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September 4, 1969

G. L. Voelz, M.D. Director
 Health Services Laboratory

ACTIVITY REPORT OF THE ENVIRONMENTAL BRANCH, JULY 21 to AUGUST 20, 1969

WASTE MANAGEMENT

Research

Supplies have been ordered so that a combustion tube furnace can be fabricated for the tritium fractionation study. The furnace will be used to separate out the crystalline water from precipitated aluminum hydroxide. This water will then be analyzed for tritium.

Together with the Analytical Branch, a survey on the aqueous chemistry of plutonium is being made to better understand the behavior of plutonium in the burial ground. The specific purpose is to define the chemical species, their concentration limits and pertinent parameters necessary for their evaluation under conditions found in the burial ground.

The column study on the adsorption of Cs-137 on alluvium is being continued as well as the preparation of the manuscript dealing with distribution of nuclides in the regolith as a result of liquid and solid waste disposal.

Environmental Monitoring

The average on and off-site air concentration of filterable gross Alpha and Beta radioactivity and Iodine-131 for July were as follows:

	<u>Alpha</u>	<u>Beta</u>	<u>Iodine-131</u>
On-Site	.003 pCi/m ³	0.981 pCi/m ³	0.006 pCi/m ³
Off-Site	.004 pCi/m ³	0.898 pCi/m ³	0.009 pCi/m ³

All of the above concentrations were less than 25 percent of the CG values for uncontrolled areas.

The average concentration of particulate material in surface air on-site for July was 33.3 ug/m³ compared to 66.8 ug/m³ for off-site locations.

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The average on-site ground water concentration of gross alpha, beta, and tritium activity for July were less than 1% of their respective CG values.

Fourteen milk samples were collected and analyzed for Iodine-131 and Cesium-137 during July. All samples showed concentration less than 20% and 0.3% of their respective CG values.

An additional off site air sampling location was established at Pocatello on 8/8/69, for comparison with the Alpha concentrations detected at the Idaho Falls and Blackfoot stations.

General

All of the companies contacted to supply us with activated charcoal filters have said they are not interested due to the small amount involved. The charcoal filter material can be purchased in large rolls from the company which supplied Gelman but it would be very time consuming to cut into discs or small tape rolls. Our present supply allows about a year to find a Denver or Salt Lake firm which would cut filters to required sizes.

The Denver compliance office was notified that our sampling equipment have not been received. The equipment was shipped the last of July from New Mexico. George Smith stated he would make every effort to get the samplers located and delivered.

Health Physics

During the routine surveys for this reporting period there were fifteen smears taken that indicated alpha activity above our limit of 10 d/m. Eleven of these were taken in the source vault (Rm 196) and ranged in activity from approximately 11 d/m to 292 d/m, with an average of 74 d/m per smear. One smear on a table around calibration sources in Rm 193 indicated approximately 30 d/m. Two smears from Rm 121 (Chemistry Lab) showed levels of approximately 21 d/m on a workbench and 73 d/m on the hood apron. One smear in the vicinity of a natural uranium slab used for calibration purposes in CF-634 indicated approximately 169 d/m.

The only smears that indicated beta-gamma activity above our limit of 200 d/m were two of the above from the Source Vault. These indicated 420 d/m and 390 d/m.

The natural uranium in the Source Vault, which is believed to be the source of the above alpha and beta radioactivity, has been sealed and efforts are planned for removal of the residual contamination.

"Safety Analysis Report For Co - processing of Aluminum and Zirconium Alloyed Fuels" was reviewed.

Environmental Studies

Controlled Environmental Release Test (CERT) Program:

Eight tests in the series designed to measure the effect of stomatal opening on deposition were completed. Analysis of the data gathered from these and previous tests is continuing. Don Adams and Earl Markee (ESSA) are preparing a paper in which some of these results will be presented.

Dr. E. L. Moody and Dr. B. R. Moss of Montana State University (MSU) visited the NRTS to discuss experiments to be performed at the Experimental Dairy Farm (EDF) in late August and at MSU in the fall. These studies will be made to gather additional preliminary data on the effect of Sudan grass on radiiodine metabolism. The experiment at the EDF will involve six cows which will be dosed with radiiodine. Total collections of urine, feces, and milk will be made, thyroid burdens will be determined and blood samples will be taken. Dr. Moss will work at the NRTS during this experiment.

A significant amount of time was spent preparing for the experiment discussed in above. Some modifications of the EDF facilities were made, arrangements for a farmer and for the cows were made in cooperation with the Contracts Branch, and supplies were procured.

Measurements of the flow at a number of points in the environmental chamber indicate that the installation of the curved vanes in the corner upstream from the working section did not solve the problem of non-uniform flow.

A new generator for I_2 was designed and tests yielded satisfactory results. Two of these new generators are being fabricated at ICPP.

Experimental Cloud Exposure Study (EXCES):

Fabrication of the EXCES cask was completed. Wheels will be installed when they arrive.

Plans have been formulated for the ^{133}Xe release tests scheduled for the period 22-31 August. An outline of these plans was submitted on 13 August.

September 4, 1969

The atomization-type aerosol generator and the spinning disk aerosol generator have been received.

Discussions of the EXCES program were held with Wm P. Gammill (RDT) and I. A. Van der Haven (ESSA/RDT) during their visit to the NRTS.

Independent Measurements Program (IMP)

Dick Bangart travelled to West Valley and Buchanan, New York to visit the Nuclear Fuel Services-New York and the Indian Point sites. Discussions with the WAE employee at West Valley identified several minor sampling problems; corrective actions are planned. At Buchanan he, Larry Denton, and a Region I Compliance man met with Consolidated Edison and local officials to discuss the IMP for Indian Point. Samples of Hudson River water were taken.

An evaluation of several filters for sampling ^{203}Hg is underway.

Other (Routine):

The regular weekly and monthly smear and radiation surveys of AEC facilities at the NRTS were completed.

Disposed of HSL radioactive waste and the laundering of anti-contamination clothing were arranged as required.

Other (Non-routine):

The evaluation of the efficiency for ^{131}I of HV-70 filters relative to the AC-1 filters was completed. The average relative efficiency for the HV-70 was found to be 96% for a 2 liter/minute flow rate and 62% for a 30 liter/minute flow rate through the filters. Only 5% of the activity collected on HV-70 filters was lost when air was passed through the filters at the rate of 30 liters/minute for 93 hours.

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-5-

September 4, 1969

U. S. Geological Survey

See attached report

ESSA/ARLFRO - Environmental Sciences Services Administration

See Attached report

HSL

Charles A. Pelletier, Chief
Environmental Branch
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Enclosure:

1. USGS Report
2. ESSA Report

cc: John R. Horan
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