RESEARCHING THE SLUDGE DIRECTIVE

THE VIEWPOINT OF THE WATER COMPANIES

EUREAU EXPECTATIONS
* INTRODUCTION

* REGULATORY FRAMEWORK

* BASIC FACTS

* GENERAL VIEWS OF EUREAU

* DETAILED PROPOSALS

* RESEARCH
REGULATORY FRAMEWORK

* BUILDING UPON THE AQUIS COMMUNITAIRE

* SLUDGE REUSE IN THE URBAN WASTE WATER DIRECTIVE

* PRINCIPLES OF WASTE MANAGEMENT IN DIRECTIVE 91/156/EEC

* PROTECTION AGAINST EROSION AND DESERTIFICATION

* SIXTH ENVIRONMENTAL ACTION PROGRAME
BASIC FACTS

* CLEANING URBAN WASTE WATERS EFFICIENTLY

* SEWAGE SLUDGE AS A RESOURCE

* A VALUABLE SUBSTITUTE IN LAND APPLICATIONS

* ONE AMONG MANY OTHER MATERIALS APPLIED INTO SOILS

* SLUDGE IS A TRAP OF UPSTREAM POLLUTION
**GENERAL VIEWS OF EUREAU**

<table>
<thead>
<tr>
<th>*</th>
<th>NEED FOR PROTECTION: SOIL, WATER, HEALTH AND ENVIRONMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>HOLISTIC APPROACH IN SOIL PROTECTION REGULATIONS</td>
</tr>
<tr>
<td>*</td>
<td>PROMOTION OF CONFIDENCE IN SEWAGE SLUDGE</td>
</tr>
<tr>
<td>*</td>
<td>RIGOROUS ASSESSMENT OF AVAILABLE SCIENTIFIC EVIDENCE</td>
</tr>
<tr>
<td>*</td>
<td>CONTROL OF POLLUTION AT SOURCE</td>
</tr>
<tr>
<td>*</td>
<td>PROMOTION OF FEASIBLE DISPOSAL AND REUSE ROUTES</td>
</tr>
<tr>
<td>*</td>
<td>LONG TERM POLICIES FOR INVESTMENTS NEEDED</td>
</tr>
<tr>
<td>*</td>
<td>CLER COMMON VIEWS IN EUROPEAN AND NATIONAL ADMINISTRATIONS</td>
</tr>
</tbody>
</table>
DETAILED PROPOSALS FOR A MODIFIED SLUDGE DIRECTIVE (I)

* SCOPE
  ➔ OPEN TO NEW APPLICATIONS IN SOIL

* TREATMENT
  ➔ STABILISH PERFORMANCE INDICATORS RATHER THAN PROCESSES
  ➔ COHERENCE BETWEEN TREATMENT AND USES

* HEAVY METALS
  ➔ SOURCES OF METALS IN SOIL
  ➔ CONTENT LIMITS IN SLUDGE

* ORGANIC SUBSTANCES
  ➔ NEGLIGIBLE RISKS FROM ORGANICS IN SLUDGE
## Detailed Proposals for a Modified Sludge Directive (II)

| * Monitoring | Develop common standards for sampling and analysis |
| * Liabilities | Quality of products |
|              | Monitoring |
| * Technical Assistance | Information on benefits to users codes of good practice |
| * Auditing | Annual report to the administration |
RESEARCH ON SLUDGE

* METHODS FOR SAMPLING AND ANALYSIS

* POSSIBILITIES IN MINIMISING PRODUCTION

* NEW TECHNOLOGIES FOR RECYCLING AND REUSE

* LONG TERM STUDIES ON SOIL PROTECTION

* PATHWAYS FOR POLLUTANTS

* EXTRACTION OF RESOURCES

* COMPARATIVE ASSESSMENT ON TREATMENT AND DISPOSAL
CONCLUSION

* BUILDING CONFIDENCE IN QUALITY AND BENEFITS

* UNDERPINNING OPERATING AND MANAGEMENT PRACTICES

* GAINING ACCEPTABILITY BY PUBLIC AND GOVERNMENT TOWARDS SUSTAINABILITY

* LAYING SOUND FOUNDATIONS WITH BEST SCIENTIFIC EVIDENCE
Avelino Martínez Herrero  
Chairman of Waste Water Commission in EUREAU  
(European Union of National Associations of Water Suppliers and Waste Water Services).

1. INTRODUCTION

1.1 EUREAU represents the operators of drinking water, waste water and sewage sludge facilities throughout the European Union and EFTA, with observer members from other European countries. EUREAU serves about 400 million people, and represents a unique concentration of technical, scientific and managerial knowledge and of practical expertise in water matters.

1.2 On the basis of such an involvement in the management of the whole water cycle and related environment, EUREAU very much welcomes the opportunity to present its views, concerns and proposals about the approaches that the new European regulation will apply to sewage sludge. The management of sewage sludge is one of the biggest burdens that Society puts on the shoulders of the operators.

1.3 The existing Sludge Directive (86/278/EEC) has provided a valuable basis for the effective protection of public health and the environment, in particular the soil, when recycling sewage sludge in agriculture. This Directive laid down the pathways for a safe, sound and useful management and control of the agricultural use of sewage sludge.

1.4 Nevertheless, EUREAU agrees that it should be reviewed in the light of experience and technological progress, although it believes that its basic structure is as relevant to sewage sludge today as it was in 1986. For that reason, any proposed new requirements or standards should be based on a rigorous assessment of available scientific evidence.

2. REGULATORY FRAMEWORK
2.1 In the process of reviewing the Sludge Directive it is necessary to take on board the already established regulatory framework. The European Union has developed by building upon the so-called *aquis communitaire*, that is, on the foundation of principles already adopted at European level. This should be the case in reviewing the Sludge Directive, taking on board principles adopted through the environmental action programmes, the European strategy for waste and certain European Directives.

2.2 Thus, I would highlight that the Urban Waste Water Treatment Directive (UWWT), in article 14, states that “sludge arising from waste water treatment shall be re-used whenever appropriate”, while requiring that “disposal routes shall minimise the adverse effects on the environment”.

2.3 Notwithstanding the fact that sewage sludge is a source for some valuable substances, it is a waste under European law and should therefore be managed according to the requirements established in Directive 91/156/EEC on waste. Article 3 of this lays down a clear hierarchy of principles for waste management, according to which Member States shall take appropriate measures to encourage:

- first, the prevention or reduction of waste production and its harmfulness;
- second, the recovery of waste by means of recycling, re-use or reclamation or any other process with a view to extracting secondary raw materials;
- third, use of waste as a source of energy.

It is notable that disposal in landfill is no longer acceptable whenever recycling is possible. Also, the use of waste as a source of energy is to be understood as a net source of energy, taking into account the energy balance throughout the whole process of the recycling of waste. Otherwise it would not be consistent with the principle of sustainability, another European Union cornerstone.

2.4 One of the aims of the Landfill Directive (1999/31/EC) is to encourage the re-use of organic matter in order to rectify the continuous loss that occurs in the soils of many areas of European countries.

Erosion and desertification is an increasing threat in Europe. The “Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions on the sixth environmental action programme of the
European Community” recalls: “soil is a finite resource vital to agriculture”. It goes on to say that soil is under pressure and that erosion, climate and weather related, is a particular problem in Southern Europe but increasingly also in the North”. EUREAU is pleased to note that the European Union intends to develop a strategy on soils.

2.5 The Sixth Environmental Action Programme declares a clear and firm aim at encouraging recovering and recycling wastes to levels that make sense, that is to the point where there is still a net environmental benefit and that are economical and technically feasible.

To meet this objective some key actions are required:
- revise the Directive on sludge;
- initiate management and legislative action on biodegradable wastes;
- establish a Thematic Strategy on waste recycling to identify which wastes should be recycled as a priority, based on criteria which are linked to the resource management priorities and to the results of analyses that identify where recycling produces an obvious net environment benefit;
- identify policies and instruments to encourage the creation of markets for recycled materials.

3. BASIC FACTS

3.1 Against this background of principles and policies, some facts need to be highlighted in respect to sewage sludge when reviewing the Sludge Directive.

Sewage sludge results from cleaning urban waste waters and is an inevitable by-product of the water cycle on which human life and health depends. Over 12 million tonnes of dry solids are produced each and every year in the EU, a small fraction of the total amount of wastes that are generated in the EU annually, but increasing in quantity as more waste waters are collected and treated according to the requirements of the UWWT Directive.

3.2 Fortunately, sewage sludge is not only a waste but in practice a resource that can be used in a number of sustainable ways. Indeed it represents an environmentally sustainable link between the city, where most sludge is produced, and the countryside, where it can be used in agriculture and other land applications. It can also be used as a source of energy and in several specialist applications, such as the production of materials for construction.
3.3 In respect of land applications, it is well known that the use of treated sewage sludge provides many benefits to agriculture, improving crop yields, and to the environment, for example reducing the potential for erosion, a major cause of soil degradation and water contamination.

The use of treated sludge in agriculture and other land applications is based on its main components, organic matter and nutrients. Organic matter provides soil conditioning properties and enhances soil stability, encouraging plants growth and allowing them to establish quickly.

Nutrients for fertilisation such as mineral phosphorus and organic nitrogen are present in municipal sewage sludge in proportions between 1 and 5% of dry matter, comparable to those in animal manures. In particular, as natural phosphorus ores with low content of heavy metals are a limited resource, the phosphorus content of sewage sludge can be a partial and valuable substitute.

Other elements are present in sludge and have agronomic value; thus, potassium, magnesium, sodium, sulphur and oligoelements like boron, cobalt and selenium. Many areas suffer deficiencies of some of these essential elements and sewage sludge offers an attractive remedy.

In short, its use in agriculture provides clear financial benefits to the agricultural sector and is fully compatible with the objectives of sustainable development.

3.4 Sewage sludge is one of many materials that is applied to agricultural and other soils and is used on less than 1% of available agricultural land in the European Union. Other wastes -notably animal manures- and materials as mineral fertilisers are used in much greater quantities and on far more hectares of land, yet without anywhere near the same level of control. It is noteworthy that animal manures are applied to agriculture in 30-40 times the amounts of sewage sludge.

Although the quantities of sewage sludge available for land applications are a small proportion (3-5%) of the total amounts of other wastes and materials that are used in agriculture, they still can make an important contribution to crop growth and soil protection.

It must be recognised too that the quality of soils is dynamic, heavily conditioned by natural processes and anthropogenic inputs, especially from the air. Sewage sludge can be helpful as part of a total management
package for soils, a fact that we hope the Commission takes on board in preparing a European soil strategy

3.5 Raw sewage sludge does reflect those substances that are used or produced by society, some of which may be discharged to the sewer and retained in the sludge phase.

Some contaminants are reduced or destroyed during treatment of the waste waters. In addition, sewage sludge is treated to minimise biological contaminants to an acceptable level: raw sludge is not used in agriculture. As a final safeguard, specific EU legislation on this use sets the quality standards and conditions under which sewage sludge can be applied safely on land. Competent management by the operators ensures not only that regulatory demands are met but that social expectations (such as avoiding odour nuisance as far as possible) are satisfied too.

Nevertheless, some minor ingredients, such as some metals and organic pollutants, are not of agronomic value and their levels need to be controlled to protect the soil, the products and the uses to which the sludge can be put. Unfortunately these contaminants are not or only slowly biodegradable and hence beyond the capability of the waste water and sludge operators to reduce. Instead strong actions by the EU, the national governments, producers and, especially, users are needed to reduce or remove these substances at source. The European Commission is quite aware of this need. For this reason its Communication on the sixth environmental action programme declares its aim at banning or phasing out as quickly as possible chemicals that are carcinogenic or mutagenic, those that affect the reproductive system or that are persistent, bioaccumulative or toxic.

4. GENERAL VIEWS OF EUREAU

4.1 Whenever a modification of the Sludge Directive is suggested, EUREAU is willing to contribute its views and position as a very relevant stakeholder in the whole water cycle. We would like to make a few general observations now.

4.2 Firstly, EUREAU wishes to emphasize the need for a regulatory framework at European level for soil protection. This would help to minimise risks to water resources (in particular those surface and groundwater used for public supply), to human or animal health (via products grown on the land) and to the general environment. We are
especially concerned that risks to the food chain are, and publicly recognised to be, minimal.

4.3 Where a significant risk to the environment or health might occur, all significant inputs to the land in question should be regulated. Therefore, EUREAU insists in the adoption of a holistic approach to soil protection, taking account of the contributions to soil quality and pollution from all sources: animal manures, mineral fertilisers, anthropogenic inputs - direct or through atmospheric deposition-, sewage sludge and other wastes and materials.

4.4 The regulatory framework should guarantee full coherence and harmonisation of different Directives dealing with specific products and wastes applied to the soil. In particular it should guarantee comparable hygienic quality for all materials applied.

4.5 Within this framework of regulatory effort, EUREAU agrees that one of the tasks is to update Directive 86/278/EEC on sewage sludge in agriculture. It is necessary to adapt it to the enormous knowledge gained during the last 15 years about the benefits and risks of sewage sludge applications and to ensure the sustainability of its reuse on land.

4.6 The use of sewage sludge to benefit crops and the environment is becoming increasingly difficult in Europe because, for political or perception reasons, some parts of the world, including some European countries, have taken unilateral action to severely restrict or even ban its application in agriculture. This fact seems to induce “epidemic” consequences for the rest of Europe, with some other countries inclined towards adopting similar restrictive strategies for sewage sludge on land (either in agriculture or another use). EUREAU wishes to stress that the update of the Sludge Directive should avoid as much as possible prohibitions and uncertainties. It should set a clear EU direction for sludge that maximises its value for agriculture and the environment. It should adopt a positive approach through codes of good practice and proposals, that support the practice and promote confidence in sewage sludge reuse among farmers, food industries – producers and retailers - and consumers.

4.7 One of the best ways to build that confidence is a sound scientific basis for any statement or standard in the new Directive, which should start with a rigorous assessment of available scientific evidence. The already mentioned Communication of the European Commission declares: “regulations, targets and policy action must be carried out in an open dialogue with all interested groups, supported by sound scientific and
economic assessments.” EUREAU very much congratulates the Commission for the research projects it put in place on the Sludge Directive, not only to assemble the best available science but to indicate where gaps need to be filled. The main results of these studies will be explained during this Seminar and should provide an excellent basis for deciding the control and management requirements that a revised Directive should elaborate.

4.8 Another essential factor in building confidence is to continually look for where improvements in the quality of sewage sludge could be made. Here, a special effort is required to control pollution at source, particularly for those substances and materials where it is not cost-effective to reduce them at the end of the pipe. EUREAU fully supports the principle of prevention of pollution at source. The restructuring and increased efficiency of European industry over the past few decades, the greater focus on industrial discharges via Directives on dangerous substances discharged to the aquatic environment and, more recently, on integrated pollution prevention and control, have already brought about significant improvements in sewage sludge quality. However to substantially lower metal levels even further in sludge and in the environment needs concerted effort by the EU and Member States over domestic and diffuse sources. It is not a task that waste water operators can or should be expected to undertake. The requirements of the new Directive should make no assumptions as to what might be achievable if control at source actions are successful but should stress that actions at source must be taken at European level, nationally and locally to bring about sustainable improvements in sewage sludge quality.

4.9 As many as possible of the feasible disposal and reuse routes for sewage sludge should be maintained and promoted in order to allow a broad range of applications for an inevitable by-product of civilised society.

4.10 The updated Directive should also give waste water treatment works’ operators the certainty to be able to prepare stable, long term policies for the investments and facilities that will be needed to meet the Directive’s requirements and to establish sound management practices and markets for the sludge and sludge products produced.

4.11 The European global strategy and regulation should not be so rigid that it prevents any country from incorporating standards or practices that are relevant to particular local circumstances.
4.12 A clearly identified focus and common position within different departments (waste, agriculture, water, etc) in the European and national Administrations would help in understanding and responding positively to the challenges posed by the need to manage and control practicably the sewage sludge that the citizens of Europe generate each day.

5. DETAILED PROPOSALS

5.1 The scope of the modified Directive should be aimed at ensuring an appropriate balance between the environmental and commercial benefits in using organic wastes on land and any possible adverse consequences of their use. It should cover all applications to agriculture, silviculture (including coppicing), land reclamation and the like.

5.2 EUREAU does not believe that it is necessary or desirable to specify the range of processes and operating conditions that are, or might be, used for the treatment of sludges. This would require additions to the list proposed and, if innovation is not to be curtailed, rapid changes as new processes came on-stream. It would be better to define the performance of the treatment processes in terms of the reduction of pathogens that they achieve. As an alternative, a very quick and efficient procedure should be put in place to let new processes to be accepted.

5.3 For this purpose, E.Coli would be a good indicator organism and treatment defined as “conventional” or “enhanced” if levels were reduced by log 2 or log 5 respectively.

5.4 EUREAU recommends the use of E.Coli (or faecal coliforms) as the indicator organism for sewage sludge, not Salmonella which is not as specific to faecal matter.

5.5 The revised Directive should establish requirements proportionate to uses, and should set out clear exemptions or relaxations to the requirements for treating sludge to be used for growing crops exclusively for industrial or energy production purposes.

5.6 Heavy metals are found naturally in soils and are often essential to sustain plant growth. There are a number of factors that should be taken into account in determining acceptable loadings in the soil. First, anthropogenic sources of metals in soils (e.g. from the atmosphere) are numerous and sewage sludge is usually minor in comparison. Second,
measures to prevent pollution at source (e.g. over vehicle emissions) will be the main way of achieving significant reductions in the rate of accumulation of heavy metals in soils. Third, many soils naturally exceed the limits and are able to support crop and vegetation growth without undue risk to human or animal health. Fourth, metals are also immobilised according to their physical and chemical properties and those of the soil.

5.7 The above reasons show that heavy metal limits in soil from sewage sludge applications should be sensible, designed to ensure toxicity effects from this route are insignificant rather than to achieve arbitrary reduction targets. In any case, limit values and measurements should relate to available rather than total metals concentrations.

5.8 EUREAU believes that metal limits in sludge to be applied to soil should be set at levels derived from a rigorous assessment of current scientific understanding and that are within the operator’s capability of achieving now. In the light of the research into sources of metals, the EU Commission should put forward proposals for their reduction at source. The sludge limits could then be reviewed in another 10 years time to assess whether they could then be amended to reflect the success of pollutant reduction measures.

5.9 Organic substances are found in sewage sludge but rarely in significant concentrations. Even when present, the substances proposed do not indicate any environmental or health risk. This negligible risk to health or the environment from organics in sewage sludge does not justify the considerable efforts and high costs of monitoring at such low levels. Sampling and analysis are difficult and unreliable. EUREAU believes that limits on organics should not be included. If necessary, Member States could ask to monitor for specified organics where they have reasons to believe that organics will be found in significant concentrations in sewage sludge. Maybe the research studies that we will hear about later will throw some light on whether or not these occasions are, as we believe now, comfortingly rare.

5.10 It will be necessary for the revised Directive to set out clearly what methods of sampling and analysis are to be used. Some methods already exist in CEN or ISO and should be followed. Others will need to be developed. We are pleased to note that there should have been at least one project proposed under the fifth EU Research Framework Programme to address this important topic, and hope that it is successful.
5.11 EUREAU agrees that producers should have clearly defined responsibilities for the quality of sewage sludge product that is applied to agriculture and other land. It is to be pointed out that not always the product applied to land is produced in a single WWTW; it is common for sludge from a number of WWTW to be brought together for treatment or distribution. Therefore it is not appropriate to identify the WWTW operator as the producer.

5.12 Producer responsibility should include analyses of sludges and eventually the soils to which they are applied. The expertise and the specialist facilities for sampling and analysis usually rest with the sludge producer. Hence although EUREAU agrees that laboratories should be independently certified for sewage sludge and soil sampling and analysis, they do not need to be independently owned.

Frequency of sampling should depend on the concentrations in the sludge relative to the limits set for both sludge and soils, and is therefore best determined locally. This would minimise unnecessary analyses and therefore costs. There will need to be some flexibility decided locally: smaller waste water treatment works with significant trade effluent input will have less buffering capacity than larger works and may require greater monitoring.

5.13 EUREAU accepts that the sludge producer should provide information to the farmer or other user about the quality of sludge and the beneficial and other effects on the land to which it is applied. The farmer needs to know the mineral fertiliser replacement value of the sludge and that the loading rates for the soils are within acceptable limits. He wants reassurance that the recycling operations do not cause damage to his land now or in the future. However this detail should be included in national Codes of Practice, not in EU requirements.

5.14 As far as providing information to the Administrations, it would be sufficient to require the sludge producer to report annually to the competent authority on sludge quality, quantity and where it has been delivered. This would provide needed data for auditing and control purposes and avoid unnecessary bureaucracy.

6. RESEARCH

6.1 EUREAU is not a R&D organization but very much supports regulations and policies based on sound scientific knowledge and
research. EUREAU keeps in close contact with R&D interests, seeking to ensure that research objectives in the areas of interest to water supply and waste water operators have practical application. It is willing to contribute its views and knowledge about the issues in water cycle management, and the gaps that exist in that knowledge.

6.2 In respect of sewage sludge, EUREAU wishes to point out that research is needed for:

- Establishing methods and criteria for sampling and analytical procedures applied to sludge, either for heavy metals, organic compounds or microbiological indicators. EUREAU supports the CEN activities in this field

- Defining possible ways and conditions to minimise sludge production

- Assessment on long-term benefits and risks to soil protection when applying sludge

- Assessment of possible pathways for pollutants to plants and the food chain when sludge is applied to agricultural land, in comparison with other products

- Development of new toxicological methodologies to assess the environmental impact of sludge pollutants

- New treatment technologies that could foster the recycling and reuse of sludge in sustainable ways

- New disposal routes and products manufactured from sludge (construction materials and others)

- Studies on feasibility of extracting resources (phosphorus and others) from sludge

- Comparative assessment on treatment and disposal options, and development of a tool for sludge management.

6.3 Some of this research has been carried out in some Member States but it would be useful to collect this together to see what more might be appropriate at EU level. Some topics are dealt with in the research
proposals named with the acronyms HORIZONTAL and SALAD, presented under the Fifth Framework Programme. EUREAU wellcomes and supports every effort made in those fields.

6.4 In the end EUREAU wants security of outlets for the sewage sludge that is produced every day in Europe. This needs

- sensible controls that give users of sludge and its products confidence in its quality and benefits,

- good operating and management practices - underpinned with codes of practice – and

- acceptability by the public and governments at all levels that reuse of sewage sludge must be regarded as an essential component of the drive towards a sustainability.

Building confidence in sewage sludge quality and use has to be based on risk assessment and a regulatory framework, using the best scientific evidence that research and practice can muster to set the standards and conditions. EUREAU welcomes this conference as a means of exposing the best available scientific information as the basis for a new EU Directive on sludge.