OAK RIDGE NATIONAL LABORATORY

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Date February 8, 1949

File 4251

Subject Contents of the ORNL Uranium Waste Storage Tanks

INV. 64

Those Eligible To Read The Attached

By W. K. Eister

Copy # 2 A

To F. L. Steahly

M. D. Peterson

Before reading this document, sign and date below:

INV. 64

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Technical Information Officer ORNL Site — Date

2-11-49

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[redacted]

To: F. L. Steahly

Date: February 8, 1949

Classification Cancelled

From: W. K. Eister

~~Or Changed To~~

Re: Contents of the ORNL Uranium Waste Storage Tanks

By Authority Of Roc

By EEB Date UG 27 1971

The ORNL uranium waste tanks were sampled 11/23/48 to determine the composition of the sludge and supernatant, preliminary to undertaking a development program for metal recovery. These samples were analyzed and results are shown in the attached table.

It is the current practice to discharge uranyl carbonate solution to these tanks. At the time the tank is full, the uranium is precipitated by the addition of 6.7% by volume of 50% sodium hydroxide. The precipitate is allowed to settle and the supernatant is then discharged through the general radiochemical waste storage system to the river. The tanks now contain approximately 150 tons of uranium of which approximately 80% has been precipitated. This precipitate occupies approximately 20% of the total tank capacity in permanent metal waste storage service.

There are now seven tanks with a total capacity of 776,000 gallons being used for storage of uranium wastes. The uranium has been precipitated in Tanks W-3, W-4, W-7, and W-10. Tank W-9 is being used for the storage of metal waste from the RaLa process and was not sampled because of its high radioactivity. Tank W-8 is now being used as receiving tank, but will be returned to the radiochemical waste service as soon as sufficient supernatant can be decanted from the precipitated waste tanks. This will reduce the total storage capacity to 606,000 gallons. The last tank is the semi-works storage tank (no number) which is not full, and is being held for use in the initial stages of the metal recovery program.

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[redacted]

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ORNL Metal Waste Analysis[a]

Tank No.	Phase Sampled	Ionic						Radiochemical[b]					
		U	Na	NO_3	CO_3	PO_4	SO_4	Gross β	Gross γ	Ru β	Ce β	Cs β	Sr β
		mg/ml						cts/ml/min					
								$x10^{-5}$	$x10^{-3}$	$x10^{-4}$	$x10^{-4}$	$x10^{-4}$	$x10^{-2}$
W-3	Supernatant	0.02	110	13.7	33.8	2.4	104	1.9	0.58	8.3	0.06	14.3	0.52
W-4		8.9	2.3	14.5	0.4	0.1	8.3	12.7	2.1	4.0	50.0	2.9	1900
W-7		0.02	54.2	15.9	29.3	6.0	132	26.0	0.58	9.6	3.2	17.2	1.7
W-10		0.02	74.1	22.4	33.0	8.7	104	29.8	0.9	8.1	4.7	26.9	4.2
W-8[c]		16.1	39.9	15.4	27.8	7.2	227	8.5	1.4	9.4	50.3	16.9	74.1
		mg/g						cts/g./min					
								$x10^{-6}$	$x10^{-3}$	$x10^{-5}$	$x10^{-6}$	$x10^{-5}$	$x10^{-6}$
W-3	Sludge	539	143	22.8	60	12.5	8.6	19.1	14.0	7.4	11.8	3.1	1.2
W-4		326	190	42.5	51	218	146	4.5	1.3	0.9	1.3	1.2	1.3
W-7		475	170	34.9	67	90	214	3.2	1.2	7.8	0.7	1.6	0.7
W-10		485	164	43.5	49	90	105	8.2	2.4	2.0	4.2	2.5	1.5

(a) The samples were taken 11/23/48 by P. B. Orr. Ionic results reported 1/4/49 by P. F. Thomason, and radiochemical results were reported 1/26/49 by C. S. Burros.

(b) Counting done at 10.18% geometry with no adsorber

(c) This tank is used as a collection tank, and no uranium is precipitated here.

[redacted]
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FILE RECORD SHEET

DATE: February 8, 1949 CLASSIFICATION: [redacted]

SUBJECT: Contents of the ORNL Uranium Waste Storage Tank

TO: Steahly FROM: W. K. Eister

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