

Office Memorandum • PUBLIC HEALTH SERVICE—DSS
UNITED STATES GOVERNMENT

TO : *[Redacted]*, PHS Off-Site Activities
Las Vegas, Las Vegas, Nevada

DATE: June 15, 1959

FROM : R. H. Neill, Special Projects Branch, DSH

SUBJECT: Inhalation Doses Sr⁸⁹ and Sr⁹⁰

403461

Although I'm sure you have calculated something similar to this before, I'm enclosing a copy of some air doses for radiostrontium during Hardtack II. The numbers are quite low.

I only wish we had some continuous ground level air sampling data from other series. It would be interesting to compare the results.

Has anyone done anything similar to this for Iodine? This one is much too complex for me to even begin to calculate here, but Kermit Larsen's results on I¹³¹ and I¹³³ concentration in rabbit thyroids seem to indicate that some calculations are called for.

The only concern that I have is that our filter is collecting a reasonable amount of total particulates, and especially the 10 micron material. However, even increasing the results by a factor of ten still leaves a very small % of the permissible.

Bob

R. H. Neill
Special Projects Branch

Attachment.

RP. Best regards to all.

BEST COPY AVAILABLE

CALCULATION OF AVG. Sr⁸⁹ AND Sr⁹⁰ AIR DOSE
IN OFF-SITE COMMUNITIES DURING PHASE II, HARDTACK

Avg. air concentration for two months 1×10^{-4} uc/m³ Total Beta
 1×10^{-10} uc/ml

Old NCRP MPC Sr⁸⁹ in air 2×10^{-8} uc/ml (occ. 12 hr. day)
 1×10^{-8} " (occ. 24 hr. day)
 1×10^{-9} " (off-site pop, 24 hr. day)

	A	B	C	D	E	F
	$\frac{Sr^{89} + Sr^{90}}{TOTAL\ BETA}$ %	TOTAL BETA ACTIVITY uc/ml	Sr ⁸⁹ (PRESENT) uc/ml	Sr ⁸⁹ (MPC) uc/ml	Sr ⁸⁹ Actual/Perm. %	Sr ⁹⁰ Actual/Perm.
If avg. Activity is D + 1	6.8	1×10^{-10}	6.8×10^{-12}	1×10^{-9}	0.7 %	0.35%
If avg. Activity is D + 2	3	1×10^{-10}	3×10^{-12}	1×10^{-9}	0.3%	0.15%
If avg. Activity is H + 12	9.0				1%	0.5%
BOLLES & BALLEAU USNRDL 456		FHS HARDTACK II Report	A x B*	OLD NCRP HB 52	C/D	MPC E(1/180)(100/1)

*Excluding fractionation, shortly after fission Sr⁸⁹/Sr⁹⁰ = 180 on an activity basis. (SRSY) Therefore, the Sr⁹⁰ present is less than $\frac{1}{180}$ of 1% of the 89 and can be ignored in calculating (C).

Including factors for new ICRP general population value (80/30) for Sr⁹⁰ still keeps the peak value around $0.35 \times (80/30)$ or 0.9% of the allowable.

The obvious conclusion of this calculation shows that airborne Sr⁸⁹ and Sr⁹⁰ was of little hazard in off-site communities during the past series.

But is slow fissioning of U²³⁵ applicable to Plutonium?