Reference Document on the Best Available Techniques for Waste Incineration 2006 (BREF)

The BREF addresses design, operational and procedural matters, including efficient processing, waste acceptance, emission controls and environmental management systems (EMS) for the incineration of wastes and the management of the residues.

Section 2.7.2 recognises that the high mineral content of incineration ash residues can make them potentially suitable for use as road or other construction material. Use is possible if the material complies with a set of environmental and technical criteria. This requires an optimisation of the ash quality through primary or secondary measures.

Section 4.6.4 describes the separation of ferrous and non-ferrous metals from the bottom ash. Ferrous metals separation is performed using a magnet. The ash is spread out on a moving belt or vibrating conveyor and all magnetic particles are attracted by a suspended magnet. This ferrous metals separation may be performed on the raw ash after leaving the ash extractor. Efficient ferrous metals separation requires a multi-step treatment with intermediate size reduction and screening.

Non-ferrous metal separation is performed using an Eddy Current separator. A rapidly rotating coil induces a magnetic field in non-ferrous particles, which causes them to be ejected from the material flow. The technique is effective for particle sizes of 4 – 30 mm and requires a good spreading of the material on the moving belt. The separation is performed after ferrous metals segregation, particle size reduction and screening.

The separation of metals is a necessary step to allow recycling of the various ash compounds. The ferrous fraction can be recycled, generally after separation of impurities (e.g. dust), as steel scrap for blast furnaces. The non-ferrous metals are processed externally by further separation according to metal type, which may then be re-melted. The resulting ash fraction has a lower metal content and may be processed to yield an inert secondary construction material.

Section 4.6.5 describes the various mechanical treatment operations for bottom ash are intended to prepare materials for road and earthworks construction that possess satisfactory geotechnical characteristics and do not cause damage to the road works. This process may be introduced at the SEHL installation at some stage in the future.

Section 4.6.6 describes the ageing of the bottom ash metals separation. The bottom ash may be stored in the open air or in specific covered buildings for several weeks. The storage is generally performed in stockpiles on a concrete floor. Drainage and run-off water are collected for treatment. The stockpiles may be wetted, if required, using a sprinkler or hose system in order to prevent dust formation and emissions and to favour the leaching of salts and the carbonisation if the bottom ashes are not sufficiently wet.

Section 4.6.7 describes the dry bottom ash treatment installations that combine the techniques of ferrous metals separation, size reduction and screening, non-ferrous metals separation, and ageing of the treated bottom ash. The product is a dry aggregate with

controlled grain size (e.g. 0 - 4 mm, 0 - 10 mm, 4 - 10mm), which may be used as a secondary construction material.

BAT Conclusions

BAT 12 stipulates the use of the techniques described in 4.1.5.5 or 4.6.4 to, as far as practicably and economically viable, remove ferrous and non-ferrous recyclable metals for their recovery either:

a. after incineration from the bottom ash residues, or

b. where the waste is shredded (e.g. when used for certain combustion systems) from the shredded wastes before the incineration stage.

BAT 52 requires the separation of remaining ferrous and non-ferrous metals from bottom ash (see 4.6.4), as far as practicably and economically viable, for their recovery.

It is proposed to remove the ferrous and non-ferrous recyclables from the bottom ash, which is compliance with BAT 12 a and BAT 52

BAT 53 requires the treatment of bottom ash (either on or off-site), by a suitable combination of:

a. dry bottom ash treatment with or without ageing, as described in 4.6.6 and 4.6.7, or

b. wet bottom ash treatment, with or without ageing, as described in 4.6.6 and 4.6.8, or

c. thermal treatment, as described in 4.6.9 (for separate treatment) and 4.6.10 (for in-process thermal treatment) or

d. screening and crushing (see 4.6.5)

to the extent that is required to meet the specifications set for its use or at the receiving treatment or disposal site e.g. to achieve a leaching level for metals and salts that is in compliance with the local environmental conditions at the place of use.

The incinerator ash will be stored in the bunker at the Dublin Waste to Energy Ltd installation for one week before consignment to the Beauparc facility. At Beauparc, the ash will be stored inside the building for up to two weeks prior to processing. The objective is to:

1. reduce the water content of the ash, as the material is allowed to dewater; and

2. allow the material time to undergo several naturally occurring chemical reactions. These reactions, including carbonization and hydration, reduces its pH and thereby improves the material prior to processing.

The pre-treatment storage time is based on the experience at incinerator treatment facilities in other EU Member States.

After processing the incinerator ash will be stored inside the building for one week, before being sent to the Knockharley Landfill Ltd Landfill (W0146-02) where it can be stored for a further four weeks, if required, in a contained area before being landfilled/used in landfill engineering works. Knockharley Landfill Ltd has already accepted, stored and landfilled incinerator ash from the Indaver WtE plant in Carranstown and the operator has confirmed that the required storage capacity is available.