

FALLINCKRODT CHEMICAL WORKS  
ST. LOUIS

August 11, 1949

MEDICINE, HEALTH & SAFETY (MHW)  
**COPY**

To: Mr. H. E. Thayer

Subject: HEALTH PROBLEMS AT THE AIRPORT PROPERTIES

This report is made as an adjunct to the report of Mr. Harold Bell of May 9th, 1949 entitled "Safety Inspection at Airport Properties." Those portions of Mr. Bell's report having some connection with health problems are commented on here. The late date of this report has been due to the fact that the problems brought up were either being acted upon at the time or presented no special problems of urgency; furthermore some special lab analyses were required for part of the investigation.

Point No. 2 concerns the problem of the disintegrating K-65 drums at the airport. This is recognized as a severe problem. The solution however, is not so simple as placing the materials in new containers, since the hazards to the workers involved in such an occupation would be considerable. The health hazard to workers handling K-65 material, especially in broken drums, is much more serious and immediate than the possible hazard of stream pollution, especially since the radium in the K-65 is in a highly insoluble form. The material is now, however, being reworked by Plant 6 and as it issues from Plant 6 as a by-product it is shipped to another location and not stored at the airport.

Point No. 3 concerns the possible radiation hazard to the bulldozer and crane operators at the aged raffinate heaps. These men have not been furnished film badges because the radiation from aged raffinate was known to be of a very low order of magnitude. The data concerning the radiation from heaps of this material is shown in the following Table One.

TABLE ONE

Location	Radiation dose-rate, mrem/hr	
	beta	gamma
	Tolerance (8 hours/day, 5 days/wk) 6	
At contact with aged raffinate heaps	0.5 - 3.3	0.3 - 0.8
Fresh raffinate heap .		
At 1' distance	70	1.6
At chest height	33	1.3
On bulldozer cab, cab pushed into heap	2.7	1.0
"C" Material heap (top of pile at waist height)	11.5	1.6
Aged BC heap (top of pile at waist height)	10.0	3 - 10
Fresh BC heap (top of pile at waist height)	35.0	2.5

IN REVIEW DATE: 8/25/49 AUTHORITY: [initials] DATE: 8/25/49 AND REVIEW DATE: 8/26/49 APPROVED BY: [signature] SPECIAL AGENT: [signature]		INFORMATION PEOPLE SERVICES 1. CLASSIFIED BY: [initials] 2. CLASSIFICATION CHANGED BY: [initials] 3. CONFIDENTIAL OR NOT CLASSIFIED HERE COORDINATE WITH: [initials] RECLASSIFICATION REQUESTED 4. CLASSIFIED INFO COLLECTED 5. OTHER REVISIONS:
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It will be noted that both the beta and gamma radiation from aged raffinate are considerably below tolerance. Even though fresh raffinate is considerably more active in beta radiation the radiation on the cab of the bulldozer when pushed all the way into a heap of raffinate is still below tolerance due to the air absorption of the beta rays. The bulldozer operator usually averages less than eight hours per week on the raffinate heap work and under those conditions it will be seen that his radiation exposure is only a very small fraction of tolerance.

Work around the airport pad where the K-65 sand and ore is stored is another question. The health hazards from gamma radiation and radon at the pad are quite severe. This problem has long been recognized and studied in some detail. The warehouse operators and maintenance men who work in the vicinity of the pad have been placed on a rigid time schedule, based on a detailed study of the problems, which have so far prevented those people from exceeding tolerance exposures.

Point No. 6 concerns the possible stream pollution hazards from washing of raffinate trucks, etc. A previous study by Lloyd in March 1948 showed that all the uranium in water concentrations in Cold Water Creek are well below the tentative tolerance of 50 ppm uranium. This study was conducted under wet weather conditions during which time there was undoubtedly a more effective washing away of uranium-bearing materials into Cold Water Creek but conversely a much larger dilution due to the volume being carried by the creek.

A second and more detailed study has been made by the AEC but the results of this study are not yet available.

On July 1st, 1949, the date of the most recent sampling, the weather was quite dry. Under these conditions there was no surface over-flow into the creek from the settling pond which catches the wash water from the trucks. Results of various samples are shown below in Table Two.

TABLE TWO

URANIUM CONCENTRATIONS IN AIRPORT WASH WATER DRAIN

<u>Location &amp; Time</u>	<u>U, ppm</u>
Water "tolerance"	60
Soil "normal"	1
#1 Water at fence line as operator near completion of washing truck	160
#2 Water at N. edge of settling basin as completion of washing trucks.	1.1
#8 Water, same as No. 2, 1/2 hour later	0.9
#9 Same as No. 2, 2 hours later	1.3
#3 Soil from N. edge of pond	240
#7 Mud (3" deep sample) from drain above pond, 1/2 way to fence	800
#6 Mud from edge of pond at overflow (3" deep, water water)	98

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Table 2 (Cont)

<u>Location &amp; Time</u>	<u>U, ppm</u>
#4 Mud from overflow 20' W of edge of pond, 3" deep	74
#5 Same as #4, 10" deep	98

Although these meager data are not conclusive, they would seem to indicate that uranium is removed rather quickly from the wash water by precipitation and/or by absorption into the soil and vegetation, and in large measure before it even reaches the settling pond. In the settling pond itself it would appear that the activity is precipitated in the mud and in the scrub vegetation in the pond. It would appear that the concentration of uranium in the water is very low; under these conditions there is no surface over-flow into Cold Water Creek and even if there is some surface drainage it would seem that the uranium is precipitated or absorbed in the soil and would not be carried with the liquid drainage. In view of these results during both dry periods and wet periods, it appears that there is no immediate cause for alarm in connection with this problem.

Point No. 7 concerns the possible use of the concrete pit for storage of K-65 and sand. Proper use of this pit can not now be accomplished without re-packaging of the materials, which as mentioned above is a much more serious and immediate health problem than is the possibility of soil or stream pollution. The disposal of the K-65 and sand now being produced by the plant is being accomplished by including the sand in the K-65, in more careful packaging, and in careful storage at a site that is more adaptable for such use.

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6pm

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