

The behavior of radioactive materials in municipal wastewater treatment plants and the countermeasures

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(keywords) The Great East Japan Earthquake, Radioactive material, Wastewater treatment plant

Since the Great East Japan Earthquake, the Fukushima Dai-ichi nuclear power plant has emitted radioactive particles on the second largest scale in history. The radioactive fallout has flowed into and accumulated in many wastewater treatment plants (WWTPs) via sewer systems, negatively impacting many WWTPs in eastern Japan. Consequently, the concentrated radioactive material has been detected in sewage sludge. Usually, in Japan, approximately 80% of treated sewage sludge can be utilized (e.g. construction material and land application), while the remaining 20% must be disposed of at landfill sites. However, this radioactive contaminated sludge can neither be recycled nor disposed of. Therefore, as of March 2012, approximately 100,000 tons of sludge has been temporarily stored at WWTPs in 12 prefectures.

We investigated the behavior of radioactive materials in WWTPs and addressed methods for safely handling contaminated sludge. High levels of radiation were detected in influent wastewater after rain. Additionally, measurements indicate that a large amount of radioactive material accumulates in aeration tanks and more than 90% of the radioactive material is trapped in the concentrated sludge during the sludge condensation process. Moreover,

we proposed specific safe handling, storage, and compaction methods for contaminated sludge in the “Committee to review countermeasures on radioactive material pollution in the sewage system” (MLIT). In the near future, urgent solutions for disposal and recycling of increasing amounts of indisposible radioactive sludge must be proposed and implemented.

[Reference]

Interim guidelines, Committee to review countermeasures on radioactive material pollution in the sewage system. (2011), *In Japanese*.

<http://www.mlit.go.jp/common/000183742.pdf>