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The most comprehensive data on fallout levels within a 500 mile radius of the Nevada Test Site have resulted from direct measurements of both the external gamma dose rates and cumulative dose. Reliable measurements of the I-131 content of milk from cows grazing on pastures in the fallout pattern from a specific shot were not begun until the summer of 1953 and were still fragmentary at the time of the Dog House venting test and the 100 kiloton yield atmospheric test on July 14, 1953 (Shot 100). The first experimental extraction experiment of July 6, 1953,

The development of a quantitative relationship between the amount of fresh pasture produced in terms of dry weight per acre and the resulting level of I-131 in milk for the summer of 1953. Deposition would then be used to estimate the amount of I-131 in milk.

1. To collect and analyze milk samples from cows grazing on pastures in the fallout pattern from the Dog House venting test and the 100 kiloton yield atmospheric test.
2. To collect and analyze milk samples from cows grazing on pastures in the fallout pattern from the Dog House venting test and the 100 kiloton yield atmospheric test.
3. To help guide and improve the sampling of milk from cows grazing on pastures in the fallout pattern from the Dog House venting test and the 100 kiloton yield atmospheric test.





not been anticipated, a hot spot was discovered  
about 300 - 400 miles from the point of detonation,  
position of the small boy cloud. The location of this  
cloud, established by an airborne radiological survey, was  
the result of a complete survey was made by airplane  
on 10/11/54. A radiological survey was also made  
on 10/12/54. The results of this survey are reported  
in Figure 21. The numbers shown in Figure 21  
represent the number of counts per minute (CPM) at  
the above locations, and the collection time.

... of interest is initially for those areas... the... will not always have arrived by this time. ... can project the dose rate back to 24 hours either by graphical interpolation of a measured decay rate, or if only a single measurement has been made, by assuming a (time)<sup>-1.2</sup> 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  $t^{-1.5}$  decay law. However, unless the external gamma dose rate is due largely to one or more induced activities (as was the case for the Sedan shot, following which the dose rate from the isotope <sup>137</sup> is believed to have been negligible), a significant fraction of the observed total dose rate is due to the external gamma dose rate due to fission products which approximately is characterized with a  $t^{-1.5}$  law between 1 day and 6 months following detonation.

The spatial distribution of activity in the atmosphere over the site is another factor which must be considered in determining the dose rate.

... the initial... a maximum level of 1-12 in the... the time period of 2 to 3 days following... very little from the... After 7 days, they... will levels decrease with the 3 day half life of I-131.

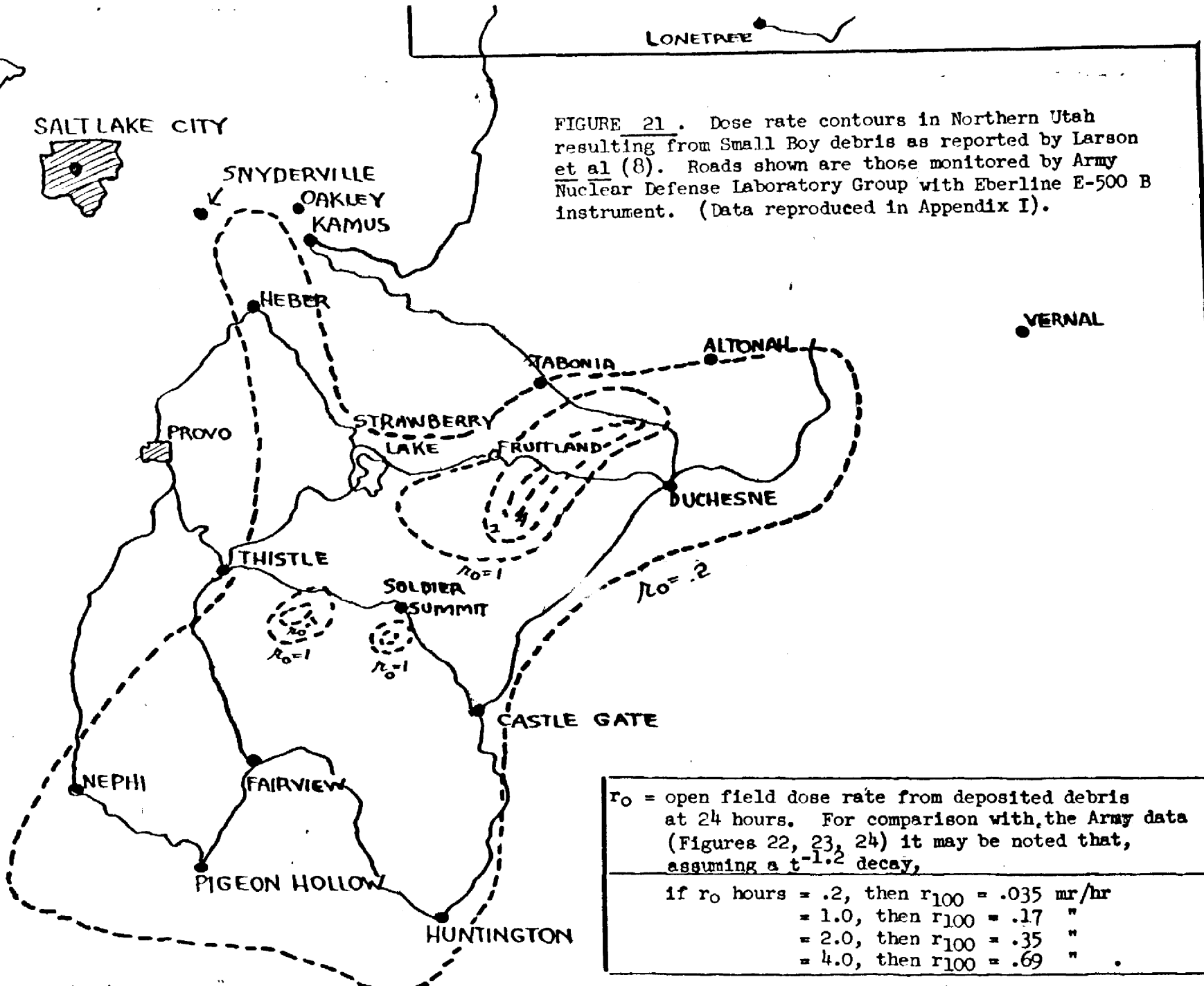


SALT LAKE CITY



LONETREE

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).



$r_0$ = 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 $r_0$ 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 "

UTAH

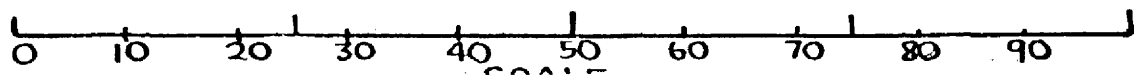
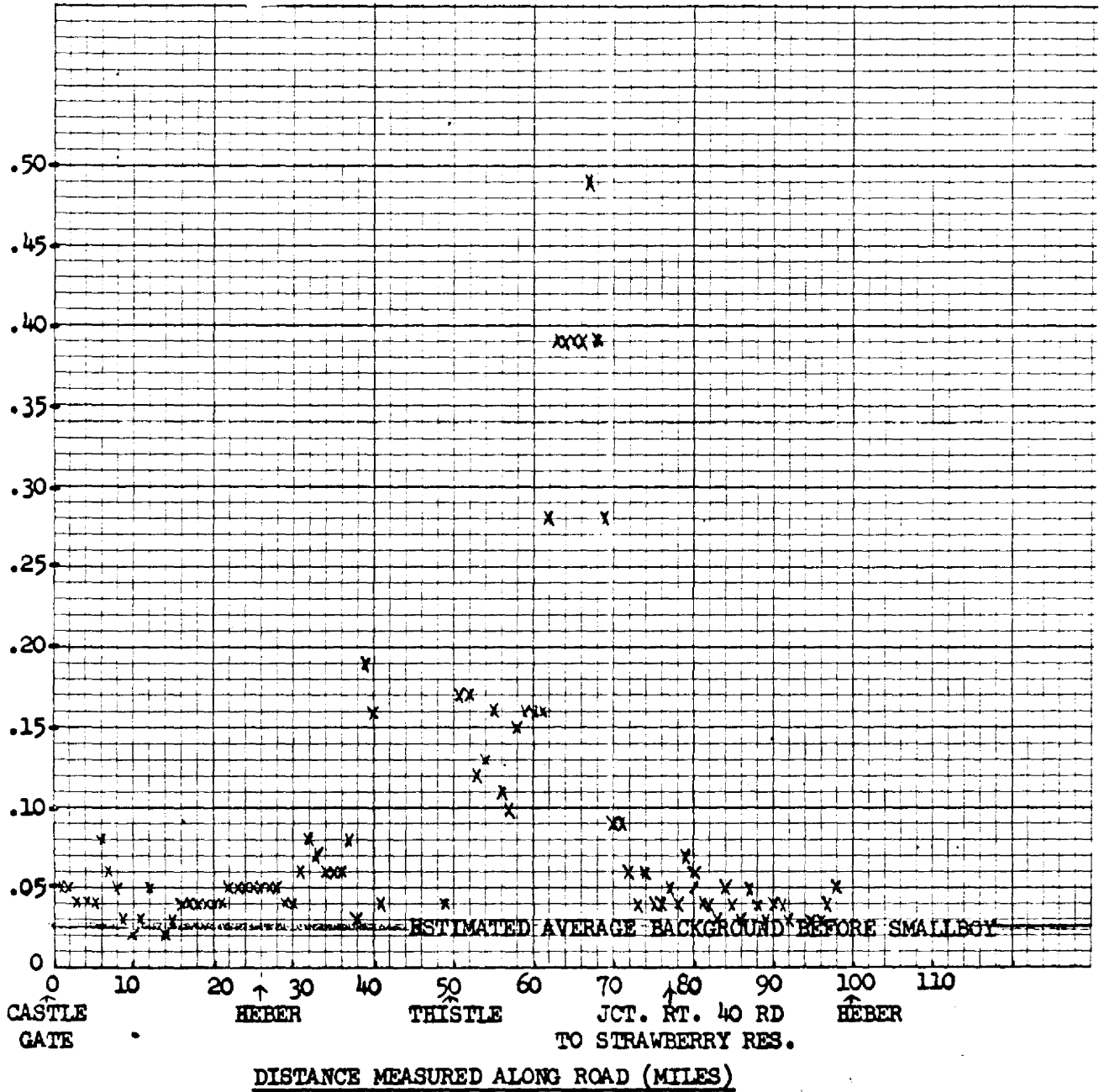


FIGURE 22. MEASUREMENTS OF GROSS, OPEN FIELD EXTERNAL GAMMA DOSE RATE ALONG U. S. HIGHWAY 50 AND 189 FROM CASTLE GATE, UTAH TO HEBER, UTAH. MEASUREMENTS MADE ON 18 JULY 1962 BY U. S. ARMY NUCLEAR DEFENSE LABORATORY (SEE DATA APPENDIX I).

GROSS EXTERNAL GAMMA DOSE RATE MEASURED ON JULY 18, 1962 (mr/hr)



GROSS EXTERNAL GAMMA DOSE RATE MEASURED ON JULY 18, 1962 (MR/HR)

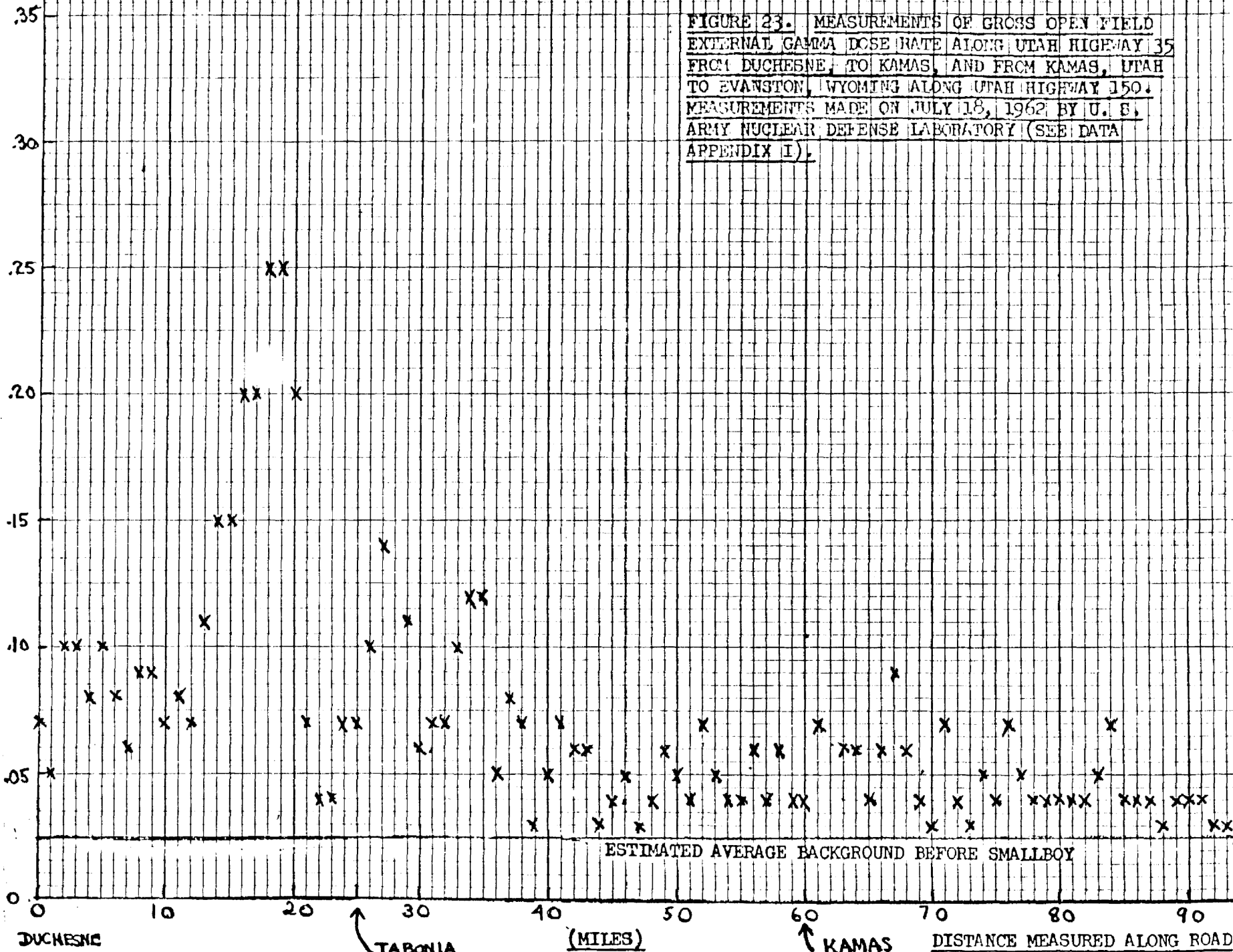


FIGURE 23. MEASUREMENTS OF GROSS OPEN FIELD EXTERNAL GAMMA DOSE RATE ALONG UTAH HIGHWAY 35 FROM DUCHECNE TO KAMAS, AND FROM KAMAS, UTAH TO EVANSTON, WYOMING ALONG UTAH HIGHWAY 150. MEASUREMENTS MADE ON JULY 18, 1962 BY U. S. ARMY NUCLEAR DEFENSE LABORATORY (SEE DATA APPENDIX I).



To obtain the net dose rates due to the Small Boy debris from the long measurements, it is necessary to subtract the component due to background prior to the shot. This measurement was not reported. It is assumed here to be 0.025  $\mu\text{r/hr}$ , i.e. the same as measured at Alamo and Chilesno on December, 1962.

The dose rate contours reported by Larson *et al* from aircraft measurements, and the surface measurements made by Lt. Wade and his men are generally consistent. Both indicate areas where the deposition level was approximately 20 times that noted in the Kansas - Oakley - Snyderville area. Both indicate some high levels of fallout on U. S. Route 24 between Strawberry Lake, and State Road 35 between Bushong and Thistle. The levels between Fruitland and Strawberry Lake and Thistle and Bushong are not exactly indicated by the contours as shown. This might be due to an incorrect location of the 1  $\mu\text{r/hr}$ -at-24-hour contour from the hot spot east of Fruitland.

Although scattered high precipitations is reported for the hot spot area July 14, 1945, the majority of the fallout was deposited on July 15, 1945, and the fallout was largely without precipitation at that time.

Map (Figure 23) indicates that the locations of Fruitland, Bushong, and Snyderville (and Strawberry Lake) lie on the edge of the hot spot area, and have 24 hour external gamma dose rates of less than 0.2  $\mu\text{r/hr}$ . The only surface measurements which indicate an  $R_p$  value at Bushong, Fruitland, and Snyderville are those made by the army monitors on their route passing thru Kansas (Figure 23).

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





