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ARGONNE NATIONAL LABORATORY

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September 25, 1973

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Los Alamos, New Mexico 87544

Dear Evan:

We will within the next few days be shipping the first group of urine samples from the plutonium recipients and it is therefore important that I summarize the information that I have on this material as well as the general approach to the analysis of these urine specimens that we (yourself, Bill Moss, Jake Sedlet, and I) agreed upon when we were at the recent Bioassay Conference. As you are well aware, these are a particularly unique group of specimens and any further suggestions that you may have that will help insure the success of this endeavor will be more than welcome.

Dr. Patricia Starzyk is the individual responsible for all the analyses at CHR. If there should be a need at some time to discuss this analytical program and I am not available, feel free to discuss it with her. She can undoubtedly provide more readily than I details of the exact operations. Her extension is 2442.

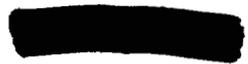
Identification

A CHR case number has been assigned to each of the three individuals. The literature case numbers, the CHR case numbers and the urine specimen numbers are given in the following table:

<u>Literature No.</u>	<u>CHR No.</u>	<u>Specimen Numbers</u>
Cal-3	40-003	3 to 13
HP-3	40-009	15 to 28
HP-9	40-012	7 to 14

The numerical system we have chosen to identify the particular aliquot of each specimen (24 hours) consists of three numbers separated by dashes. The first indicates the CHR number, the second the specimen, and the third the aliquot. (The order of the specimen numbers has a direct correspondence

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PROVENANCE

REPOSITORY: OFFICE OF HUMAN RADIATION
EXPERIMENTS (OHRE)

COLLECTION: PLUTONIUM INJECTION INVESTIGATION
FILES (OHRE 1)

BOX: 3

FOLDER: PLUTONIUM - CHR

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with the order in which the specimens were obtained. However as shown in the above table the first specimen in no case bears the number "1".) A typical aliquot designation will be 12-8-3. This is the third aliquot from the second urine specimen obtained during the confinement of CHR Case No. 40-012.

Relevant Information

Information about these cases which you will need is summarized in the following table:

<u>CHR Case No.</u>	<u>Plutonium Isotope</u>	<u>Amount Injected, μ Ci</u>
40-003	238	0.09
40-009	239	0.30
40-012	239	0.33

Three aliquots from CHR Case No. 40-009 have been analyzed, aliquots 9-7-1, 9-7-2, and 9-7-3. The amount of plutonium excreted in that 24 hour period was about 7 μ Ci.

The level of plutonium in the urine of 40-003 is expected to be a factor of 5 to 10 lower than the levels in 40-009 and 40-012. A lower level of plutonium was administered and shortly after injection into a leg, the leg was amputated. Analysis of this tissue showed that 50% of the injected plutonium had been retained in the amputated section.

Specimen History

Subsequent to obtaining the specimens, they were frozen in polyethylene containers and shipped to CHR. Since their receipt, they have been kept frozen.

Aliquoting

Aliquoting has been carried out on a weight basis. The specimen is thawed and transferred to a tared 2-liter mixing cylinder. The bottle is washed three times with concentrated nitric acid, the total amount being that which makes final acidity of the urine about 2N. After the mixing cylinder and its contents have been weighed, the urine is mixed thoroughly by shaking and aliquoted by transferring approximately equal volumes into 12-250 ml polyethylene bottles. The exact fraction in each bottle is established from the pre- and post-transfer bottle weights.

Each of these bottles is demonstrated to be leak-proof prior to use by screwing on the cap, immersing the top under water, and squeezing the bottle. Prior to shipment the caps are taped.

In the determination of plutonium the entire contents of the bottle constitutes the aliquot. The contents are to be transferred into the container to be used for wet-ashing, the bottle washed several times with small quantities of concentrated nitric acid, and the washings added to the container. Three specimens have been aliquoted. Three aliquots from each are about to be shipped to you.

Standards

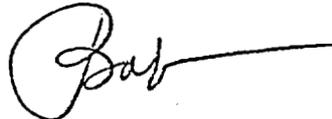
Included in the shipment will be six standards, each of which is to be analyzed as if it were an aliquot of the specimens discussed above. These standards are 250 ml portions of urine that have been spiked with a known amount of ^{239}Pu .

Order of Analysis

As you have suggested in our previous discussions, the standards should be analyzed initially and the values obtained reported to CHR prior to analyzing the specimens. If, as anticipated, the values you obtain agree with the amounts of ^{239}Pu that we spiked in, the analysis of the specimen aliquots can proceed. I suggest the data be reported in the units of disintegrations per minute per aliquot.

When the analysis of the standards and the first aliquots from the first three specimens have been completed, the data will be evaluated. If, as expected, there are no problems, we will ship single aliquots of the other specimens to you. If there are any discrepancies between your value and ours for any of the specimens, we will ship an additional aliquot to you for analysis and we will analyze another aliquot in order to resolve the discrepancy.

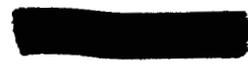
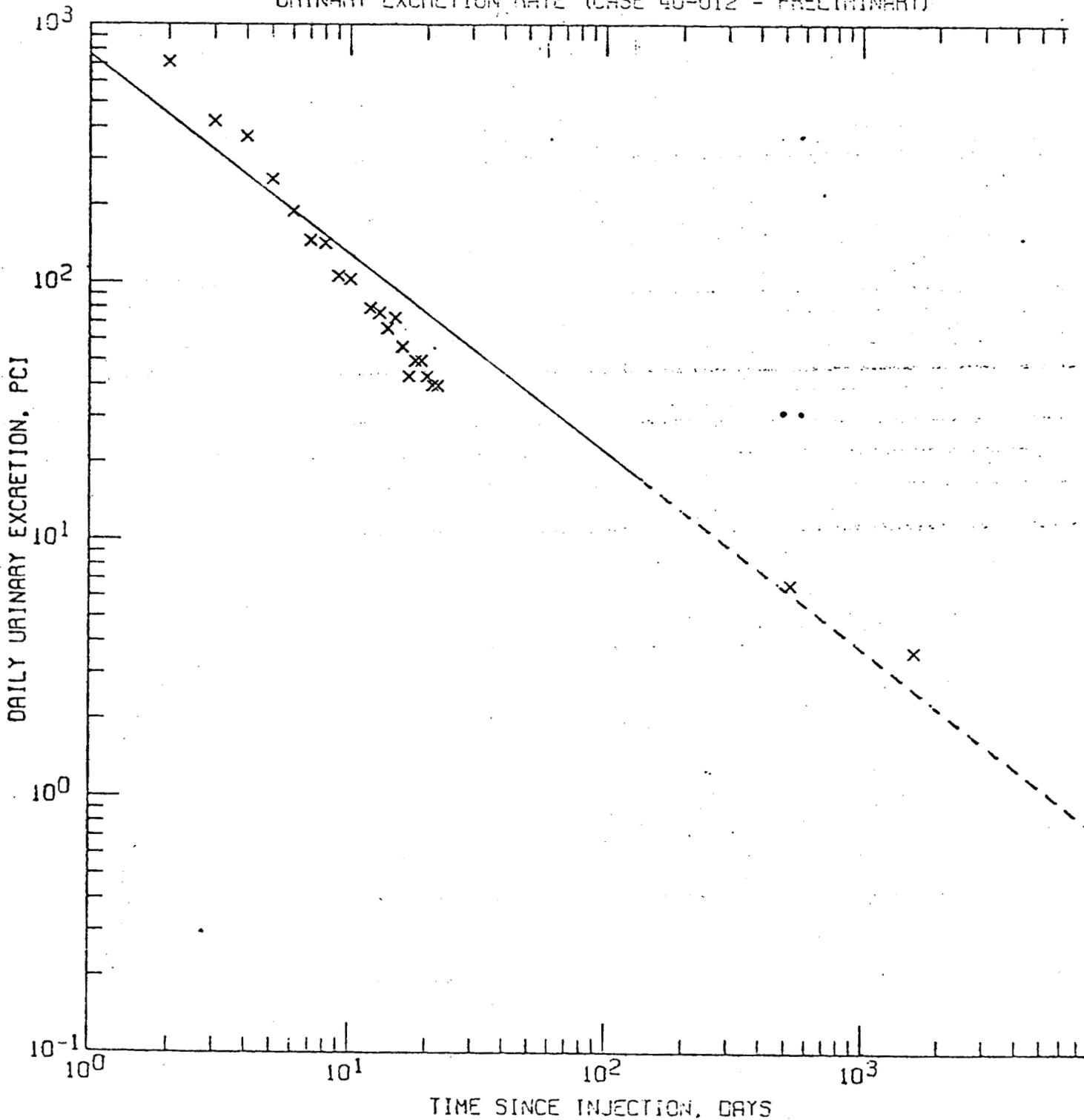
Sincerely yours,



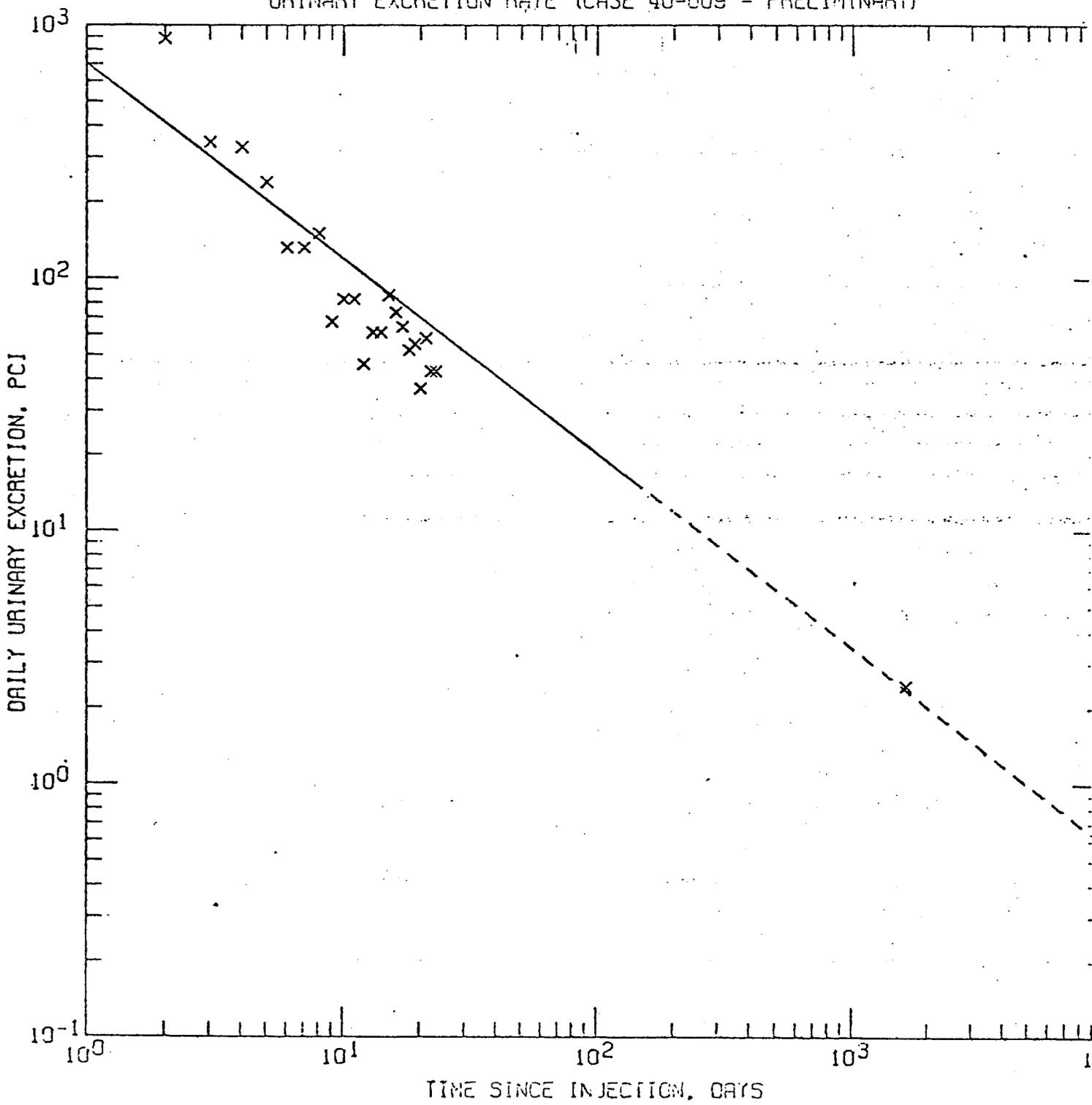
Robert P. Larsen
Radiological and Environmental
Research Division

RPL:hmb

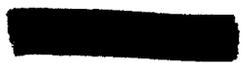
URINARY EXCRETION RATE (CASE 40-012 - PRELIMINARY)



URINARY EXCRETION RATE (CASE 40-009 - PRELIMINARY)



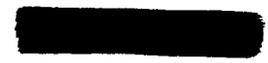
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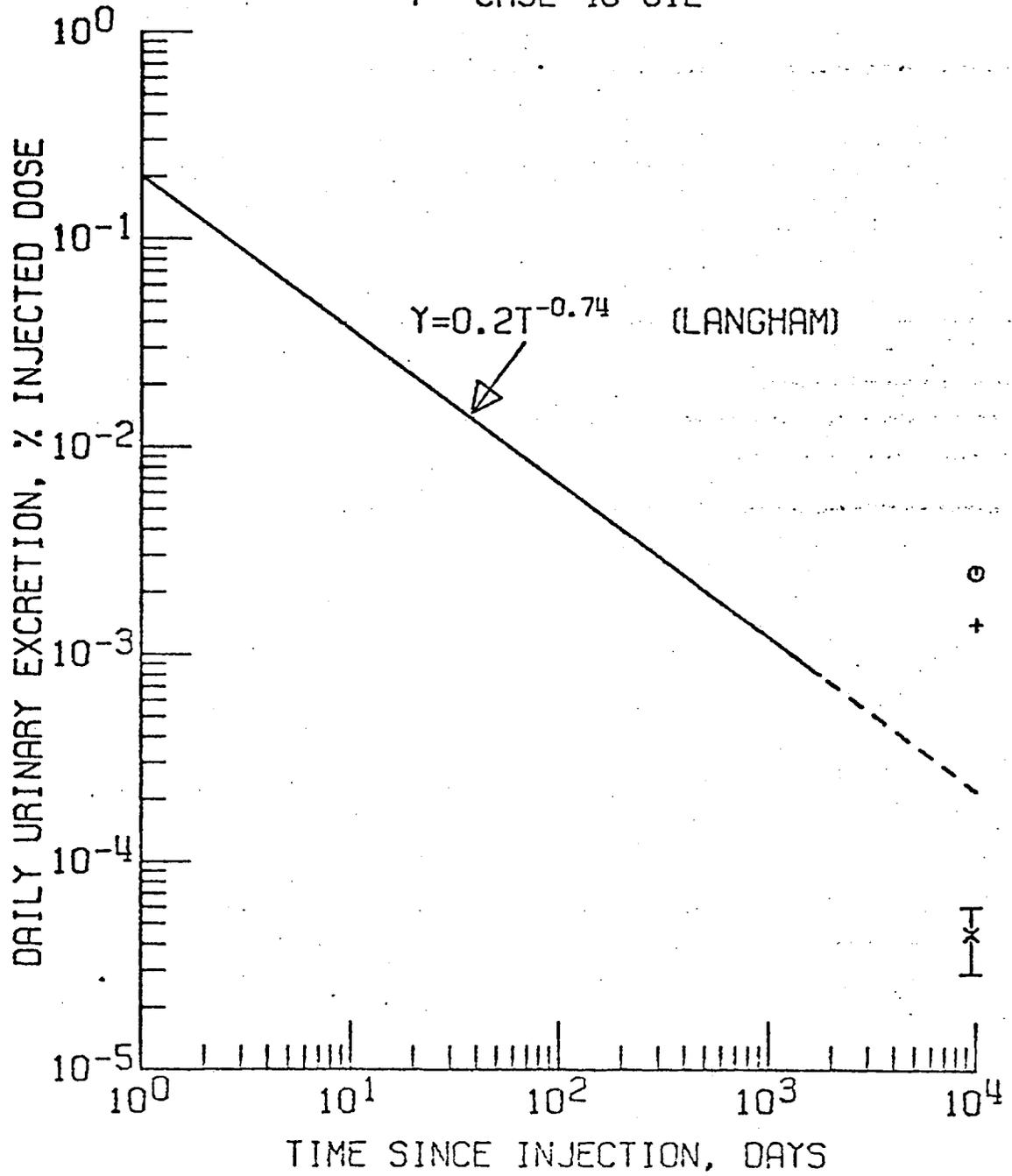
40-009 - 7.6 pCi/day urine.

40-012 ~5. pCi/day

40-003 ~0.04 pCi/day



- × CASE 40-003
- ⊙ CASE 40-009
- + CASE 40-012



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