

March 17, 2020
Ministry of the Environment, Japan

Inspection Results of Large Container Bags for Removed Soil in Temporary Storage Sites (TSS) after Heavy Rain by Typhoon Hagibis

The Ministry of the Environment, Japan (MOE) implemented overall inspection of all Temporary Storage Site (TSS) from December 2019 to February 2020, after the large container bags, which contain removed soil from off-site decontamination works derived from the accident of TEPCO's Fukushima Dai-ichi Nuclear Power Station, were carried away from TSS into rivers due to the heavy rain by Typhoon Hagibis.

The methods and findings of overall inspection are as follows:

- Method of overall inspection of TSS
Based on the geographical information, MOE picked up 322 TSS located close to rivers or located in flood hazard areas out of all 765 TSS storing the removed soil as of November 2019 (44 locations outside Fukushima Pref.) and inspected the sites and analyzed the possibility that the container bags are carried away, consulting with experts.
- Result of overall investigation and future responses
As the result of the investigation, it was confirmed that 12 TSS in Fukushima Prefecture need recurrence prevention measures. Therefore, MOE will implement necessary measures for these TSS in cooperation with municipalities by the end of May this year.

At all TSS, MOE will also conduct thorough daily management and inspections, and take precautionary measures when disasters such as heavy rain are expected.

1. Result of overall inspections in TSS

(1) Survey on outflow risks

① The first survey (Extracted the TSS assumed to have risk of water damage / desk research)

There were 996 locations of TSS in total (236 in SDA-Special Decontamination Area, 760 in ICSA-Intensive Contamination Survey Area) under management by the time of 2019 Typhoon Hagibis and among them, 231 TSS were excluded as the removed soil was already transported as of the end of November 2019. After careful study, based on the map, through locations close to river and overflow-assumed-areas on the rest of 765 TSS (44 TSS are outside Fukushima Prefecture), 322 TSS (13 TSS outside Fukushima Prefecture) were extracted.

②Secondary Survey (extracted TSS necessary for outflow prevention measures / field survey)

Conducted field survey to analyze following causes on extracted TSS in the first survey.

Flooding / Running water: If there is heavy rain equivalent to 2019 Typhoon Hagibis and outflow and flooding above a certain level occur, it can be expected that the stored materials to be carried away.

River erosion: If there is heavy rain equivalent to 2019 Typhoon Hagibis, river erosion could occur and container bags could be carried away.

Slope collapse: Container bags could be damaged with slope collapse or be carried away into rivers.

Debris flow: Container bags could be damaged by debris flow or carried away into rivers.

Based on the survey of all the potential risks and previous measures assumed at each TSS, discussing with experts, and analyzing possible outflow, it was confirmed that 12 TSS (only in Fukushima Prefecture) need outflow prevention measures.

*For the details, refer to the attached data

(2) Survey on management status at TSS

Fukushima Prefecture conducted a questionnaire survey to 21 relevant municipalities (municipalities in which removed soil stored as of the end of November 2019). It was confirmed that all 21 municipalities implemented periodic check-ups as well as preliminary check-ups before the 2019 Typhoon.

There were 4 TSS in which container bags were carried away and at these 3 out of 4 TSS were in process of loading the bags and were not perfectly covered with upper impermeable sheets which considered to be one of the reason to lead the carry-away of the bags

2. Future responses

(1) Countermeasure for outflow prevention

① Export at early stage

At TSS necessary for outflow prevention measures, Fukushima Prefecture, relevant municipalities, and Fukushima Regional Environmental Office (MOE) shall work together and implement following measures early as possible by the end of May 2020.

- 1) Transport container bags to Interim Storage Facility (ISF), Incineration Facility or TSS with low risk of outflow
- 2) Move them to spots with low risk of outflow within the same TSS
- 3) Installation of fences as not to outflow the bags, installation of sandbags for deceleration measures of incoming water as well as incoming earth and sand

② Policy review on TSS management

The policy on TSS management will be revised in order to implement measures of ① with useful examples which will be notified to municipalities.

(2) Thorough check-ups and management

MOE will support municipalities to provide guidance and share information on following points:

① Thorough check-ups and management on daily routine

- 1) To conduct visual inspection on storage facilities and surrounding ground periodically and any unusual appearance found, it should be promptly repaired
(example of abnormal appearances are as follows:)
 - Collapse of slopes
 - Drainage blockage of surface water, water flow obstacle
 - Improper way of covering, damage, or deterioration of impermeable sheets, etc
 - Damage of the fences
- 2) By the loading of removed soil to the tracks, impermeable sheet should be taken out little by little but not to remove all at once.
- 3) Proper archive records should be kept in cooperation with concerned parties.

② Preliminary measures by the disaster

If natural disaster such as heavy rain could be expected with

the weather forecast, following measures should be conducted.

- 1) Role sharing and contact system should be confirmed beforehand and if the natural disaster is expected, storage sites should be checked and protection measures such as emergency maintenance should be implemented in advance.
- 2) If there were large container bags without any upper impermeable sheets during loading process, MOE should instruct transport operators to connect several bags with ropes and fix them with piles or heavy machineries.

③ Outreach of MOE to municipalities

As for TSS managed by municipalities, the system shall be established as follows between MOE and relevant municipalities based on actual situation, if necessary.

- 1) Periodic check on all the archive records
- 2) Periodic check on visual inspection for storage sites and peripheral ground
- 3) Preliminary inspection and maintenance of storage sites when natural disaster is expected.