

Research on Area-wide Treatment and Resource Utilization Plan of Sewage Sludge

Whole term

1993.9 ~ 1994.3

(Purpose)

The first priority has been given to solve the problem of area-wide treatment and disposal of sewage sludge in Ishikawa prefecture. The problem has been discussed since "Ishikawa Prefecture Sewage Works Area-wide Treatment and Disposal Exploratory Committee" was established in 1988. The committee categorized the prefecture into seven areas and designed frameworks and basic plans for sewage sludge treatment and disposal for the each area. Based on the plan, a joint treatment project has been conducted using mobile dewatering cars in Kawakita area.

Minamikaga area was selected as a research area among the other six areas, to make a plan for sludge treatment and resource utilization with Midorigaoka sewage treatment center as the centralized sludge treatment base.

(Results)

1. Effective utilization methods suitable for the local situation of Ishikawa Prefecture

Lightweight aggregate, interlocking brick and roadbed are among the construction materials, where sludge can be utilized effectively. Secondary products by sintering incineration ash, which depend on manufacturers for their production, are made at the area-wide treatment plants up to the process of incineration. It is desirable to carry out the secondary production in parallel to the construction material production. Therefore, implementation of this secondary production should be based on the local situations in order to practice the various disposal methods.

It is considered to be difficult to apply the total amount of the sludge to green farmland utilization, therefore, only a part of the amount of the sludge generation will be used if it is utilized.

2. Discussion on economic efficiency

Economic calculations for the effective utilization methods and the landfill disposal were carried out. The cases are as follows:

- (dewatered sludge) incineration production of lightweight aggregate
- (dewatered sludge) incineration production of interlocking brick
- (dewatered sludge) incineration melting crushing• grain size control(roadbed)
- (dewatered sludge) incineration disposal by contract (landfill)
- (dewatered sludge) mixing lime treatment by contract(cement material)
- (dewatered sludge) disposal by contract (landfill)

Annual payment accounts for a large proportion of annual expenses (operating cost + annual payment). However, if a government subsidy is introduced and the products are sold at the equal prices as similar commercial products, the expense of materialization from dewatered sludge into cement or the expense of landfill by dewatered sludge will be comparable to that of construction material production.

With respect to producing construction materials from incineration ashes (especially the methods ~), it is probable that the evaluation of the economic efficiency will vary according to the product sales profits. Hence, for the effective utilization of the sludge, the following items are particularly important:

Keeping the product yield rate at a high level

Since product sales are the influential items on the economic efficiency, it is important to utilize the incineration ash fully into the products.

Moreover, if the yield rate is low, a number of defective products will be produced which will need to be discarded as industrial wastes. This would cause more economically negative damages.

The level of yield rate depends on the product specifications. Therefore, if the specification is strict, the yield rate will be low. Again, if the specification is strict, the sales unit will be high. Hence, it is important to consider what extent the specification of the product is aimed to.

Securing adequate demands for the products

Adequate demands for the products need to be secured. If not, the products will have to be consequently discarded as wastes.

Collaborators: Ishikawa Prefecture

Japan Institute of Wastewater Engineering Technology

Researchers: Kazuaki Sato, Tadahiro Murakami, Susumu Akaishi, Yosaku Urakawa

Keywords

area-wide sludge treatment, construction materials