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TO: H. M. PARKER

FROM: J. W. HEALY

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LEAKS IN 107-F AND 107-D BASINS

A close check has been kept on the warm springs which have appeared along the Columbia River beside the 107-F and 107-D Retention Basins. The first sampling on 9/13/45 - 9/18/45 indicated that the activity in the springs at 100-F was low, compared to the activity of the water in the Retention Basin. Since that time samples have been taken at both 100-D and 100-F every week. The results are listed in Tables I and II.

TABLE I

ACTIVITY OF WATER IN SPRINGS AT 100-D

Date	30' above spillway		2' below spillway		75' below spillway		410' below spillway	
	Temperature	µc/liter	Temperature	µc/liter	Temperature	µc/liter	Temp.	µc/liter
10/11		1.7 x 10 ⁻⁴		2.1 x 10 ⁻⁴				
10/18		2 x 10 ⁻⁴		1.9 x 10 ⁻⁴				4.5 x 10 ⁻⁵
10/25	27° C	1.9 x 10 ⁻⁴						4.5 x 10 ⁻⁵
11/2	30° C	1.5 x 10 ⁻⁴	29° C	1.1 x 10 ⁻⁴	19° C	1.6 x 10 ⁻⁴	19° C	1.3 x 10 ⁻⁴
11/9	27° C	9.2 x 10 ⁻⁵	28° C	9.7 x 10 ⁻⁵			18° C	2.3 x 10 ⁻⁵
11/6	28° C	1.1 x 10 ⁻⁴	30° C	1.2 x 10 ⁻⁴			17° C	1.4 x 10 ⁻⁵
							19° C	4.1 x 10 ⁻⁵

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TABLE II

ACTIVITY OF WATER IN SPRINGS AT 100-F

Date	460 ft. Above Spillway		110 ft. Above Spillway		2 ft. Below Spillway		1500 ft. Below Spillway	
	Temp.	µg/liter	Temp.	µg/liter	Temp.	µg/liter	Temp.	µg/liter
10/11		< 10 ⁻⁵				7.3 x 10 ⁻⁴		6.8 x 10 ⁻⁵
10/18		6.0 x 10 ⁻⁵				7.3 x 10 ⁻⁴		1.0 x 10 ⁻⁴
10/25		-	33° C	2.9 x 10 ⁻⁴	37° C	6.5 x 10 ⁻⁴	19° C	3.0 x 10 ⁻⁴
11/2	18° C	< 2 x 10 ⁻⁵			37° C	6.9 x 10 ⁻⁴	24° C	1.6 x 10 ⁻⁴
11/9	14° C	< 10 ⁻⁵			37° C	4.2 x 10 ⁻⁴	25° C	4.6 x 10 ⁻⁵
11/16	15° C	< 2 x 10 ⁻⁵			36° C	5.3 x 10 ⁻⁴	25° C	1.6 x 10 ⁻⁴

For comparison the 107-F pond exit was sampled on 11/2/45, and was found to have an activity of 0.2 µg/liter and a temperature of 38° C.

The maximum activity at both areas appears to occur beside the spillway with 100-F consistently giving values 5-7 times those at 100-D. The temperature of these springs is comparable to that of the 107 basin, indicating that the hold-up time is probably not long. However, the activity of the water is less than 1 per cent of that in the basin indicating that the sodium (14.8 hrs.) and manganese (2.5 hrs.) may be adsorbed in the soil through which it passes.

Decay curves on two samples from 100-F on 10/2/45 gave values of ~ 25% (0.5-1.0 day) and ~ 75% (15-25 days). Four samples from 10/22/45 have given values of 30 ± days. The latter four samples are being followed further to see if this could be a two component system.

At 100-D, there are about 15 areas from which the water flows. The term "Area" may mean only one spring or a general seepage out of an area of several square feet. The springs extend from 1000 ft. below the spillway to 30 feet above. At 100-F, there are about 30 areas from which the water flows. These springs extend from 1500 feet below the spillway to 800 feet above.

The P Department has drained both sides of the 107-F basin and one side of the 107-D basin to look for leaks. Apparently no major leak has been found in the basin as yet. Some work has been done on adding salt to various spots in the pond to see if it comes out in the springs. The results appear somewhat inconclusive as yet. For a full evaluation of the work, the reports of the Technical Department should be consulted.

JWH:swc

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