

Plan and investigation on centralization of the sludge treatment

Whole term

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(Purpose)

In Osaka City, since the sewerage service ratio of population replenishment is almost 100%, the existing wastewater treatment systems have to cope with the development and the expansion of the city. The first objective that was to upgrade to be compatible with the population replenishment was achieved. However, the role of a wastewater treatment plant is more than that. It is in the process of centralizing the sludge treatment to cope with the advanced treatment systems and effective sludge treatment towards the 21st century.

This investigation examines the necessity of centralization of the sludge treatment in Osaka City, and proposes to commercialize this plan, based on the examination of the emergency management and technological problems.

(Results)

1) Examination of the necessity of centralizing sludge treatment.

In Osaka city, the plan, ' Maisima Sludge Center' was established to solve the problems faced by wastewater treatment systems and to remodel the existing sludge treatment facility to achieve the new objective, because of the following reasons.

(1) It would be able to plan an effective and stable management system for the increase of sludge in the future.

(2) Adopting the sludge melting system would result in the promotion of the utilization of resources, and then it may contribute to the recycling society.

(3) Prevention from the odorous nature of sludge conveyers and the air pollution, and the environmental conservation can be promoted.

(4) The advanced wastewater treatment would be promoted by centralizing the sludge treatment.

(5) The centralization of the sludge treatment would reduce the cost of construction and maintenance.

2) Investigation on the emergency management in case of centralization of the sludge treatment.

The effects due to normal accidents and earthquakes that might cause huge damages, were investigated in this regard.

The emergency management for an earthquake is divided into two. One is use of a centralized system and the other is solving the problem by the aspect of structure. Measures for normal accidents were determined according to the measures for corrosion by hydrogen sulfide that occurs accidentally.

3) Investigation on the technological skill of the centralization of sludge treatment.

The sludge conveyed by the centralized sludge treatment system in Osaka City is highly concentrated with a sludge having 3% solid. The investigation for measures was done by a test on predicting the pressure loss and gas from a digested sludge. And a measure for the rejected water was investigated.

4) Proposal for the commercialization of the centralized sludge treatment system.

This plan takes care of the emergency management by conveying the highly concentrated digested sludge; and incineration and melting being carried out in three places. However, this examination focuses on the establishment of a safety system through the proposal mentioned below.

(1) Proposal for the emergency management

- The measures to be taken in case of a damage of the centralized sludge treatment system is: storing the sludge temporary in the treatment plant from which the sludge is generated, and transferring by means of an urgent conveyor such as using a ship; establishing a network of sludge

pipes; securing the utility; and establishing an information management system.

- The precautions set according to the aspects of the structure are that plants likely to generate liquefaction can be equipped with a new facility, and earthquake-resistant structures can be designed according to the new guidelines for buildings.

- Usually, adding an agent to prevent the generation of hydrogen sulfide in the existing sludge conveyors is considered as a measure for an accident. Lining pipes can be used for new sludge conveyors in order to prevent from the above problem.

(2) Proposal for technical problems

- Setting up a proper pump lift and system options based on the test of pressure loss in a long transport service, and establishing a room for eliminating gas in case of an odor-generation from the digested sludge.

- The principle is that the measure for the returned water is based on the biological and isolated treatments in each plant.

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Keywords

Central disposal of sludge, Crisis management, High-concentrated digestion, Sewer-transportation