

# European Water Association



## Secure disposal routes for sewage sludge? - EWA/ÖWAV conference on 10 and 11 September in Vienna

On 10 and 11 September the Austrian Water and Waste Management Association (ÖWAV) organised together with the European Water Association (EWA) a conference in Vienna about "Sewage Sludge Disposal - Sustainable and/or Reliable Solutions". More than 60 European experts followed the lectures and shared their experiences with this issue. Main focus was the security of disposal for wastewater treatment plant operators. The use of sewage sludge in agriculture, still the most important way of disposal in many European countries, is now critically reviewed, becoming a very controversial issue and leading to changes of environmental policies in several European countries.

*Jan Le Moux* from Andersen Consulting introduced the topic by presenting a study performed for the European Commission about the sociological acceptance of disposal and recycling routes for sewage sludge in Europe. His overview showed that the critics about agricultural reuse have started in Northern Europe in the nineties. The analysis of the different stakeholder showed that in different countries the same groups can represent different positions. The example of Sweden shows that strict regulations for agricultural re-use of sewage sludge do not necessarily increase the acceptance of this disposal route. A guarantee fund or an insurance solution could win the farmers' acceptance, but not the public trust. The crucial point is that not the real risk decides about the public opinion, but the risk perception, which can differ significantly from the genuine risk.

*Prof. Dr.-Ing. E.h. Hermann H. Hahn* from the University of Karlsruhe presented pros and cons of the agricultural reuse of sewage sludge. A basic problem is that a closing of this natural nutrient cycle causes accumulation of unwanted or even dangerous materials, similar to industrial cycles. The lecturer also compared the fertilising effects of sewage sludge and manure as well as the share of agricultural reuse in the different European countries. These figures suggested that the share of agriculturally reused sewage sludge is lower for countries the higher the production of sewage sludge is in relation to other countries.

*Prof. Dr.-Ing. Harro Bode* and *Dr.-Ing. Ferdinand Schmitt* from the German river association Ruhrverband presented the sludge disposal concept of the association which is in charge of the disposal of sewage sludge from 94 wastewater treatment plants. They reported about their problems in the light of rapidly changing political opinions and frameworks. These problems result on the one hand from the fact that a change from agricultural reuse to incineration of sewage sludge necessitates another pre-treatment of the sludge. Furthermore, as the construction of wastewater treatment plants, landfills and incineration plants needs long-term investments, rapid changes of political opinions cause additional uncertainties for the wastewater treatment plant operators.

*Prof. Dr. Paul H. Brunner* from the Technical University Vienna showed the role of sewage sludge in the context of a regional material management. All material flows increase day by day, which accounts also for sewage sludge. The lecturer presented a study that examined nutrient flows from private households. He showed that 90% of phosphorus found in private

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households ends up in the sewage, only 9% in the solid waste. The same applies to nitrogen which ends up to 89% in the wastewater. These figures show the importance of reusing the nutrients in the wastewater, be it in the form of direct agricultural reuse or by recovering the nutrients.

*Prof. Dr. Reinhard Böhm* from the University of Hohenheim presented health risk linked with the agricultural utilisation of sewage sludge. He explained in detail the types of health risk, by what these risks are caused and the different ways of transmission by which humans and animals can get infected. He also showed examples about the correlation between the appearance of pathogens in sewage sludge and the outbreak of related diseases.

*Michael Pollak* from the engineering constancy WPA (Vienna) presented soil protection aspects related to the application of sewage sludge to land. The criterion of soil protection is the prevention of irreversible losses and degradations of the soil. A study was presented that compared in more than 300 analyses sewage sludge from 103 wastewater treatment plants with mineral fertiliser, regarding dangerous substances and nutrients. The results showed that sewage sludge brought twice as much phosphate into the soil as mineral fertiliser while containing less cadmium. The origin of the organic substances LAS, DEHP and NPE in the soils however could not as easily be attributed to either sewage sludge or mineral fertiliser as the results depended to a great extent on the soil itself.

The role of quality assurance and marketing for the acceptance of agricultural reuse of sewage sludge was presented by *Tim Evans* from Tim Evans Environment (UK). As example for such a quality assurance system he proposed the Hazard Analysis and Critical Control Point system (HACCP) which was originally designed for the food sector. In this system critical points are identified and controls are implemented at these points.

He showed the results of consistent marketing with an example where due to well considered naming and marketing farmers did not consider a product as sewage sludge, but as a fertilising product. The communication - especially towards the public - is thus an important, yet difficult factor.

The French situation was presented by *Olivier Borraz* from the Centre de Sociologie des Organisation (Paris) from a sociological perspective. The discussion about agricultural use of sewage sludge arose in France on local scale, caused by odour nuisances. A round table founded on national scale in 1998 between the stakeholders has however practically failed as it was not able to find a solution for the problems on the local scale. The idea of a guarantee fund was abandoned as well. Based on the French experience that the problems of agricultural use of sewage sludge arise on local scale and even national panels are not able to solve this problem the lecturer pleaded against a detailed prescription of sewage sludge use on a European scale. He recommended to prescribe limits and goals and leave it to the (local) stakeholders to find suitable solutions.

The recovery of phosphate from sewage sludge was the topic of *Peter Piekema* from the Dutch Foundation of Applied Water Research (STOWA). The Urban Wastewater Treatment Directive sets down the obligation to remove phosphorus from the sewage, but does not mention the possibility of recovering this important substance. The discussed restriction of agricultural reuse of sewage sludge however promotes the interest in this way of using the phosphorus contained in sludge. The lecturer described the possibilities and potentials of phosphorus recovery and different technologies. He also presented a Dutch study which worked out under which requirements wastewater streams can be used for phosphorus recovery.

*Christoph Leitzinger* from the Entsorgung + Recycling Zurich (Switzerland), which is responsible for the disposal in the City of Zurich, described the sewage sludge disposal of the City of Zurich. The presentation of the wastewater treatment plant Werdhölzli, its biological efficiency and other technical information comprised data about the amount of sewage sludge,

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its contents and the treatment. The agricultural reuse has continuously decreased since 1992, while the landfilling was already ceased in 1990. Today most of the sewage sludge is used as energy source in the cement industry. Another big part is used in the city's waste incineration plants for heat production.

The Vienna wastewater treatment plant, which is currently enlarged, and its sludge incineration plant were presented by *Franz Klager* from the Entsorgungsbetriebe Simmering, *Franz Tikovsky* from the Fernwärme Wien GmbH and *Prof. Dr. Helmut Kroiss* from the University of Vienna. The sludge disposal is the main problem for the operators of the plant. The original idea was to use the sewage sludge in agriculture. This was however abandoned for political reasons, and the raw sludge is completely incinerated.

The treatment and disposal of sewage sludge in Sweden was the topic of the lecture held by *Peter Balmér* from Gryaab, the Göteborg Regional Sewage Works. The Swedish wastewater treatment plant operators do not consider agricultural sludge re-use as a reliable disposal route, as the national farmers' association advises farmers against use of sewage sludge. Nevertheless 20% of the Swedish sewage sludge is used in agriculture. The Swedish legislation, currently under revision, prescribes the recovery of phosphorus before or after sludge incineration. As most of the Swedish wastewater treatment plants are too small to cost-efficiently organise sludge incineration there will be a need of a regionally organised incineration. Co-incineration with domestic waste also comes into question, although the incineration capacities will meet their limits in 2002, because from this date on the landfilling of organic waste will be forbidden.

The situation in Denmark was presented by *Svend-Erik Jepsen* from the Danish Environmental Protection Agency. In compliance with the general goals of waste management the first priority of sewage sludge disposal is the recovery of nutrients by using the sludge as fertiliser in agriculture. This is supported by a tax law that favours this way of disposal financially and discriminates unwanted ways of disposal (landfilling of sewage sludge). The agricultural use of sewage sludge in Denmark rose from 1987 to 1995 from 42% to 70%; when stricter limits for organic substances were introduced shortly after, the agricultural utilisation sank to 60%. The Danish limits for harmful substances in sewage sludge that is used in agriculture are based on the precautionary principle. They are stricter than both those of the current EU directive from 1986 and than those planned for the revised directive.

*Thomas Schmidt* from the Department of Waste, Water, Energy, and Air (Amt für Abfall, Wasser, Energie und Luft - AWEL) of the Canton Zurich stated that also in Switzerland the discussions about food safety and BSE have had a result on the image of agricultural reuse of sewage sludge. The national legislation prefers the prevention of waste to reduction, recycling and sustainable disposal. Being the regional administration of the federal government the Swiss cantons are responsible for the implementation of national legislation. To fulfil this task, the cantons have to set up a plan for sewage sludge management. The main priority of the plan of the Canton of Zurich is the agricultural reuse of sewage sludge and to assure the existence of a second disposal option (incineration or use as energy source). To ensure this option the canton Zurich assigns each wastewater treatment plant to an incineration plant, which is sometimes criticised as violating the principles of free trade. Seen only under the perspective of quality nearly 100% of the produced sewage sludge in the Canton of Zurich could be used in agriculture. Due to the politically insure situation and the discussions in society only 34% are used in agriculture, 29% are incinerated and 37% used in the cement industry.

*Prof. Dr. Helmut Kroiss*, who organised the conference, draw the conclusion that there is not one single solution for the problem of sewage sludge disposal, but many different options that have to be developed on a regional scale. Based on the conference a task group "Sewage Sludge" was founded which shall critically accompany the European legislation in this

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sector. This task group shall operate in the framework of the European Water Association (EWA).

A visit of the main wastewater treatment plant of the City of Vienna and its sludge incineration plant on the afternoon of the 11 September completed the interesting programme.

The proceedings of the conference will soon be available. For further information please contact the EWA secretariat.

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