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The most comprehensive data on fallout levels [illegible] of the Nevada Test Site have resulted from direct measurements of [illegible] external gamma dose rates and cumulative doses. Reliable measurements of the I-131 content of milk from cows grazing on pastures in the fallout [illegible] from a specific shot were not begun until the [illegible] of [illegible], and were [illegible] fragmentary at the time of the Des Moines [illegible] yield atmospheric test on July 14, 19[illegible] ([illegible]) [illegible] mental excavation experiment of July [illegible], [illegible].

The development of a quantitative [illegible] fresh fission [illegible] and the resulting level [illegible] deposition would [illegible]

1. for [illegible]

[illegible]

3. to help guide [illegible] the [illegible] on fallout and [illegible]

[illegible]

[illegible] difficulties, both conceptual and [illegible]

the [illegible] level of nuclear test fallout. [illegible]

fission products -- that is fission products for [illegible]

are in the same proportions as for the debris [illegible]

define a time-independent measure of the [illegible] in terms of

the [illegible]-equivalent of deposited fission [illegible]

the number of fissions represented per square [illegible]

area. For fractionated debris, however, [illegible]

One could consider only the initial [illegible]

as the quantity of most direct [illegible]

able as is the external [illegible]

quantity have been [illegible]

most practical [illegible]

[illegible]

2) A discussion of the [illegible]
[illegible]
relations between [illegible]
given in [illegible]
the Nevada Test Site off-site area [illegible]
dose rate.

[illegible] not been anticipated, a hot spot [illegible]

[illegible] 300 - 400 miles from the point of [illegible]

passage of the Small Boy cloud.[1] The location of [illegible]

[illegible] determined by an airborne radiological [illegible]

[illegible] a complete survey was made by airborne [illegible]

[illegible] Geological Survey and from [illegible]

[illegible] The results of this survey are reported [illegible]

[illegible] in Figure 21. The contours [illegible]

[illegible] relations that 50,000 [illegible]

[illegible] the [illegible]

[illegible]

[illegible] of [illegible] -- notably for those [illegible] the [illegible] will not always have arrived by this time. [illegible] can project the dose rate back to 24 hours either by [illegible] of a measured decay rate, or if only a single measurement has been made, by assuming a $(\text{time})^{-1.2}$ decay rate. It is known that different samples of debris from the same shot as well as samples of debris from different shots have decay characteristics which vary from a $T^{-1.2}$ decay law. However, unless the external gamma dose rate is due largely to [illegible] or more induced activities (as was the case for the Sedan shot, [illegible] dose rate from the isotope $W^{187}$ is believed to [illegible] significant fraction of the observed total dose [illegible] external gamma dose rate due to deposited fission [illegible] approximately in accordance with a $T^{-1.2}$ law [illegible] months following [illegible]

The symbol $r_0$ is [illegible] the [illegible] dose rate, in [illegible] from deposited [illegible]

[illegible]

[illegible] the initial [illegible] a maximum level of I-131 in the [illegible] the time period of [illegible] following [illegible] very little from [illegible] level. At 1 day [illegible] After 7 days, they [illegible] milk levels decrease [illegible] 8 day half life of I-131.

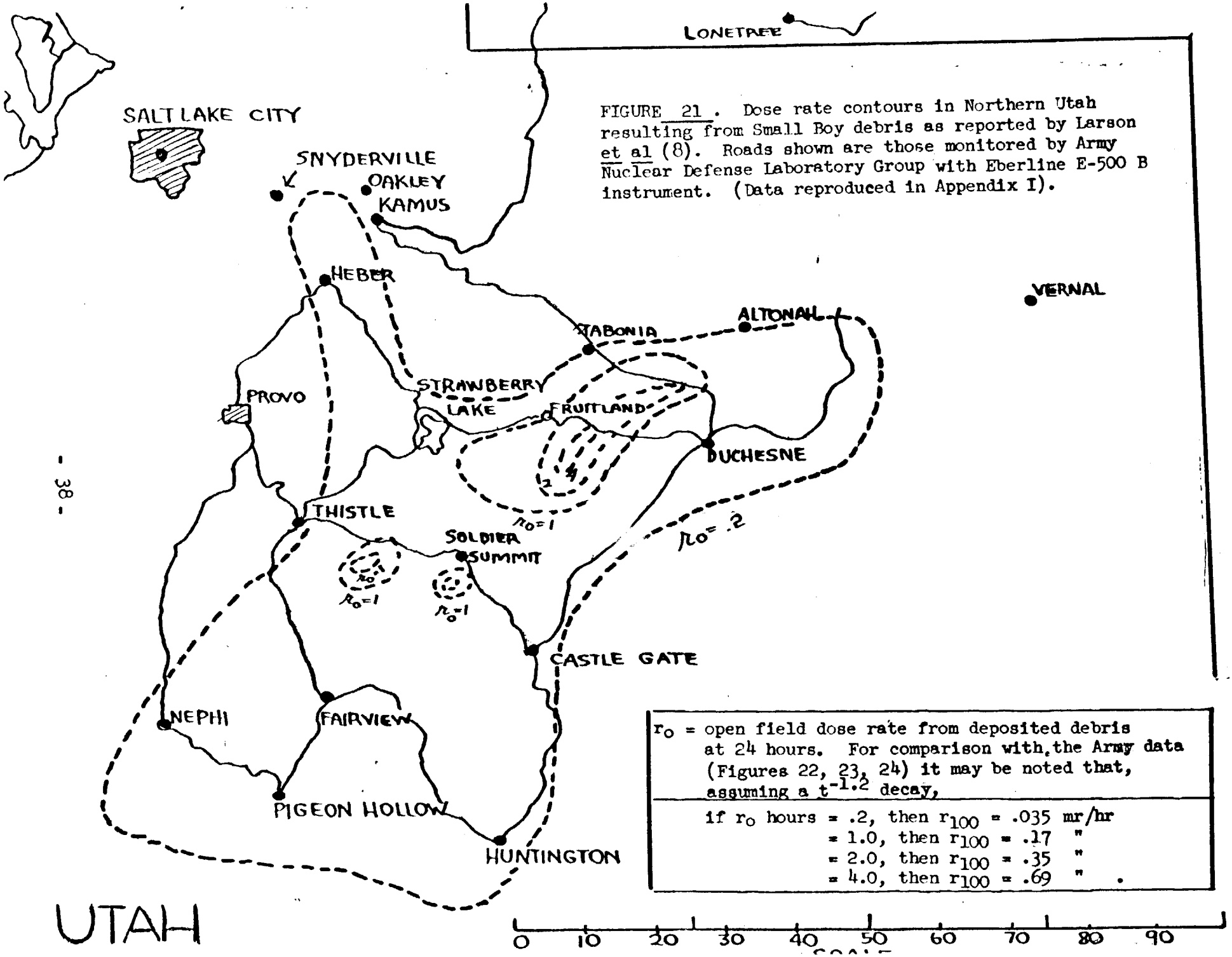
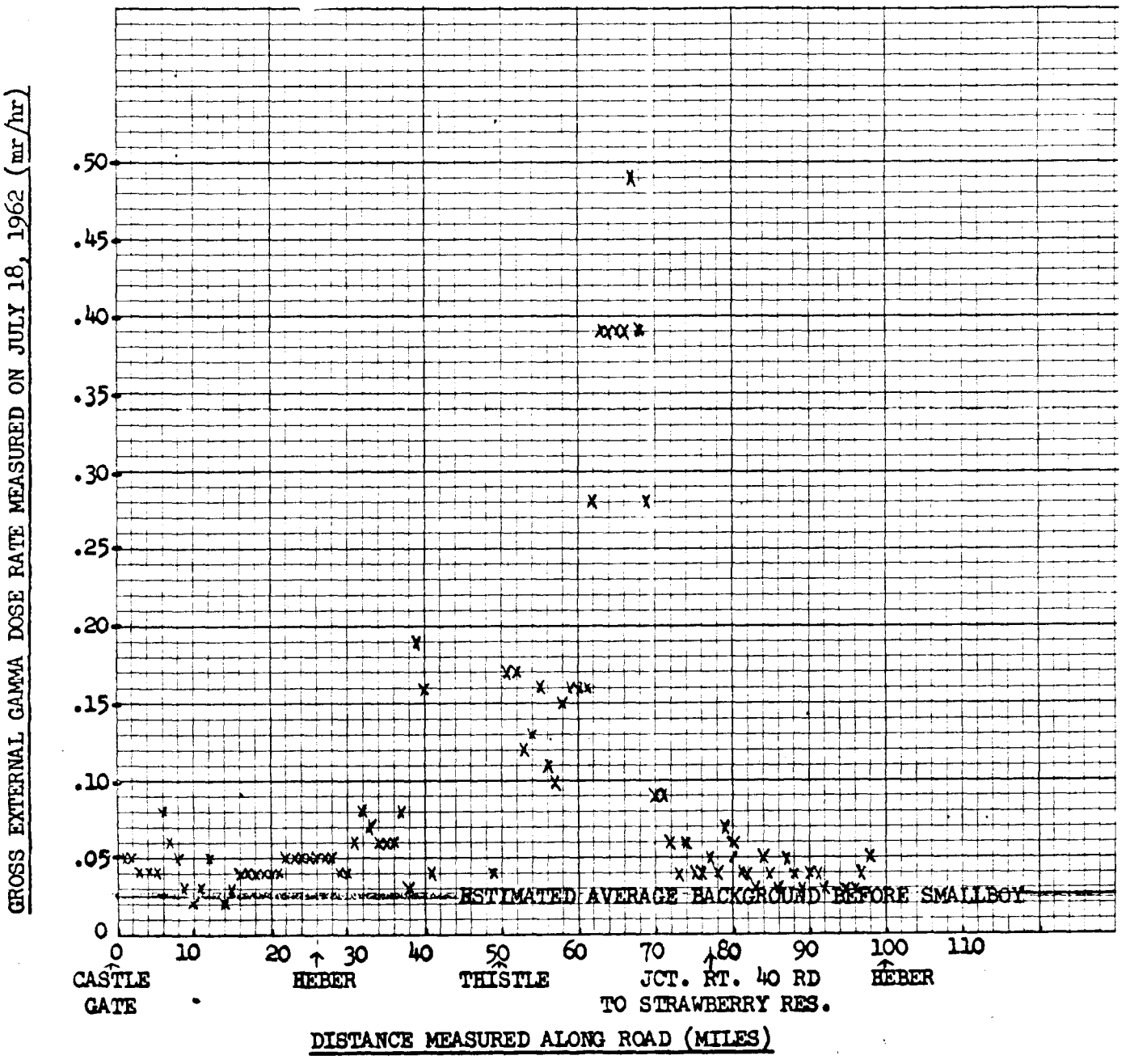



FIGURE 21. Dose rate contours in Northern Utah resulting from Small Boy debris as reported by Larson et al (8). Roads shown are those monitored by Army Nuclear Defense Laboratory Group with Eberline E-500 B instrument. (Data reproduced in Appendix I).

$r_o$ = open field dose rate from deposited debris at 24 hours. For comparison with the Army data (Figures 22, 23, 24) it may be noted that, assuming a $t^{-1.2}$ decay,

if $r_o$ hours = .2, then $r_{100}$ = .035 mr/hr
= 1.0, then $r_{100}$ = .17 "
= 2.0, then $r_{100}$ = .35 "
= 4.0, then $r_{100}$ = .69 " .

FIGURE 22. MEASUREMENTS OF GROSS, OPEN FIELD EXTERNAL GAMMA DOSE RATE ALONG U. S. HIGHWAY 50 AND 189 FROM CASTLE GATE, UTAH TO HEBER, UTAH. MEASUREMENTS MADE ON 18 JULY 1962 BY U. S. ARMY NUCLEAR DEFENSE LABORATORY (SEE DATA APPENDIX I).



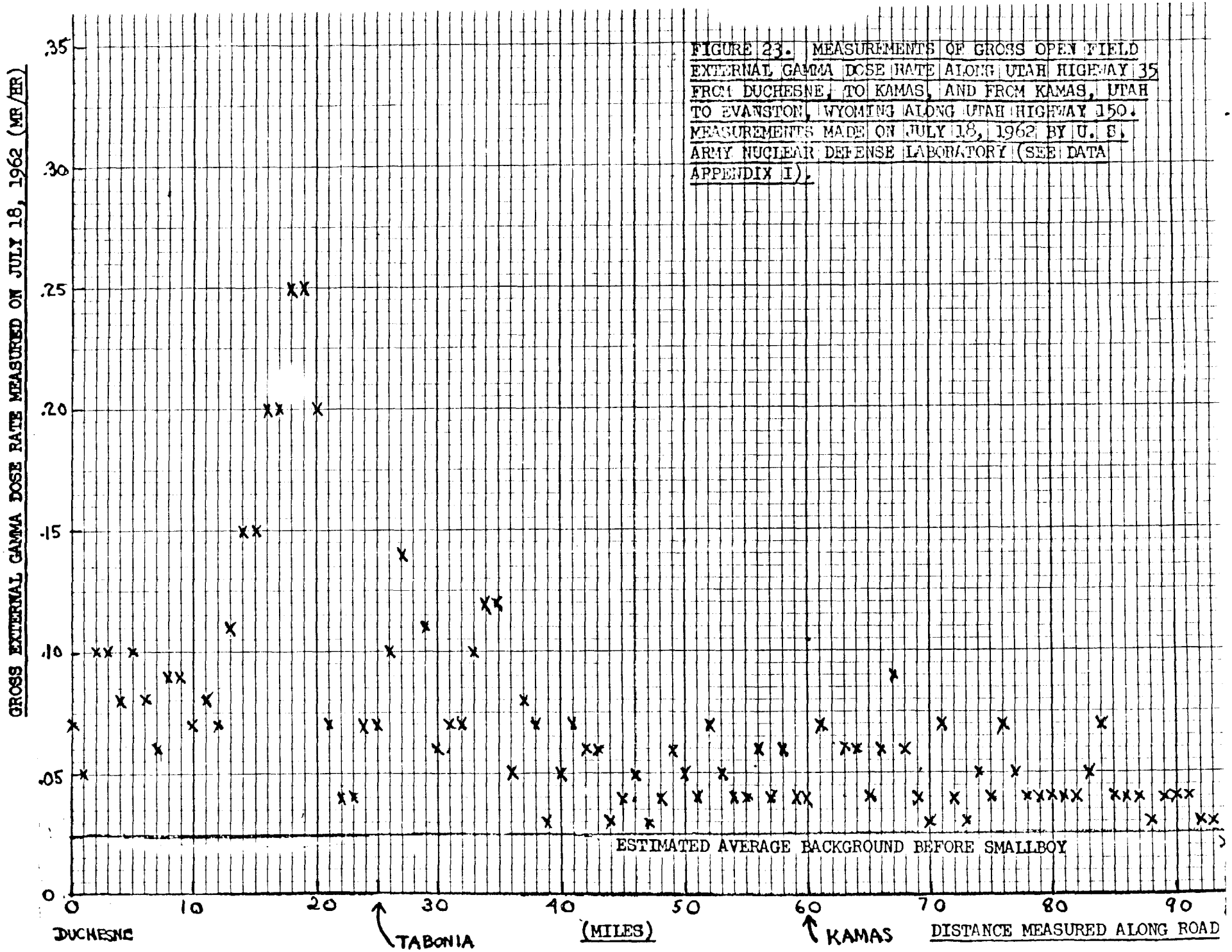



FIGURE 23. MEASUREMENTS OF GROSS OPEN FIELD EXTERNAL GAMMA DOSE RATE ALONG UTAH HIGHWAY 35 FROM DUCHESNE, TO KAMAS, AND FROM KAMAS, UTAH TO EVANSTON, WYOMING ALONG UTAH HIGHWAY 150. MEASUREMENTS MADE ON JULY 18, 1962 BY U. S. ARMY NUCLEAR DEFENSE LABORATORY (SEE DATA APPENDIX I).

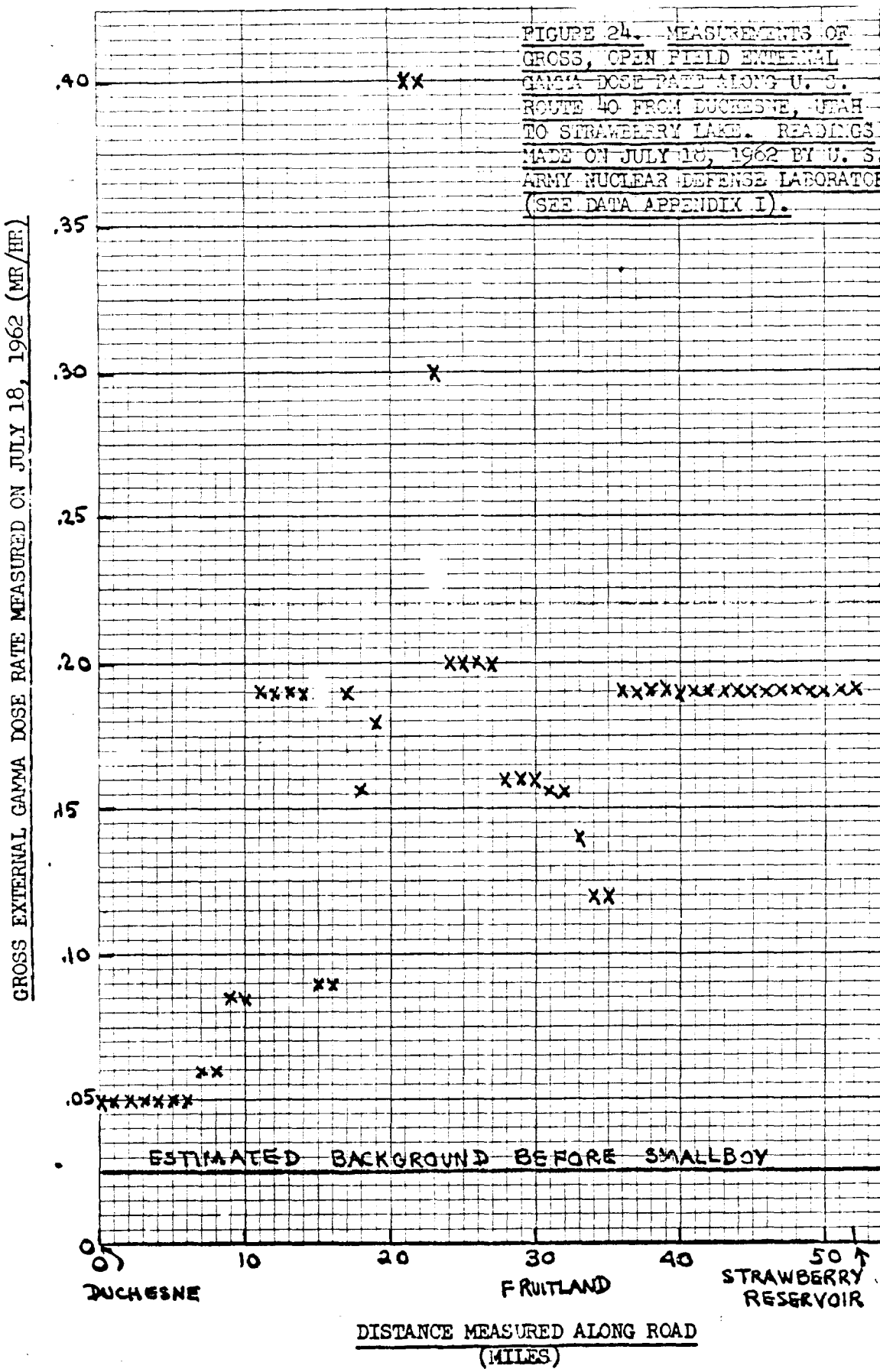



FIGURE 24. MEASUREMENTS OF GROSS, OPEN FIELD EXTERNAL GAMMA DOSE RATE ALONG U. S. ROUTE 40 FROM DUCHESNE, UTAH TO STRAWBERRY LAKE. READINGS MADE ON JULY 18, 1962 BY U. S. ARMY NUCLEAR DEFENSE LABORATORY (SEE DATA APPENDIX I).

To [illegible] the net dose rates due to the Small Boy [illegible] measurements, it is necessary to substract the component [illegible] prior to the shot. This measurement was not reported. [illegible] to be 0.025 mr/hr, i.e. the same as measured at Alamo and [illegible] December, 1962.

The dose rate contours reported by Larson et al from aircraft measurements, and the surface measurements made by Lt. Wade and his monitors are [illegible] consistent. Both indicate areas where the [illegible] ly 20 times that noted in the Kamas - Oakley - Snyderville [illegible] indicate some high levels of fallout on U. S. [illegible] Strawberry Lake, and State Road 35 between Duchesne and [illegible] levels between Fruitland and Strawberry Lake and [illegible] are not exactly indicated by the contours as shown. This might be due to an incorrect location of the 1 mr/hr-at-24-hour contour from the hot spot [illegible] east of Fruitland.

Although scattered light precipitation is reported [illegible] July 14, [illegible] the readily available [illegible] the fallout [illegible] largely without precipitation [illegible]

[illegible] indicate that the [illegible] [illegible] and Snyderville) lie on the edge of the [illegible] area, and have 24 hour external gamma dose rates of less than 0.2 mr/hr. The only surface measurements which indicate an $r_0$ value at Kamas, Oakley, and Snyderville are those made by the army monitors on their route passing thru Kamas (Figure 23).

From Figure 23 it is seen that the net dose rate (i.e. [illegible] 0.025

[illegible]) [illegible]

[illegible] town lies between 0.015 mr/hr and [illegible]

value [illegible] 0.026 mr/hr. These measurements were made [illegible]

and H + [illegible] hours. Assuming a $t^{-1.2}$ decay rate, the [illegible]

H + 24 hour dose rate in Kansas due to deposited debris [illegible]

mr/hr. This is about 50% greater than that estimated [illegible]

but a factor of 10 lower than the 24 hour rate of [illegible]

Pahranagat Valley 9 miles south of Alamo ([illegible]

It is here assumed that $r_0$ for Kansas, Oakley, [illegible]

range of 0.07 mr/hr at 24 hours to 0.30 mr/hr [illegible]

single estimate taken as 0.15 mr/hr at 24 hours.

[illegible]

Small Bay shot with one in the [illegible]

April 25, 1953 [illegible] shot of [illegible]

a [illegible] kt. device was fired on a [illegible]

hours later a severe [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

summarized in Table II.

[illegible] the net dose rates due to the [illegible]

[illegible], it is necessary to substract the [illegible]

prior to the shot. This measurement was not [illegible]

to be 0.025 mr/hr, i.e. the same as measured at [illegible]

December, 1962.

The dose rate contours reported by Larson [illegible]

and the surface measurements made by [illegible]

[illegible]. Both indicate areas where [illegible]

ly 20 times that noted in the [illegible]

indicate some high levels of fallout on [illegible]

Strawberry Lake, and State Road 35 between [illegible]

levels between Fruitland and Strawberry Lake [illegible]

are not exactly indicated by the contours [illegible]

incorrect location of the [illegible]

east of Fruitland.

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] indicated [illegible]

[illegible]

area, [illegible]

The only surface measurements which [illegible]

and Snyderville are those made by the [illegible]

thru Kane (Figure 23).

[illegible] Figure 23 it is seen that [illegible]