



# Environmental Science and Research Foundation

## Results of INEEL Offsite Environmental Surveillance for the Second Quarter of 1997

Environmental surveillance during the second quarter of 1997 (April-June) found no radionuclides in the offsite environment attributable to Idaho National Engineering and Environmental Laboratory (INEEL) operations. The Environmental Science and Research Foundation sampled potential pathways by which radioactive contamination, called radionuclides, from the INEEL could reach members of the public. The pathways sampled during the first quarter were air, water, milk, big game, sheep, direct environmental radiation, and fine particulate matter. A total of 584 samples were collected and analyzed. Results are presented in the report *INEEL Offsite Environmental Surveillance Program Report: Second Quarter of 1997* [ESRF-021(2QT97)].

### Air

The Foundation maintained a network of 12 continuously-operating air samplers around the INEEL. Three additional samplers were located on the INEEL for comparison to offsite samplers. Air filters from the samplers were collected weekly for analysis. The filters were analyzed weekly for "gross" activity—a measurement of the total amount of radioactivity per milliliter of air pulled through the filter. At the end of the quarter all of the filters from each location were combined and analyzed for specific radionuclides. Charcoal cartridges included with the air filters trap iodine-131, that exists as a gas. These cartridges were analyzed weekly, since radioactive iodine decays rapidly. Atmospheric moisture and precipitation samples were collected and analyzed for tritium, a radioactive form of hydrogen.

- All concentrations of radionuclides were within the range that is typical of background radioactivity.
- Cesium-137 was found in a composite sample from Montevue. This substance was not found in composite collected a replicate sampler at the same location.
- Gross alpha and gross beta concentrations were within expected ranges. There was a higher average gross beta result from onsite locations when compared statistically to boundary and distant locations, however. The gross beta concentrations at the Experiment Field Station onsite were elevated.
- No iodine-131 was found in any sample.
- Strontium-90 was detected in all six of the composite samples analyzed for that substance. Similar results have been seen in recent years, and the concentrations were similar between all locations. Detection of this substance was attributed to blowing dust. Strontium-90 is present worldwide in topsoil because of above-ground nuclear weapons testing.
- Americium-241 was detected in a sample from Mountain View Middle School at Blackfoot. The barely detectable concentration is consistent with previous results and is likely due to worldwide fallout.
- Tritium was detected in atmospheric moisture samples from Atomic City and Idaho Falls. The detected amounts are within the range usually attributed to historical weapons testing and natural processes.

### Water

In May, the Foundation collected 13 drinking water samples and five surface water samples. Seven of these locations are in the Magic Valley. Each sample was tested for tritium, gross alpha, and gross beta.

- Tritium was detected in a sample from Shoshone. This tritium is most likely due to nuclear weapons testing during the 1950s and 1960s and to natural atmospheric reactions.

## Water, continued

- No gross alpha concentrations were detected.
- Almost all of the samples showed detectable concentrations of gross beta. The detected concentrations were consistent with those acquired naturally as water flows through deposits of uranium and thorium in the earth's crust.

## Milk

Milk samples were collected weekly from a dairy in Idaho Falls, as well as monthly from eight other dairies across southeastern Idaho. Each milk sample was analyzed for iodine-131. Selected milk samples were analyzed for tritium and strontium-90.

- Iodine-131 and tritium was not detected in any of the 38 samples.
- Strontium-90 was indicated in samples from Blackfoot, Carey and Idaho Falls. The concentrations were consistent with those previously reported, and are likely due to worldwide fallout from above-ground testing of nuclear weapons.

## Game

Samples from two sheep grazed on the INEEL, two sheep grazed offsite, one road-killed mule deer, and one road-killed pronghorn antelope were collected. Thyroid gland, muscle and liver from the game animals from each animal were analyzed for radionuclides.

- All four sheep and the pronghorn had detectable amounts of cesium-137 in their muscle tissue. One of the offsite sheep also had this same substance in its liver. The concentrations were consistent with those previously reported, and are likely due to worldwide fallout from above-ground testing of nuclear weapons. This substance is also known to be found in soils contaminated by INEEL operations around the Test Reactor Area and other INEEL facilities. It is possible for game animals to ingest this contaminated soil and plants growing in it.

## Environmental Radiation

A network of 14 thermoluminescent dosimeters (TLDs) monitors environmental radiation around the INEEL. TLDs are collected every May and November. They provide a direct measure of radiation occurring in the environment.

- No differences were found in radiation exposure between locations near to and distant from the INEEL. Amounts of radiation measured were similar to those seen in previous years.

## Fine Particulate Matter (PM-10)

Three PM-10 air samplers collected a total of 38 samples. These devices collect a 24-hour sample every sixth day to measure tiny particles of dust in the air. Such particles are small enough for a person to breathe and may cause health problems. PM-10 samplers are located at Community Monitoring Stations in Blackfoot and Rexburg. An additional sampler is operated in Atomic City.

- Dust concentrations averaged 14 micrograms per cubic meter in Atomic City, 17 micrograms per cubic meter in Blackfoot and 19 micrograms per cubic meter in Rexburg. These averages are well below the regulatory standard of 50 micrograms per cubic meter during a year.

For questions or more detailed results, contact:

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NOTE: Photographs suitable for illustrating this information are available for downloading at the Foundation web site.