

May 1999

**Report, Lawrence Livermore National Laboratory, Z
Division, 'Challenges of Advanced Nuclear Weapon
Development in Pakistan'**

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Summary:

This study, even more heavily redacted than the Z Division study on India (November 1988), examined the status of Pakistan's nuclear weapon status, and number of other topics (deleted from the table of contents), and policy implications. The Joint Special Operations Command is among the agencies on the distribution list. As the report is a "Gamma Controlled Item," some of the excisions relate to communications intelligence information.

Credits:

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Contents:

Original Scan

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Challenges of Advanced Nuclear Weapon Development in Pakistan (U)

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Foreign Nuclear Programs Section
Z Division
NAI Directorate
Lawrence Livermore National Laboratory

May 1999

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Office of Intelligence
US Department of Energy



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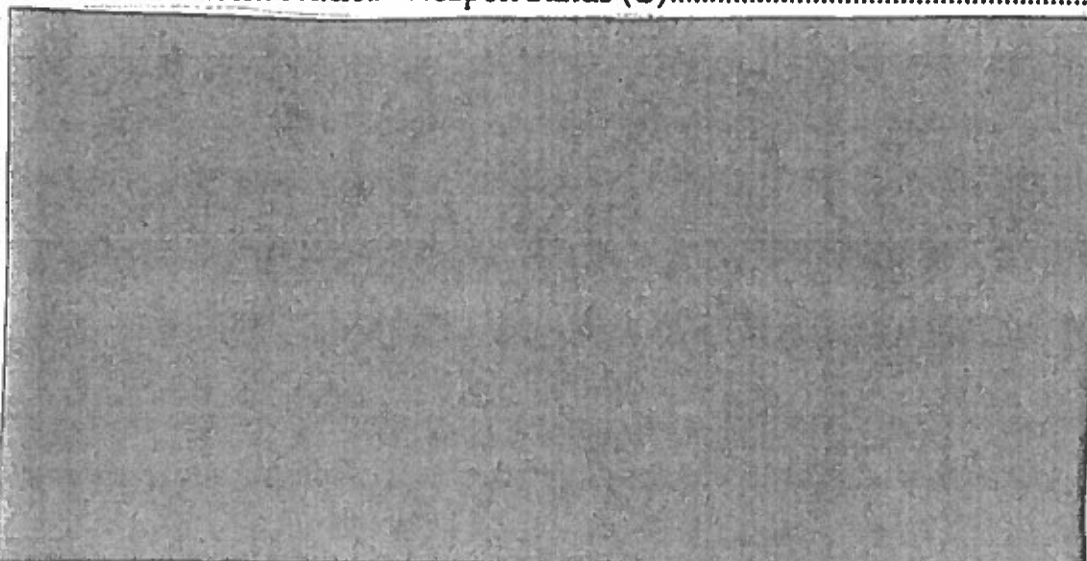
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Executive Summary (U)

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Introduction (U)

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**Pakistan's Present Nuclear
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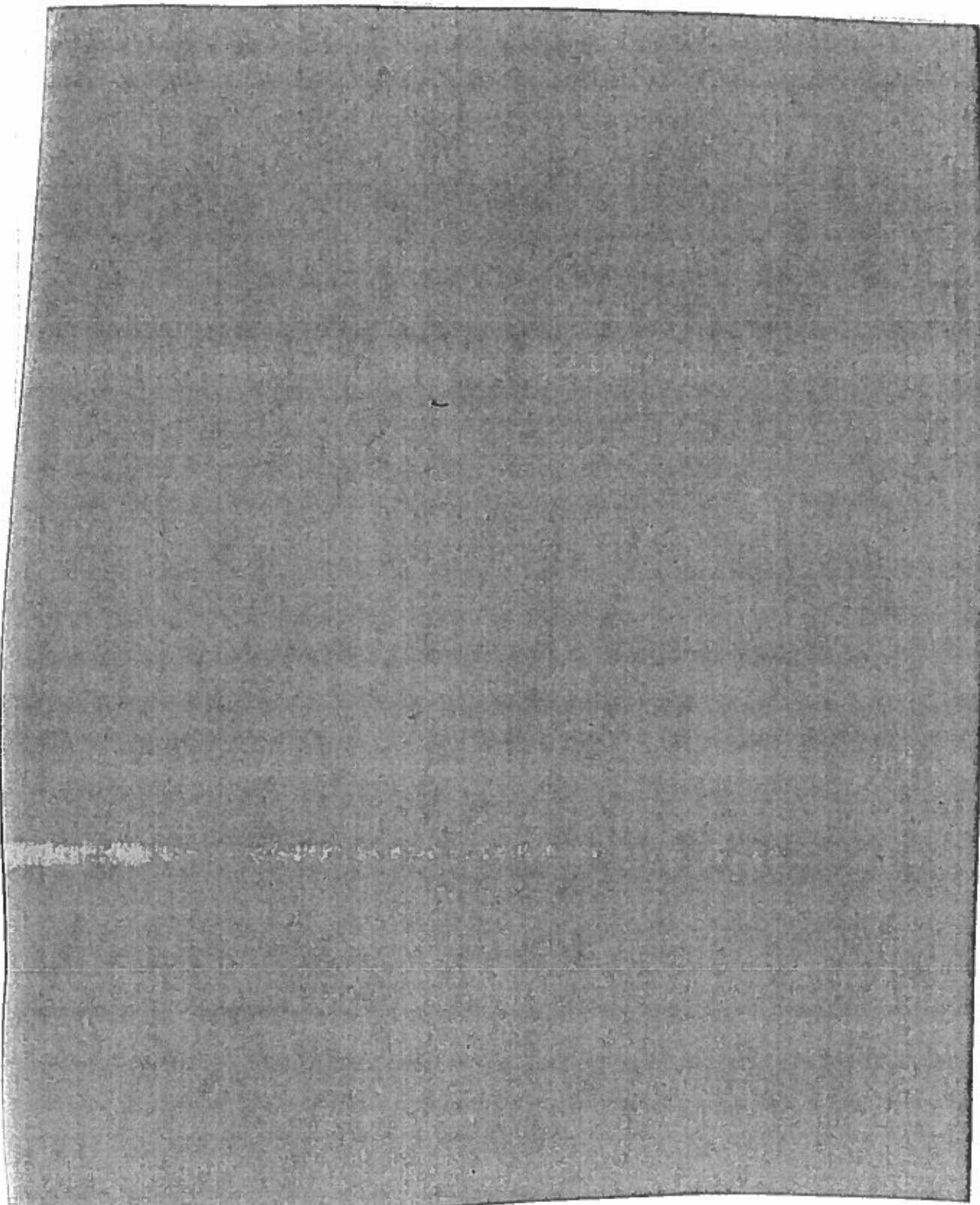
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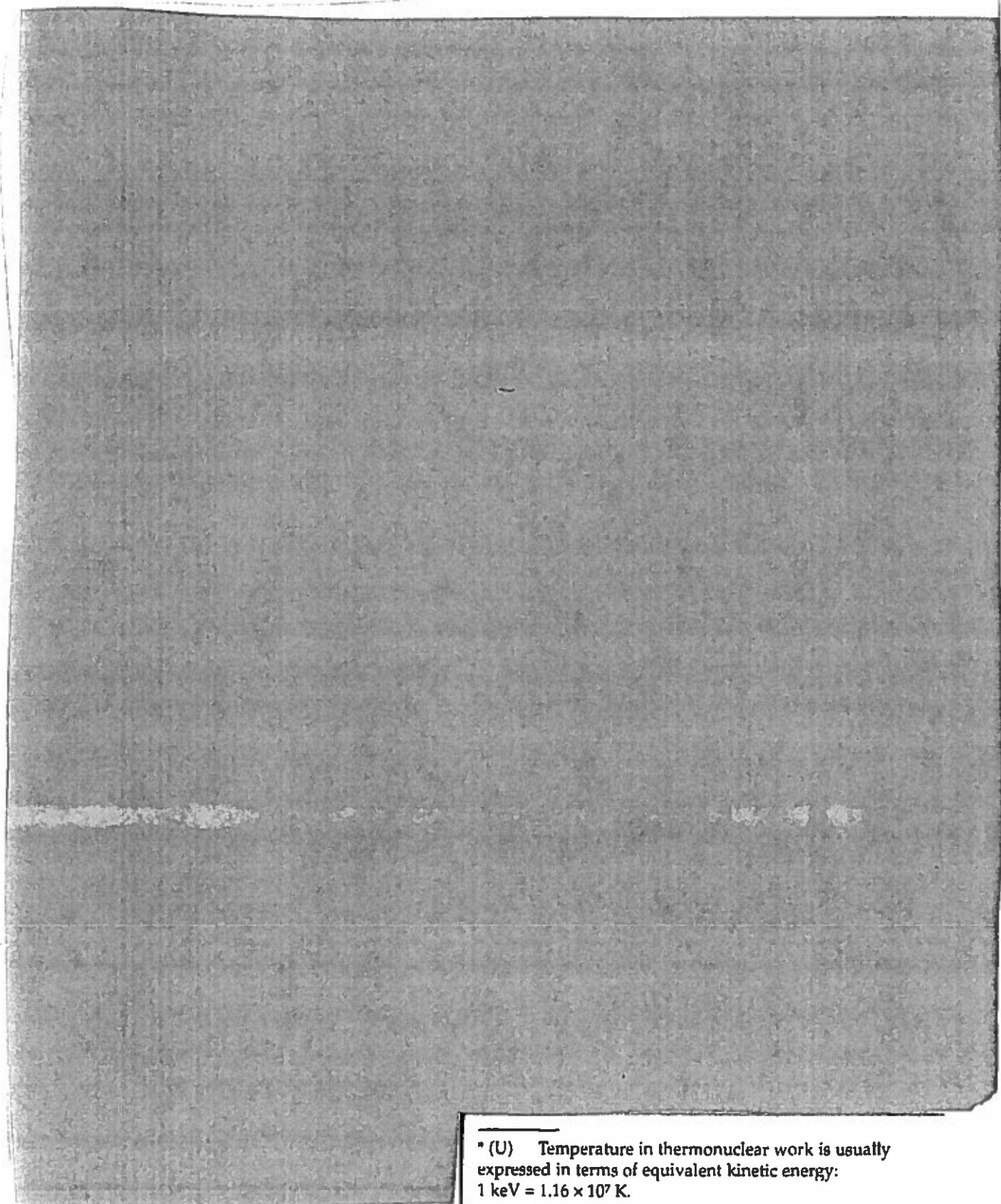
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* (U) Temperature in thermonuclear work is usually expressed in terms of equivalent kinetic energy:
 $1 \text{ keV} = 1.16 \times 10^7 \text{ K}$.

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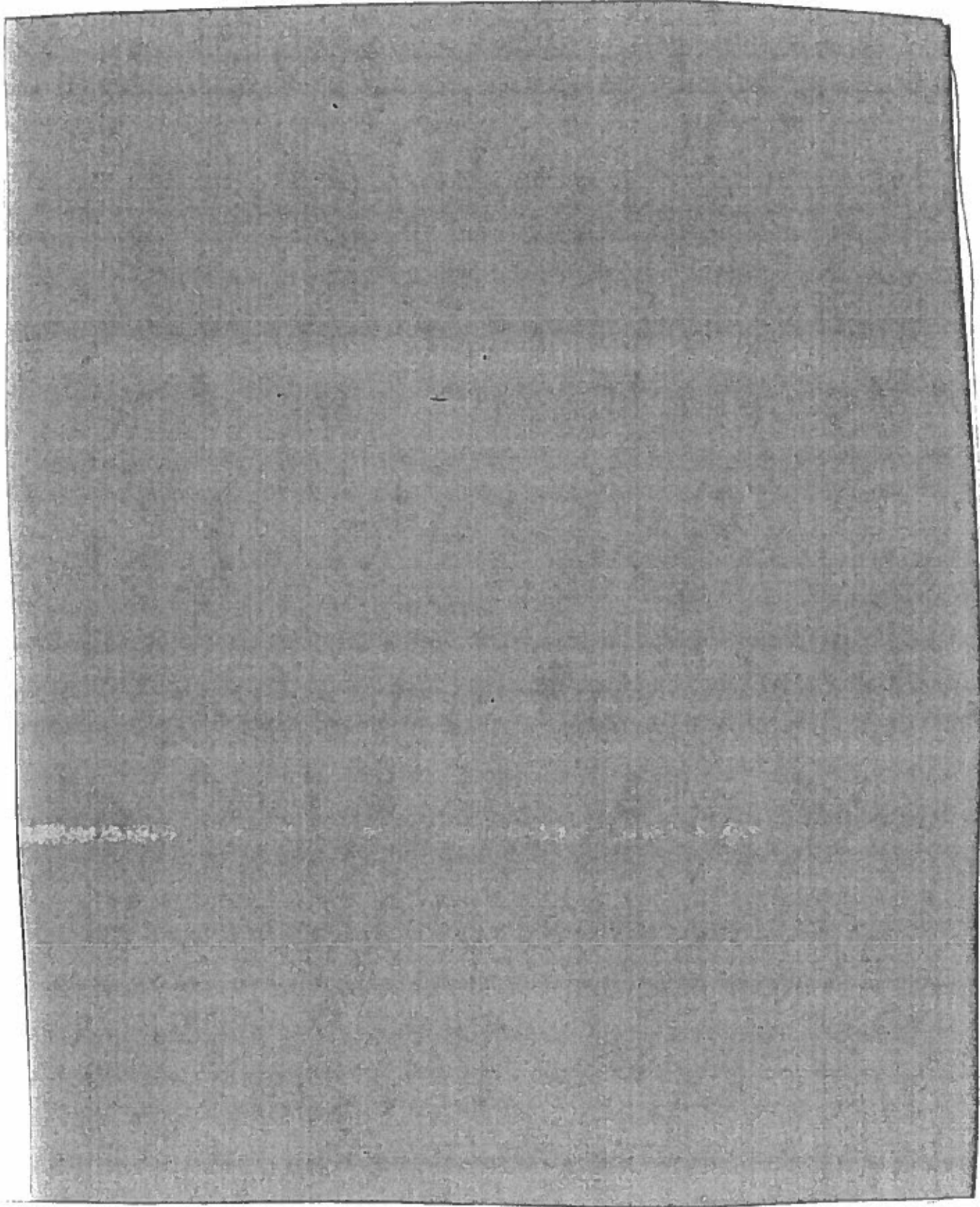
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* (U) The correct detailed chemical formula for this lithium hydride or lithium "salt" is $({}^6\text{Li}_x {}^7\text{Li}_{1-x})(\text{D}_y \text{T}_{1-y})$ where x and y are isotopic fractions ≤ 1 . For natural Li (${}^n\text{Li}$), $x = 0.075$. For equal mass DT, $y = 0.6$ and for equimolar DT, $y = 0.5$.

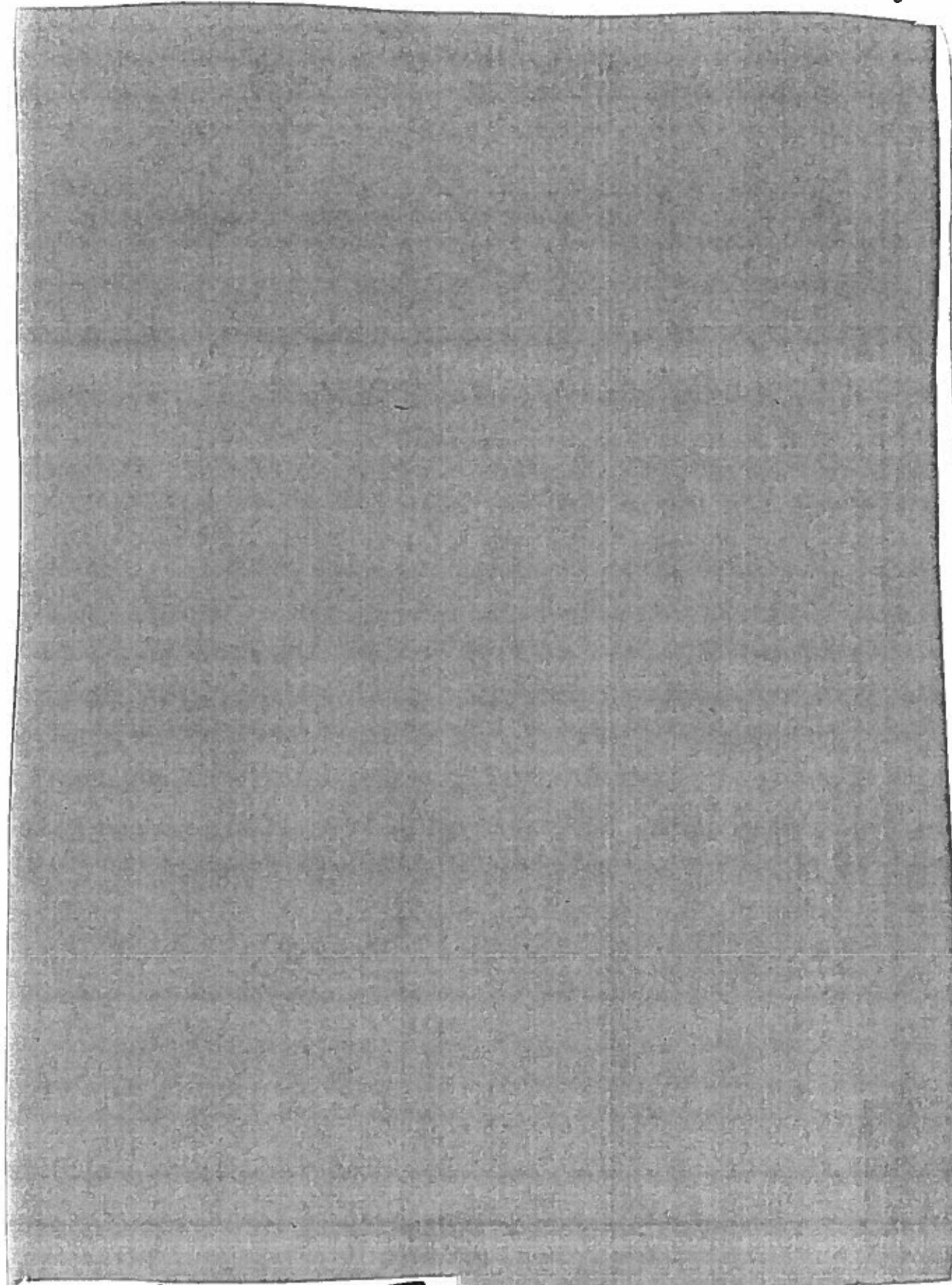
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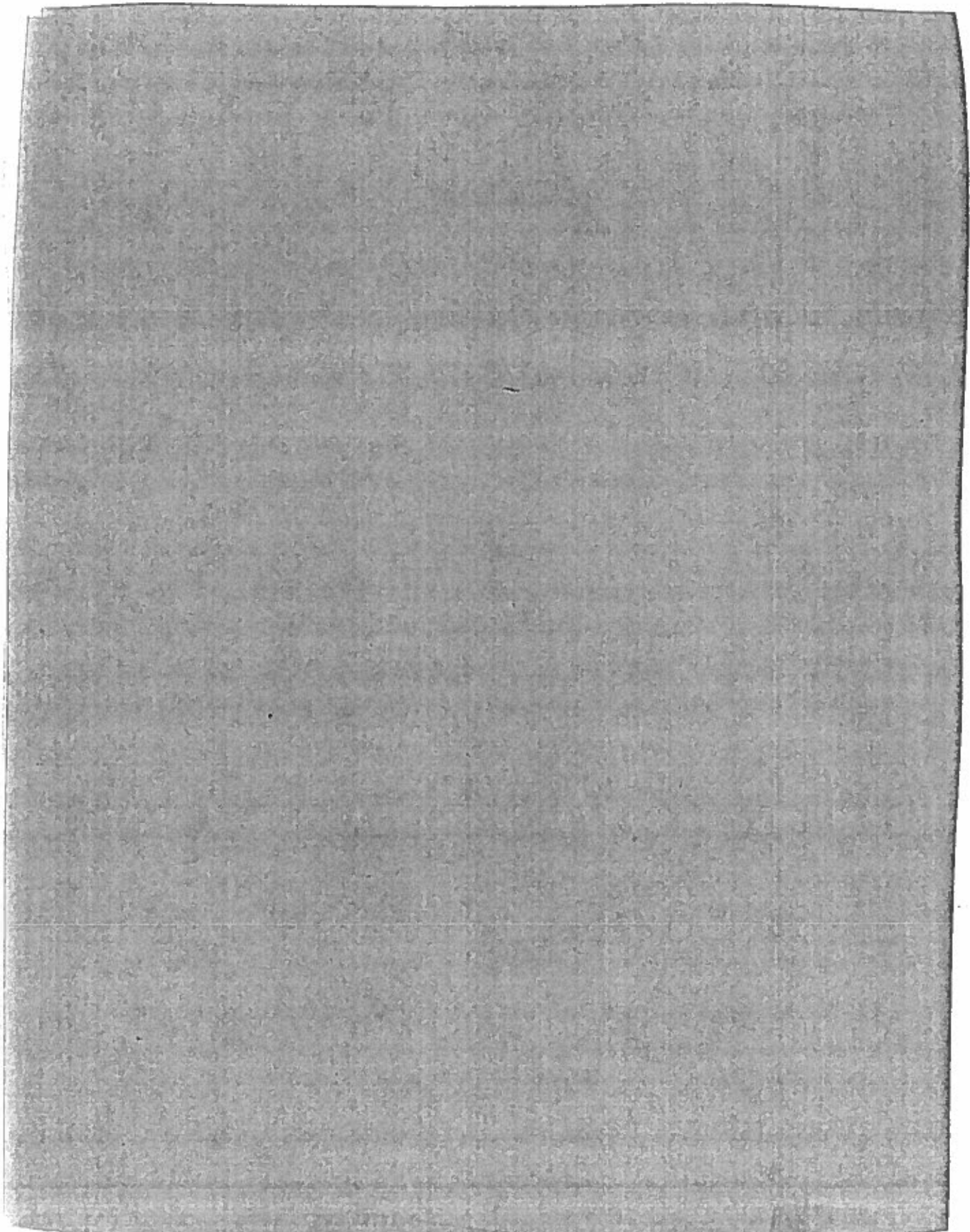
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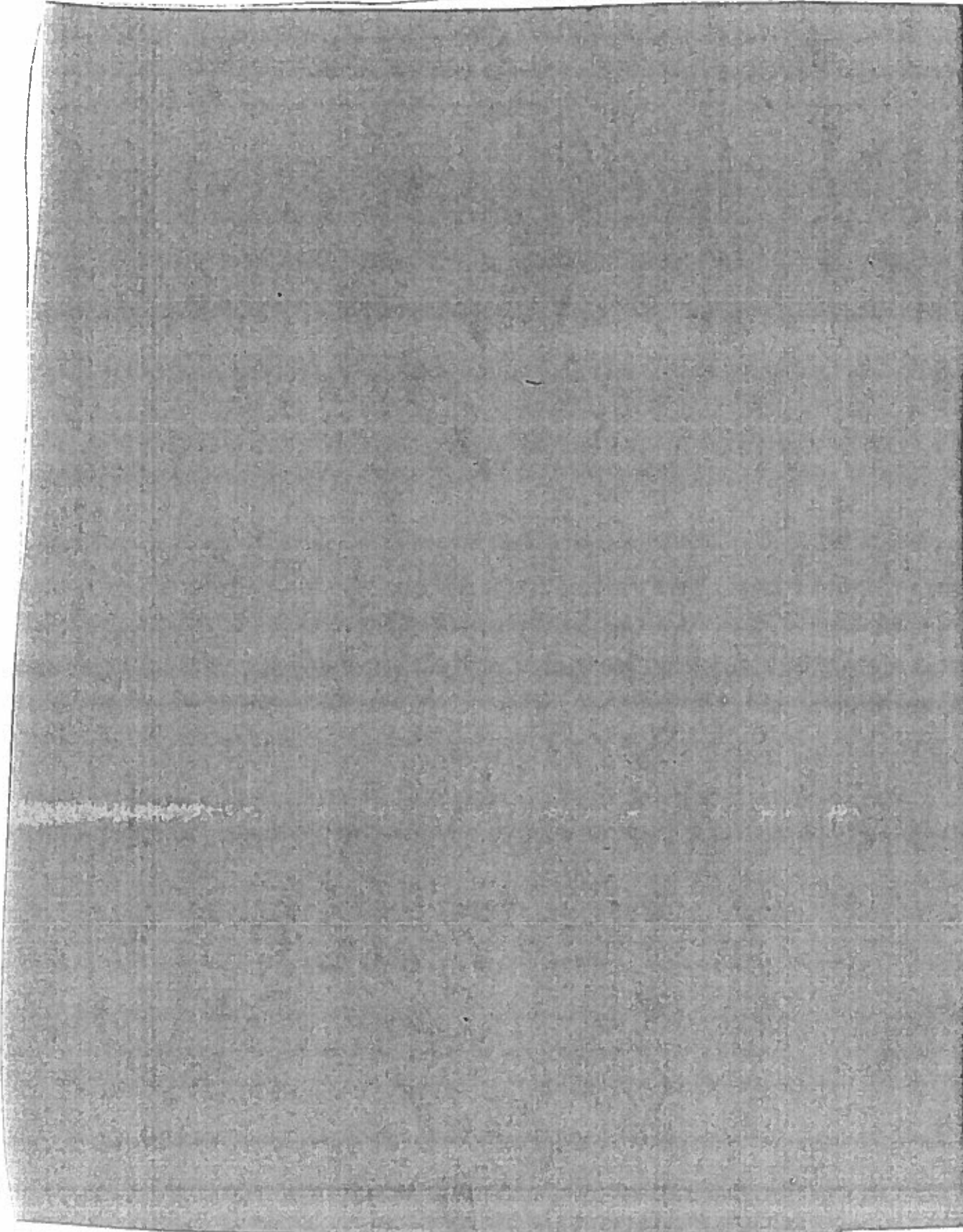
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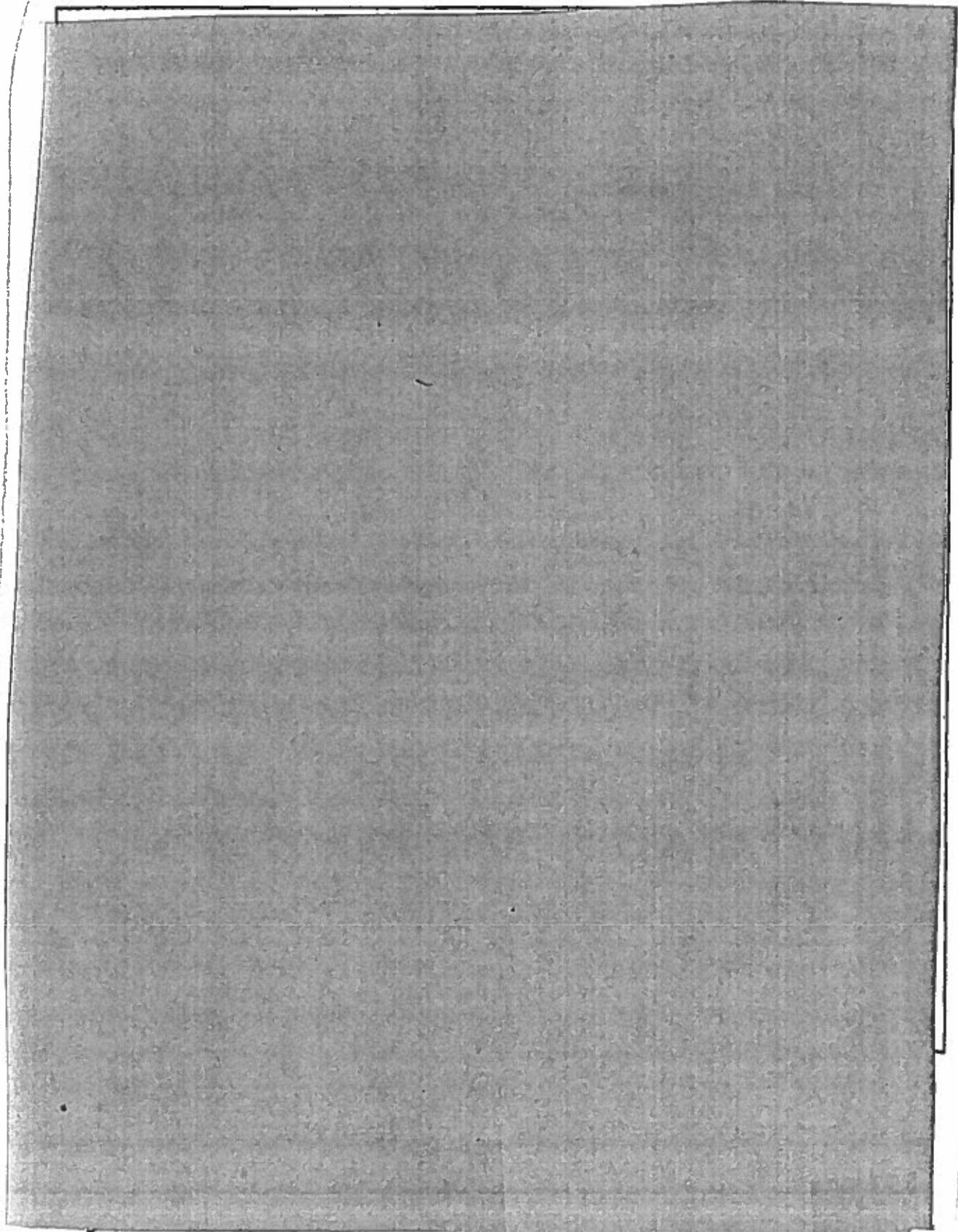
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* (U) Slifer stands for shorted location indicator by frequency of electromagnetic resonance, a way of measuring the rate at which a cable extending away from the shot point is shorted at the shot end by the expanding shock wave. Because the rate depends upon the yield, the latter can be determined. Gas sampling is a way of sampling the air in the shot cavity (minutes to days after the shot) by pumping through a preemplaced hose or permeable cable for gaseous fission products and chemical tracer gases to determine the number of fissions and thus the nuclear yield.

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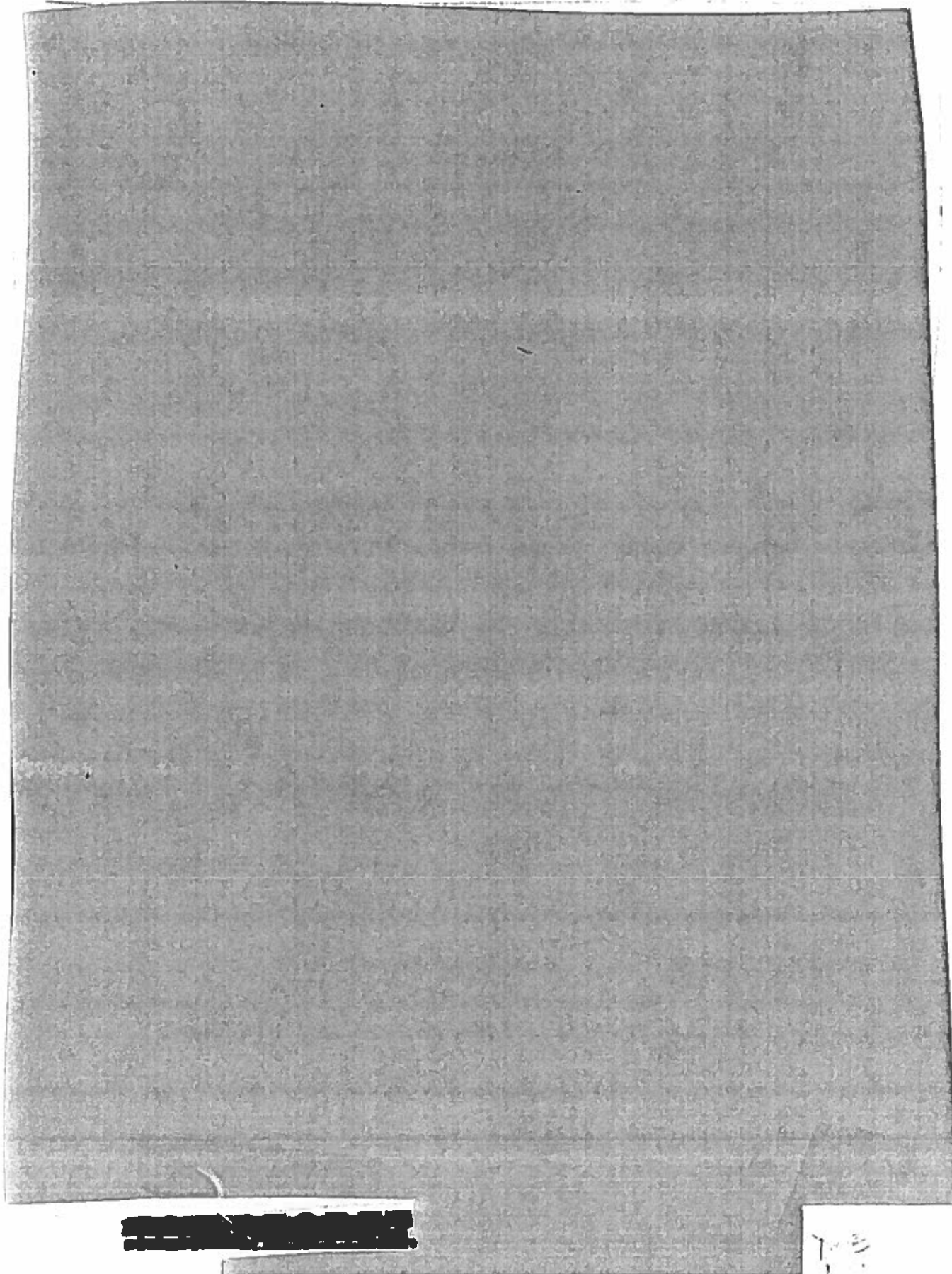
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Policy Implications (U)

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Conclusions (U)

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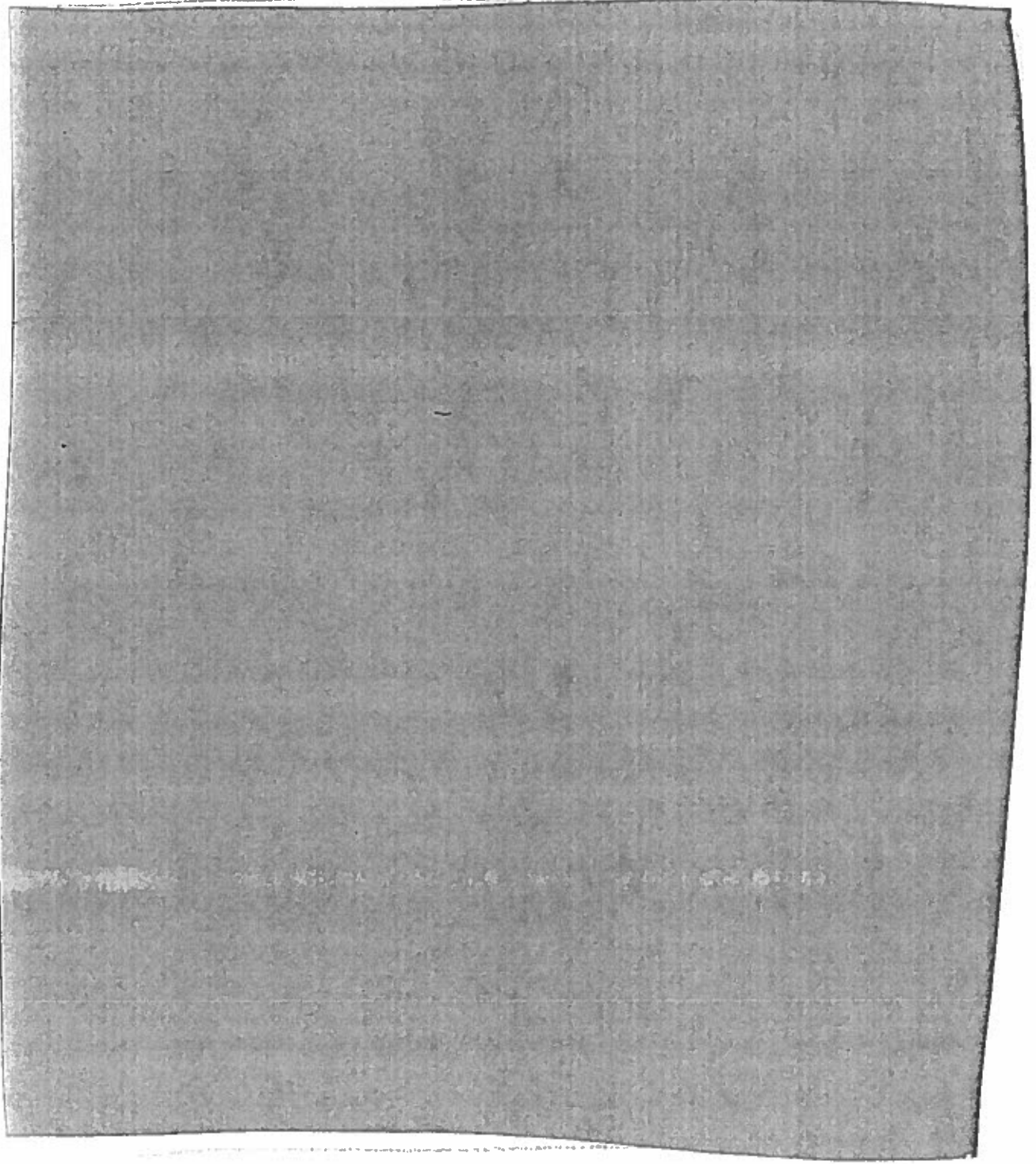
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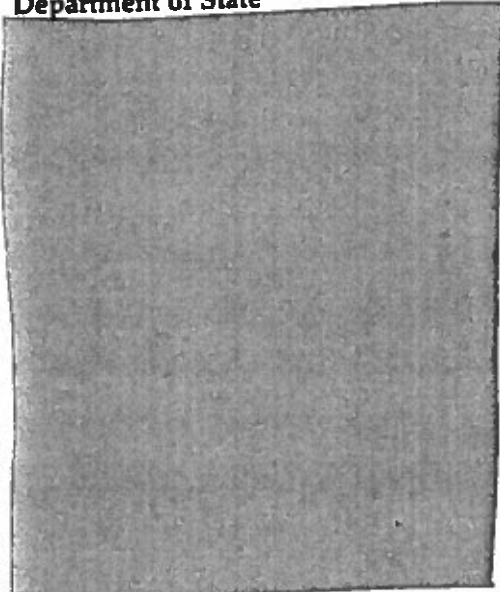

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