



Gets more out of sludge!



SNB GETS
MORE OUT OF
SLUDGE!

WHAT IS SLUDGE?

The production of sludge starts with the use of water. Every Dutch person uses on average 132 litres of water a day.

Water consumption means water pollution. Water boards are responsible for the purification of waste water from households and industry. With the help of sewage treatment plants, polluted water is returned, virtually clean, to nature. A by-product results from this process: communal sewage sludge. Per inhabitant, we produce on average 90 kilos of sludge a year. All together this means 1.5 billion kilos of communal sewage in the Netherlands. In addition, treatments performed by companies also produce 0.9 billion kilos of sewage sludge.

Stringent laws and regulations require that sludge is processed in such a way that damage to the environment is minimised. N.V. Slibverwerking Noord-Brabant (SNB) does this with the aid of mono-combustion. To date, this is the most environmentally friendly solution for sludge processing.

RESPONSIBLE AND RELIABLE

Annually, Dutch households consume 800 billion litres of water. We take showers, use the toilet, wash clothes, etc. When treating this used water, an enormous amount of sludge is left behind - a dark, damp sediment. In total this is almost 1.5 billion kilos! All of that has to be processed.

A method that is commonly used is incineration. For example, by using it as a fuel in coal-fired power stations, cement ovens or in waste incineration plants. Incineration ensures that the dangerous substances in the sludge – for example, remnants of medicines, hormonal substances, organic contaminants and heavy metals – are largely prevented from entering the environment. However, the incinerator that SNB has designed for sludge incineration goes even further. The extensive flue gas cleaning means that SNB can guarantee and demonstrate that the emission of mercury is extremely low. Moreover, mono-combustion offers possibilities for the recycling of the valuable components, such as phosphates.



SNB processes approximately 420,000 tonnes of sludge each year. That is almost 30 percent of all the sludge in the Netherlands. Sludge processing by means of mono-combustion is efficient and, based on current opinion, has the brightest future. Thanks to modern technologies, we are able to process increasing amounts of sludge. At the same time, we are reducing the harmful emissions into the air further still, plus we are reducing the pollution in waste water. The installation more than meets the environmental standards and we monitor this constantly. SNB is certified in the fields of quality (ISO 9001), environment (ISO 14001) and safety (VCA**).

Mono-combustion is the most reliable method of processing sludge. Since the start in 1997, SNB has never had to refuse a truck load of sludge. Furthermore, we have four large bunkers, in which we are able to store 16,000 tonnes of sludge. That is great assurance for our sludge suppliers. SNB is a sludge processor that you can trust.

PHOSPHATE

Reducing a shower by one minute results in a saving of 8 litres of warm water. If, from now on, everyone were to reduce their showers by one minute, we would save 28 billion litres of water and 126 million m³ of gas in the Netherlands.

During sludge incineration, the sludge volume reduces by circa 90 percent. The remaining 10 percent consists of inorganic material and is incombustible. Residues therefore remain. At 36,000 tonnes a year, the fly ash is the greatest percentage. A significant amount of phosphate is present in this fly ash. We are conducting research on possibilities to reclaim these phosphates in the long term in cooperation with a number of partners - a development that is being followed with great interest throughout the world.

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SNB is not just a company that incinerates sludge. We do more. After all, sludge is more than a by-product. In addition to harmful components, it also contains energy and valuable nutrients, such as phosphate. SNB wants to put these components to effective use, or to recycle them.

We do that by using the energy released during sludge incineration in the sludge processing process, amongst others. For example, when drying the sludge. The use of the energy present in the sludge allows us to incinerate the extremely wet sludge without using natural gas. We only need natural gas for the start-up. We also convert part of the energy from the sludge into electricity. This involves a quantity that is comparable to the annual consumption of 1500 households. SNB is currently developing plans to generate so much electricity in the future that absolutely no more electricity need be purchased for the processing of the sludge.



The CO₂ produced during the incineration process also has a useful purpose. A pipeline leads the majority of the CO₂ to an adjacent company that uses it for the production of a lime product. This product is used to make paper white. This standard of cooperation between SNB and a neighbouring company is a unique example of industrial symbiosis between companies.

Ninety percent of all solid remnants that are released during the processing are given a useful function. The fly ash is used in processes such as the production of asphalt. The salts that are released are used to prevent subsidence in an old salt mine and to produce soda. However, SNB is still searching for other applications, such as the reclamation of phosphate.

PHOSPHATE RECOVERY

Phosphate is vital for the production of food and therefore life. Phosphates that we consume in our food are excreted again in urine and faeces. In view of the fact that phosphate reserves are gradually running out all over the world it is important that we search for possibilities to recycle the phosphates that we excrete, so that we can use it to produce food again. This will enable us to close the phosphate cycle and thereby make it sustainable. Moreover, we will prevent phosphate reserves from running out. The reclamation of phosphates from fly ash can make a significant contribution to the prevention of phosphate shortages. SNB is a pioneer in these developments.

KNOWLEDGE CENTRE

SNB has a lot of knowledge about sludge processing. SNB makes this knowledge available to its shareholders and customers. That enables us to achieve a sludge and water chain that is as optimal as possible. We also share our knowledge by participating in the monitoring committees of the STOWA, *The Dutch Foundation for Applied Water Research* – the water boards' research organisation, and by giving lectures at conferences. Our own knowledge library ensures that our knowledge is properly preserved.

SLUDGE INCINERATION PROCESS

Every day, more than 1500 tonnes of sludge is delivered to SNB. This sludge is stored in bunkers and grab buckets mix the various layers of sludge. This results in a consistent composition that is required for effective incineration. Various systems ensure that the area surrounding SNB are not inconvenienced by bad odours.

Before sludge is incinerated in the ovens, it has to be dried. The drying causes the water level of the sludge to reduce from 77 percent to 60 percent. That is exactly enough to enable the sludge to combust independently without another fuel being required for this. The dried sludge is then transported to the fluid bed ovens. In these ovens, sand is turbulated at a temperature of circa 900 °C. The majority of the sludge is incinerated when it touches this turbulated hot sand.



The flue gases that are formed and that leave the ovens cool down in the steam boilers. An electrostatic filter separates the flue gases from the ash particles. We store the incineration ash in silos. External parties then collect the ash for reuse.

Before the flue gases leave the chimneys, they are washed. During this stage, ammonia, sulphur dioxide, acids and heavy metals are removed. The waste water from the washer is then evaporated and centrifuged. A firm residue then remains that is taken away as hazardous waste. During a final purification stage, the mercury that is left behind in the flue gases is captured in a so-called cloth filter.

The flue gases are now as good as clean and have no perceptible effect on the environment. This means that SNB more than satisfies the requirements of European legislation regarding flue gas emissions. Some of the flue gases are transported via a pipe to a neighbouring calcium producer. This company uses the CO₂ that is present in the flue gases for the production of calcium products. The flue gases that cannot be used by the calcium producer enter the air via a sixty-metre-high chimney.



TAX MONEY

The costs for sludge processing are paid by taxpayers through the pollution levy of water companies. SNB strives to keep these costs as low as possible for citizens. We do that by incinerating the sludge in the most efficient manner possible, and we are always searching for further optimisations in the water and sludge chain. These efforts have resulted in sludge processing being cheaper today than ten years ago.

WATER COMPANIES AND SNB

SNB was founded in 1994 by the North Brabant water boards. In the meantime, the Regge and Dinkel water board and the Scheldestromen water board have joined as co-owners of SNB.

Jointly, the shareholding water boards are responsible for most of the sludge processed annually by SNB. SNB also incinerates sludge from a number of external customers and occasionally from other parties in the Netherlands.

The shareholding of SNB has a number of advantages. It guarantees that the water boards have a way of continuously removing sludge with a technology that is environmentally responsible. It also creates the possibility to create improved harmonisation in the water and sludge chain.



For more
information on SNB, view
our film at www.snb.nl



Until the nineteen nineties a lot of sludge was spread over the land as fertiliser. Using sludge in agriculture is no longer permitted due to the environmental contaminants that it contains. However, the dumping of sludge is not an alternative. This requires a great deal of space and is also forbidden. Stringent laws and regulations require that sludge is processed in a way that causes minimum environmental damage. Mono-combustion – the method used by SNB – is the most reliable and environmentally friendly sludge processing solution to date.



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