

REPOSITORY INEL
 COLLECTION MISCELLANEOUS RESL RECORDS
 BOX No. 4, RESL CFA-690 ROOM #191
MONTHLY REPORT OF ACTIVITIES
 FOLDER 21 MARCH - 20 APRIL 1972

May 2, 1972

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MONTHLY REPORT OF ACTIVITIES: 21 MARCH--20 APRIL 1972

The efforts of the Environmental Branch during the reporting period are summarized below.

A. NRTS Environmental Monitoring

1. The following table summarizes the results of air concentration measurements for the month of March.

<u>Location</u>	<u>Air Concentrations ($\mu\text{Ci}/\text{cm}^3 \times 10^{12}$)</u>		
	<u>Acropor Filter (AN-800)</u>		<u>Charcoal Filter (AC-1)</u>
	<u>Gross Alpha</u>	<u>Gross Beta</u>	<u>Gross Beta</u>
NRTS Average	0.0014	0.250	<0.05
Offsite Average	0.0017*	0.283	<0.05
IF Headquarters	0.0031	0.266	<0.05
Blackfoot	0.0025	0.214	<0.05
Arco	0.0018	0.233	<0.05
Butte City	0.0012	0.209	<0.05
Pocatello Fire Station	0.0036	0.614	<0.05
Pocatello Sewage Plant	0.0408	0.216	<0.05
Mud Lake	0.0017	0.450	<0.05
Howe	0.0011	0.263	<0.05
Montevieu	0.0012	0.179	<0.05
Reno Ranch	0.0012	0.191	<0.05
EBR-I	0.0014	0.228	<0.05
CFA	0.0014	0.253	<0.05
TRA	0.0018	0.266	<0.05
NRF	0.0014	0.228	<0.05
TAN	0.0012	0.279	<0.05
SPERT	0.0012	0.243	<0.05
ARA-II	0.0014	0.310	<0.05
EBR-II	0.0015	0.188	<0.05

* Excluding Pocatello alpha results.

The following radionuclides were detected on the Low Volume air samples collected March 17-24 at Pocatello and Mud Lake; ^{141}Ce , ^{239}Np , ^{131}I , ^{95}Zn , ^{95}Nb , ^7Be and ^{140}Ba and/or ^{140}La . This

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radioactivity was attributed to fallout from a Chinese nuclear device test performed on March 18, 1972. This activity was also detected on the CFA High Volume air sample of March 23, 1972.

2. The average concentrations of airborne particulates were $50 \mu\text{g}/\text{m}^3$ and $17 \mu\text{g}/\text{m}^3$ for offsite and onsite locations respectively.
3. The measured dust fall rates were $0.048 \text{ mg}/\text{cm}^2/\text{mo}$ at CFA, $0.049 \text{ mg}/\text{cm}^2/\text{mo}$ at NRF and $0.058 \text{ mg}/\text{cm}^2/\text{mo}$ at TAN.
4. The average concentration of gross alpha, gross beta, and tritium radioactivity in onsite drinking water were less than 6% of the AECM 0524 drinking water limits; it should be noted that these concentrations include background radioactivity. Both ICPP well #1 and #2 were used during March. The average beta and strontium-90 concentrations in well #1 were $1.5 \times 10^{-8} \mu\text{Ci}/\text{ml}$ and $1.23 \times 10^{-8} \mu\text{Ci}/\text{ml}$ and for well #2 were $7.8 \times 10^{-9} \mu\text{Ci}/\text{ml}$ and $4.0 \times 10^{-9} \mu\text{Ci}/\text{ml}$ respectively.
5. Fourteen milk samples were collected during March and analyzed for I-131 and Cs-137. All samples showed concentrations below the detection limit of $2 \times 10^{-8} \mu\text{Ci}/\text{ml}$ and $3 \times 10^{-8} \mu\text{Ci}/\text{ml}$ respectively.
6. Tritium samplers were established at EBR-I, NRF, and Idaho Falls Headquarters on March 24, 1972. Analysis results have not yet been completed on the first samples.
7. Weekly surveys of the six fallout plates surrounding the ICPP continued. Except for the first week in April, each plate collected less than 10 particles between surveys. The activity of these particles ranged from 1,000 to greater than 50,000 cpm as counted with an RM-14 and was identified as Ru-106. The survey covering the first first week in April identified as many as 96 particles on an individual plate; the activity was predominantly Cs-137. ICPP operations personnel admitted having trouble with the WCF during this period.

B. Independent Measurements Program

All reports for Indian Point and Humboldt Bay have been completed. Work on the others continues.

C. Plutonium Studies

Work is continuing on the "Plutonium Behavior in the Soil/Water Environment" study which is a cooperative effort between Dow of

Rocky Flats and the Environmental Branch. An evaluation was made to determine the size of the particles of plutonium oxide to be used as a source of plutonium in the soil studies. Information was obtained from the literature on the size of PuO_2 particles that are produced by oxidizing metal and plutonium containing compounds and evaporating plutonium-containing solutions. In addition information was obtained on the size of the particles found in the air in buildings in which plutonium is handled. A wide range of particle sizes was indicated, but the data are weighted in favor of the small sizes. It was decided that the mean particle diameter of PuO_2 for this study should be in the range of .01 to 10 μ .

Work is in progress in the characterization of soils to be used in the study. Information is also being obtained on methods for measuring distribution coefficients, diffusion coefficients and elution characteristics of plutonium in soil.

D. Burial Ground Study

As of April 20, the drillers have reached a depth of approximately 90 feet on the third core hole inside the burial ground. The bit became wedged inside the core hole at an approximate depth of 88 feet, but was freed with some effort.

The second core hole was drilled to the sediment zone at a depth of 223 feet. A relatively small amount of standing water, perhaps five gallons, was observed in the hole. Water samples have been taken for analyses and water level measurements are being made to evaluate the amount and source of water.

Starting April 24, the drillers will work 12 hour shifts (8:00 a.m. to 8:00 p.m.) six days a week to assure completion of drilling operation by May 26. The Environmental Surveillance Section will provide health physics surveillance during off hour drilling. The USGS and the Environmental Surveillance Section will cooperate to provide security surveillance during these off hours.

E. Tritium Study

Twelve samples of tritiated bayerite were prepared by precipitating $\text{Al}(\text{OH})_3$ out of a calibrated solution of tritiated NaOH . Each sample was heated and the structural water and/or water of hydration was collected at the following temperature ranges; room temperature - 200°C, 200°C - 350°C and 350°C - 600°C. The water collected at each temperature range was counted on a liquid scintillation counter. The results show the highest concentration of tritium to be within the 200°C - 350°C interval. The lowest tritium concentration was at the lowest temperature range. In all cases the tritium concentration of the supernate was higher than the tritium concentration found in the water collected at the different temperature ranges.

F. Document Review and Meetings

The following documents were reviewed and appropriate comments were prepared.

- (1) Draft ID Manual Chapter 0601, ID-NRTS Emergency Preparedness Program.
- (2) Draft ID Manual Appendix 0601, ID-NRTS Emergency Preparedness Program (subsequently recalled by OS).
- (3) Draft ID-NRTS Emergency Plan.
- (4) Preliminary Safety Analysis for Modifications to ICPP Fuel Storage Basin Cleanup Systems, ACI-105.
- (5) Draft Letter from Simonds to Rice on Transport of Radioactive Materials.
- (6) Proposed Extension of Permit Grazing Lands on NRTS.
- (7) Draft procedures for HSL response to a road contamination incident and emergency offsite monitoring after an accidental release of radioactivity to the atmosphere have been written. These procedures have been (road contamination incident) or will be (offsite monitoring) routed to the Environmental Studies Section for review. Ultimately these procedures, combined with other emergency procedures, will be used by the Environmental Branch in implementing ID's NRTS Emergency Plan.
- (8) The document "PSAR Review for ICPP Fuel Storage Basin Cleanup System - ACI-105" was reviewed.
- (9) A meeting on the waste system removal at Fuels Storage Facilities, ICPP, was attended April 14. Others in attendance were Ron Vansice, Bill Ison and Curt Willis of ACC; Bud Hickman, Cliff Nickols and Dee Halls of ANC.

G. Other

Approximately 4000 cubic yards of soil will be excavated at F.S.F. and approximately 2000 cubic yards of soil are needed for backfill. The problem discussed was one of defining at what levels of radioactivity can excavated soil be (a) used as backfill, (b) disposed outside of fenced area (old gravel pit east of CPP) and (c) removed and disposed to the burial ground.

The decision was reached that a letter be written to C. Wayne Bills, Director, Production and Technical Support Division (with a copy to D. I. Walker, Director, HSL) asking AEC to define the levels of activity for problem mentioned above.

H. Emergency Planning and Preparedness

- (1) A set of action levels for contamination of NRTS roadways was developed for integration into the HSL response plan for road contamination incidents.
- (2) A draft procedura was developed for emergency monitoring actions to be taken by Security in the event a fire at the Burial Ground is discovered during off-shift hours.
- (3) Four lectures on emergency monitoring, with particular emphasis on airborne Pu contamination, were presented to uniformed Security personnel as part of their training program.
- (4) Action levels were developed for (a) inhalation exposure of the general public to radioiodines and (b) milk ingestion exposure of the general public to I-131.
- (5) A status report was prepared on the availability and analysis of meteorological data in the event of an emergency.
- (6) The following are locations of new telemetry stations installed during the reporting period: Tabor, Sand Dunes, Minidoka, and EBR-II. Seventeen stations have now been completed and are reporting data routinely.
- (7) The VCOs received with the last nine remote stations for the telemetry system were found to be temperature sensitive and were returned to the factor for replacement.

I. Internal Dosimetry

- (1) A proposal for human ingestion of Rb-86, Mo-Te-99, and I-131 for the purpose of calibrating the whole body counter was reviewed and comments were prepared.
- (2) The existing and proposed reporting requirements for internal exposures were reviewed and an evaluation of the required detection capabilities was initiated.

J. Instrumentation

- (1) A high range radiation detection system was installed on a Dosimetry Branch calibration system. This detection system provides automatic radiation surveillance and warning when the cobalt source is in use.
- (2) Assistance was provided to the NOAA seismic study representative (John West) in determining station locations and arranging for required services.

K. Miscellaneous

- (1) Blair Johnson spent one week working on the committee which investigated problems related to transport of radioactive materials.
- (2) Paul Voilleque assisted in the preparation of the ID response to comments on the PBF Draft Environmental Statement made by the Idaho Alpine Club.
- (3) Contribution to the HSL Annual Report was prepared and submitted.
- (4) O. Doyle Markham, radioecologist, joined the Branch on 17 April 1972.
- (5) Two Form 189 proposals were prepared for submission to the Division of Biology and Medicine:
 - (a) Controlled Environmental Release Test Program and
 - (b) NRTS Radioecology Program.
- (6) Evaluation of the Ru-Rh-106 contamination continued. Special surveys of Lincoln Boulevard were conducted before and after a test section was washed by the AEC Fire Department. A decontamination factor of 2 was achieved.

L. Seismic Studies

110 earth tremors were recorded from March 20 through April 19 on the continuous recording seismometer in building 690. 59 tremors were from 110 to 380 kilometers from building 690 with 41 being relatively weak and mostly due to mine blasts. None of the remaining 18 local tremors were strong and perhaps could not be felt by people located directly over the hypocenter. Of the 47 tremors which occurred more than 400 kilometers from the NRTS, 16 were distinct enough to be analyzed with regard to distance to the epicenter. The buses still cause interference. Wendell Mickey and John West of NOAA used a portable seismograph on April 10 and located a quiet area one mile west of building 690. The detector will be installed at that location by May 12.

The specific locations for the strong motion accelerometers were established during the week of April 10 to 14 by Wendell Mickey and John West of NOAA. The instruments are scheduled for installation during the second week of June, 1972.

A preliminary study has been completed of the NOAA data on earthquakes which have been recorded between 40 and 47 degrees latitude and between 110 and 117 degrees longitude during the period 1944 through 1971. Over 700 earthquakes have been recorded with the majority recorded after 1963 due to the recent use of sensitive seismometers. 125 earthquakes of modified Mercalli intensity of V or above have been recorded. No earthquakes of intensity IV or above have been recorded on or near the Snake River Plain. Most of the earthquakes occurred (1) on an L-shaped line from Logan, Utah to Hebgen Lake, Montana and then west to Lima, Montana, (2) on a Z-shaped line in Idaho from Challis to Clayton to Stanley to Hailey with the major activity between Clayton and Stanley, and (3) in the general Montana area from Bozeman to Missoula with Virginia City on the south and Helena on the north. A few earthquakes have been recorded north of Boise, Idaho. A detailed listing of recorded earthquakes will be issued later in a Health Services Laboratory report.

M. U. S. Geological Survey (USGS)

See attached report.

N. ARLFRO-NOAA

See attached report.

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Enclosures:

1. USGS Report
2. NOAA Report

cc: D. I. Walker, w/encl.

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