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A STUDY OF TOTAL AMOUNTS OF ACTIVE WASTE RELEASED IN ALL MANNERS BY THE H.E.W. PROCESS TO DATE

Much of the material in this report has been based on rather incomplete data obtained from one or two analyses, information from the H.E.W. Technical Manual and informal estimates by the author and others. In specific cases where such sources could lead to rather large errors, mention of the fact is made.

All figures of total curies of fission products are calculated on the basis of the activity at the time the waste is discharged.

In general, all figures should be correct within a factor of two or three.

Summary

The sum total of all curies of waste from the entire Plant from startup to date is approximately 2.1×10^8 curies. The total amount of product discharged as waste from startup to date is approximately 17.5 kg of Pu. A breakdown of these amounts is given below:

100 Areas

Total activity discharged to Columbia River to date = 40,000 curies.

Present monthly rate = 1500 curies.

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Buried Wastes

No estimate of total activity buried can be made. Approximately 25,000 cubic feet of material have been buried in all three 100 Areas. The current rate of burial is about 1,200 cubic feet per month. This waste consists principally of used dummy slugs, replaced thimbles and other contaminated equipment from the Pile.

200 Areas

Active wastes stored in the underground storage tanks in the B, C, T and U Area Tank Farms combined.

Storage Tank	Total Fission Product Activity in Curies	Current Monthly Rate of addition of F.P. in Curies	Total Amount of Plutonium Present in Grams	Current Monthly Rate of Addition of Pu in Grams
Metal Waste	$\sim 1.8 \times 10^8$	$\sim 9 \times 10^6$	About 2000	About 100
1st Cycle Waste	$\sim 2.0 \times 10^7$	$\sim 1 \times 10^6$	About 5400	About 270
2nd Cycle Waste	$\sim 2.0 \times 10^5$	$\sim 1 \times 10^4$	About 2700	About 135

361 Sump Tanks, Dry Wells and Associated Underground Cribs in T and B Plants combined.

Approximately 7,500 gms of Plutonium have been discharged to the sump tanks from the Concentration Buildings.

One or two analyses of the effluent from the sump tanks to the dry wells or cribs indicate that approximately 80 grams of Pu have gone into the wells or cribs. This means that about 7,400 grams of Plutonium is in the two 361 tanks. This figure is high because it is known that at the time the dry well in the "z" plant plugged that the product-containing sludge from the 361 tank had been going into the well for an undetermined period. Current rates are about 350 grams/month into the settling tanks and 2 to 4 grams discharged into the cribs.

Control Laboratories Dry Wells

It is difficult to estimate how much activity has gone down these wells, but it is probably in the order of a few hundred curies of fission products at the most. Rather small amounts of product were contained in this material.

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Isolation Building Dry Well and Associated Crib Tanks

About 500 grams of Plutonium have been sent to the dry wells and crib tanks. The current monthly rate is approximately 18 to 20 grams.

T and B Plant Stacks

These stacks discharge radio-iodine, radio-xenon and small amounts of fission products and Plutonium to the atmosphere. Some 4.7×10^5 curies of I^{131} and 2.2×10^5 curies of Xe^{133} have been discharged with current monthly rates of 7,000 curies for iodine and 1000 curies for xenon.

The best estimate on the amount of Plutonium up the stacks to date is on the order of 0.5 grams for two stacks. The approximate monthly rate now is about 20 mg Pu for two stacks.

No good data are available on the amounts of fission products discharged by this method. All these materials are widely dispersed in currently insignificant concentrations.

Burial Grounds

Here again no estimate of the total activity buried can be made. About 35,000 cubic feet of material have been buried to date with the current rate being about 2,000 cubic feet per month. The material in these areas consists largely of contaminated paper, tools and equipment from the Process Buildings, and solid wastes from the laboratories.

300 Area

Retention Basin

Approximately 750 g of Uranium have been discharged to this pond by normal Plant operations. Current monthly rate is about 30 grams. Small amounts of Plutonium are present, probably less than 1 gram total.

Burial Ground

The waste buried consists of large quantities of gloves from Metal Fabrication buildings, discarded crucibles, miscellaneous equipment from Process buildings and solid laboratory wastes. Nearly 5,000 cubic feet of material have been buried with a current monthly rate of about 250 cubic feet.

General Plant

Small amounts of both product and fission products are probably discharged in enormous volumes of water in several open ditches in the Plant. Wash water from the contaminated laundry, cooling water from Process vessels, and excess water from the 200-North Areas contribute most of the total. These waters are in general monitored before release and are not released unless the activity is very low. The eventual fate of active material disposed to the ground as liquid wastes is being extensively studied at the present time. Detailed information is not expected in less than 6 months.

FPS:swc

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