Hungary's final opinion regarding environmental impact assessment under the Espoo Convention for the planned Verespatak (Rosia Montana, Romania) goldmine project based on cyanide technology

International environmental impact assessment

During the licensing procedure of the Verespatak goldmine Hungary has requested Romania from the very beginning to apply the UNECE Convention on Environmental Impact Assessment in a Transboundary Context signed at Espoo on 26 February 1991 (Espoo Convention).

The Convention governs the procedure of the so-called international environmental impact assessments. Both Hungary and Romania are Parties to the Convention. The purpose of the procedure is to enable any potentially affected state to take part in the licensing procedure if the proposed investment project is expected to produce major adverse transboundary impacts.

According to the agreed rules of procedure, the affected party – including the local population – will have the right to study the impact assessment documents, attend public hearings and state its opinion. With the involvement of consultants, the relevant issues may be clarified at a technical consultation, after which the authority in charge – in this particular case the Ministry of Rural Development responsible for the environment – will lay down its final opinion and forward it to the same ministry in the neighbouring country.

Espoo arrangements in the licensing procedure of the Verespatak goldmine project

- January 2005: start of the international environmental impact assessment procedure under the Espoo Convention – notification
- June 2006: forwarding of the environmental impact assessment documentation
- August 2006: holding of 2 public hearings in Hungary:
    - 28 August in Szeged,
    - 29 August in Budapest,
- 30 September 2006: Hungary's environmental ministry forwarded its comments (in 122 points)
- May 2007: the Rosia Montana Gold Corporation (RMGC) sent its replies
- 30-31 July 2007: in line with the provisions of the Espoo Convention, consultation meeting held in Bucharest where Hungary requested the submission of additional expert materials from RMGC
- 13 September 2007: due to the insufficiencies of the area development plan, Romania's Ministry for Environment Protection suspended the EIA procedure
- 2010: the licensing procedure as well as the procedure as per the Espoo Convention continued
- February 2011: additional documents received and assessed

Following the assessment of the additional documents prepared by the investor during the past three years, Hungary's final opinion has been completed as part of the international environmental impact assessment procedure governed in the Espoo Convention.

Main questions and concerns

Based on Hungary's previously sent proposals, the following issues were discussed during the technical consultations in 2007:

- cyanide-free alternatives for gold extraction;
- operation of the tailings pond;
- stability of the tailings dam;
- estimation of accidents/risks;
- modelling of accidental pollution spread.

Among others, Hungary's experts objected to the planned use of a technology that involves excessive cyanide pollution and found the modelling of pollution spread insufficient. The experts did not agree with the level of details in the case of earthquake risk assessments and found the analysis of accident risks insufficient.

By the autumn of 2010, the investor arranged for the compilation of numerous other studies, totalling about 1600 pages, in an attempt to reply to the questions. Such other studies arrived in February 2011 at the Ministry of Rural Development, where the – already full – documentation produced the following general picture.

The vast (6600 pages) documentation has a rather complicated structure and contains a lot of cross-references, overlappings and repetitions. What is more, it leaves numerous technical questions unanswered and it fails to justify certain engineering solutions despite our specific requests. The vast documentation fails to give a technically adequate description of the impacts of the proposed investment project and an objective picture of the potential effects of the proposed investment project on nature and environment.

The documentation is biased and lists almost always positive evaluation results; yet, it contains contradictions and several major uncertainties. Though the supplementation made in 2010 was provided by highly acclaimed scientists, the additional materials still fail to give an in-depth account of the potential problems and adverse consequences. The explanations often fail to reach the level expected from scientific essays and mostly remain at the level of easy scientific literature intended for the public.

Typically, the entire document displays risks of "very low probability" or "highly improbable" risks, which is not scientific at all, mostly if such statements are used as the basis for the major final conclusions. These statements should have been supported with modelling results and probability calculations.

Detailed comments

In addition to the above general aspects, we wish to highlight three issues which have been rarely examined yet but which can bring substantial changes in the assessment of the risks involved in the proposed Verespatak project. These issues include bacterial/microbiological degradation, significant cyanide oversupply and insufficient spread calculations.

Microbiological degradation

The impact assessment fails to describe the list and in-depth study of the environmental risks caused by the microbiological (bacterial) acidic degradation of the metal sulphide minerals of the ore. None of the documents contain the expected quantitative risk assessment of the microbiological (bacterial) impacts resulting from heavy metal pollutions associated with the occurrence of ARD (Acid Rock Drainage) and the degradation of sulphide minerals.

According to literature data and to foreign and domestic measurements, locations like the Verespatak ore deposit feature mostly anaerobic, chemoautotrophic and acidophilic bacteria such as Thiobacillus ferroxidans and Thiobacillus thiooxidans. This is confirmed by the following quotations from the impact assessment documents that basically admit the presence of adverse microbiological impacts.

- As stated on page 33 of the Safety report 33, "ARD water is typically characterised by high sulphate concentration, high levels of dissolved metals (Al, Fe, Mn and other heavy metals) and acid pH".
- According to the statements of the non technical summary: "When a rock containing sulphide ores (normally pyrite or iron sulphide) contacts air or water in the presence of bacteria, the sulphides turn into a sludge called ARD. ARD may dissolve the minerals present in the rock (…) Particular concentrations of certain metals such as zinc, copper, arsenic, cadmium, mercury, selenium or lead may pollute drinking water and have a major impact on aqueous habitats and organisms".

In view of that it is probable that the planned project areas are more or less "infested" mostly with Thiobacillus genus populations or similar microbes, the number and spreading of which can be characterised with the pollution they cause. These issues could have been clarified through a basic condition survey (e.g. number of bacteria per volume unit) and then through a quantitative risk assessment. Unfortunately, the EIA documentation contains no information about such assessment, which is considered by us as a major deficiency. In the long run, the microbiological metal dissolution and acidification may occur also in the TMF (Tailing Management Facility), which will substantially influence the evaluation of the project's risk level.

Cyanide oversupply

Both the volumes/concentrations of the compounds formed during the degradation and side reactions of sodium cyanide supplied for the process and the precipitations of heavy metal content directed from the ARD treatment plant to the TMF represent substantial sources of potential hazards, none of which have been studied.

According to reaction (1) and (2) on page 70 of EIA (Environmental Impact Assessment) Volume 8, a total annual volume of 32.19 tons of sodium cyanide will be required for the extraction of 16 tons of gold and 58 tons of silver from the ore volume of 13 million tons planned for processing each year. However, for such purpose an annual volume of 7,000 tons of cyanide (!) is supplied in the CIL process, which is a surprisingly large volume. Calculating with an operation time of 16 years, this cyanide volume equals a total of 112,000 tons of cyanide or 210,952 tons of sodium cyanide. This means 1 kg of sodium cyanide per ore ton for an ore volume of 208 million tons intended for processing.

According to our expert analysis, the planned storage in the TMF of toxic or potentially toxic substances produced from the extremely high use of sodium cyanide and from ARD treatment – with due regard to the concentration of such substances caused by the recirculation of treated water – may represent extreme hazard potentials in case of accidental release. A quantitative risk assessment should have been carried out for an in-depth clarification of this issue. Unfortunately, the EIA documentation contains no detailed risk assessment regarding the cyanide compounds that would arise from the excess use of cyanide.

Insufficient supply of basic accident data

As to the issue of a TMF accident, we still find it problematic that there is an insufficient supply of simulation data regarding the dispersion of pollutants.

Table 4.8 on page 96 of the Safety Report gives a summary of the basic data (concentration in the TMF mg/l) but these are referenced to a Romanian standard (Romanian standard for surface water mg/l). However, in this manner – regardless of the theoretical part of the model – the dispersion calculations cannot properly address the issue of risks for the following reasons:

- The study deems the TMF pollutant concentrations constant, regardless of the accident events (overflow, dam break, etc.) that may cause the leakage of both decent water and solid suspended toxic compounds to the environment. The Safety Report calculates with a "TMF dam breach" scenario but, as it is clear from the listing, more pollutants may occur than those shown in the table.
- The EIA analyses fail to consider the soluble or insoluble degradation cyanide compounds – resulting from the extremely high levels of sodium cyanide use – in the tailings and also ignore the heavy metal precipitations resulting from ARD treatment.
- The EIA does not take into consideration the concentration of pollutants caused by the recirculation of treated water.

Therefore the comparison of the pollutant concentrations shown in Table 4.8 with the Romanian surface water standard cannot give a realistic picture of the risks involved. It is surprising to see that, although the water standards contain provisions for solid (suspended) material content, the table seems to show as if in the case of a TMF accident only clean treated water, free from suspended solids, would leave the area, which is unconceivable in the case of major emergencies.

Conclusion

The deficiencies in the study of the Rosia Montana project may involve substantial water pollution hazards and risks along the Hungarian section of river Maros. In case of a TMF

accident the degradation compounds of sodium cyanide (used in a total volume of some 210,000 tons during ore processing) entering the facility may represent an improperly studied environmental risk. The calculations of pollutant dispersion made for a TMF accident should have been extended in the documentation also to such components as well as to other materials (which are also missing) such as heavy metal precipitations.

Furthermore, without investigating the causes of the improperly studied phenomena listed above, the implementation of the project can be considered risky in terms of environment protection. The fact that the data of the various technological steps are supported in the relevant documentation only by laboratory tests (e.g. cyanide detoxication) and with literature references represent additional risks or, at least, major deficiencies of the planning phase. The lack of non-stop systematic pilot plant tests with the relevant ore, as customary elsewhere, is unacceptable as the result of such tests would be indispensable for the correct professional evaluation of the technological risks.

The documentation fails to give fully sufficient replies to the issues raised in the list of questions handed over to the investor. The technological analysis fails to describe the reference plant, which would be very important for the evaluation of the experiences of the already existing technology. For such purpose it would be sufficient to show the reference data of the two European plants of similar size and similar technology. With the help of these data it would be possible to assess the engineering design parameters of the various facilities, the ecological risks caused by the release of hazardous materials into the recipient water currents, the use of environmental management systems, the provision of access to measurement data and the engineering control methods planned for use during the construction phase. However, the EIA documentation does not contain any such reference data.

The cyanide balance, so important for Hungary, is also superficial; it means that the numerous potential risk scenarios involved in the relevant technology have not been studied. The accidental pollution spread model calculations based on such disputable data are not convincing either – even if the pollution spread models themselves comply with international standards. It is also interesting to see that the hypothetic water pollution concentrations included in the model calculations tend to decrease to zero always at the Nagylak border crossing point.

Apart from the evaluation of the additional documents, there is one question still unanswered: is BAT (Best Available Techniques) will be applied for the Verespatak project despite the intended volume of sodium cyanide that is so substantial in comparison with the volume of recovered gold?

Initiatives to ban the cyanide technology at international and EU level

Naturally, Hungary's opinion about the proposed Verespatak project cannot be separated from the impacts (and the resulting public notion) of the cyanide and heavy metal pollution caused by the dam break at Nagybánya (Baia Mare) in 2000. That is why we wish to summarise here our environmental policy actions taken for the restriction of cyanide technology during the past few years.

In 2007 the environmental ministers of the Visegrád Group (V4) issued a joint statement on the replacement of cyanide technology and agreed to enforce the representation of such joint statement at national, EU and international levels.

Upon Hungary's initiative (Péter Olajos, EP member), the European Union discussed the banning of cyanide technology in 2006, and there have been repeated demands to achieve it ever since.

The actual decision was made on 5 May 2010 when the European Parliament approved with an overwhelming majority of the proposal for resolution submitted by EP members János Áder and László Tőkés. The resolution requests the EU Member States to refrain from supporting the cyanide mining technology and demands the European Commission to initiate a general ban of the cyanide mining technology in the EU before the end of 2011.

Ban on cyanide technology in the EU Member States

There are examples for the ban on cyanide leaching in the European Union. Due to the risks involved, its use in mining is prohibited or strictly limited in a growing number of locations. In our region the Czech Republic was the first to introduce a ban on the use of cyanide leaching processes in 2002.

The tenth anniversary of the year 2000 cyanide disaster highlighted the issue again in Hungary and that is why, through an amendment to Act XLVIII of 1993 on Mining, the Hungarian Parliament banned the use of cyan and cyanide compounds in mining technologies. Apart from its symbolic importance attached to the anniversary, the ban had the explicit purpose of promoting similar decisions in other EU Member States.

Cyanide pollution in other EU Member States

A cyanide pollution occurred also in Central England in early October 2009. As a result of the use of a similar technology, cyanide polluted the environment causing the contamination of river Trent along a section of some 30 miles between Stoke-on-Trent and Yoxall. Despite the fact that the cyanide pollution measured in the river was only one-tenth (1 ppm) of the limit value laid down in the EU mining waste directive, it caused the wiping out of fish stocks.

The British cyanide pollution clearly shows that the EU legislation is not satisfactory and not strict enough. The limit values contained in the applicable directive will not provide sufficient protection for the prevention of a potential ecological disaster. This fact is an evidence that progress in the regulation of mining technologies, which represent major risks and pollutions to the environment, is slower than expected.

Summary

Hungary's Ministry of Rural Development responsible for the environment pays special attention to each such new investment project that intends to use cyanide technology for the recovery of precious metals from ores. The Ministry will use all means to minimise any risk for the repeated occurrence of the year 2000 cyanide pollution disaster.

Human negligence, insufficient engineering solutions and lack of technological discipline played a major role in the disaster that occurred 11 years ago. Similar disasters may occur as long as an investor fails to show the technological care and social responsibility expected for such projects.

Despite its huge volume, the EIA documentation prepared and submitted by the investor RMGC is unsuitable for an objective evaluation. The frequent repetitions, inaccuracies and cross-references make the EIA documentation very confused.

Based on the expert evaluation, it can be stated that, despite its lengthy supplementations, the EIA documentation lacks sections that would be important for a real assessment. Mostly in the parts analysing the impacts of the safety report, the documentation lays down generalities and subjective statements as facts, often without giving any explanation or supportive data. The documentation fails to give references to the environmental impacts of already operating similar investment projects so that – instead of assumptions and laboratory experiments – the reader could get a practical and realistic view of the possible consequences, which would be rightly justified for the impact assessment of an investment of this magnitude.

In view of the foregoing and due to the very general nature, wrong basic assumptions, erroneous final conclusions and serious deficiencies of the submitted EIA documentation, Hungary's Ministry of Rural Development responsible for the environment does not propose for Romania's Ministry of Environment to issue an environmental license for the Verespatak mining project. We hereby request the competent entities to take our opinion into consideration as far as possible during the licensing procedure.