The Mining Waste Directive – will it address the toxic burden?

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Introduction

Mining and quarrying waste is a significant source of pollution and general environmental degradation, in particular of freshwater ecosystems, both in terms of physical volume and ability to cause damage. More than 400m tonnes of waste from the extractive industries is produced each year in the EU. This is usually generated as a by-product (eg topsoil, overburden and waste rock) during extraction of the mineral resources or processing ore and accounts for around 30 per cent of the EU's annual waste production.[1]

The environmental impact of this waste can result from inappropriate day-to-day management practices leading, for example, to water pollution through acid drainage and/or from accidental spills resulting from the failure of the structures, such as dams, built to contain the waste. In these cases, heavily polluted water, often rich with heavy metals and cyanide, escapes into the river systems, frequently killing the aquatic life and having a serious impact upon the local environment and population. Since 1975, the failures of tailings dams have accounted for around three quarters of all major mining-related environmental accidents worldwide.

Another main issue is that there is physically just so much of the waste. Even the so called 'non-hazardous inert' mining and quarrying wastes can be detrimental to aquatic fauna and flora, for instance by damaging fish gills or by blanketing streambeds to such an extent that photosynthesis becomes impossible. Waste heaps can collapse. In 1966, waste from the Merthyr Vale colliery slid down the mountainside in Aberfan in Wales, swamping a local school and killing 144 people, 116 of whom were children.

WWF engaged in the debate on mining waste in 1998, as a reaction to a mining toxic spill in Aznalcóllar (Spain) where 5,000,000 cubic meters of acid and metal rich water together with nearly 2,000,000 tonnes of toxic tailings flooded the river banks along the Agrio and Guadiamar rivers to the Entermuros marshes 40 kms south of the mine at the border of Doñana Natural Park. In the days following the spill, 30 tonnes of dead fish and 170 kg of dead crabs and amphibians were collected. Adult birds could fly away, but they had to abandon their eggs because the spillage happened during the breeding season. As a result, a whole generation was lost. Socio-economic impacts were felt most strongly in the fields of tourism, agriculture and mining. The cost of remediating the environmental damage was estimated at €377.7m.[2]

Following this event, WWF commissioned a study[3] to evaluate whether tailing ponds from mining operations could pose an environmental risk elsewhere in Europe. The findings of the report were that all EU Member States at the time had either extensive or small-scale mining activities and many of them had abandoned mining facilities. There was also evidence of significant pollution in at least five Member States and there was no regulatory EU framework to manage this. This was when WWF started calling on the EU to take action.

It took one of the most serious mining accidents to date for this call to be heard. In January 2000, the tailings dam at a gold mine in Baia Mare, Romania, burst and 100,000 m^3 of cyanide-rich water was released into the Lapus river, travelling downstream to the Somes and Tisza rivers and continuing into the Danube. The slick killed more than 1242 tonnes of fish and created severe consequences for the health of local people and their livelihoods.

A Baia Mare Task Force[4] was organised which included high level officials from the European Commission and international and regional bodies for environmental protection in the Danube basin. The task force examined what exactly had happened and looked at other existing tailings lagoons that posed a similar risk and what could be done to prevent similar events.[5]

Something needed to be done at the EU level. In May 2000, the European Commission issued a communication, 'Promoting Sustainable Development in the EU Non-energy Extractive Industry',[6] which stated that:

> One essential requirement for achieving sustainable development is the integration of environmental concerns into every stage of an operation from planning stage, to operational, to site restoration and aftercare.

In October 2000, this was followed by a more detailed communication, 'Safe Operation of Mining Activities: A

1 EEA 2001, EC 2005.

2 *Mining in Doñana:Lessons Learned*, WWF Spain (April 2002), available at www.wwf.es.
3 *Toxic Waste Storage Sites in EU Countries: a Preliminary Risk Inventory* Institute for Environmental Studies Vrije Universiteit Amsterdam (report February 1999).
4 EC/ICPDR/HU/RO/BG.
5 Report of the International Task Force for Assessing the Baia Mare Accident (the Baia Mare Task Force) (December 2000).
6 COM (2000) 265.

Follow up to Recent Mining Accidents',[7] which outlined key actions that the EU intended to take. These were to be amendments to the Seveso II Directive,[8] and were to include:

- mineral processing of ores
- tailings ponds or dams
- an amendment to the Hazardous Waste List[9] to include certain mining wastes
- a best available techniques reference document on waste rock and tailings
- a legislative instrument on the management of mining waste.

The last point resulted in the Mining Waste Directive.[10]

The Mining Waste Directive

The Mining Waste Directive went through two readings in March 2004 and September 2005, was concluded in January 2006 and has already entered into force.

The directive stands on its own. It has strong links to the Waste Framework Directive[11] and the Landfill Directive[12] and also to other EU legislation dealing with waste, such as integrated prevention pollution control;[13] Seveso II; the hazardous waste list; the Water Framework Directive;[14] environmental impact assessment and the nature directives.[15]

Objectives

The objectives of the directive are to ensure safe management of mining waste and to prevent or reduce effects from day to day management of all mining waste facilities (ie waste heaps and tailings ponds) throughout their lifecycle. This includes measures for planning and licensing of waste facilities, as well as for managing their eventual closure and after care. One of the main aims is to prevent accidents of the type that happened in Doñana and Baia Mare, or at least minimise the consequences of such accidents at Category A (high risk) waste facilities through measures based on best available techniques.

Scope

The most controversial issue is probably the directive's scope.[16] It covers waste from prospecting for, extracting and processing mineral resources. However, it excludes non-mining wastes because they are covered by other legislation, and does not cover waste from offshore extraction. The directive's requirements for 'inert waste' – waste that does not necessarily enter into chemical reactions or cannot dissolve in water (such as unpolluted soil, waste from peat) – are fairly limited. As we have seen, this waste can have an impact simply from existing in large quantities, but is exempted under the directive from a number of stringent provisions on permits and post closure procedures (unless classed in a Category A facility when all provisions apply).

The Council has also introduced a completely new class of waste – 'non-hazardous non-inert' waste – which despite the fact that it can be both physically and chemically hazardous is exempted from a number of more stringent requirements on, eg, financial guarantees (unless present at a Category A facility which will have stricter management rules).

General requirements

The general requirements for Member States and operators are quite ambitious.[17] Member States need to take measures to ensure that:

> extractive waste is managed without endangering human health and without using processes or methods which could harm the environment, and in particular without risk to water, air, soil and fauna and flora.

They must also take measures 'to prohibit … uncontrolled depositing of extractive waste'. We will see later that, even within the directive itself, there are contradictions to this general requirement.The operator needs to 'take all measures necessary to prevent or reduce as far as possible any adverse effects on the environment and human health', including the management of any waste facility both while it is operating and after closure, and the prevention or mitigation of major accidents.

Waste management plans

Each mining facility needs to produce a waste management plan, drawn up by the operator.[18] Again, the idea is to

7 COM (2000)664.
8 Council Directive 96/82/EC on the control of major-accident hazards (the Seveso II Directive) OJ 1997 L10/13. This directive was extended by Directive 2003/105/EC OJ 2003 L345/97. The Seveso II Directive has fully replaced its predecessor, the original Seveso Directive 82/501/EEC, which was first put in place after a major chemical accident in 1976 in Seveso Italy.
9 Council Decision 94/904/EEC establishing a list of hazardous waste pursuant to Article 4(1) of Council Directive 91/689/EEC on Hazardous Waste OJ 1994 L356 and OJ 1991 L377 respectively.
10 Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 on the Management of Waste from the Extractive Industries and amending Directive 2004/35/EC OJ 2006 L102/15. http://eur-lex.europa.eu/LexUriServ/site/en/oj/2006/l_102/l_10220060411en00150033.pdf.
11 Directive 2006/12/EC of the European Parliament and of the Council of 5 April 2006 on waste OJ 2006 L114/9.
12 Council Directive 99/31/EC of 26 April 1999 on the Landfill of Waste OJ 1999 L182/1.
13 IPPC Directive, Council Directive 96/61/EC of 24 April 1996 OJ 1996 L257.
14 Directive 2000/60/EC of the European Parliament and of the Council Establishing a Framework for Community Action in the Field of Water Policy OJ 2000 L327/1.
15 Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds OJ 1979 L/103; Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora OJ 1992 L206.
16 Article 2.
17 Article 4.
18 Article 5.

'prevent or reduce' waste, to promote back-filling and recovery of waste and to ensure short and long term safe disposal. There are specific minimum requirements for these plans:

- documentation of major accidents (where applicable)
- waste characterisation and quantity
- waste-generating operations
- environmental effects, mitigation measures, monitoring
- prevention of water status deterioration and air and soil pollution
- survey of land affected
- plan for closure and after-care.

Waste management plans must be reviewed every five years and approved by the competent authority.

Permits for facilities

All waste facilities, apart from those for non-hazardous inert waste, need a permit to operate.[19] Permit applications must include:

- identity of the operator
- proposed location
- waste management plan
- provision of a financial guarantee in case something goes wrong (money must be available to carry out remediation and other activities after closure)
- environmental impact assessment if required under the EIA Directive.[20]

The public must be kept informed throughout the application and permit procedure, the results of public consultations must be taken into account in the decision and the public must be informed about the decision.

Major accident prevention

One of the main aims of this directive is to prevent major accidents. High risk (Category A) facilities need to be identified.[21] Over and above other requirements covering design, construction, operation and maintenance, a major accident prevention policy must be drawn up. Emergency plans in the event of an accident must be in place, with provision for a safety manager and a safety management system for implementing recognised procedures. These include minimising the effects of an accident on human health and the environment, providing for clean-up and rehabilitation of the environment, and a mechanism for immediately notifying the competent authority. The public concerned must be given an early opportunity to participate in preparing the emergency plan, and due account should be taken of public comments in the decision.

Construction and management of waste facilities

There are also provisions on how to construct and manage waste facilities.[22] Construction and management need to be carried out by technically competent persons. There are requirements for suitable location and design; physical stability and prevention of pollution of water and soil; monitoring and follow-up action; closure and after-care. Any adverse events must immediately by notified and corrective measures put in place. Regular reports of monitoring results must be submitted to the competent authority.

Water, air and soil pollution

The operator must satisfy the competent authority that necessary measures are in place to meet Community environmental standards for water, air and soil and, in particular, to prevent the deterioration of current water status in line with the Water Framework Directive.[23] These may include evaluation and prevention of leachate generation; collection and treatment of contaminated water and leachate, with any disposal into water bodies made subject to compliance with the standards of EU water legislation; and prevention or reduction of dust and gas emissions. There are also provisions to limit the cyanide concentration in tailings ponds. WWF advocated a regulatory limited based on total concentration of cyanide in tailings ponds. However, what is included in the provisions is a weak acid dissolvable concentrate.[24]

Closure and after-care procedures

Mining waste facilities cannot just be closed down and left. There are conditions that have to be met[25] to start the closure procedure and the operator is responsible for after-care. Provisions include monitoring the 'physical and chemical stability of the facility' by controlling and conserving facility structures, and minimising any negative environmental effect, in particular with respect to surface and groundwater. Any developments and subsequent corrective measures are to be notified to the competent authority by the operator, together with reports of monitoring results. There are also provisions to rehabilitate the land affected by a waste facility. 'Rehabilitation' means treating the land so as to restore it to a satisfactory state, with particular regard to soil quality, wildlife, natural

19 Articles 7, 8.
20 Directive 85/337/EEC, as amended by Directive 2003/35/EC OJ L156, 25.6.2003.
21 Article 6.
22 Article 11.
23 Article 13.
24 The concentration of weak acid dissociable cyanide (WAD CN) must be reduced to the lowest possible level and not exceed 50ppm as from 1 May 2008, 25 ppm as from 1 May 2013, 10 ppm as from 1 May 2018 and 10 ppm at new waste facilities which are granted a permit from transposition date (1 May 2008); Article 13 (6).
25 Article 12.

habitats, freshwater systems, landscape and appropriate beneficial uses.

Financial security

A system of financial guarantees must be established by the operator before the permit is granted and the operation starts.[26] Funds need to be readily available to cover the costs of rehabilitating affected land and to prevent operators walking away and abandoning facilities. The financial guarantees are to be calculated independently and periodically adjusted.

Environmental liability

The Environmental Liability Directive[27] applies to the management of mining waste facilities.

Backfilling

The directive includes provisions on the excavation voids where waste has been taken out.[28] It promotes backfilling of these voids for reasons of stability, rehabilitation or construction. However, there is some controversy here because the directive does not insist upon the backfilling of all excavation voids; it merely imposes a number of requirements on the management of those voids that are in any case being backfilled. WWF is concerned that operators may be discouraged from backfilling because of the need to fulfil these additional requirements. It might be easier for operators to leave the excavation voids as they are, despite the fact that they will then still pose one of the main risks to the water environment and to safety.

Inventory of closed facilities

Member States are required to draw up inventories by 2012 of closed waste facilities, including abandoned waste facilities, which are causing or likely to cause negative effects on the environment or human health.[29] These inventories must be kept up to date and made available to the public. Member States are to ensure that they share technical and scientific information on methodologies for preparing the inventories and rehabilitating polluting facilities.

Transboundary effects and other provisions

Transboundary effects are considered important under this directive and Member States must inform each other immediately in case of accident and consult with each other.[30] Requests for information from one Member State to another and exchange of practice methodologies are also encouraged. There are requirements for regular inspections by the competent authority and record keeping by the operator, and also for exchange of information on best available techniques.

Transitional provision

Facilities that are already permitted or in operation on transposition (1 May 2008) must be included under the new scheme within four years (six years for financial guarantee) of that date.[31] Compliance with the Water Framework Directive is applicable immediately. There are specific requirements for facilities under closure when the directive entered into force, which need to be effectively closed by 2010.

Implementing measures

This is a typical EU framework directive. It is relatively vague. It does tell operators what they need to do by when, but quite a lot is left to the implementation process which is mostly undertaken by 'comitology'.[32] Technical discussions are taking place on waste characterisation and the definition of inert waste is being developed further. Other areas of discussion include the classification of waste facilities – which facilities should be categorised as high risk (Category A)? How do you ensure the transmission of information to competent authorities? How do you measure cyanide? What exactly is the procedure for financial guarantee? What methods should be used for sampling and analysis? Some of these discussions are still ongoing, so many of the directive's requirements are still being defined. Implementing measures are due to be adopted by the Commission within two years of entry into force of the directive.

Conclusions

The main shortcomings of the directive are as follows: first, the bulk of EU waste production – the 'non-hazardous inert' waste – will not be adequately managed because it will not be subject to all the requirements of the directive, unless the waste deposits present a clear physical hazard.

Secondly, the definition of 'extractive waste facility' is linked to time periods, so that non-hazardous (non Category A) and inert waste can be stored for up to three years without adequate regulation.

Thirdly, small and medium sized deposits are not adequately covered, in that no permits are required for

26 Article 14.
27 Directive 2004/35/CE of the European Parliament and of the Council on Environmental Liability with Regard to the Prevention and Remedying of Environmental Damage OJ 2004 L143/56.
28 Article 10.
29 Article 20, 21.
30 Article 16.
31 Article 24.
32 Most EU regulation in not enacted as legislation by the Council and Parliament but as implementation measures under the executive duties of the Commission. Such regulation can be adopted when the Council has conferred executive powers on the Commission and after an implementation committee, composed of policy experts from the Member States, has given its opinion on or approved the Commission's proposed measures. The committee procedures are commonly referred to as 'comitology'.

them. The strong push from the Council for their exemption is understandable – smaller operators should not be overburdened. However, this concern is not really justified, because the impact assessment that the European Commission Services carried out concluded that the increased administrative cost would be only €1 per tonne of the aggregated waste. Therefore it would not impose a massive burden.

Fourthly, provisions for the 'scope of the directive' are still being defined and the whole subject is quite complicated. It is not clear how competent authorities are going to cope with 'scope'.

Fifthly, there is no requirement for an EU-wide inventory of new facilities. All old or closed facilities must be listed, but the directive does not call for a specific inventory of EU-wide new facilities. This information would be provided when permits are applied for, so it is to be hoped that an inventory of new facilities will emerge during implementation.

Finally, there is the lack of any requirement under the directive to backfill all excavation voids, leaving the possibility of instability and pollution.

However, there are three very positive messages. First, the EU finally has a regulatory framework which harmonises minimum standards and improves the situation in those Member States where national regulation is poor. This has been recognised, for example, by Bulgaria and Romania, who are committed to implementing the directive immediately according to the timeframe of EU25. Although there is provision for a transitional period, these countries are keen to comply and see the value of the provisions. Secondly, the directive does contain adequate provisions for managing the most hazardous extractive waste, so facilities similar to Baia Mara and Doñana should be managed properly. Thirdly, all waste facilities capable of causing a major accident through presenting a clear physical hazard should be classed as high risk (Category A) and be covered by all provisions of the directive regardless of the type of waste stored.

The answer to the question 'will the directive address the toxic waste burden?' is therefore 'yes' – *but* only for the most damaging waste. Much still needs to be achieved in the implementation of the directive; it will only address the issues of toxic waste if the implementation is adequate.