

The RadioActivist Campaign

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RADIOACTIVITY ENTERING RIO GRANDE: CONFIRMED

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INTRODUCTION

In the summer of 2004, the New Mexico Environment Department (NMED) submitted two samples of aquatic moss to The RadioActivist Campaign (TRAC) for analysis of artificial radionuclides.

Sample 1 is aquatic moss from Spring 4A, below the Los Alamos National Laboratory, at the head of a stream flowing into the Rio Grande. Sample 1 provides a semi-independent check of TRAC's 2003 report of cesium-137 flowing from Spring 4A into the Rio Grande.

Sample 2 is aquatic moss from Hemingway Spring, that is logically uncontaminated by any measurable, artificial radioactivity. Sample 2 is therefore a candidate for a "background" reference material.

RESULTS

Sample 1. Moss from Spring 4A, flowing into the Rio Grande, down gradient from the Los Alamos National Laboratory. (Date of Collection: April 15, 2004. Wet/Dry weight ratio: 7.8)

$$\text{Cesium-137} = 6.2 \pm 1.2 \text{ pCi/kg(wet)}$$

Sample 2. Moss from Hemingway Spring, flowing into the Rio Grande, 89 miles upstream of Los Alamos National Laboratory. (Date of Collection: May 05, 2004. Wet/Dry weight ratio: 4.9)

$$\text{Cesium-137} = 12.1 \pm 2.5 \text{ pCi/kg(wet)}$$

DISCUSSION

Sample 1. This new result of cesium-137 (Cs-137) in moss from Spring 4A, above, confirms TRAC's previous report of Cs-137 in Spring 4A moss. This new result is significantly higher than the Cs-137 = 2.4 ± 1.2 pCi/kg(wet) levels reported by TRAC in 2003. (See TRAC's November 2003 report: "Early Warning: a radioactive Rio Grande" posted at www.radioactivist.org/lanreports.html.)

This new result supports TRAC's conclusion that cesium-137 has begun to seep from the Los Alamos National Laboratory into the Rio Grande.

These old and new positive results invite monitoring of aquatic moss in Spring 4A to determine how quickly contamination seeping from the lab into the river is increasing.

Sample 2. NMED reports that the source of water from Hemingway Spring is an aquifer uncontaminated by modern human activities. Therefore, Hemingway Spring water and moss growing in it are expected to be chemically and radiologically unaffected by events of the atomic era. Hemingway Spring water and moss therefore provide “background” materials for fallout from atmospheric testing of nuclear weapons and releases of radioactivity from the Los Alamos National Laboratory.

Logically, a sample of moss from Hemingway Spring would contain zero Cs-137. Cesium-137 is an artificial product of nuclear fission that did not exist on Earth before the advent of the atomic era in the 1940s.

The 12 pCi/kg(wet) activity of Cs-137 in the “background” moss sample from Hemingway Spring is logically inconsistent with the reported “background” nature of the sample. There are several possible explanations for this logically implausible result:

- (a) Hemingway Spring is contaminated with Cs-137 by an unidentified means.
- (b) The moss sample collected from Hemingway Spring was contaminated with Cs-137 during handling, processing, or analysis.
- (c) TRAC’s analysis provided a false positive for the moss sample from Hemingway Spring, for an unknown reason. (Two other moss samples TRAC collected from streams in Livermore, California in May 2004 tested negative for Cs-137.)

This inconsistent, positive result invites an entirely independent check to provide an explanation.

TECHNICAL NOTES

- A. “±” values are one standard deviation, counting uncertainty.
- B. Report is for wet weight. For dry weight basis, multiply by given Wet/Dry weight ratio.
- C. TRAC has archived the sample materials.