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NO. 1 OF 4 COPIES, SERIES A

21 July 1945

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By Authority of the District Engineer

Per. *K. M. [illegible]*

TO: Major Gen. Groves

SUBJECT: Report on Test II at Trinity, 16 July 1945

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1. The test was performed two days ahead of the tentative schedule because everything of importance to the test was ready.
2. A study of the weather indicated that a variety of wind directions at slow speeds going in general N.W., and N.E. could be expected with different directions and speeds at different levels for 16 and 17 July 1945. These slow winds would be advantageous in localizing the outfall of active material from the cloud to the site and nearby desert areas. They would also dilute the outfall most effectively in the early hours of the life of the cloud when it would help the most. The monitoring problem would be worse however, because of the wide area covered.
3. In the two days available, the population of the surrounding areas was located by G-2 on large scale maps for a radius of 75 to 100 miles. The deserted areas corresponded fortunately to the most probable courses of the outfall from the cloud as predicted by the directions of the winds at the various altitudes. Troops under Major Palmer were available if monitoring indicated that evacuation was necessary.
4. At zero minus five hours, five cars with Dr. J. Hoffman in charge were stationed with Major Palmer and troops at the outlet road near the east-west highway #380. They were in radio communication with Base Camp and Post #2. Outlying monitor cars were in San Antonio; Roswell, Carrizozo and Fort Sumner to cover these areas in case the speed of the cloud was greater than predicted.
5. Dr. Aebersold was in general charge of the monitoring at Base Camp and the three shelters at 10,000 yards, with local telephone and radio communication. There was a technician monitor and doctor in each shelter and at Base Camp.
6. Dr. Hempelmann in charge of all the monitoring program was at S 10,000, the center of communication and final decisions (also Brig. Gen. ~~Farrell~~, Dr. Oppenheimer, Dr. Bainbridge, Mr. Hubbard, etc.) *Farrell*
7. This officer acted as liaison in a secondary communication center in Base Camp. Lt. Col. Friedell was located with G-2 at Albuquerque as another communication center via long distance for controlling the field monitoring in case Base Camp communications came down. All groups were keyed in by identical maps showing preliminary locations of the monitors; their presumed course, the two possible paths of the cloud, WNW and NNE (depending upon the altitude which it reached) houses and nearby ranges, etc.
8. Accessory equipment and other preparations were in keeping with the preliminary plans submitted in the preliminary plans. *Classification changed to ~~TOP SECRET~~ with the approval of J. R. [illegible] A.C. [illegible] 5-10-50*

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Authority *NND 730039*

By *2 R* Date *10-29-73*

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9. The shot was fired at 0530 on 16 July 1945.

The energy developed in the test was several times greater than that expected by scientific group. The cloud column mass and top reached a phenomenal height, variously estimated as 50,000 to 70,000 feet. It remained towering over the northeast corner of the site for several hours. This was sufficient time for the majority of the largest particles to fall out. Various levels were seen to move in different directions. In general the lower one-third drifted eastward, the middle portion to the west and northwest, while the upper third moved northeast. Many small sheets of dust moved independently at all levels and large sheets remained practically in situ. By zero plus 2 hours, the main masses were no longer identifiable except for the very high white mass presumably in the stratosphere.

10. By 0800 hours the monitors reported an area of high intensity in a canyon 20 miles northeast of zero. Since this was beyond the tolerance set and equally high intensities were expected in other areas, four more monitor cars were sent into this northeast area from Base Camp. The roving monitors in this area were each accompanied by a trooper in a 4 wheel drive and authorized to evacuate families if necessary. At no house in this whole north and northeast area between 20 miles and 40 miles from zero was a dangerous intensity found. The highest intensities fortunately, were only found in deserted regions. The highest found is shown in detail attached #1. Intensities in the deserted canyon were high enough to cause serious physiological effects.

11. The distribution over the countryside was spotty and subject to local winds and contour. It skipped the nearby highway #380 (20mi. N.E.) except for low intensities which were equaled at twice and three times the distances. It is presumed that the largest outfall occurred in the N.E. quadrant of the site. This can only be explored by horseback at a later date.

12. The monitors all took considerable risks knowingly and many have received exposures of considerable amounts, i.e., 8r total. This is safe within a considerable margin. They should not be exposed to more radiation within the next month.

13. The dust could be measured at low intensities 200 miles north and northeast of the site on the 14th day. (Attached #2) There is still a tremendous quantity of radioactive dust floating in the air.

14. Neither the Base Camp or the shelters were contaminated very much.

15. Partially eviscerated dead wild jack rabbits were found more than 800 yards from zero, presumably killed by the blast. A farm house 3 miles away had doors torn loose and suffered other extensive damage.

16. Details indicating blast, heat and other effects cannot be worked out until the area around the crater "cools down".

It is this officer's opinion, however, that lethal or severe casualties would occur in exposed personnel up to two miles from a variety or combination of causes, i.e., blast, heat, ultraviolet and missiles.

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The light intensity was sufficient at nine miles to have caused temporary blindness and this would be longer lasting at shorter distances. Several observers at 20 miles were bothered by a large blind spot for 15 minutes after the shot. The light together with the heat and ultraviolet radiation would probably cause severe damage to the unprotected eyes at 5-6 miles; damage sufficient to put personnel out of action several days if not permanently. All of the personnel obeyed the safety precautions during the test so that no such injury resulted.

17. A great deal of experience was obtained on the requirements for quick and adequate monitoring. Excellent radio communications, good transportation and better and more rugged meters are required.

18. It is this officer's opinion based on the damage to "Jumbo" (2400 ft), the extent of the glazed sand area (up to 500 ft.), the extent of the cleaned off area (about 1 mile), the farm house (at 3 miles) that this explosion was a great many times more violent than the 100 ton test. "Conservative" estimates by the scientific groups put it at least equivalent to 10,000 tons of T.N.T.

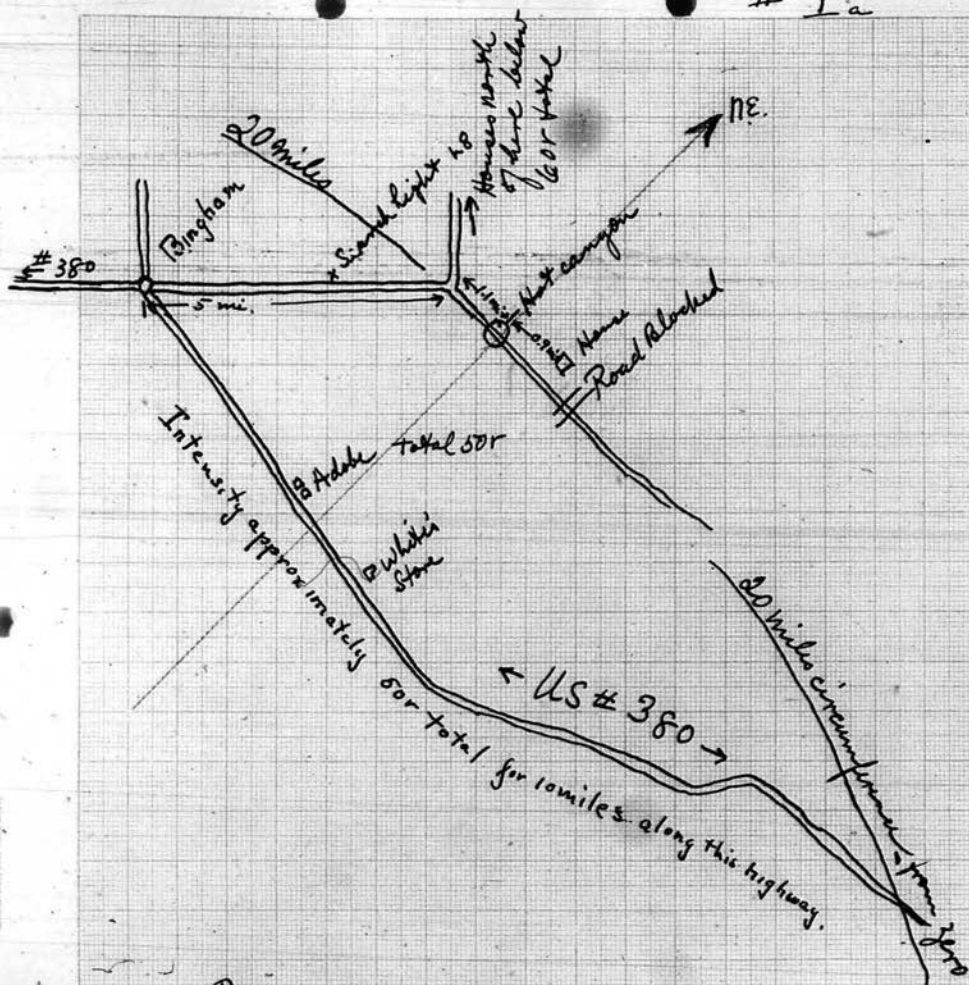
19. While no house area investigated received a dangerous amount, i.e., no more than an accumulated two weeks dosage of 60r, the dust outfall from the various portions of the cloud was potentially a very dangerous hazard over a band almost 30 miles wide extending almost 90 miles northeast of the site.

20. It is this officer's opinion that this site is too small for a repetition of a similar test of this magnitude except under very special conditions. It is recommended that the site be expanded or a larger one, preferably with a radius of at least 150 miles without population, be obtained if this test is to be repeated.

Stafford L. Warren
Colonel Stafford L. Warren
Chief of Medical Section
Manhattan District

SLW/fp

cc/ Maj. Gen Groves (2)
R. Oppenheimer (1)
Col. Warren (1)

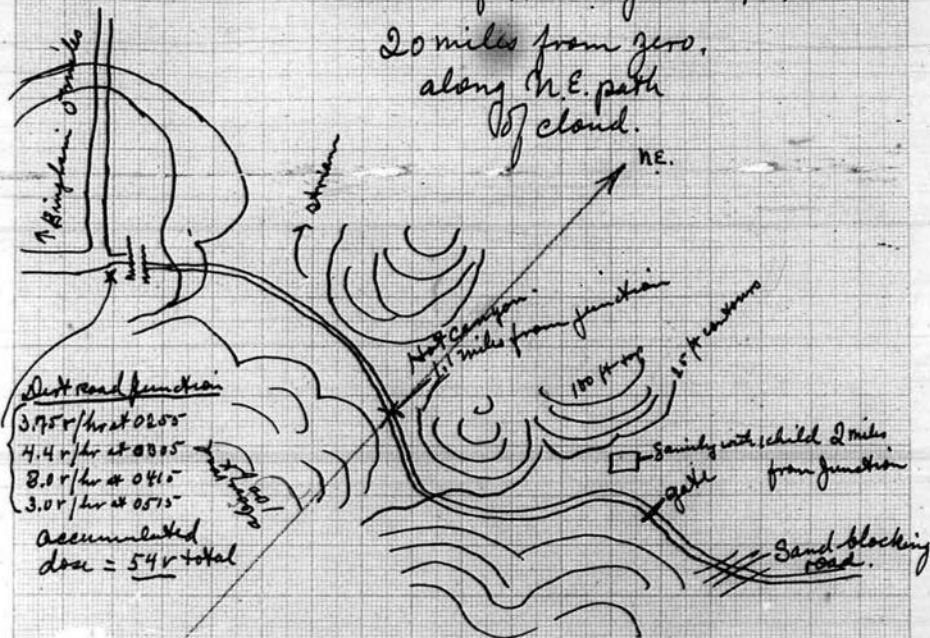
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16 July 1940 at plus 0255
hours and following time
see* Ib attached.

Ib.

Location of "Hot Canyon" 7/16/45

20 miles from zero,
along N.E. path
of cloud.



"Hot Canyon" 1.1 miles east of road junction

15.0 r/hr at 0300 hours after zero

14.0 r/hr at 0330 hours " "

6.0 r/hr at 0630 hours " "

0.6 r/hr at 3600 hours " " (after rain)

Total dose = 212
to 230 r

House (with family) 0.9 miles beyond "Hot Canyon"

0.4 r/hr at 3600 hours after zero + after a rain

Accumulated total dose 57-60 r.

Data put together from combined sources.

25 ft. Contours are "from memory."

#II attached
Reduced map of Breton Curves showing
— Spread of Activity
Calculated by John Major
7/21/45

#II
Reduced Isodose Curves
showing
Spread of Activity
7/16/45 to 7/19/45 Survey.

