Vol.5, No.1, pp.27 - 33, 2017 / J. Soc. Remed. Radioact. Contam. Environ.

Research Report

Radioactive Contamination Status of an Elementary School in Southern Miyagi Prefecture, Japan, Four Years after Decontamination

Toshiro YAMAGUCHI[1*], Mitsuyoshi SATO[2], Kazuyoshi NAGAKUBO[2], Keizo ISHII[1], Hirotsugu ARAI[1], Tohru OHNUMA[1], Hiromu ARAI[1], Sodai TAKYU[1], Tetsuo MATSUYAMA[1], Shigeo MATSUYAMA[1], Atsuki TERAKAWA[1], and Akira HASEGAWA[1]

[1]Department of Quantum Science and Energy Engineering, Tohoku University
(6-6-01-2 Aramaki Aza-Aoba, Aoba-ku, Sendai, Miyagi 980-8579, Japan)
[2]Technical Division, School of Engineering, Tohoku University
(6-6-04 Aramaki Aza-Aoba, Aoba-ku, Sendai, Miyagi 980-8579, Japan)

Summary

We investigated the radioactive contamination status of an elementary school in southern Miyagi Prefecture, Japan, four years after decontamination. The radioactive dose rate was measured in the playground (n = 36), back yard (n = 1), parking lot (n = 3), and gutters (n = 30) with a thallium-activated sodium iodide scintillation detector. In addition, topsoil from the playground and gutters sediment were measured with a high-purity germanium semiconductor detector, and sand from the parking lot and sediment from gutters was imaged following an autoradiography method. The mean radioactive dose rate in the playground was almost 0.08 μSv/h. The dose rate was higher at sites facing the mountains, near the main gate, and by the front entrance of the school building. Meanwhile, the radioactive cesium (Cs) concentration of sediment imaged using autoradiography was > 8,000 Bq/kg.

These results indicated that the radioactive dose rates in the decontaminated school were below the threshold for being a health hazard. However, the topsoil in the playground had been re-contaminated with radioactive Cs, which had likely been transported via dirt attached to children's shoes and car tires. In addition, the radioactive sediment in the gutters had likely been contaminated by rainwater, suggesting that radioactive protection is necessary when handling gutter sediment.

Key Words: Fukushima Daiichi nuclear power plant, Decontamination, Elementary school, 4 years, Re-contamination