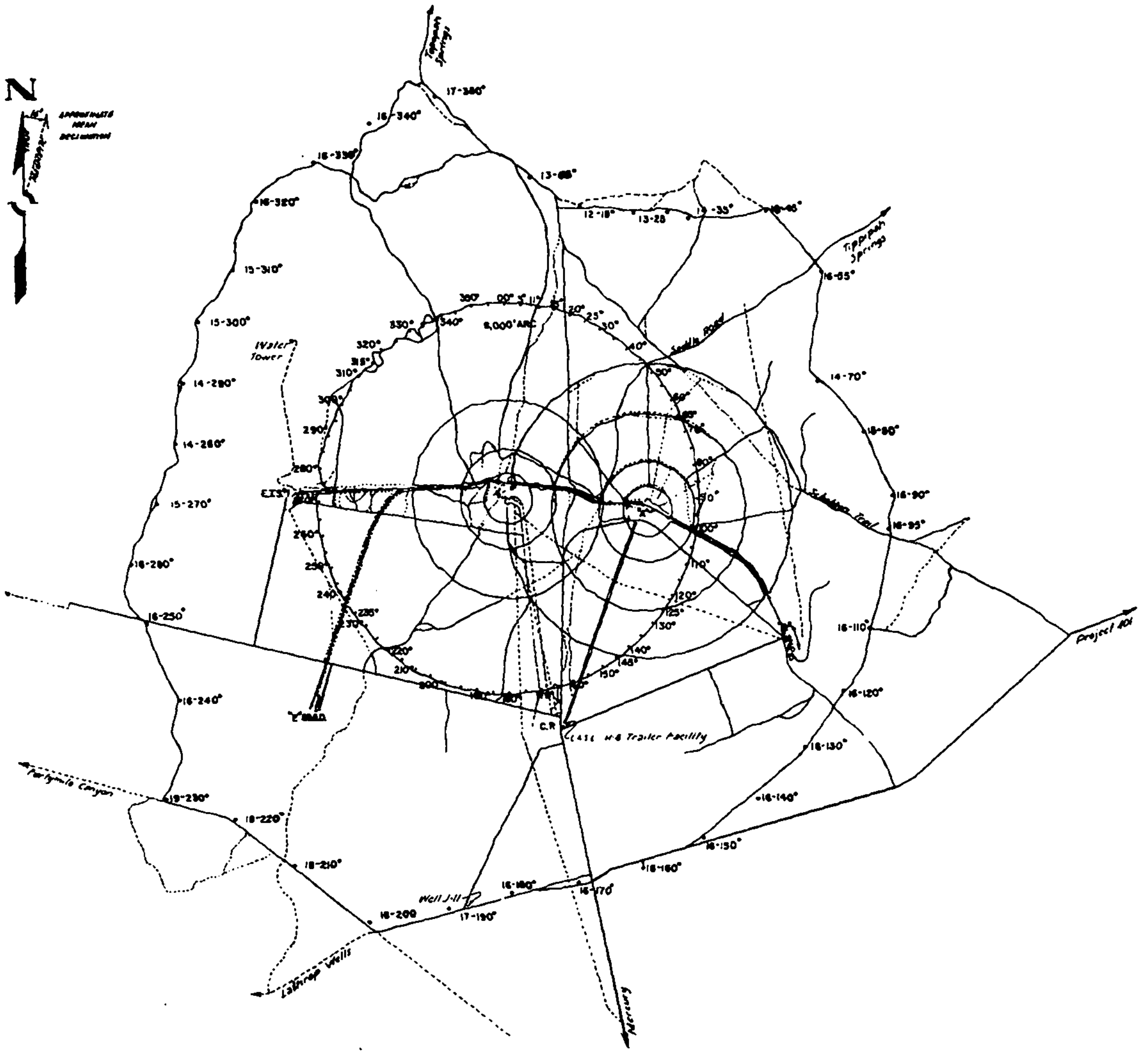

Fig. 2. Placement map showing 16,000 foot arc for Test Cells A and C. Also shown is the 8,000 foot arc for Test Cell C.

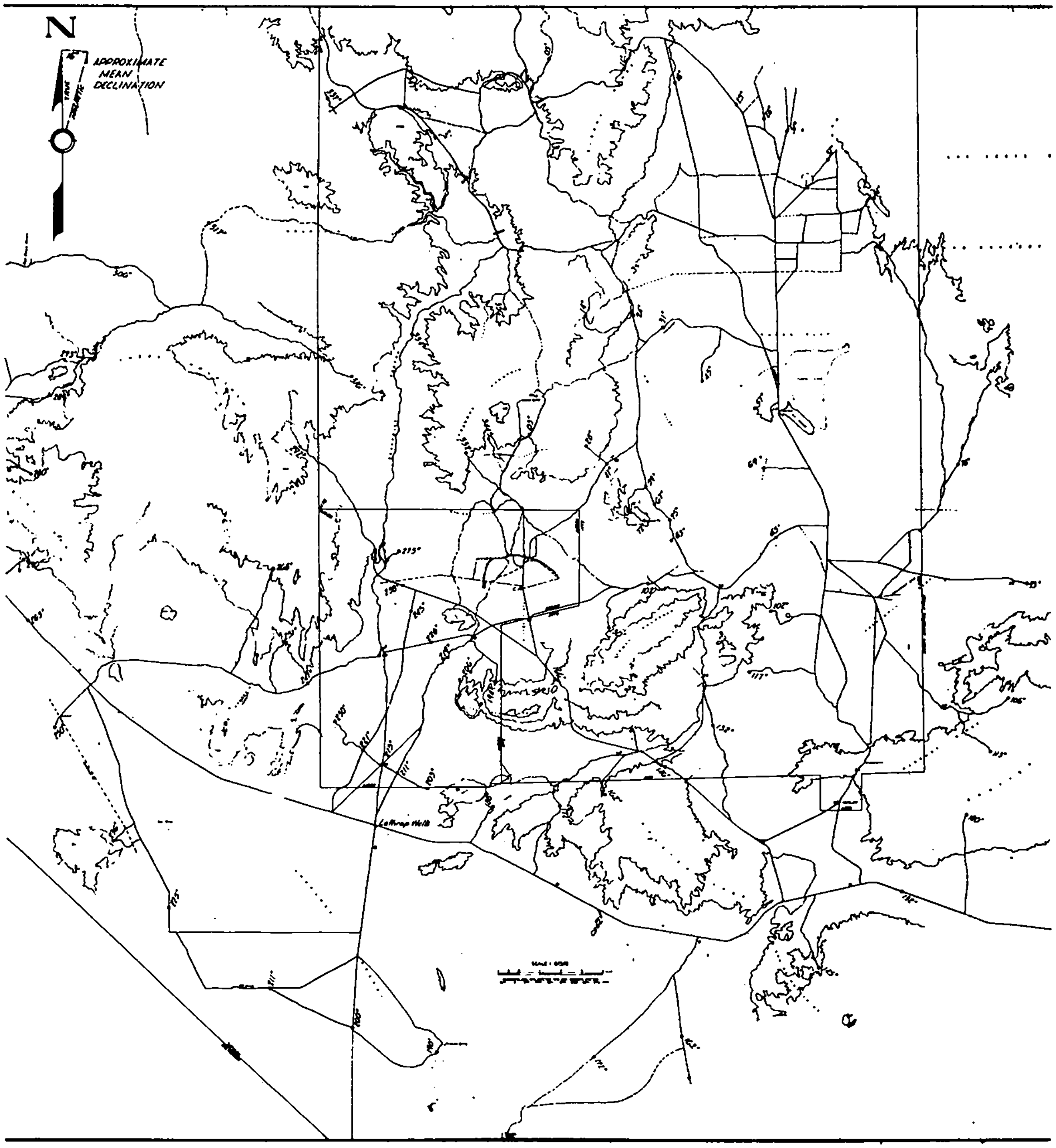

Fig. 3. Extended arc placement map showing 32,000, 64,000, and 128,000 foot arcs.

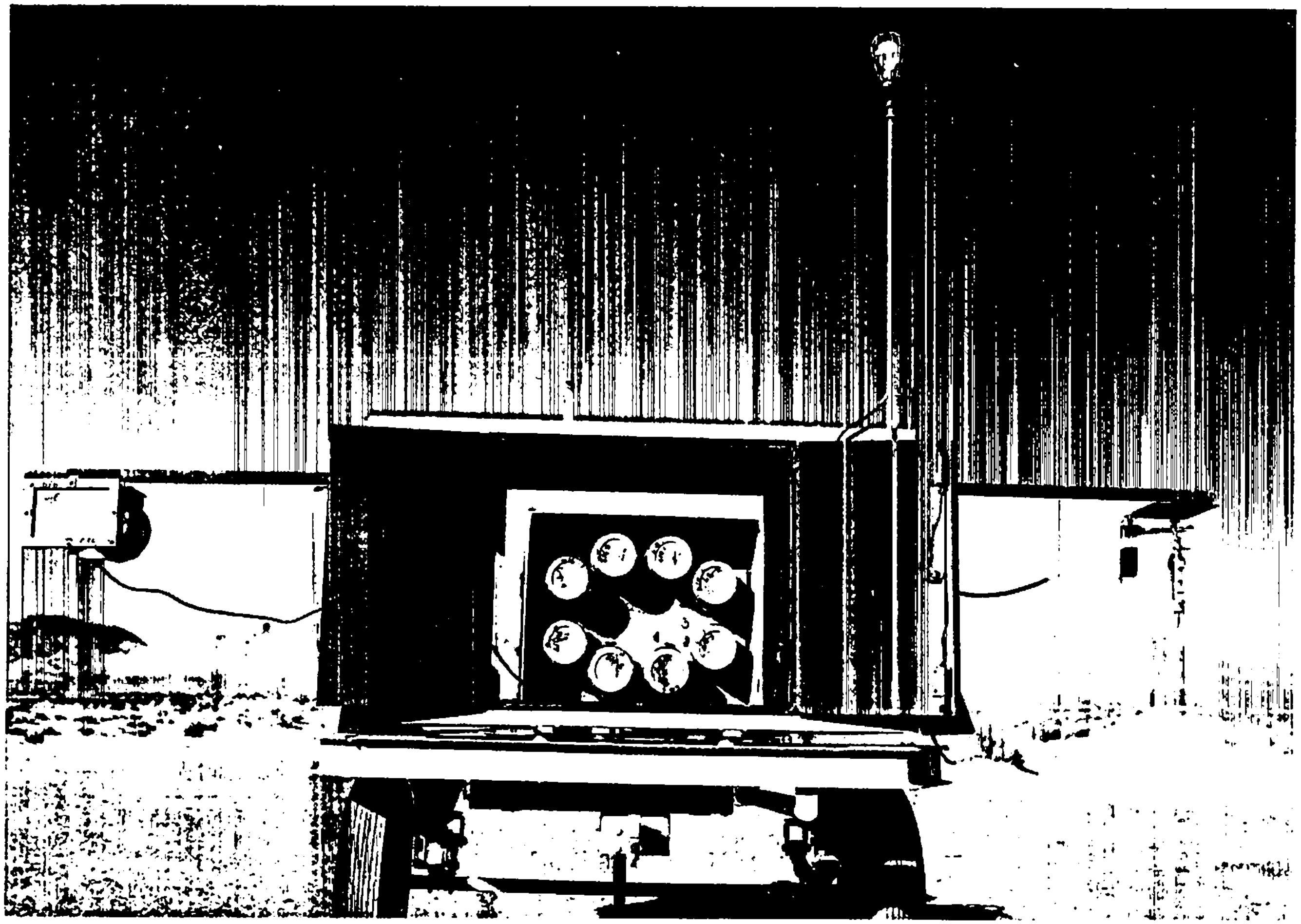

Fig. 4. Fully equipped air sampling trailer showing high volume air sampler, sequential sampler, and cascade impactor.

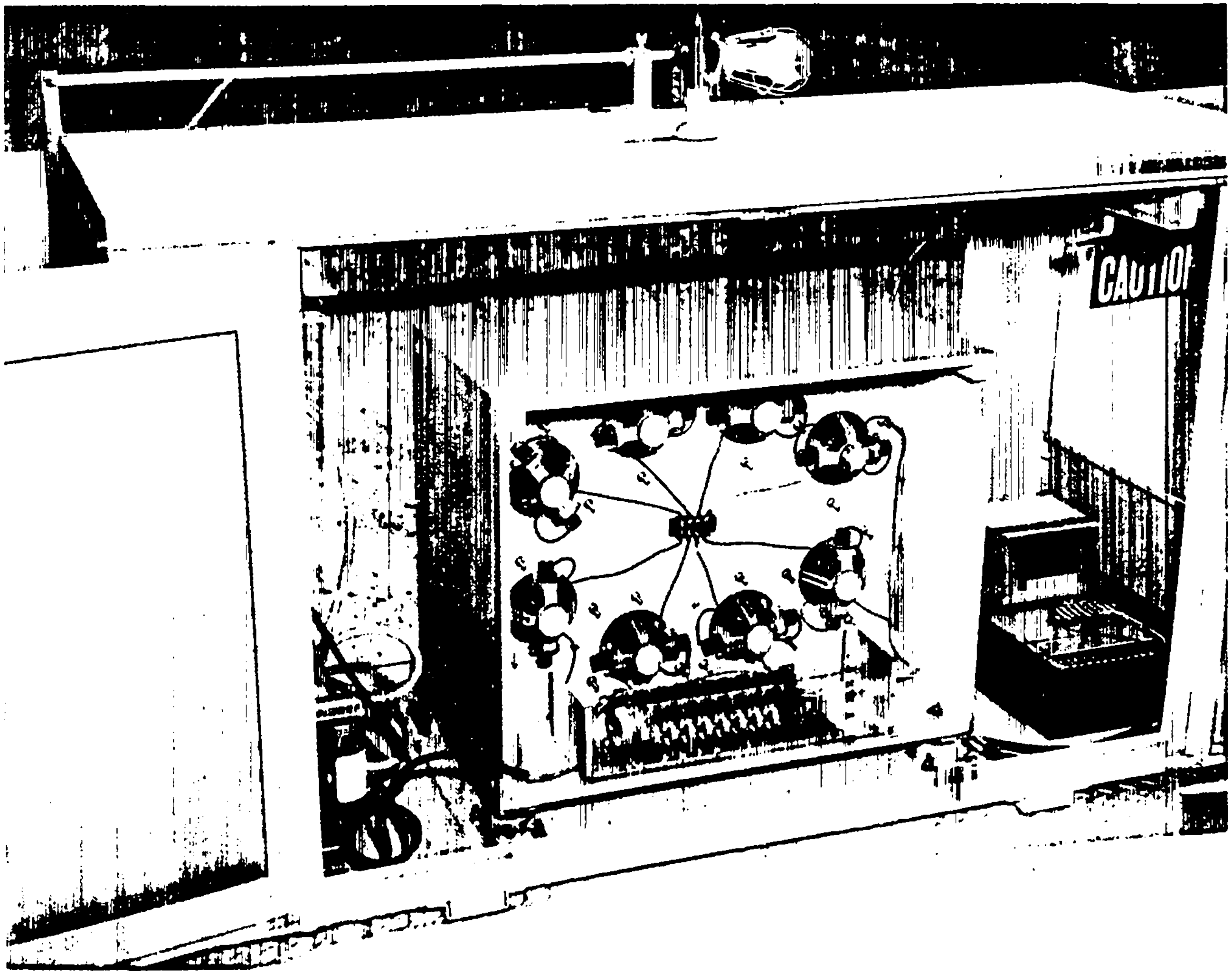

Fig. 5. Rear view of sampling trailer showing sequential sampler with timer and radio control unit.

Fig. 6. Control unit for remote operation of sampling equipment.

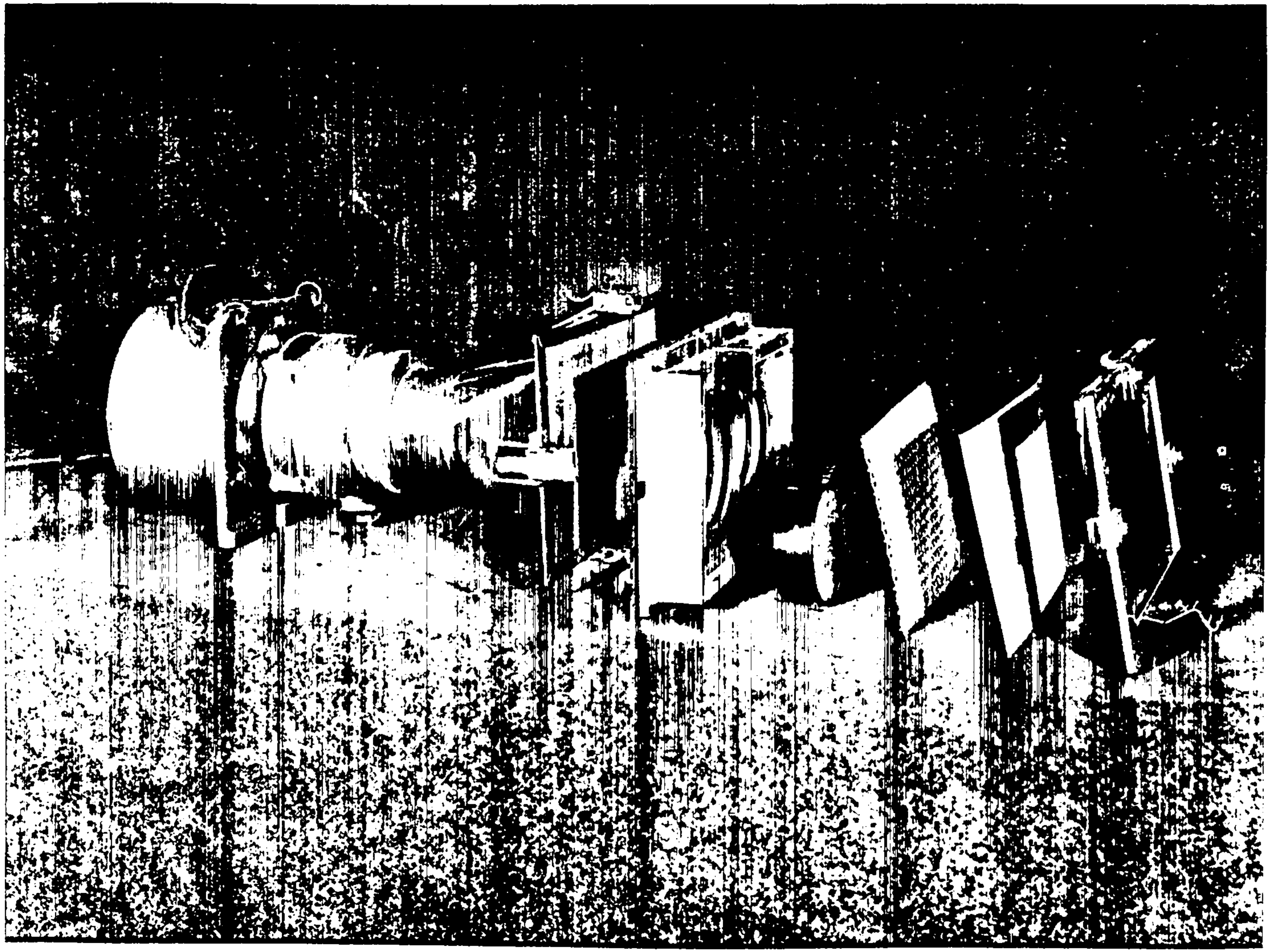

Fig. 7. Exploded view of high volume air sampler showing pump and transition piece, sampling head, charcoal cartridges, spacer screen, filter paper, and retainer frame.

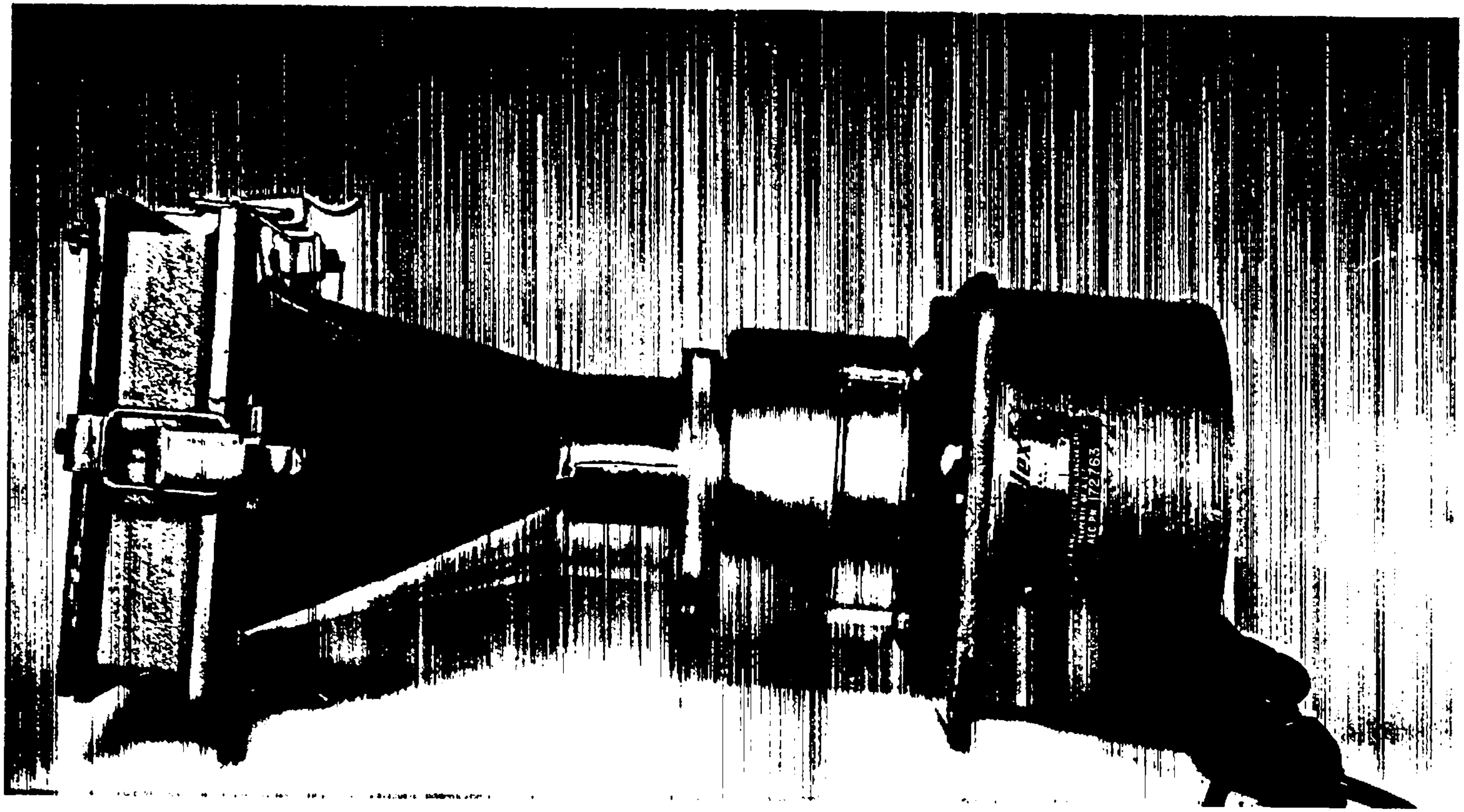

Fig. 8. Assembled view of high volume air sampler.

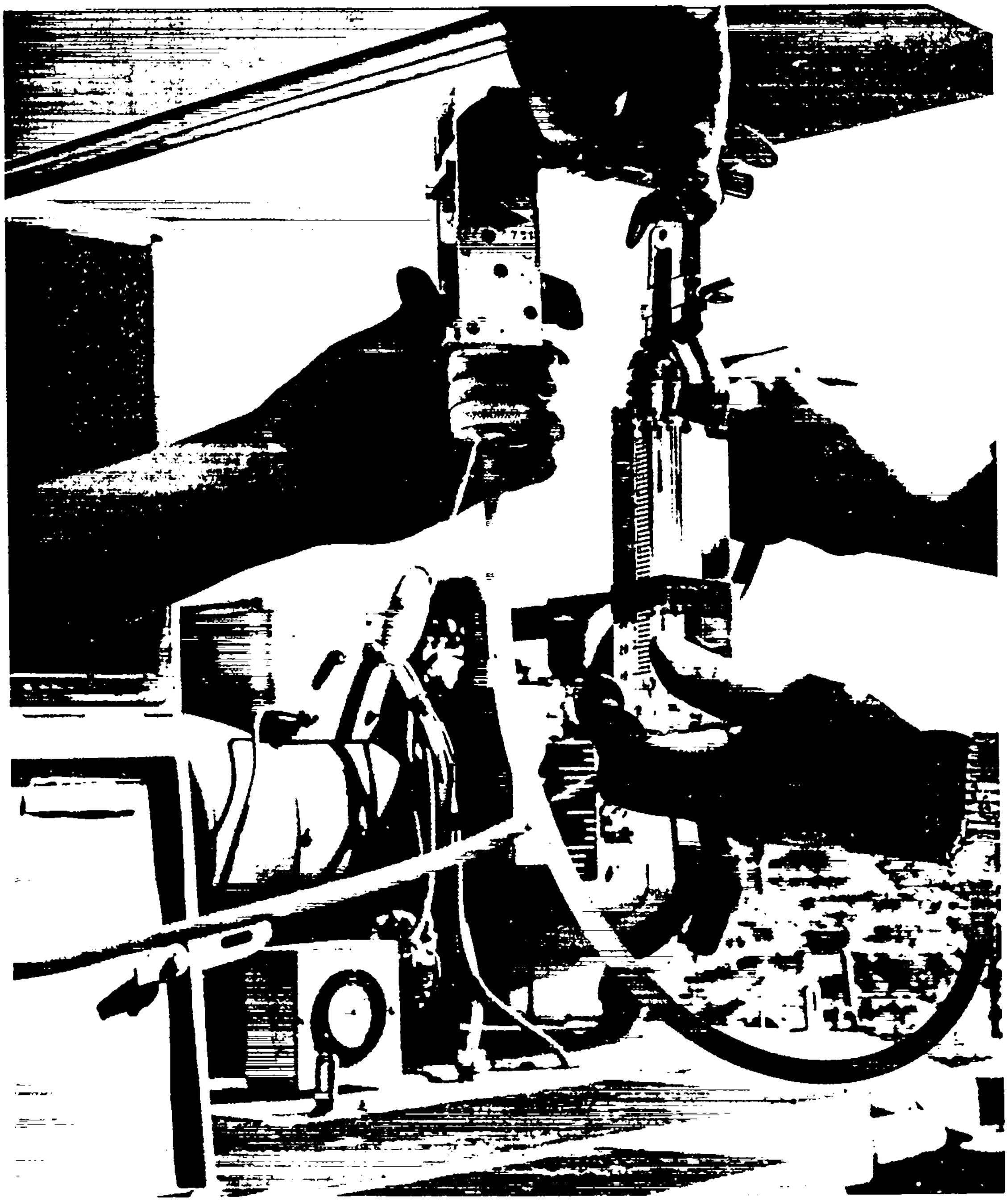

Fig. 9. Unico impactor and rotometer during installation.

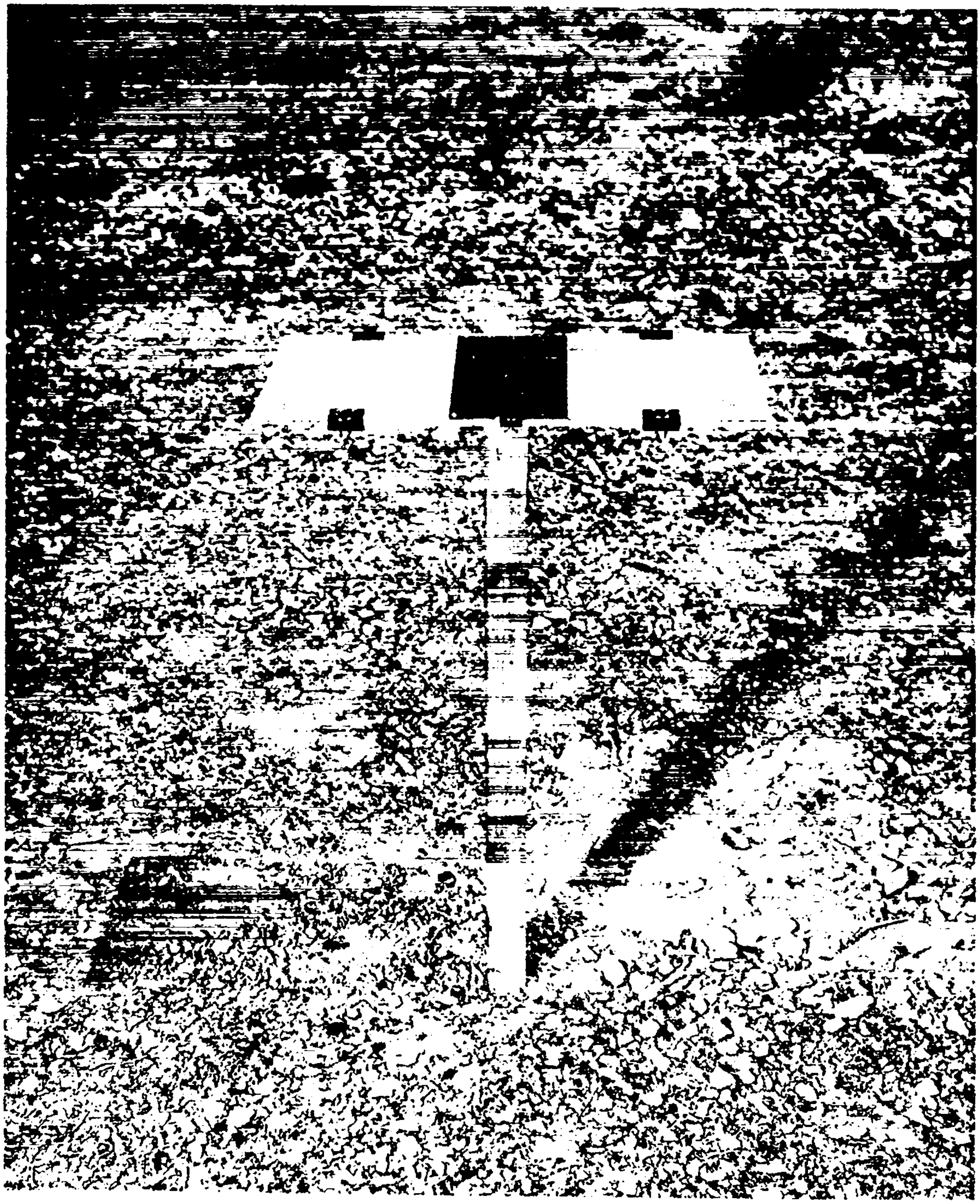

Fig. 10. Resin-coated trays as placed in field.

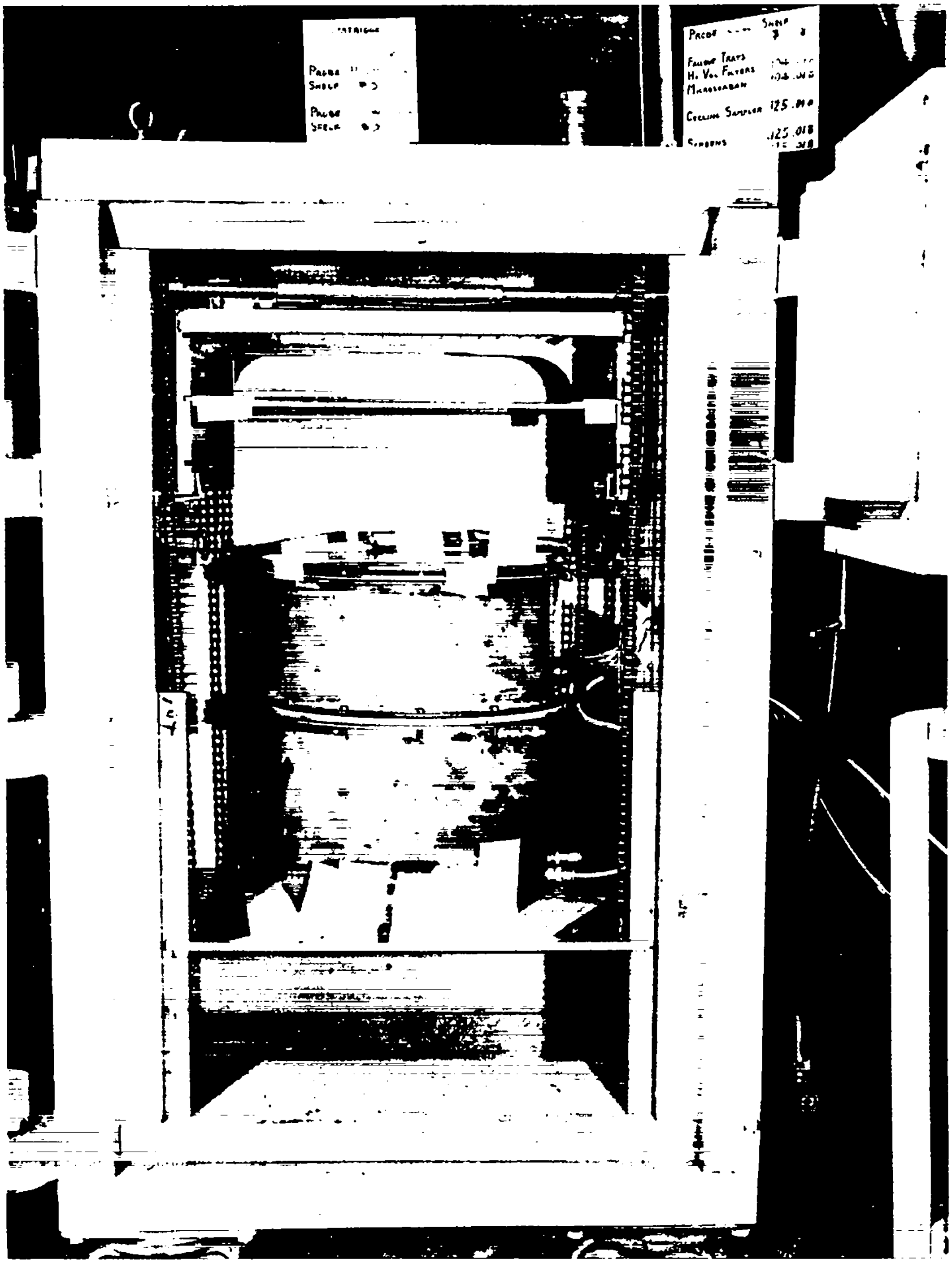

Fig. 11. Gross counting shield showing beta probe at top, sample holder, and gamma probe.

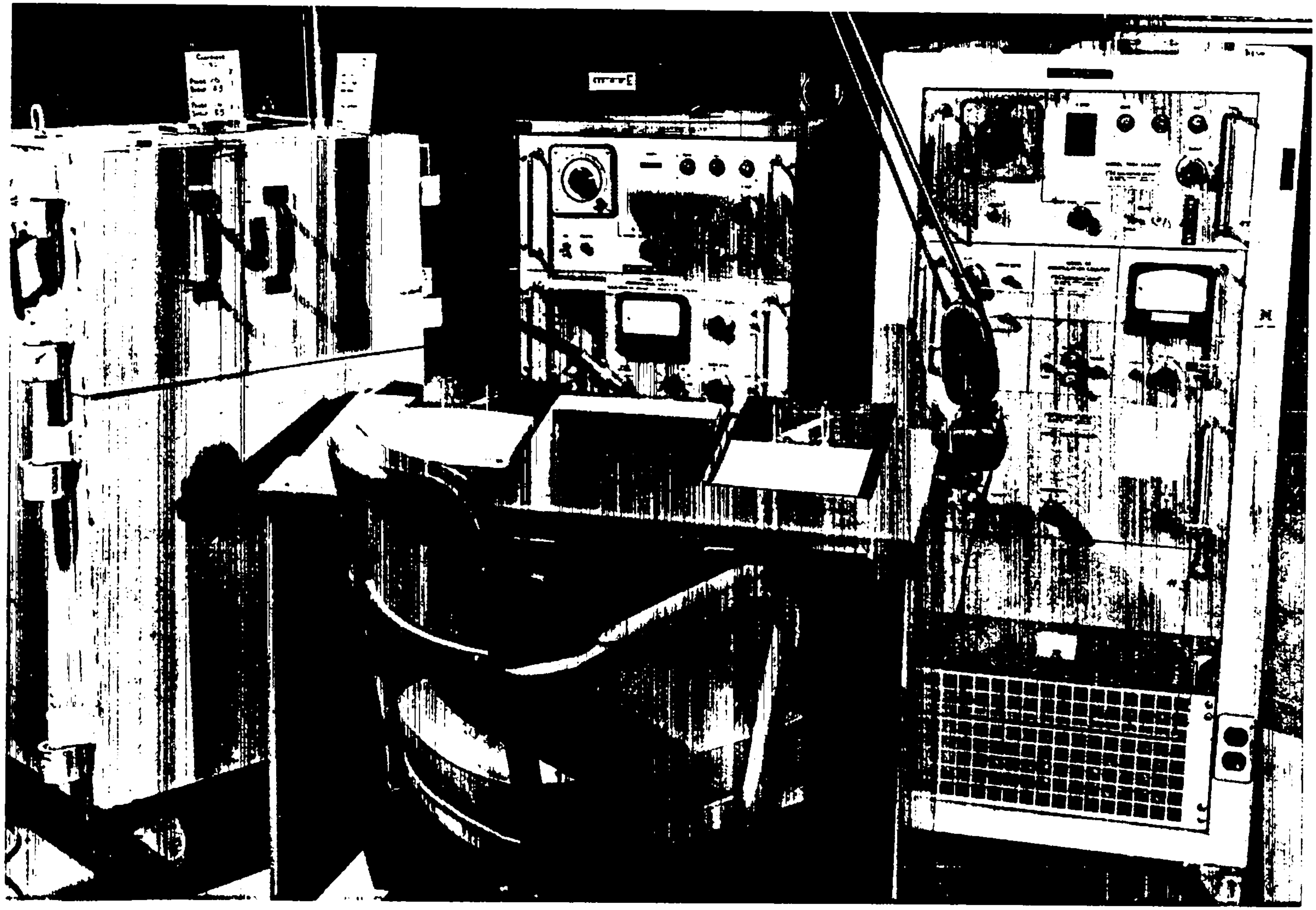

Fig. 12. Gross counting station showing shield, beta count electronics, and gamma count electronics.

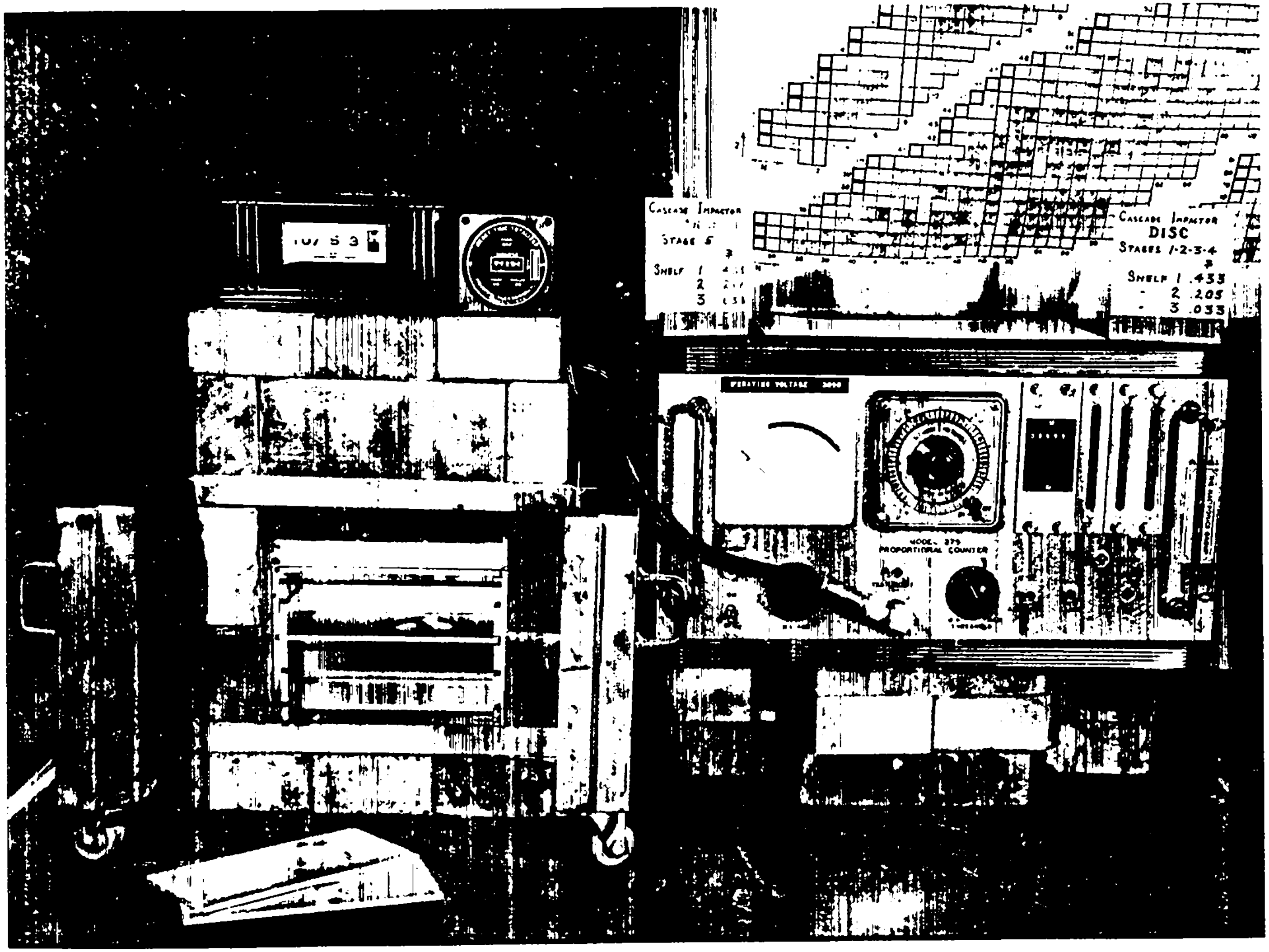

Fig. 13. Gross beta counter specially designed for Unico impactor samples.

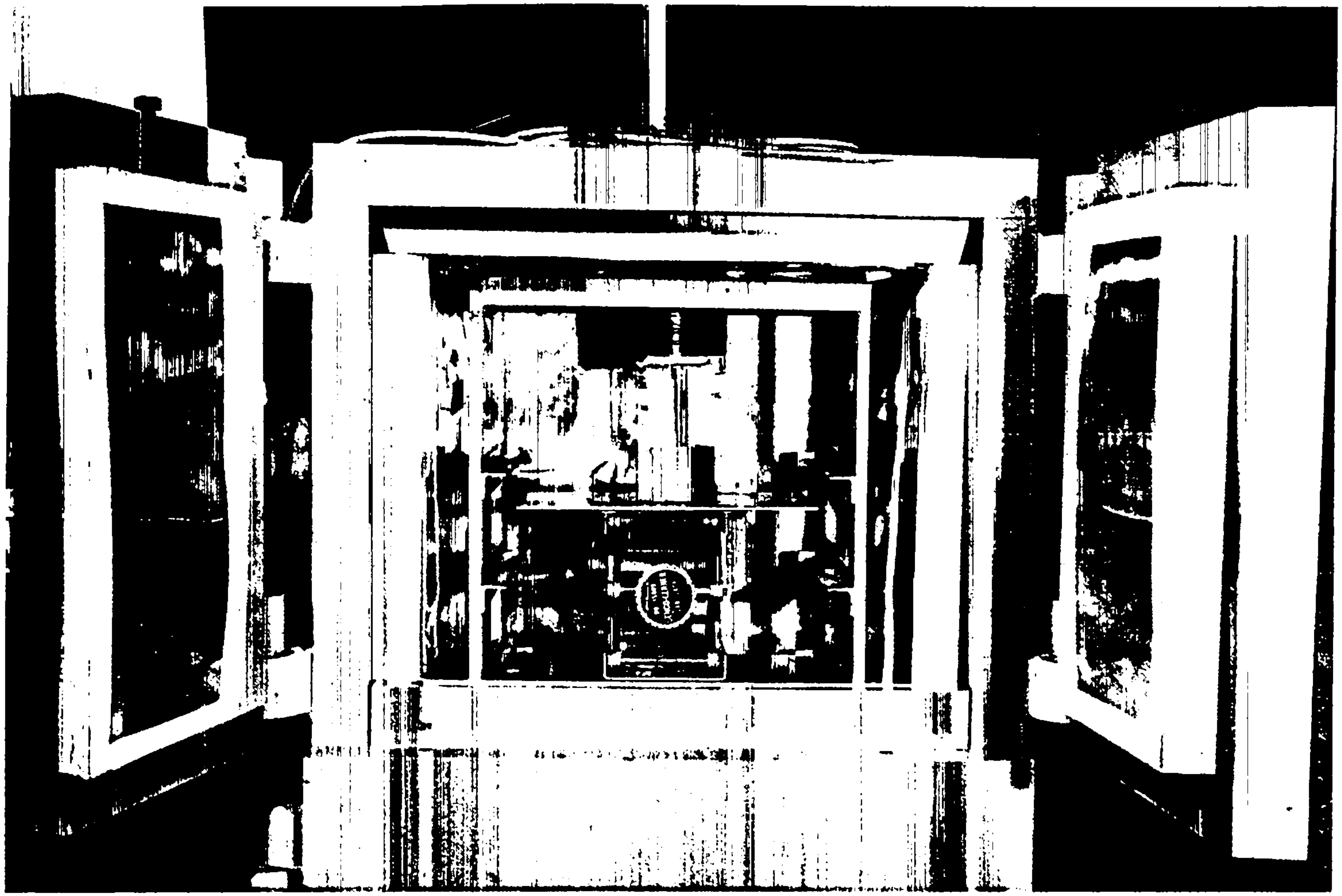

Fig. 14. Gamma pulse height analysis detector assembly showing shield, crystal, and sample positioning mechanism.

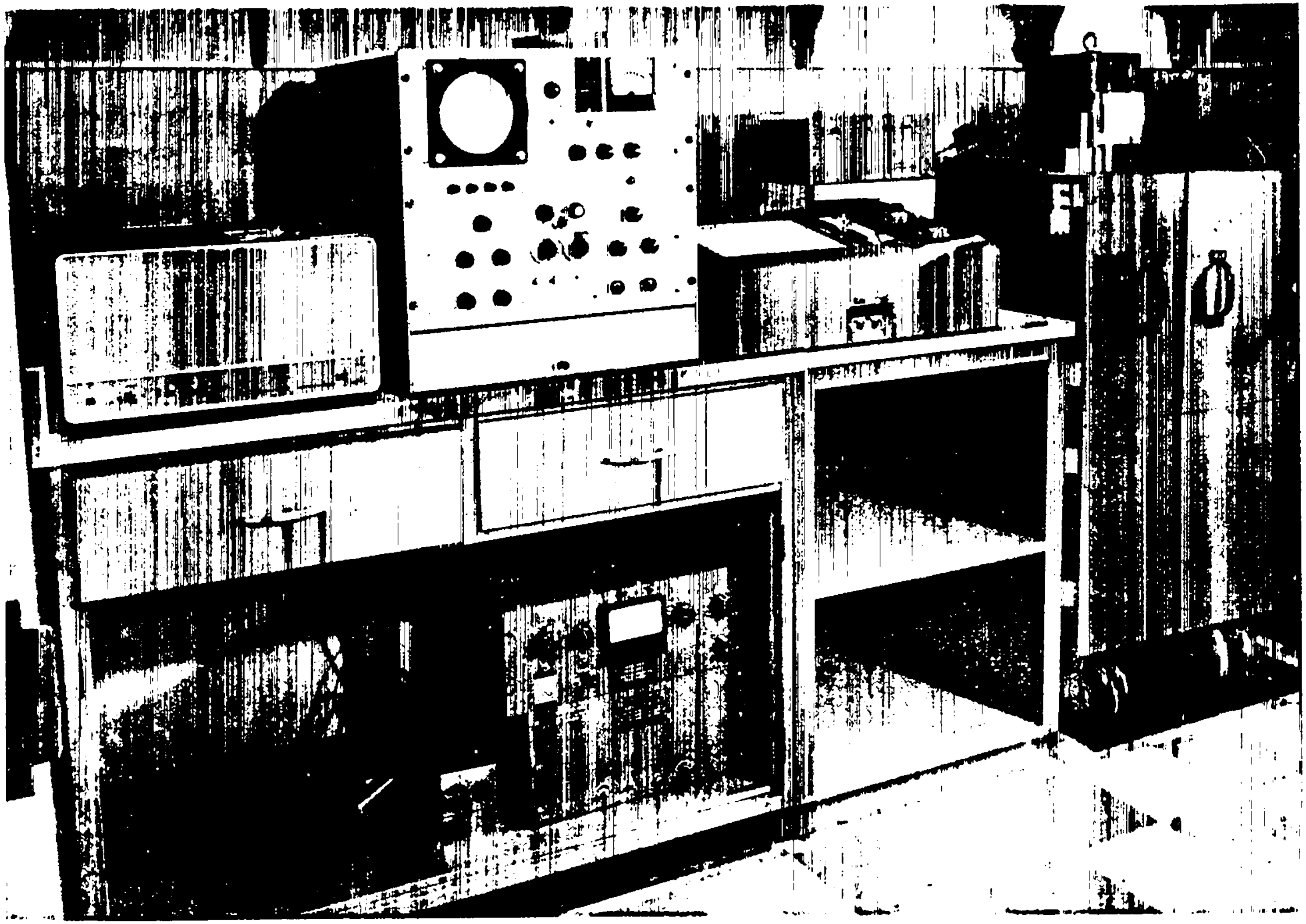

Fig. 15. Gamma pulse height analysis system showing printer, 400-channel analyzer, X-Y recorder, and detector shield.

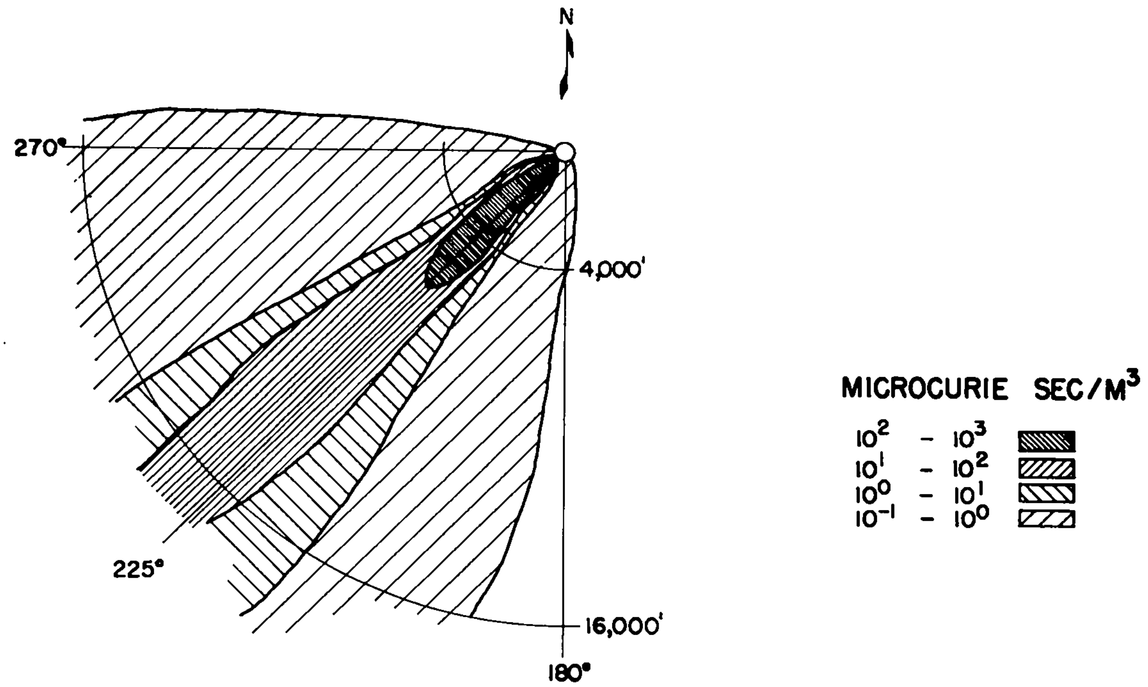

Fig. 16.

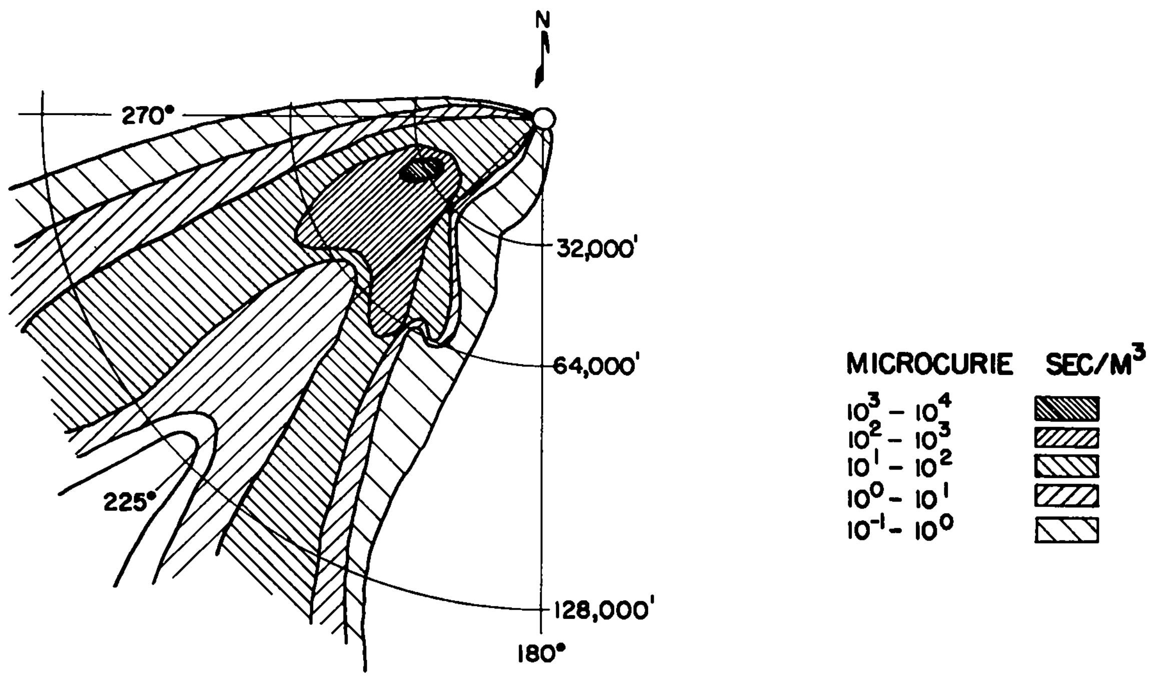

Fig. 17.

NRX A-2 Dosage from airborne particulate activity. Beta activity corrected to estimated time of cloud passage.

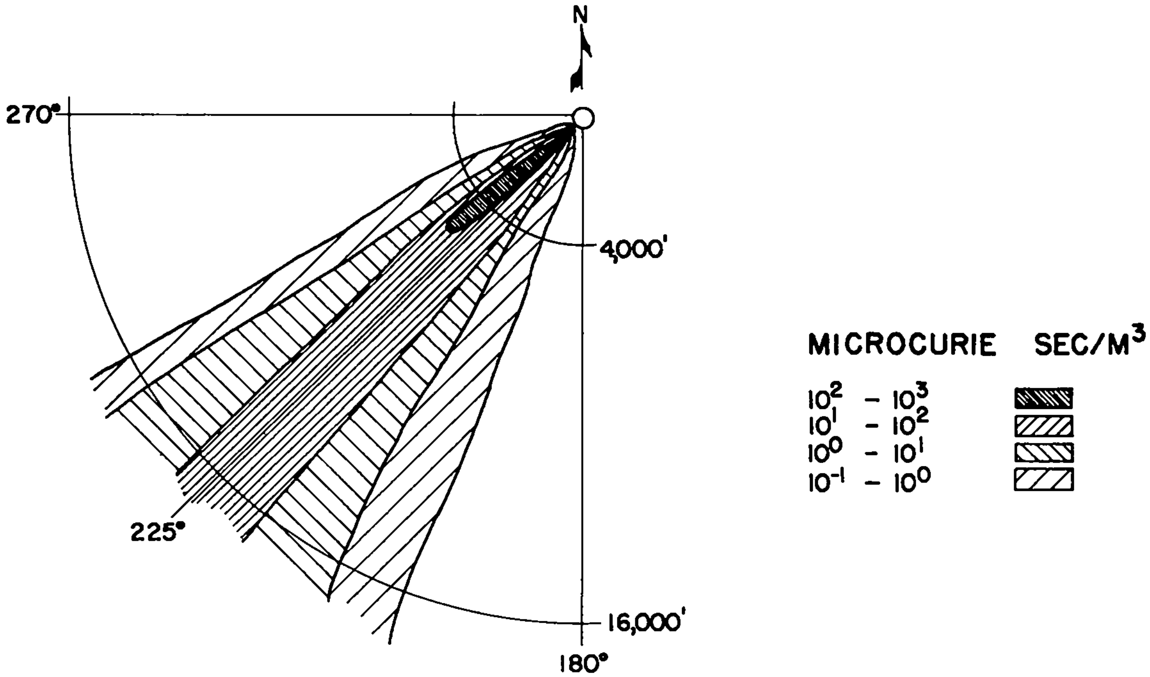

Fig. 18.

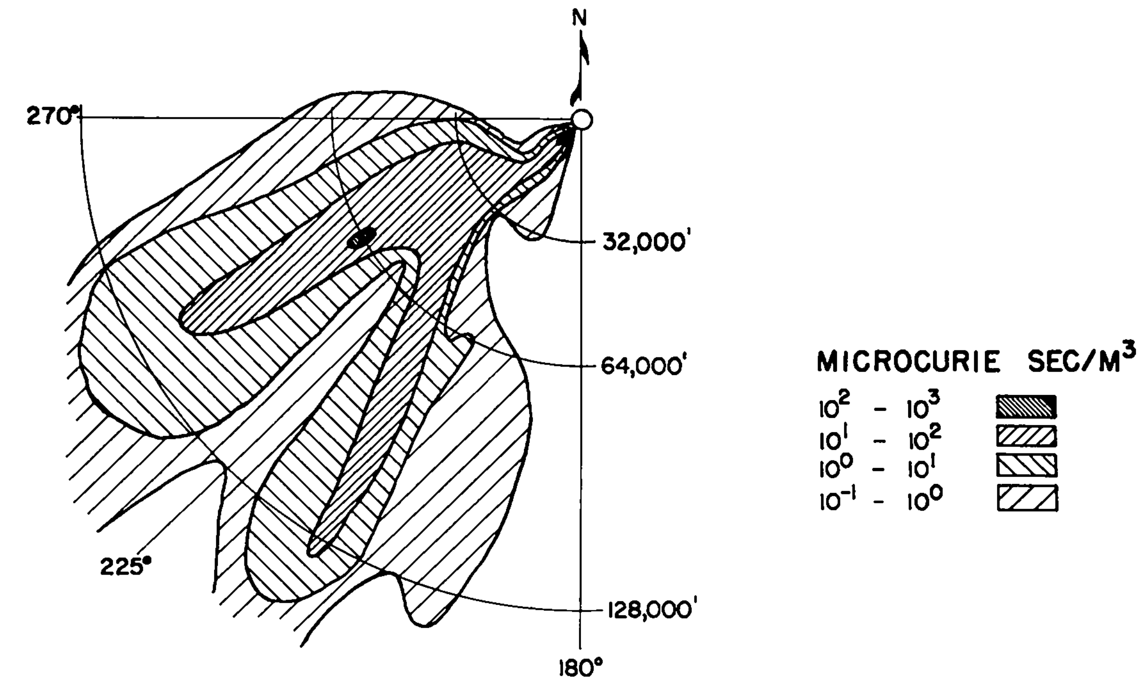

Fig. 19.

NRX A-2 Dosage from airborne gaseous activity. Gamma activity corrected to estimated time of cloud passage.

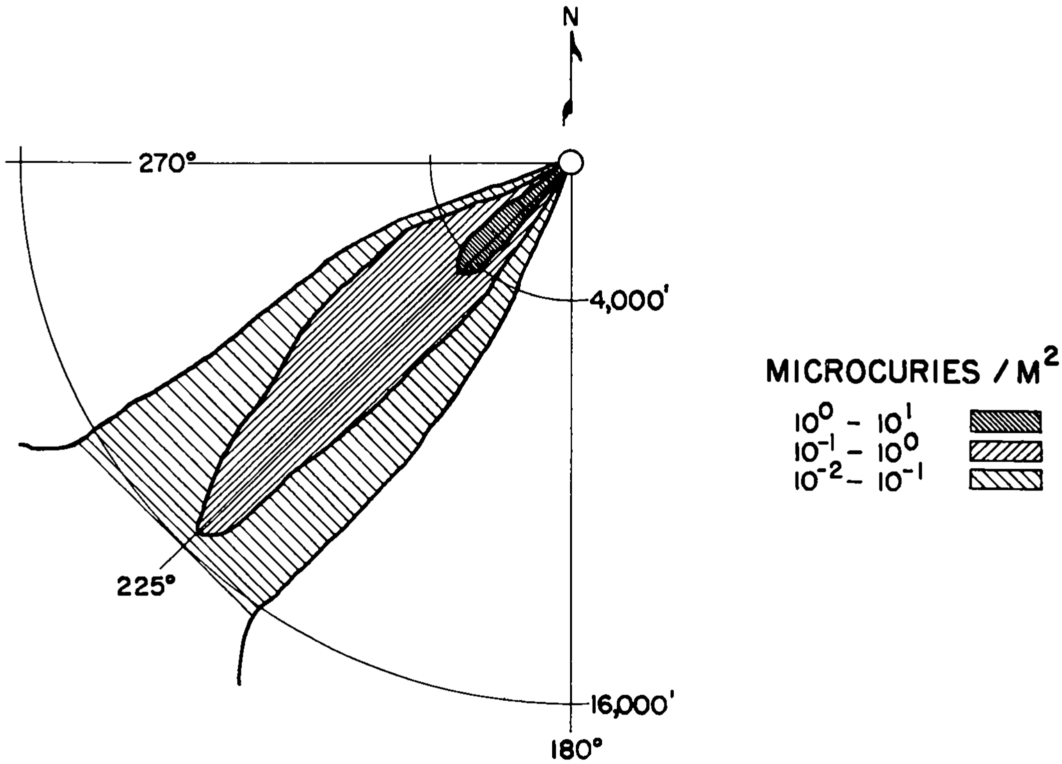

Fig. 20.

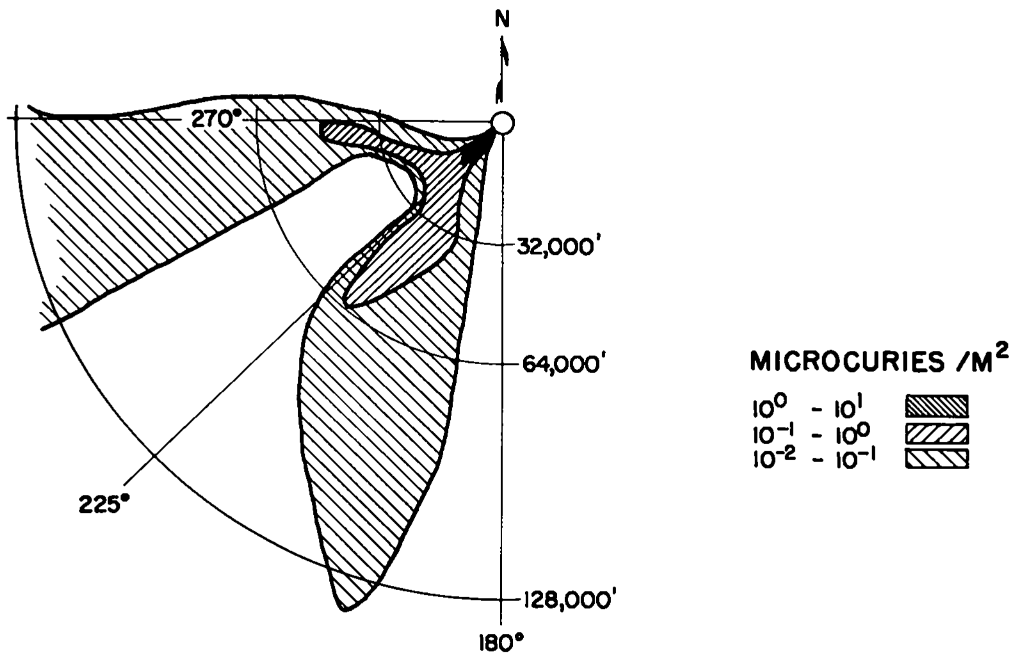

Fig. 21.

NRX A-2 Activity on resin-coated trays. Beta activity corrected to estimated time of cloud passage.

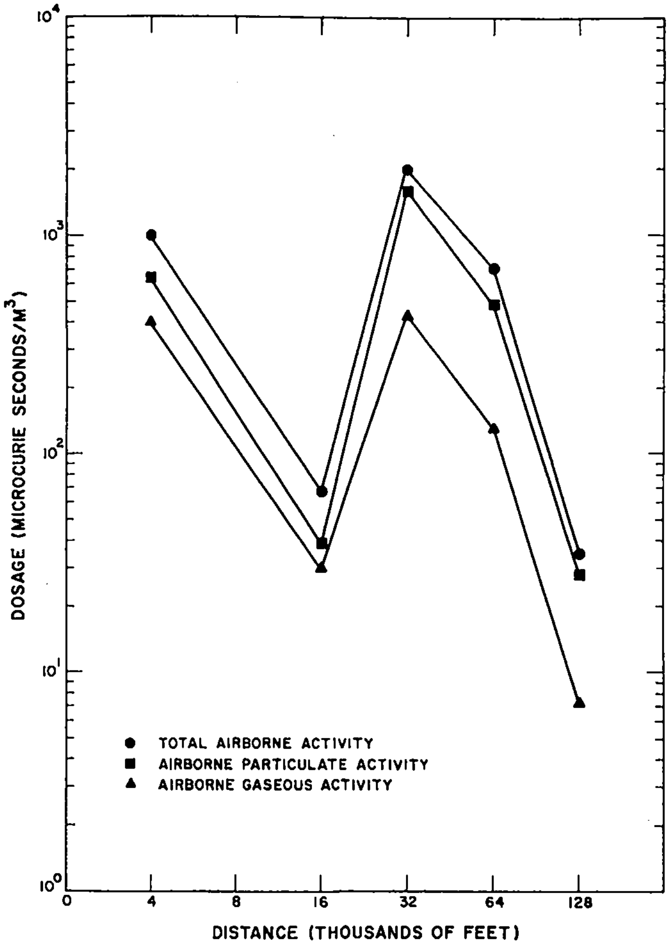

Fig. 22. NRX A-2 EP-4 Hot line exposure dosages.

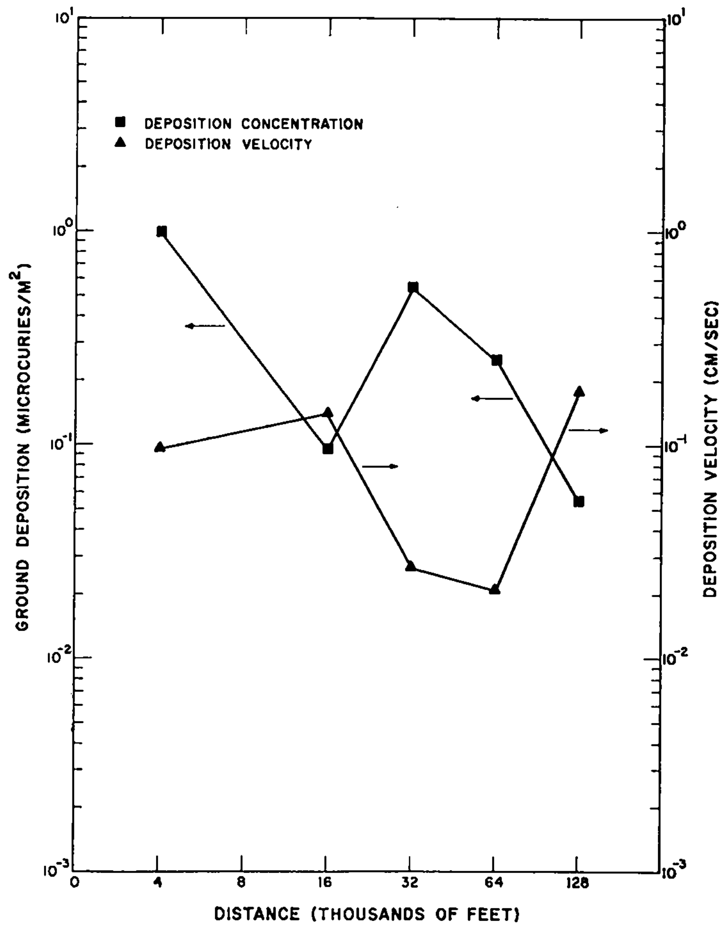

Fig. 23. NRX A-2 EP-4 Hot line ground deposition concentration and total deposition velocity.

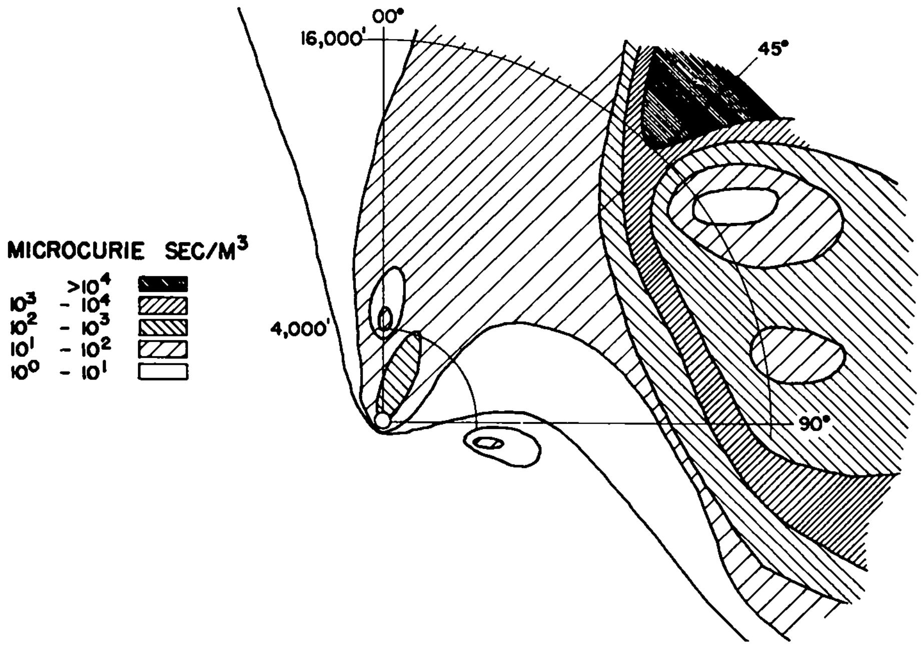

Fig. 24.

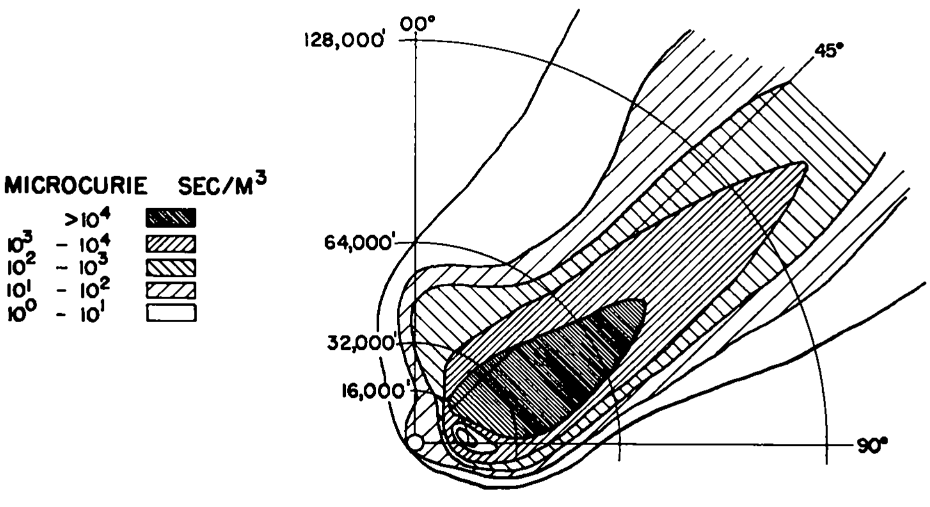

Fig. 25.
NRX A-3 EP-5 Dosage from airborne particulate activity. Beta activity corrected to estimated time of cloud passage.

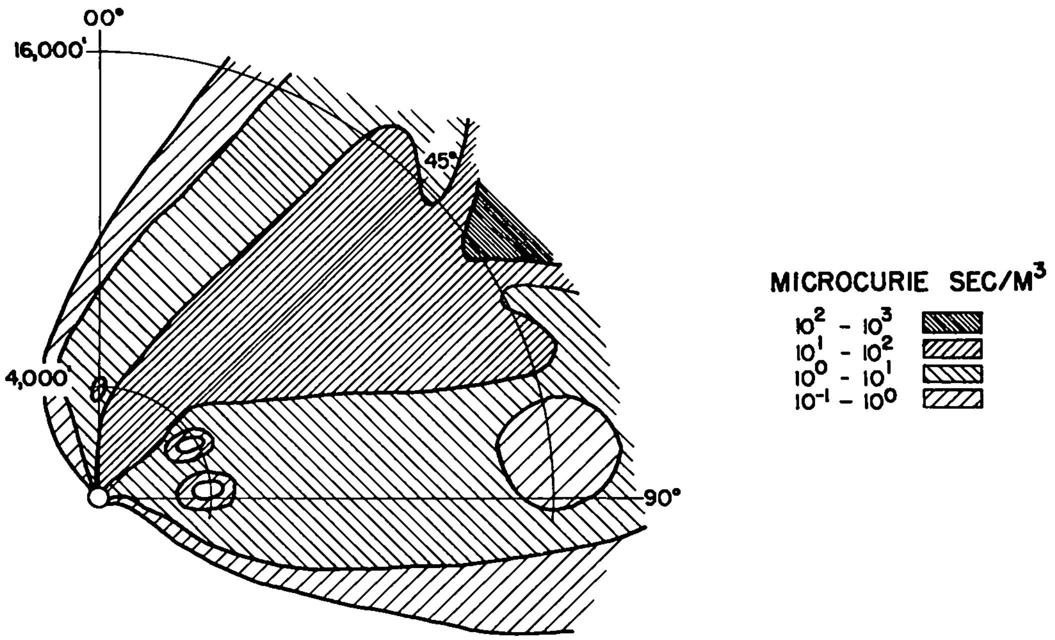

Fig. 26.

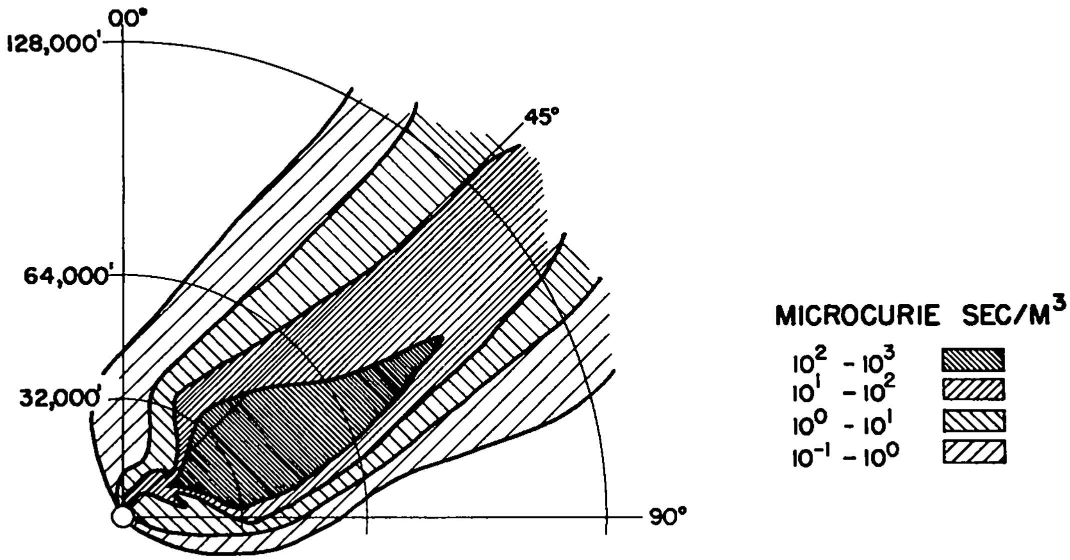

Fig. 27.
NRX A-3 EP-5 Dosage from airborne gaseous activity. Gamma activity corrected to estimated time of cloud passage.

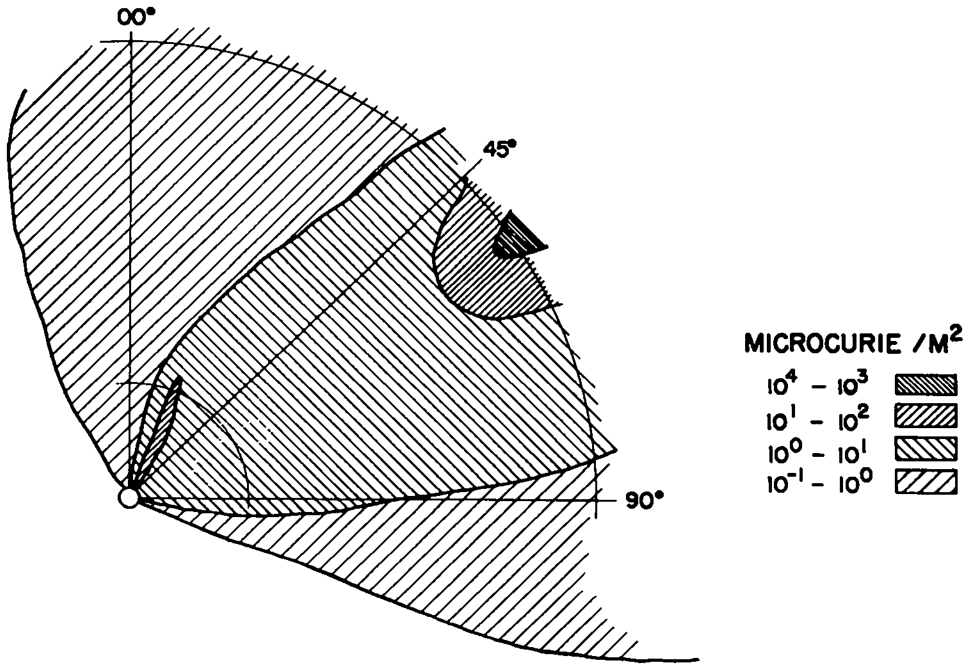

Fig. 28.

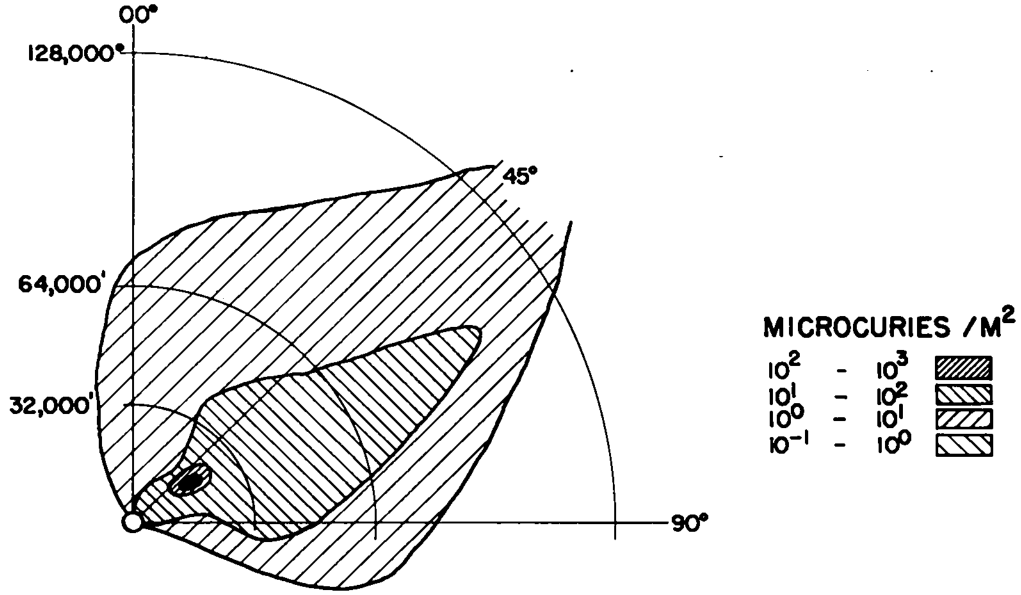

Fig. 29.

NRX A-3 EP-5 Activity on resin-coated trays. Beta activity corrected to estimated time of cloud passage.

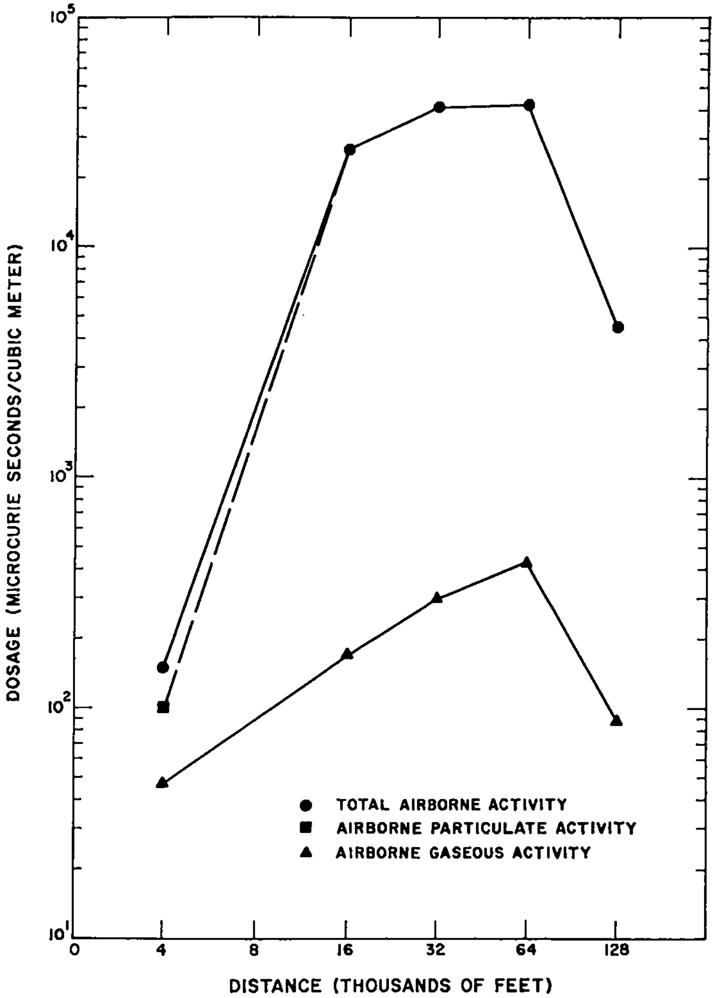

Fig. 30. NRX A-3 EP-5 Hot line exposure dosages.

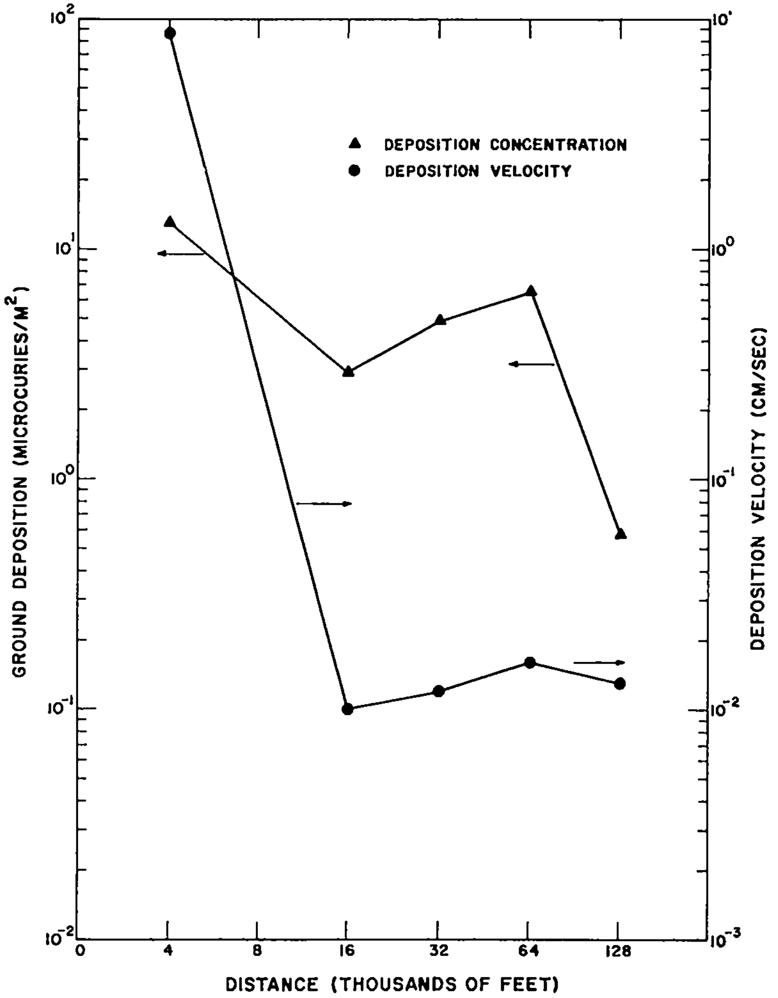

Fig. 31. NRX A-3 EP-5 Hot line ground deposition concentration and total deposition velocity.

TABLE I. MEASURED DOSAGES AND DEPOSITION CONCENTRATIONS - NRX A-2

Station	Dosage (μCi sec/M^3) Airborne Particulate	Dosage (μCi sec/M^3) Airborne Gaseous	Total	Ground Deposition (μCi/M^2)
4,000 ft arc				
4-190	1.6×10^{-1}	1.8×10^{-1}	3.3×10^{-1}	3.4×10^{-3}
4-195	-	-	-	5.0×10^{-4}
4-200	2.3×10^{-1}	1.9×10^{-1}	4.2×10^{-1}	3.1×10^{-3}
4-205	-	-	-	2.3×10^{-2}
4-210	8.4×10^{-1}	4.4×10^{-1}	1.3×10^{0}	6.0×10^{-2}
4-215	-	-	-	8.1×10^{-1}
4-220	6.4×10^{2}	4.0×10^{2}	1.0×10^{3}	9.9×10^{-1}
4-225	-	-	-	1.9×10^{0}
4-230	4.7×10^{2}	3.5×10^{2}	8.2×10^{2}	1.4×10^{0}
4-235	-	-	-	3.0×10^{-1}
4-240	1.2×10^{0}	2.8×10^{-1}	1.5×10^{0}	1.5×10^{-1}
4-245	-	-	-	1.4×10^{-1}
4-250	5.0×10^{-1}	5.3×10^{-1}	1.0×10^{0}	4.4×10^{-2}
4-255	-	-	-	6.8×10^{-4}
4-260	1.9×10^{-1}	6.8×10^{-2}	2.6×10^{-1}	0.0
4-265	-	-	-	1.1×10^{-3}
16,000 ft arc				
16-206	2.2×10^{-1}	2.5×10^{-1}	4.7×10^{-1}	1.7×10^{-3}
16-228	3.9×10^{1}	3.0×10^{1}	6.8×10^{1}	9.6×10^{-2}
16-246	1.6×10^{-1}	3.8×10^{-1}	5.3×10^{-1}	3.4×10^{-3}
16-272	7.1×10^{-1}	9.5×10^{-1}	1.7×10^{0}	1.2×10^{-3}
32,000 ft arc				
32-194	0.0	6.5×10^{-2}	6.5×10^{-2}	4.8×10^{-3}
32-206	2.4×10^{-1}	4.9×10^{-1}	7.3×10^{-1}	2.3×10^{-2}
32-219	2.1×10^{-1}	9.8×10^{-2}	3.0×10^{-1}	3.9×10^{-2}
32-228	1.7×10^{2}	9.1×10^{1}	2.6×10^{2}	1.1×10^{-1}
32-245	1.6×10^{3}	4.3×10^{2}	2.0×10^{3}	5.5×10^{-1}
32-258	3.9×10^{1}	1.6×10^{1}	5.6×10^{1}	2.6×10^{-2}
64,000 ft arc				
64-203	1.6×10^{1}	4.6×10^{0}	2.1×10^{1}	0.0
64-211	5.3×10^{-1}	5.6×10^{-1}	1.1×10^{0}	5.8×10^{-2}
64-215	1.6×10^{2}	5.7×10^{1}	2.2×10^{2}	6.4×10^{-2}
64-221	1.7×10^{2}	5.6×10^{1}	2.3×10^{2}	1.1×10^{-1}
64-230	1.2×10^{0}	3.9×10^{-1}	1.5×10^{0}	1.2×10^{-1}
64-241	4.8×10^{2}	1.3×10^{2}	6.1×10^{2}	1.3×10^{-1}
64-251	5.9×10^{1}	1.4×10^{1}	7.3×10^{1}	1.4×10^{-1}
128,000 ft arc				
128-190	1.4×10^{-1}	1.2×10^{-1}	2.6×10^{-1}	5.1×10^{-3}
128-200	0.0	9.1×10^{-2}	9.1×10^{-2}	1.1×10^{-2}
128-211	5.3×10^{1}	1.1×10^{1}	6.5×10^{1}	5.4×10^{-2}
128-225	2.3×10^{-1}	1.0×10^{-1}	3.3×10^{-1}	7.1×10^{-2}
128-236	2.8×10^{1}	7.3×10^{0}	3.5×10^{1}	6.5×10^{-2}
128-250	1.1×10^{1}	2.1×10^{0}	1.3×10^{1}	6.4×10^{-3}
128-263	1.0×10^{-1}	4.4×10^{-3}	1.1×10^{-1}	3.2×10^{-3}

TABLE II. MEASURED DOSAGES, EXPERIMENTAL PLAN 4 - NRX A-3

Station	Dosage (μCi sec/M^3) Airborne Particulate	Airborne Gaseous	Total
<u>2,000 ft arc</u>			
2-150	8.9×10^{0}	3.8×10^{1}	4.7×10^{1}
2-190	6.2×10^{0}	4.9×10^{1}	5.5×10^{1}
2-240	4.9×10^{2}	2.3×10^{2}	7.2×10^{2}
<u>4,000 ft arc</u>			
4-160	1.6×10^{1}	5.8×10^{0}	2.2×10^{1}
4-200	5.3×10^{0}	1.6×10^{0}	6.8×10^{0}
4-250	8.1×10^{-1}	7.4×10^{-1}	1.6×10^{0}
<u>6,000 ft arc</u>			
6-170	7.7×10^{1}	2.4×10^{1}	1.0×10^{2}
6-210	2.7×10^{-1}	0.0	2.7×10^{-1}
6-260	1.3×10^{-1}	1.2×10^{-1}	2.5×10^{-1}
<u>16,000 ft arc</u>			
16-080	1.3×10^{-1}	1.2×10^{-1}	2.4×10^{-1}
16-130	3.8×10^{1}	1.3×10^{1}	5.1×10^{1}
16-140	4.2×10^{2}	9.0×10^{1}	5.1×10^{2}
16-150	4.2×10^{2}	1.0×10^{2}	5.2×10^{2}
16-160	4.4×10^{2}	1.9×10^{2}	6.3×10^{2}
16-170	1.9×10^{2}	5.0×10^{1}	2.4×10^{2}
16-180	5.2×10^{1}	8.7×10^{0}	6.0×10^{1}
<u>32,000 ft arc</u>			
32-102	0.0	2.6×10^{-2}	2.6×10^{-2}
32-130	5.5×10^{-1}	0.0	5.5×10^{-1}
32-166	8.4×10^{1}	6.4×10^{1}	1.5×10^{2}
32-194	5.6×10^{-2}	6.7×10^{-2}	1.2×10^{-1}
<u>64,000 ft arc</u>			
64-117	4.3×10^{-1}	0.0	4.3×10^{-1}
64-132	6.6×10^{-2}	0.0	6.6×10^{-2}
64-162	3.6×10^{1}	2.2×10^{1}	5.9×10^{1}
64-172	1.0×10^{1}	6.1×10^{0}	1.6×10^{1}

TABLE III. MEASURED DOSAGES AND GROUND DEPOSITION CONCENTRATIONS, EXPERIMENTAL PLAN 5 - NRX A-3

Station	Dosage (μCi sec/M^3) Airborne Particulate	Airborne Gaseous	Total	Ground Deposition (μCi/M^2)
4,000 ft arc				
4-340	5.4×10^{0}	8.5×10^{-1}	6.3×10^{0}	1.4×10^{-1}
4-350	3.1×10^{1}	5.3×10^{0}	3.6×10^{1}	4.8×10^{-1}
4-000	8.6×10^{-1}	4.3×10^{-1}	1.3×10^{0}	5.0×10^{-2}
4-010	7.1×10^{1}	2.8×10^{1}	1.0×10^{2}	2.0×10^{0}
4-020	1.0×10^{2}	4.7×10^{1}	1.5×10^{2}	1.3×10^{1}
4-030	3.8×10^{1}	1.6×10^{1}	5.5×10^{1}	4.8×10^{0}
4-040	5.5×10^{1}	2.8×10^{1}	8.3×10^{1}	7.0×10^{0}
4-050	6.5×10^{0}	1.2×10^{0}	7.7×10^{0}	4.3×10^{0}
4-060	4.0×10^{0}	0.0	4.0×10^{0}	4.0×10^{0}
4-070	6.9×10^{0}	7.9×10^{0}	1.5×10^{1}	2.1×10^{0}
4-080	1.2×10^{0}	0.0	1.2×10^{0}	7.9×10^{0}
4-090	6.8×10^{-1}	0.0	6.8×10^{-1}	2.4×10^{0}
4-100	2.6×10^{1}	2.1×10^{0}	2.8×10^{1}	8.6×10^{-1}
16,000 ft arc				
16-005	1.1×10^{1}	1.2×10^{-1}	1.1×10^{1}	-
16-015	8.4×10^{0}	3.4×10^{-1}	8.7×10^{0}	2.1×10^{-1}
16-034	5.2×10^{1}	4.2×10^{0}	5.6×10^{1}	2.9×10^{-1}
16-043	2.7×10^{4}	1.7×10^{2}	2.7×10^{4}	2.9×10^{0}
16-055	3.1×10^{0}	3.8×10^{-1}	3.5×10^{0}	2.1×10^{2}
16-070	3.6×10^{2}	5.7×10^{1}	4.2×10^{2}	1.1×10^{0}
16-080	5.4×10^{1}	2.3×10^{-1}	5.4×10^{1}	2.3×10^{0}
16-095	9.8×10^{2}	1.5×10^{0}	9.8×10^{2}	1.8×10^{-1}
16-110	1.8×10^{3}	5.9×10^{-2}	1.8×10^{3}	3.9×10^{-1}
32,000 ft arc				
32-344	5.1×10^{1}	3.0×10^{-1}	5.1×10^{1}	6.5×10^{-1}
32-003	1.2×10^{2}	1.4×10^{-1}	1.2×10^{2}	4.6×10^{-1}
32-028	2.2×10^{3}	2.7×10^{1}	2.2×10^{3}	3.7×10^{-1}
32-041	3.1×10^{4}	2.2×10^{2}	3.1×10^{4}	3.8×10^{0}
32-059	2.7×10^{4}	2.0×10^{2}	2.7×10^{4}	1.8×10^{0}
32-067	3.5×10^{4}	2.8×10^{2}	3.5×10^{4}	2.0×10^{0}
32-075	4.0×10^{4}	2.7×10^{2}	4.0×10^{4}	3.0×10^{0}
32-083	4.1×10^{4}	3.0×10^{2}	4.1×10^{4}	4.9×10^{0}
32-102	3.7×10^{2}	5.5×10^{-1}	3.7×10^{2}	4.7×10^{-1}
64,000 ft arc				
64-356	-	-	-	1.0×10^{-1}
64-014	5.3×10^{0}	1.1×10^{-1}	5.4×10^{0}	1.6×10^{-1}
64-024	9.2×10^{0}	5.4×10^{-1}	9.7×10^{0}	1.5×10^{-1}
64-031	1.4×10^{1}	1.6×10^{0}	1.6×10^{1}	5.3×10^{-1}
64-045	5.5×10^{3}	4.0×10^{1}	5.5×10^{3}	5.8×10^{-1}
64-057	1.2×10^{4}	9.6×10^{1}	1.2×10^{4}	2.4×10^{0}
64-069	4.1×10^{4}	4.3×10^{2}	4.2×10^{4}	6.6×10^{0}
64-085	8.3×10^{-1}	9.7×10^{-2}	9.3×10^{-1}	2.4×10^{-1}
128,000 ft arc				
128-011	1.1×10^{1}	1.1×10^{-1}	1.1×10^{1}	4.9×10^{-2}
128-018	1.2×10^{2}	1.2×10^{0}	1.2×10^{2}	4.5×10^{-2}
128-028	4.4×10^{0}	1.0×10^{-1}	4.6×10^{0}	3.7×10^{-2}
128-044	1.6×10^{2}	8.8×10^{0}	1.7×10^{2}	1.1×10^{-1}
128-054	4.6×10^{3}	8.7×10^{1}	4.6×10^{3}	5.8×10^{-1}
128-068	1.9×10^{1}	6.0×10^{-1}	2.0×10^{1}	1.8×10^{-2}
128-078	-	-	-	4.0×10^{-2}

TABLE IV. DEPOSITION VELOCITIES IN CENTIMETERS PER SECOND, FULL POWER TEST - NRX A-2

Station	Airborne Particulate Material	Total Airborne Material
4,000 ft arc		
4-190	2.1	1.0
4-200	1.3	0.73
4-210	7.2	4.7
4-220	0.16	0.096
4-230	0.31	0.18
4-240	12.	10.
4-250	8.8	4.3
16,000 ft arc		
16-206	0.77	0.36
16-228	0.25	0.14
16-246	2.1	0.63
16-272	0.17	0.073
32,000 ft arc		
32-194	-	7.3
32-206	9.6	3.1
32-219	19.	13.
32-228	0.062	0.041
32-245	0.035	0.027
32-258	0.068	0.048
64,000 ft arc		
64-211	11.	5.3
64-215	0.040	0.029
64-221	0.056	0.049
64-230	11.	8.0
64-241	0.026	0.021
64-251	0.24	0.20
128,000 ft arc		
128-190	3.7	1.9
128-200	-	12.
128-211	0.10	0.084
128-225	31.	22.
128-236	0.23	0.18
128-250	0.059	0.049
128-263	3.1	3.0

TABLE V. DEPOSITION VELOCITIES IN CENTIMETERS PER SECOND, EXPERIMENTAL PLAN 5 - NRX A-3

Station	Airborne Particulate Material	Total Airborne Material
4,000 ft arc		
4-340	2.6	2.2
4-350	1.6	1.3
4-000	5.8	3.9
4-010	2.7	1.9
4-020	13.	8.7
4-030	12.	8.7
4-040	13.	8.5
4-050	66.	56.
4-060	99.	99.
4-070	30.	14.
4-080	670.	670.
4-090	350.	350.
4-100	3.4	3.1
16,000 ft arc		
16-015	2.5	2.4
16-034	0.55	0.51
16-043	0.011	0.011
16-055	6800.	6100.
16-070	0.30	0.26
16-080	4.3	4.3
16-095	0.018	0.018
16-110	0.022	0.022
32,000 ft arc		
32-344	1.3	1.3
32-003	0.38	0.38
32-028	0.017	0.017
32-041	0.012	0.012
32-059	0.0064	0.0064
32-067	0.0058	0.0057
32-075	0.0076	0.0075
32-083	0.012	0.012
32-102	0.12	0.12
64,000 ft arc		
64-014	3.1	3.0
64-024	1.6	1.6
64-031	3.8	3.4
64-045	0.011	0.011
64-057	0.020	0.020
64-069	0.016	0.016
64-085	29.	26.
128,000 ft arc		
128-011	0.45	0.45
128-018	0.037	0.037
128-028	0.84	0.82
128-044	0.069	0.065
128-054	0.013	0.013
128-068	0.092	0.090

TABLE VI. APPARENT ZERO TIME COMPOSITION OF SAMPLES, FULL POWER TEST - NRX A-2

Airborne Particulate Material
4,000 and 16,000 ft arcs

Isotope	%
I-134	98.0
I-135	0.83
I-133	0.91
Te I-132	0.38
I-131	0.036

Airborne Particulate Material
32,000 and 64,000 ft arcs

Isotope	%
I-134	98.3
I-135	1.4
I-133	0.24
Te I-132	0.043
I-131	0.025
Ba La-140	0.0052

Airborne Particulate Material
128,000 ft arc

Isotope	%
I-134	98.7
I-135	1.2
I-133	0.090
Te I-132	0.038
I-131	0.021

Airborne Gaseous Material
4,000 and 8,000 ft arc

Isotope	%
I-134	96.7
I-135	1.2
I-133	1.9
Te I-132	0.048
I-131	0.11

Airborne Gaseous Material
32,000, 64,000, and 128,000 ft arcs

Isotope	%
I-134	94.0
I-135	4.4
I-133	1.4
Te I-132	0.090
I-131	0.081

Ground Deposited Material
All arcs

Isotope	%
I-132	49.8
I-135	23.4
I-133	25.1
Te I-132	0.42
I-131	1.2

TABLE VII. APPARENT ZERO TIME COMPOSITION OF SAMPLES, EXPERIMENTAL PLAN 4 - NRX A-3

Airborne Particulate Material
2,000, 4,000, 6,000, and 16,000 ft arcs

Isotope	%
I-134	93.6
Sr Y-92	4.14
I-135	1.22
I-133	0.87
Te I-132	0.058
I-131	0.089
Ba La-140	0.016

Airborne Particulate Material
32,000 and 64,000 ft arcs

Isotope	%
I-134	95.5
I-135	3.5
I-133	0.75
Te I-132	0.054
I-131	0.17

Airborne Gaseous Material
2,000, 4,000, 6,000, and 16,000 ft arcs

Isotope	%
I-134	86.7
I-132	5.4
I-135	5.1
Xe-135	1.1
I-133	1.4
Te I-132	0.18
I-131	0.11

Airborne Gaseous Material
32,000 and 64,000 ft arcs

Isotope	%
I-134	96.8
I-135	1.3
Xe-135	1.5
I-133	0.33
Te I-132	0.076
I-131	0.059

TABLE VIII. APPARENT ZERO TIME COMPOSITION OF SAMPLES, EXPERIMENTAL PLAN 5- NRX A-3

Airborne Particulate Material 4,000 ft arc

Isotope	%
I-134	96.4
I-135	1.9
I-133	1.3
Te I-132	0.11
I-131	0.27

Airborne Particulate Material 16,000, 32,000, 64,000, and 128,000 ft arcs

Isotope	%
I-134	99.92
I-135	0.071
I-133	0.0064
Te I-132	0.0016
I-131	0.00056
Ba La-140	0.00016
LL beta[a]	0.00020

Airborne Gaseous Material 4,000 ft arc

Isotope	%
I-134	98.0
I-133	1.7
I-131	0.32

Airborne Gaseous Material 16,000, 32,000, 64,000, and 128,000 ft arcs

Isotope	%
I-134	90.9
I-135	7.6
I-133	1.3
Te I-132	0.085
I-131	0.11

Deposited Material All arcs

Isotope	%
I-134	98.7
Sr-91	0.42
I-133	0.85
I-131	0.076

(a) Unidentified long-lived beta activity.

TABLE IX. CLOUD PASSAGE EFFECTS - NRX A-2

Station	Whole Body Dose Due to Cloud Passage (rads)	Adult Inhalation Thyroid Dose (rads)
4,000 ft arc		
4-190	5.8×10^{-8}	2.5×10^{-6}
4-200	7.4×10^{-8}	3.1×10^{-6}
4-210	2.2×10^{-7}	9.3×10^{-6}
4-220	1.8×10^{-4}	7.6×10^{-3}
4-230	1.4×10^{-4}	6.0×10^{-3}
4-240	2.6×10^{-7}	1.0×10^{-5}
4-250	1.8×10^{-7}	7.8×10^{-6}
4-260	4.5×10^{-8}	1.8×10^{-6}
16,000 ft arc		
16-206	8.2×10^{-8}	3.7×10^{-6}
16-228	1.2×10^{-5}	5.3×10^{-4}
16-246	9.3×10^{-8}	4.4×10^{-6}
16-272	2.9×10^{-7}	1.3×10^{-5}
32,000 ft arc		
32-194	1.1×10^{-8}	6.3×10^{-7}
32-206	1.3×10^{-7}	6.4×10^{-6}
32-219	5.3×10^{-8}	2.3×10^{-6}
32-228	4.6×10^{-5}	2.0×10^{-3}
32-245	3.5×10^{-4}	1.5×10^{-2}
32-258	9.7×10^{-6}	4.2×10^{-4}
64,000 ft arc		
64-203	3.6×10^{-6}	1.7×10^{-4}
64-211	1.9×10^{-7}	1.0×10^{-5}
64-215	3.8×10^{-5}	1.8×10^{-3}
64-221	4.0×10^{-5}	1.9×10^{-3}
64-230	2.7×10^{-7}	1.3×10^{-5}
64-241	1.0×10^{-4}	4.9×10^{-3}
64-251	1.3×10^{-5}	5.8×10^{-4}
128,000 ft arc		
128-190	4.6×10^{-8}	3.7×10^{-6}
128-200	1.6×10^{-8}	1.8×10^{-6}
128-211	1.1×10^{-5}	6.8×10^{-4}
128-225	5.7×10^{-8}	4.0×10^{-6}
128-236	6.1×10^{-6}	3.8×10^{-4}
128-250	2.3×10^{-6}	1.4×10^{-4}
128-263	1.9×10^{-8}	9.7×10^{-7}

TABLE X. CLOUD PASSAGE EFFECTS, EXPERIMENTAL PLAN 4 - NRX A-3

Station	Whole Body Dose Due to Cloud Passage (rads)	Adult Inhalation Thyroid Dose (rads)
2,000 ft arc		
2-150	8.2×10^{-6}	4.0×10^{-4}
2-190	9.6×10^{-6}	4.8×10^{-4}
2-240	1.3×10^{-4}	5.4×10^{-3}
4,000 ft arc		
4-160	3.8×10^{-6}	1.6×10^{-4}
4-200	1.2×10^{-6}	5.0×10^{-5}
4-250	2.7×10^{-7}	1.2×10^{-5}
6,000 ft arc		
6-170	1.8×10^{-5}	7.5×10^{-4}
6-210	4.7×10^{-8}	1.8×10^{-6}
6-260	4.4×10^{-8}	2.0×10^{-6}
16,000 ft arc		
16-080	4.3×10^{-8}	2.0×10^{-6}
16-130	9.0×10^{-6}	4.0×10^{-4}
16-140	8.9×10^{-5}	3.9×10^{-3}
16-150	9.1×10^{-5}	4.0×10^{-3}
16-160	1.1×10^{-4}	5.0×10^{-3}
16-170	4.2×10^{-5}	1.9×10^{-3}
16-180	1.1×10^{-5}	4.6×10^{-4}
32,000 ft arc		
32-102	4.6×10^{-9}	1.9×10^{-7}
32-130	9.6×10^{-8}	5.2×10^{-6}
32-166	2.6×10^{-5}	1.3×10^{-3}
32-194	2.2×10^{-8}	1.0×10^{-6}
64,000 ft arc		
64-117	7.4×10^{-8}	5.4×10^{-6}
64-132	1.2×10^{-8}	8.3×10^{-7}
64-162	1.0×10^{-5}	6.5×10^{-4}
64-172	2.8×10^{-6}	1.8×10^{-4}

TABLE XI. CLOUD PASSAGE EFFECTS, EXPERIMENTAL PLAN 5 - NRX A-3

Station	Whole Body Dose Due to Cloud Passage (rads)	Adult Inhalation Thyroid Dose (rads)
4,000 ft arc		
4-340	1.1×10^{-6}	5.3×10^{-5}
4-350	6.3×10^{-6}	3.1×10^{-4}
4-000	2.3×10^{-7}	1.1×10^{-5}
4-010	1.8×10^{-5}	8.4×10^{-4}
4-020	2.6×10^{-5}	1.2×10^{-3}
4-030	9.6×10^{-6}	4.6×10^{-4}
4-040	1.4×10^{-5}	7.0×10^{-4}
4-050	1.3×10^{-6}	6.5×10^{-5}
4-060	7.1×10^{-7}	3.4×10^{-5}
4-070	2.6×10^{-6}	1.3×10^{-4}
4-080	2.1×10^{-7}	1.0×10^{-5}
4-090	1.2×10^{-7}	5.7×10^{-6}
4-100	4.8×10^{-6}	2.3×10^{-4}
16,000 ft arc		
16-005	2.0×10^{-6}	6.6×10^{-5}
16-015	1.5×10^{-6}	5.1×10^{-5}
16-034	9.9×10^{-6}	3.4×10^{-4}
16-043	4.7×10^{-3}	1.6×10^{-1}
16-055	6.1×10^{-7}	2.2×10^{-5}
16-070	7.3×10^{-5}	2.6×10^{-3}
16-080	9.4×10^{-6}	3.1×10^{-4}
16-095	1.7×10^{-4}	5.6×10^{-3}
16-110	3.1×10^{-4}	1.0×10^{-2}
32,000 ft arc		
32-344	9.0×10^{-6}	3.0×10^{-4}
32-003	2.2×10^{-5}	7.1×10^{-4}
32-028	3.9×10^{-4}	1.3×10^{-2}
32-041	5.5×10^{-3}	1.8×10^{-1}
32-059	4.8×10^{-3}	1.6×10^{-1}
32-067	6.2×10^{-3}	2.0×10^{-1}
32-075	7.0×10^{-3}	2.3×10^{-1}
32-083	7.2×10^{-3}	2.4×10^{-1}
32-102	6.6×10^{-5}	2.2×10^{-3}
64,000 ft arc		
64-014	9.5×10^{-7}	3.3×10^{-5}
64-024	1.7×10^{-6}	6.3×10^{-5}
64-031	2.8×10^{-6}	1.1×10^{-4}
64-045	9.6×10^{-4}	3.2×10^{-2}
64-057	2.1×10^{-3}	7.1×10^{-2}
64-069	7.3×10^{-3}	2.5×10^{-1}
64-085	1.6×10^{-7}	6.5×10^{-6}
128,000 ft arc		
128-011	1.9×10^{-6}	7.2×10^{-5}
128-018	2.1×10^{-5}	7.8×10^{-4}
128-028	8.0×10^{-7}	3.1×10^{-5}
128-044	3.0×10^{-5}	1.3×10^{-3}
128-054	8.1×10^{-4}	3.1×10^{-2}
128-068	3.5×10^{-6}	1.4×10^{-4}

TABLE XII. GROUND DEPOSITION EFFECTS - NRX A-2

Station	Deposition Dose Rate (R/hr)	1 Year Integrated Deposition Dose (rads)	Iodine in Milk (pCi/liter)	Child Thyroid Dose (rads)
4,000 ft arc				
4-190	4.2×10^{-8}	2.4×10^{-7}	7.1×10^{-1}	8.5×10^{-5}
4-195	6.3×10^{-9}	3.6×10^{-8}	1.1×10^{-1}	1.3×10^{-5}
4-200	3.9×10^{-8}	2.2×10^{-7}	6.5×10^{-1}	7.8×10^{-5}
4-205	2.9×10^{-7}	1.7×10^{-6}	4.9×10^{0}	5.9×10^{-4}
4-210	7.5×10^{-7}	4.2×10^{-6}	1.3×10^{1}	1.5×10^{-3}
4-215	1.0×10^{-5}	5.7×10^{-5}	1.7×10^{2}	2.1×10^{-2}
4-220	1.2×10^{-5}	7.0×10^{-5}	2.1×10^{2}	2.5×10^{-2}
4-225	2.4×10^{-5}	1.3×10^{-4}	4.0×10^{2}	4.8×10^{-2}
4-230	1.8×10^{-5}	1.0×10^{-4}	3.0×10^{2}	3.6×10^{-2}
4-235	3.8×10^{-6}	2.1×10^{-5}	6.3×10^{1}	7.6×10^{-3}
4-240	1.8×10^{-6}	1.0×10^{-5}	3.1×10^{1}	3.7×10^{-3}
4-245	1.8×10^{-6}	1.0×10^{-5}	3.1×10^{1}	3.7×10^{-3}
4-250	5.5×10^{-7}	3.1×10^{-6}	9.3×10^{0}	1.1×10^{-3}
4-255	8.5×10^{-9}	4.8×10^{-8}	1.4×10^{-1}	1.7×10^{-5}
4-260	0.0	0.0	0.0	0.0
4-265	1.4×10^{-8}	7.9×10^{-8}	2.4×10^{-1}	2.8×10^{-5}
16,000 ft arc				
16-206	2.1×10^{-8}	1.2×10^{-7}	3.8×10^{-1}	4.6×10^{-5}
16-228	1.2×10^{-6}	6.9×10^{-6}	2.1×10^{1}	2.6×10^{-3}
16-246	4.2×10^{-8}	2.4×10^{-7}	7.5×10^{-1}	9.1×10^{-5}
16-272	1.5×10^{-8}	8.8×10^{-8}	2.7×10^{-1}	3.3×10^{-5}
32,000 ft arc				
32-194	5.9×10^{-8}	3.5×10^{-7}	1.1×10^{0}	1.4×10^{-4}
32-206	2.8×10^{-7}	1.7×10^{-6}	5.4×10^{0}	6.5×10^{-4}
32-219	4.9×10^{-7}	2.9×10^{-6}	9.4×10^{0}	1.1×10^{-3}
32-228	1.3×10^{-6}	8.0×10^{-6}	2.6×10^{1}	3.1×10^{-3}
32-245	6.9×10^{-6}	4.1×10^{-5}	1.3×10^{2}	1.6×10^{-2}
32-258	3.3×10^{-7}	2.0×10^{-6}	6.4×10^{0}	7.7×10^{-4}
64,000 ft arc				
64-203	0.0	0.0	0.0	0.0
64-211	7.2×10^{-7}	4.6×10^{-6}	1.6×10^{1}	1.9×10^{-3}
64-215	8.0×10^{-7}	5.0×10^{-6}	1.8×10^{1}	2.2×10^{-3}
64-221	1.4×10^{-6}	8.8×10^{-6}	3.1×10^{1}	3.7×10^{-3}
64-230	1.5×10^{-6}	9.8×10^{-6}	3.5×10^{1}	4.2×10^{-3}
64-241	1.6×10^{-6}	9.9×10^{-6}	3.5×10^{1}	4.2×10^{-3}
64-251	1.8×10^{-6}	1.1×10^{-5}	4.0×10^{1}	4.8×10^{-3}
128,000 ft arc				
128-190	6.4×10^{-8}	4.6×10^{-7}	1.9×10^{0}	2.3×10^{-4}
128-200	1.4×10^{-7}	1.0×10^{-6}	4.3×10^{0}	5.1×10^{-4}
128-211	6.8×10^{-7}	4.9×10^{-6}	2.1×10^{1}	2.5×10^{-3}
128-225	8.8×10^{-7}	6.4×10^{-6}	2.7×10^{1}	3.2×10^{-3}
128-236	8.1×10^{-7}	5.8×10^{-6}	2.5×10^{1}	2.9×10^{-3}
128-250	8.0×10^{-8}	5.8×10^{-7}	2.4×10^{0}	2.9×10^{-4}
128-263	4.0×10^{-8}	2.9×10^{-7}	1.2×10^{0}	1.5×10^{-4}

TABLE XIII. GROUND DEPOSITION EFFECTS, EXPERIMENTAL PLAN 5 - NRX A-3

Station	Deposition Dose Rate (R/hr)	1 Year Integrated Deposition Dose (rads)	Iodine in Milk (pCi/liter)	Child Thyroid Dose (rads)
4,000 ft arc				
4-340	1.8×10^{-6}	3.2×10^{-6}	1.1×10^{1}	1.3×10^{-3}
4-350	6.0×10^{-6}	1.1×10^{-5}	3.8×10^{1}	4.6×10^{-3}
4-000	6.3×10^{-7}	1.2×10^{-6}	4.0×10^{0}	4.8×10^{-4}
4-010	2.4×10^{-5}	4.5×10^{-5}	1.6×10^{2}	1.9×10^{-2}
4-020	1.6×10^{-4}	3.0×10^{-4}	1.0×10^{3}	1.2×10^{-1}
4-030	6.0×10^{-5}	1.1×10^{-4}	3.8×10^{2}	4.6×10^{-2}
4-040	8.8×10^{-5}	1.6×10^{-4}	5.6×10^{2}	6.8×10^{-2}
4-050	5.4×10^{-5}	9.9×10^{-5}	3.4×10^{2}	4.1×10^{-2}
4-060	5.0×10^{-5}	9.3×10^{-5}	3.2×10^{2}	3.9×10^{-2}
4-070	2.6×10^{-5}	4.8×10^{-5}	1.6×10^{2}	2.0×10^{-2}
4-080	9.9×10^{-5}	1.8×10^{-4}	6.3×10^{2}	7.6×10^{-2}
4-090	3.0×10^{-5}	5.5×10^{-5}	1.9×10^{2}	2.3×10^{-2}
4-100	1.1×10^{-5}	2.0×10^{-5}	6.9×10^{1}	8.3×10^{-3}
16,000 ft arc				
16-015	2.6×10^{-6}	5.2×10^{-6}	2.3×10^{1}	2.7×10^{-3}
16-034	3.6×10^{-6}	7.4×10^{-6}	3.2×10^{1}	3.8×10^{-3}
16-043	3.6×10^{-5}	7.5×10^{-5}	3.2×10^{2}	3.9×10^{-2}
16-050	2.7×10^{-3}	5.5×10^{-3}	2.4×10^{4}	2.8×10^{0}
16-070	1.4×10^{-5}	2.8×10^{-5}	1.2×10^{2}	1.4×10^{-2}
16-080	2.9×10^{-5}	5.9×10^{-5}	2.5×10^{2}	3.0×10^{-2}
16-095	2.2×10^{-6}	4.5×10^{-6}	2.0×10^{1}	2.3×10^{-3}
16-110	4.8×10^{-6}	9.9×10^{-6}	4.3×10^{1}	5.1×10^{-3}
32,000 ft arc				
32-344	8.1×10^{-6}	2.0×10^{-5}	1.1×10^{2}	1.3×10^{-2}
32-003	5.8×10^{-6}	1.4×10^{-5}	7.9×10^{1}	9.5×10^{-3}
32-028	4.6×10^{-6}	1.1×10^{-5}	6.3×10^{1}	7.6×10^{-3}
32-041	4.8×10^{-5}	1.2×10^{-4}	6.5×10^{2}	7.8×10^{-2}
32-059	2.2×10^{-5}	5.4×10^{-5}	3.0×10^{2}	3.6×10^{-2}
32-067	2.5×10^{-5}	6.2×10^{-5}	3.5×10^{2}	4.2×10^{-2}
32-075	3.8×10^{-5}	9.3×10^{-5}	5.2×10^{2}	6.2×10^{-2}
32-083	6.1×10^{-5}	1.5×10^{-4}	8.4×10^{2}	1.0×10^{-1}
32-102	5.9×10^{-6}	1.4×10^{-5}	8.0×10^{1}	9.6×10^{-3}
64,000 ft arc				
64-356	1.3×10^{-6}	5.1×10^{-6}	4.1×10^{1}	4.9×10^{-3}
64-014	2.1×10^{-6}	8.2×10^{-6}	6.6×10^{1}	7.9×10^{-3}
64-024	1.9×10^{-6}	7.5×10^{-6}	6.0×10^{1}	7.2×10^{-3}
64-031	6.6×10^{-6}	2.6×10^{-5}	2.1×10^{2}	2.5×10^{-2}
64-045	7.3×10^{-6}	2.9×10^{-5}	2.3×10^{2}	2.8×10^{-2}
64-057	3.0×10^{-5}	1.2×10^{-4}	9.5×10^{2}	1.2×10^{-1}
64-069	8.3×10^{-5}	3.3×10^{-4}	2.6×10^{3}	3.2×10^{-1}
64-085	3.0×10^{-6}	1.2×10^{-5}	9.4×10^{1}	1.1×10^{-2}
128,000 ft arc				
128-011	6.1×10^{-7}	7.8×10^{-6}	8.8×10^{1}	1.1×10^{-2}
128-018	5.6×10^{-7}	7.1×10^{-6}	8.0×10^{1}	9.6×10^{-3}
128-028	4.6×10^{-7}	5.9×10^{-6}	6.7×10^{1}	8.0×10^{-3}
128-044	1.4×10^{-6}	1.8×10^{-5}	2.0×10^{2}	2.4×10^{-2}
128-054	7.3×10^{-6}	9.3×10^{-5}	1.0×10^{3}	1.3×10^{-1}
128-068	2.2×10^{-7}	2.8×10^{-6}	3.2×10^{1}	3.8×10^{-3}
128-078	5.0×10^{-7}	6.4×10^{-6}	7.2×10^{1}	8.6×10^{-3}

TABLE XIV. TEST CELL A COORDINATES FOR THE 16,000 FOOT ARC STATIONS

Station	Distance	Azimuth (°)
16-005	14,550	341
16-015	12,800	349
16-025	12,300	358
16-034	12,150	010
16-043	13,300	023
16-055	12,200	037
16-070	9,000	054
16-080	9,600	072
16-090	10,300	087
16-095	10,150	095
16-110	10,500	118
16-120	11,050	132
16-130	11,750	146
16-140	12,700	159
16-150	13,700	171
16-160	14,700	181
16-170	15,600	191
16-180	16,750	201
16-190	18,400	208
16-200	20,600	216
16-210	20,850	226
16-220	21,500	234
16-230	23,450	240
16-240	21,150	249
16-252	21,550	258
16-261	21,800	265
16-270	21,600	272
16-280	20,000	278
16-290	20,150	286
16-300	20,400	293
16-310	20,050	300
16-320	20,750	306
16-330	20,050	316
16-340	19,800	324
16-350	19,250	323