

**ROMANIA
THE MINISTRY OF ECONOMY AND COMMERCE**

**ENVIRONMENTAL MANAGEMENT FRAMEWORK
FOR UNIDENTIFIED MINE SITES**

OCTOBER 2004

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1. Introduction

Ministry of Economy and Commerce has been implementing Government Mining Sector Restructuring Program since 1997. Strategy for Mining Sector for the period 2004-2010 was approved by Government Decision in April 2004. 29 mines were included to be closed in the current World Bank (WB) financed Mine Closure and Social mitigation Pilot-Project that closes in June 2005. A further 20 mining sites and additional unidentified mines are intended to be closed under the proposed new Mine Closure, Environmental and Socio-Economic Regeneration Project.

The new mine closure project will include closure of hard coal, lignite and polymetallic mines and mine processing facilities. The project will not include closure of uranium and salt mines.

The closure process will include the following:

- Closure of mine workings;
- Decommission of equipment, steel structures and other metallic materials
- Scraping plant and machinery and other metallic materials;
- Demolition of surface buildings and structures;
- Stabilizing of waste tips;
- Strengthening of retaining structures of tailing storage facilities;
- Filling of subsidence (crownholes and the like) areas;
- Construction of water treatment plants where necessary;
- Reclamation, re-vegetation and return to community of post-mining land.

Following have been identified as the major tasks throughout the closing that are detrimental to the environment:

a. Decommissioning and demolition of surface structures may causes the following harms:

- Generation of waste, including of potential hazardous nature;
- Noise emission generated by equipment involved in site operations and explosive during the blasting for demolition of buildings and structures;
- Dust emission generated by traffic and operations;
- Vibration generated by blasting and traffic; and
- Smoke emission where blasting operations are used.

b. Earthworks causes the following harms:

- Noise emission;
- Dust emission;
- Smoke emission;
- Vibration generated by blasting of hard rocks;
- Mud generated by traffic during the wet season.

- c. **Filling of mine shafts**, of likely temporary negative impact on the underground waters due to works backfilling with solid waste. Examination of run-off water typically evidences their higher-than-normal concentration of suspensions, heavy metals with acid or alkaline reaction. However, the run-offs are not possible due to very low water table in shafts.
- d. **Discharge of underground waters to surface courses, causing the following effects:**
 - Disposal of pollution charges of salts, chlorides and sulphates contained in the underground water discharged;
- e. **Land reclamation and re-vegetation may have a negative impact because of:**
 - Potential use of unacceptable fertilizers;
 - Potential using of contaminated import topsoil

Mine closure will be done in line with Romanian legislation, now compatible with the good industry practice. The key legal deeds, underpinning the closing of mines have been listed in Appendix 4 to this plan.

Closing of mines will have a moderate impact on environment. The impact may be mitigated by dedicated measures. Based on the size and nature of the environmental impacts the applicable World Bank category for Environmental Assessment is considered to be Category B.

The master Plan that follows will be a guideline and pattern for detail plans, provided for the individual mines.

The procedures presented in this Framework Document details actions, which will be taken to ensure compliance with Romanian Environmental Regulations and Procedures (basically Environmental Impact Assessment (EIA) Regulation) and the World Bank Environmental Assessment (EA) policies and procedures as specified in the World Bank Operational Policy OP/BP/GP 4.01 (Environmental Assessment) for a “Category B” project.

The procedures consist of the following elements, which address both design, construction (closure) and post-closure monitoring aspects:

Design/Construction Phase

- Project Screening
- EA Documentation/Document Content
- Consultation
- EA Review and Approval
- Disclosure
- Institutional Solutions
- Environmental Standards/Guidelines
- Reporting

Descriptions for the above elements, basically the procedures, which will be followed, are presented below.

2. Description

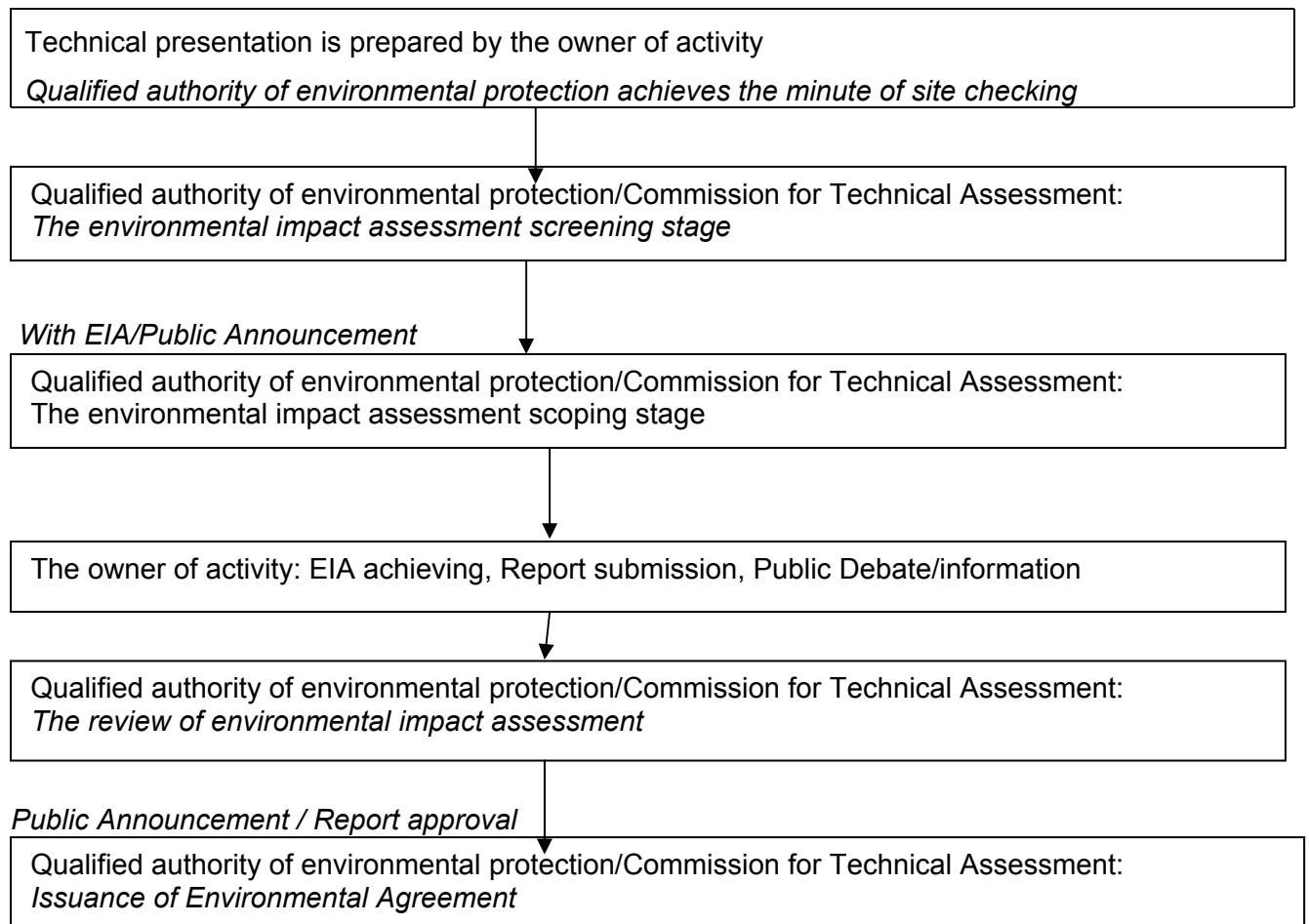
2.1 Screening

The implementation of mine closure project is under responsibility of Ministry of Economy and Commerce (project management unit – PMU). PMU will decide if an environmental management plan (EMP) will be required for the project in accordance with the Romanian EIA regulation and the World Bank requirements.

According to Romanian legislation, the designer who will draft the Technical mine closure plan has the obligation of obtaining different approvals and authorizations. One of these approvals is the **environmental agreement based on an Environmental Impact Assessment (EIA) Report**. EIA report and process (that is the classification equivalent to the EA requirements of the World Bank for a Category B project) is required for the mine closure projects. The EMPs (compliant to the World Bank Procedures) will be drafted by the Design Institutes during the elaboration of the EIA report required by the Romanian legislation, and will be included as an annex to the EIA, after being subject to the approval by the Technical-Economic Committee of the Ministry of Economy and Commerce.

The Romanian process for full EIA requirements can be followed from the flowchart provided below.

Romanian Environmental Impact Assessment Logical scheme



Following documents are mandatory at closure of any mine, in accordance to Romanian Mine Closure Manual:

- Activity cessation plan (that integrates the Care and maintenance program)
- Technical mine closure project,
- **Environmental Remediation Plan**
- The social protection program
- **The Post-closure monitoring program**

Closure and environmental remediation of any mine should be performed based on Technical Mine Closure Plan. Mine closure projects require the Environmental Impact Assessment (which is part of the Mine Closure Plan) in order to obtain Environmental Agreement. The EIA report will be prepared in accordance with the project specific format to be provided by the Ministry of Water and Environmental Protection through Environmental Protection Agency. However, this format will have some differences with the general format of the EA World Bank for Category B projects.

Basically all of the topics are covered in the specific format provided by the Ministry of Water and Environmental Protection for the full EIA reports. In addition, mitigation actions are required to be specified for the adverse impacts and a monitoring plan is required as a part of the EIA report by the Ministry of Water and Environmental Protection. However, they may not be in the form required by the World Bank. Furthermore, institutional requirements for the monitoring actions are not much explicitly specified as required by the World Bank.

Therefore, for a project that requires a full EIA report according to Romanian Regulation, the appendices of this report will include an appendix for the EMP (mitigation and monitoring activities as a plan) as required by the World Bank's format and the institutional requirements to carry out the mitigation and monitoring measures and an Appendix for the Record of Public Consultation.

As can be seen from the Appendix 1 the key elements of the EMP are the Mitigation and Monitoring Plan for which samples are provided in Appendix 2 and Appendix 3. Other key components of an EMP are Institutional Arrangements and Consultation with Local NGOs and project-affected communities.

The final EIA report (for the projects requiring a full EIA) and the final EMP for any project will be translated into English and copies of each will be submitted to the World Bank by PMU. In addition, the approval documents for the EMP and the verdicts of the Ministry of Water and Environmental Protection will be provided to the World Bank as well.

2.3 Documentation review and approval

Certain detail documents are required for delivery of the individual tasks listed in the closure plans. These include are decisions and permits issued for the individual structures or areas of the mine being closed, or any projects run as part of the closing, including permits and agreement from:

- National Agency for Mineral Resources;
- Local counsel and town hall;
- County Commission for Urban Development;
- Cadastral Authority;

- Electrical Energy Supplier;
- Telephone Services Suppliers;
- Sanitary Administration;
- Oil and Gas transportation Company;
- Historical Monuments and Archaeology Authority;
- Fire Fighting;
- Romanian Waters Authority;
- Romanian Forestry Authority; (where forestry involved)
- Environmental Protection Agency;
- Agreement for Demolition from County Counsel
- Approval of Technical and Economical Commission of Ministry of Economy and Commerce;

The review and approval for projects with environmental impact is the responsibility of Ministry of Water and Environmental Protection, through its subordinated Environmental Protection Agency.

The steps to be taken to obtain this Environmental Agreement under the Romanian legislation are:

- Submission to Local Environmental Protection Agency of request and technical file regarding environmental protection measures
- The Local Environmental Protection Agency will apply stamp B (for unique agreement) if the project is subject to environmental assessment
- The Local Environmental Protection Agency establishes the necessity of environmental impact assessment according to Order no. 863/2002 of Ministry of Water and Environmental Protection
- The preparing of public announcement in accordance to Annex II.4 of Order 860/2002
- The preparing of technical documentation for obtaining the environmental agreement
- The preparing of impact assessment study and the report to the assessment study
- The disclosure and public consultation phase - Local Environmental Protection Agency shall inform the public about the report to the assessment study by public debate
- The Local Environmental Protection Agency makes public the decision of issuance the environmental agreement
- Obtaining of agreement if no any comments/protests is received in 10 days

2.4 Community consultations

For the projects requiring full EIAs under the Romanian legislation, the public consultation process is basically compatible with the World Bank.

Community consultations are made in two phases:

1. According to Romanian Mine Closure Manual, a public information and consultation is made in the stage of taking the decision for mine closure. The issues identified in this

meeting are taken into account in the formation of the specific format for the project and preparation of the Mine Closure Technical Plan (inclusive of environmental impacts) Consultations are run at the following levels:

- Local government, when needed for Environmental Impact Assessment;
- Relevant environment authorities;
- Water authorities;
- NGOs
- Affected community
- Other relevant authorities

Conclusions from community consultations are included in Mine Closure Plans.

2. At the stage of EIA process, a public consultation is made during the obtaining the Environmental Agreement, as part of the review process by the Ministry of Water and Environmental Protection through its subordinated Local Environmental Protection Agency.

When the review period is started by the Local Environmental Protection Agency it is announced to the public and the EIA report is opened to public review at the local authorities. The locals are informed via the written announcements in the local mass media and authorities (municipalities, etc.). Public consultation at this stage aims to determine if any other issues should be added or removed from the EIA report. By these means the voice of the locally affected groups are fully recognized in the final EIA report.

The conclusions from community consultations will be also included in the EMP prepared according to the World Bank's requirements. The consultation meeting(s) will be conducted before a draft EMP is prepared and when preparing the EMP the issues identified in the consultation will be included. The final EMP will be open to public access in the local authorities and PMU will make it available to whom it may concern.

2.5 Disclosure of documents

List of decisions, permits or agreements held, authorizing conduct of works and information on tenders will be available at the Ministry of Commerce office and on its website.

List of decisions, permits or agreements relating to a particular mine provided for closure will be available at Ministry of Commerce.

Environmental Impact Assessment and Environmental Agreement will be also available at the Local Environmental Protection Agency.

Environment Management Plans of the mines to be closed will be available at Ministry of Commerce and on its website.

3. Mitigation plan

A sample mitigation plan to be used in any future project is offered in Appendix 2.

The following threats will be address:

3.1 Generation of waste by the decommissioning of surface structures, plant and machinery

Waste generated throughout closure of structures will be broken-down into categories and stored separately and particular attention will be given to separation of hazardous waste.

Asbestos, used oil containing PCB, and other waste posing threat to environment, will be put under particular scrutiny. The companies providing decommissioning services should hold license authorizing the working with asbestos and other dangerous substances, their transport and destruction in line with applicable regulations in force. Because it is not expected to find any approved landfill near the site a special landfill will be constructed to be used for unacceptable materials and wastes discovered on site or produced during the closure process.

In respect of generation of waste:

Requirements to be satisfied by bidders refer to the framework plan for waste management and its transport to the sites of their disposal, future use or destruction. Asbestos sheets are expected to be found. These will be collected and disposed off following a separate program.

Construction of Landfill

Because it is not expected to find any approved landfill near the site a special landfill will be constructed to be used for disposal of unacceptable materials and wastes discovered on site. Three layers shall be placed onto compacted surface:

- Layer 1 Bentonite mattress 2.5 cm depth comprising bentonite by geotextile material;
- Layer 2 A geomembrane layer of 2.5 mm high resistance polyethylene will be layed onto the bentonite mattress;
- Layer 3 a geotextile layer of 5 mm shall be placed on top of geomembrane.

On completion of final layer of unacceptable material the surface shall be domed to assist water run off, and a perforated gas vent pipe 1.5m long and 0.2 m dia will be installed onto deposited material. If the unacceptable materials deposited here do not assure the dome shape, this will be done using acceptable and compacted materials.

On top of landfill a layer of 0.5 m of compacted clay and a final 0.3m topsoil will be installed. The landfill surface will be grassed. It is forbidden to be planted.

The landfill will be used exclusively for disposal of unacceptable materials from site.

Location of landfill should be established by the design institute according to relevant rules. It is preferable to use a single landfill for more than one site.

The size of the landfill shall be 125% of the identified volume of unacceptable material.

3.2 Noise and vibration control

The Contractor shall employ the best practical means to minimize noise and vibration produced by his operations. He shall have regard to the recommendations in the Romanian Standard S 10009/1988, and shall comply with the following requirements:

- a) all vehicles and mechanical plant used for the purpose of the Works shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order;
- b) all compressors shall be 'sound reduced' models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all ancillary pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers;
- c) machines in intermittent use shall be shut down in the intervening periods between work or throttled down to a minimum;
- d) all items of stationary plant, e.g. generators, pumps, etc., shall be housed in acoustic enclosures when in operation;

- e) the noise emitted by any plant used on the Works shall have a maximum noise level measured at a point 1 metre from the facade of adjacent buildings to a value below: $leq 75dB(A)$

Vibration and noise levels will be measured by competent services at request of the Engineer of the Contract to establish noise and vibration levels during relevant operations (Blasting and traffic).

3.3 Dust emission

The technical measures and technologies used will enable the maximum feasible reduction of dust emission during the conduct of work. The measures will include the equipment for washing vehicles and access roads and dampening the material/products used, or sprinkling the site in order to minimize emission of dust to the environment.

3.4 Discharge of underground waters to surface courses

Because some mines that extracted ore discharge mine water, a water monitoring program should be performed during the execution of the contract. The program will show changes generated by the works. On the other hand this will generate the data for potential water treatment plant if necessary.

Detailed specification for the program can be found on Technical Specifications. A table showing the water monitoring program can be found in Appendix 3.

3.5 Cultural heritage protection

All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the Site shall, as between the Employer and the Contractor, be deemed to be the absolute property of the Employer. The Contractor shall take reasonable precautions to prevent his workmen or any other persons from removing or damaging any such article or thing and shall, immediately upon discovery thereof and before removal, acquaint the Engineer of such discovery and carry out the Engineer's instructions for dealing with the same. The Engineer will stop any physical operations :until competent authority (County Commission for Historical Monuments or Ministry of Culture and Religious Affairs) provides permission to continue.

4. Environment monitoring

A sample Environment Monitoring Plan is attached in Appendix 3.

Following will be monitored:

- Waste generated or used throughout the projects;
- Volume of waters and pollution in the underground water discharged;
- Dust pollution: The dispersed emission; and
- Noise and vibration levels.

The monitoring will be the responsibility of the engineer of the Contact for mine closure and environmental remediation works (during the execution of works) and CONVERSMIN (during the post-closure monitoring).

Waste will be monitored on-line as the closing process progresses, after breaking them down into categories. Each piece of waste will be identified. Both the used waste and the waste provided for destruction will be monitored.

Monitoring of pollution of waters discharged to surface courses

All analyses of underground waters will be outsourced to specialist labs. In keeping with the terms and conditions set forth in water permits (i.e. in respect of the time and extent of monitoring), physical and chemical analyses will be requested. These analyses will specify physical and chemical properties of waters. The parameters and intervals for monitoring are set forth in Water Monitoring Program.

Monitoring will cover the volume of water discharged to surface courses.

Dustiness, noise and vibration levels will be monitored by the Engineer of the Contract.

5. Supervision of execution of the Environment Management Plan

In order to supervise execution of the Environment Management Plan, during the execution of mine works the Engineer shall provide for specialist in environmental monitoring and remediation.

For the post-closure monitoring, CONVERSMIN will contract specializes services.

6. Costs

Detail cost breakdown will be given at the stage of bidding the execution of works. Tests ordered by the Engineer will be covered from provisional sums under those contracts. The post-closure environmental program will be carried out by CONVERSMIN from its own budget, by contractors selected through bidding.

7. Institutional strengthening and solutions

The closure works require four units to closely co-operate on:

- Responsibility for threat mitigation and monitoring; and
- Circulation of information on the environment and operation decisions and instructions on environment management to all parties involved in the works;

The units to co-operate are:

Contractors, who in their work use the measures referred to in the Environment Management Plans for the individual mines.

Engineers, who supervise the monitoring process and report to Ministry of Economy and Commerce. Every month, the persons monitoring threats should, based on the information collected by Contractor, run reports including quantitative and qualitative analysis of each parameter. Each report should be submitted to the Ministry of Economy and Commerce, to enable drafting of aggregate report for the unit being liquidated. Analysis of such aggregate report may help any potential preventive action, likely to eliminate a potential treat, should such threat be identified.

Design Institutes, which shall make the necessary adjustments to the Technical closure plans and will propose solutions to be approved by the Ministry of Economy and Commerce (i.e. water treatment plants, etc.).

CONVERSMIN, that will continue Environmental Monitoring during the Post-Closure Monitoring Programme.

EMP will be part of the conditions to be complied with and shall be included in all bid

documents. Qualified contractor's personnel will ensure delivery of tasks in keeping with environment protection requirements; thus it has not been planned to run specialist training. The equipment, machinery and specialist check and measurement apparatus will be provided by successful bidders, requested to minimize negative impact on environment of threats occurring as result of mine closure works.

8. Environmental Standards/Guidelines

PMU will use Romanian or World Bank environmental standards and standards (which ever is stricter) for mine closure projects. These standards are basically related, but not limited, to the following:

- Environmental impact assessment
- Solid and hazardous waste management
- Noise levels (during construction)
- Polychlorinated biphenyl's (PCBs)
- Environmental auditing
- Health and safety
- Cultural Heritage
- Natural Habitats

The criteria and standards for the above mentioned issues, and any other relevant issue can be found in the Romanian Regulations and the Pollution Prevention and Abatement Handbook of the World Bank (which ever applicable). With regard to these issues the requirements of Romanian Regulations will be certainly complied with. If there are no standards or requirements in Romanian Regulations or if the standards of the World Bank are stricter these will be used. The major World Bank documents related to these issues are Bank Operational Policies, EA Sourcebook and Updates, and the above mentioned handbook available from the website of the World Bank. Some of the directly related Romanian Environmental Regulations are:

- Noise Control Regulation
- Water Pollution Control Regulation
- Air Pollution Control Regulation
- Solid Waste Control Regulation
- Soil Pollution Control Regulation
- Environmental Impact Assessment Regulation
- Environmental Auditing Regulation
- Harmful Chemical Substances and Products Control Regulation
- Hazardous Waste Control Regulation
- Workers Health and Safety Regulation

9. Reporting

PMU will include a discussion of environmental progress and status in implementing the requirements in the EMPs in its quarterly report to the World Bank. This information will be based on the status reports to be prepared by the Environmental Specialist of the PMU.

10. Appendixes

Appendix 1 Format for an Environmental Management Plan

Appendix 2 Template for Mitigation Plan

Appendix 3 Template for Environment Monitoring Plan and Water Monitoring Table

Appendix 4 List of key legal deeds, underpinning the closing of mines

Appendix 5 Information on legal grounds of, and basic document on mines closure

Appendix 6 Information on mine closure tasks – legal basis and specific documents required to carry out mine closure tasks

Appendix 7 Decision making diagram and the documents necessary for mine closure

APPENDIX 1: FORMAT FOR AN ENVIRONMENTAL MANAGEMENT PLAN (EMP)

Responsible Party

The name of who prepared the EMP should be specified, his title and the date when it was prepared.

Project Description

Present a brief description of the subproject. Include the nature of the project, the location, and any characteristics of the area that are of particular interest, e.g. near a protected area, area of cultural, historical, religious interest etc. Also, very briefly describe the general land characteristics, and the location(s) of the nearest population centers and watercourse. If available, a simple map should be included.

A. MITIGATING PLAN

Phase	Issue	Mitigating Measure	Responsibility*
Planning/Design	<ul style="list-style-type: none"> • • • 		
Construction (Closure)	<ul style="list-style-type: none"> • • • • • 		
Post-Closure	<ul style="list-style-type: none"> • 		

* Items indicated to be the responsibility of the contractor shall be specified in the bid documents

B. MONITORING PLAN

Phase	What <i>parameter is to be monitored?</i>	Where <i>is the parameter to be monitored?</i>	How <i>is the parameter to be monitored/ type of monitoring equipment?</i>	When <i>is the parameter to be monitored- frequency of measurement or continuous?</i>	Responsibility
Construction (Closure)					
Post-Closure					

NOTE: Any item identified in the mitigation plan must have a corresponding entry in the monitoring plan. For example, if noise is an issue presented in then mitigating plan, than noise should be an item in the monitoring plan

C. SCHEDULE

Present (preferably in Chart Form) Start Dates and Finish Dates for:

- Mitigation Activities
- Monitoring Activities

D. INSTITUTIONAL ARRANGEMENTS

A narrative discussion supported by organizational charts detailing:

- Institutional responsibilities and procedures for mitigation and monitoring and how they are linked for environmental management
- Environmental information flow (reporting—from who and to who and how often)
- Decision making chain of command for environmental management (to take action, to authorize expenditures, to shut down, etc.)

In short, how is all the monitoring data going to be used to maintain sound environmental performance—who collects the data, who analyzes it, who prepares reports, who are the reports sent to and how often, and who does that person send it to, or what does he/she do with the information—who has the authority to spend, shutdown, change operations etc.

E. CONSULTATION OF LOCAL NGOs AND PROJECT AFFECTED COMMUNITIES

Provide documentation of the following:

Date(s) consultation(s) was (were) held

- Location(s) consultation(s) was (were) held
- Who was invited

Name, Organization or Occupation, Telephone/Fax/e-mail number/address
(home and/or office)

- Who attended

Name, Organization or Occupation, Telephone/Fax/e-mail number/address
(home and/or office)

- Meeting Program/Schedule

What is to be presented and by whom

- Summary Meeting Minutes (Comments, Questions and Response by Presenters), including the name(s) of the staff member(s) who participated in the Consultation
- Any agreed actions or necessary follow-on work and agreed schedule

APPENDIX 2 – TEMPLATE FOR MITIGATION PLAN MINES AND OPEN PITS

Phase/Operation	Issue - Mitigation Measure	Cost	Institutional Responsibility / Approval and inspection
Demolition Works			Contractor
Blasting of buildings and structures	<ul style="list-style-type: none"> i. Noise: - Restriction of blasting program to 8:00 – 18:00 o'clock, Monday to Saturday; - Informing of the affected community about blasting program; ii. Vibration: - Restriction of the explosive quantity for each charge – 0.5Kg/blasting hole, minimum 1 second delay each other; iii. Dust: - Dust suppression measures (wet blasting) 	Contract	Engineer of Contract
Processing of demolition materials	<ul style="list-style-type: none"> i. Dust: - Dust suppressors (wet processing) ii. Noise: - Location of the processing facilities not less than 1Km far from inhabited Area; - Noise screens around of processing equipment if necessary; iii. Pollutants on or in demolition materials: - Selection of the contaminants from demolition materials before being processed. Contaminated materials will be disposed off separately at landfill; 		Engineer of Contract
Haulage/deposition of demolition materials	<ul style="list-style-type: none"> i. Mud - Keeping the lorries clean while working on or outside of the site area; ii. Dust - Sprinkling of demolition materials on lorries and at dumping location; - Cover of lorries if the haulage is through inhabited area; 	Contract	Engineer of Contract
Earth Works			Contractor
Blasting of hard rocks	<ul style="list-style-type: none"> i. Noise - Restriction of blasting program to 8:00 – 18:00 o'clock, Monday to Saturday; - Informing of the affected community blasting program; ii. Vibration - Restriction of the explosive quantity for each charge (max. 15Kg/blasting hole and maximum 15 borehole/blasting charge, minimum 1 second delay each other; 		Engineer of Contract

Phase/Operation	Issue - Mitigation Measure	Cost	Institutional Responsibility / Approval and inspection
Excavation and loading of materials	<p>iii. Dust and smoke over inhabited areas</p> <ul style="list-style-type: none"> - Dust suppression measures (wet blasting); - Restriction of blasting when wind drive dust and smoke over the inhabited area; <p>i. Lubricant and/or fuel spillage:</p> <ul style="list-style-type: none"> - The equipment should be inspected¹ for technical compliance with safety end environmental regulations, by the Engineer monthly. Equipment which will not pass the inspection will be removed from the site according with contractual clauses; <p>ii. Spillage of tailing materials during of works on tailing dams:</p> <ul style="list-style-type: none"> - Access roads will be refurbished in accordance with kind of equipment, duration of works, before to commence any works; - Using of sealed lorries for haulage of tailing material outside of TSF; <p>iii. Failure of benches or slopes during of works:</p> <ul style="list-style-type: none"> - Each work bench for excavators and access roads on excavation place will be constructed to comply with Technical Prescriptions appended (TP-C**), 1997 edition; - Fencing and barriers around of unstable areas; 		Engineer of Contract
Haulage/deposition spread/level/place	<p>i. Noise during the transport on site or public roads;</p> <ul style="list-style-type: none"> - Restriction on haulage program to 8 o'clock 18 o'clock, Monday to Saturday; - Restriction of lorries speed to 30Km/h, or less as agreed with community; <p>ii. Mud and dust on public roads</p> <ul style="list-style-type: none"> - Cleaning of lorries wheel before emerging from loading/unloading location; - Suppress of any spillage from lorries during the transport by sealing off; <p>iii. Noise</p> <ul style="list-style-type: none"> - Noise suppressors at the exhaust pipes; 		Engineer of Contract
Concrete works			Contractor
preparing and placing of concrete in	i. Concrete outside of construction areas:		Engineer of Contract

¹ Inspection is referred to visual to identify possible oil or fuel spillage, level of noise and level of smoke produced by the equipment's engine (exhaust), status of tires and legal status related to periodic Technical Inspection as law asks for. (Note: according with Romanian Law for Public Road Circulation each vehicle should pass periodic technical inspection (each two years). The inspection refers to: brakes efficiency, steering efficiency, emissions in exhaust system, lighting system, horns and noise. The vehicles which pass the inspection receive a licence). For other equipments used on site like bulldozers, tractors, excavators this is not compulsory. The Engineer will inspect that machinery too.

Phase/Operation	Issue - Mitigation Measure	Cost	Institutional Responsibility / Approval and inspection
situ haulage of concrete	<ul style="list-style-type: none"> - Using only mechanical batching equipment for preparing of concrete; - Location of batching facilities for concrete to be approved by the site Engineer i. Pollution of public roads because of concrete spillage during the transport - Using only specialised concrete transport trucks for haulage of concrete; - Cleaning of site and equipment at the end of each day; 		
General Works			Contractor
Working adjacent over or in water courses or accumulation (Lakes)	<ul style="list-style-type: none"> i. Surface waters pollution - Working with equipment free of any pollutant in vicinity of lake - Fencing or erecting of barriers near lake or river; ii. Rainfall control - Construction of guard ditches to control runoff and to protect lakes or rivers iii. Underground water pollution - Filling material used for underground workings will be inspected by the Engineer before to be used. Inspection will guarantee that it is free of deleterious materials; 	Contract	Engineer of Contract
Cultivating re-vegetation and curing of existing vegetation	<ul style="list-style-type: none"> i. Pollution with unacceptable pesticides - Using only fertilizers approved by the Engineer of the contract; - topsoil, subsoil or natural fertilizer will be tested by laboratory analyses to be free of pesticides heavy metals or any other unaccepted materials; ii. Damage of existing vegetation - The Engineer will keep the necessary records of number of trees and existing natural grassed areas. The contractor will restore on his own cost any damage on vegetation. 	Contract	Engineer of Contract
Operation of site offices, workshops	<ul style="list-style-type: none"> i. Pollution of the area adjacent of offices, workshops and storage facilities - construction of site facilities on approved areas by the Engineer of The Contract, having all necessary facilities to deal with domestic and industrial waste²; - industrial and domestic waste should be disposed of daily at site landfill 	Contract	Engineer of Contract

² For more details See Technical Specification – Annex 1 Site Accommodation.

Phase/Operation	Issue - Mitigation Measure	Cost	Institutional Responsibility / Approval and inspection
Hazardous materials			Contractor
<p>Decontamination of buildings and equipments by flotation reactants</p> <p>Storage, handling/ using of explosives</p> <p>Storage using distributing of fuel and lubricants</p>	<p>i. Accidents involving contaminated materials</p> <ul style="list-style-type: none"> - Storage of hazardous chemicals, in areas approved by the Engineer of the contract; - Collection of contaminated materials still contained in the flotation building and equipment and disposal at open pit as it was approved by the Environmental Permit; - Washing of flotation equipment and location before to be demolished or decommissioned. The resulted materials will be disposed of at open pit; - Neutralizing of the equipment and their location with lime solution 10% before to be removed or demolished; <p>i. Accidents involving explosives</p> <ul style="list-style-type: none"> - Using of proper storage facilities (existing explosive storage facilities); - Using containers and lorries approved by the Engineer of the Contract <p>i Spill of lubricants and/or fuel</p> <ul style="list-style-type: none"> - Using of spillage collection tanks in storage facilities. Cleaning of the storage area every day disposing off any contaminated material. <p>ii. Fuel/oil spillage during refilling operations</p> <ul style="list-style-type: none"> - construction and operate of fuel/oil repository - using only filling pump installed on refilling tank to refill equipment on site <p>iii. Fire on storage facilities</p> <ul style="list-style-type: none"> - construction of fuel storage facilities on location and according an approved by the engineer method of construction; - fire extinguishing equipment as regulation for fire fighting and control asks³ 		Engineer of Contract

³ Depend on size of storage facilities the fire extinguish equipment and means must be supplied. Fire extinguishers (water, CO₂, foam etc).and hand shovels, picks, hook and 1 cubic meter of sand. For large fuel storage facilities is compulsory a permanent water source and necessary hoses etc.

APPENDIX 3 – TEMPLATE FOR MONITORING PLAN MINES AND OPEN PITS

Issue	Where is parameter to be monitored	How is parameter to be monitored	Frequency of measurement	Responsible for the measurement
A. CONSTRUCTION				
i. Noise generated by: <ul style="list-style-type: none"> • Blasting; • heavy machinery • lorries 	On site and inhabited area	Noise measurement equipment (dB-meter ⁴)	Daily	The Engineer of the Contract
ii. Vibration generated by: <ul style="list-style-type: none"> • Blasting; • heavy machinery • lorries 	Near sensitive buildings	Vibrometer	A measurement should be performed to establish level of blasting and transport along the inhabited area	The Engineer of the Contract
iii. Dust generated by: <ul style="list-style-type: none"> • blasting • traffic and equipment and lorry's 	On site and inhabited area	Visual	Daily	The Engineer of the Contract
iv. Smoke generated by: <ul style="list-style-type: none"> • blasting • equipment and lorry's engines 	On site and inhabited area	Visual for blasting; Specialised equipment for engines	Monthly and when a new equipment is bring on site	The Engineer of the Contract
v. Mud generated by <ul style="list-style-type: none"> • traffic on site and public roads 	On site and inhabited area	Visual	Daily	The Engineer of the Contract
vi. Soil pollution by fuel oil <ul style="list-style-type: none"> • Fuel and lubricants (tank leaks, engines leaks, other operations involving fuel and lubricants) • Cement or concrete • Contaminated material (tailing material, chemicals) 	<ul style="list-style-type: none"> • Where fuel and lubricants are stored; • Where equipment is refilled; • Where equipment is maintained • Where fuel/lubricants are used; • Where concrete is prepared, transported, used • Tailing storage facilities and flotation 	Visual	Daily	The Engineer of the Contract
vii. Water pollution <ul style="list-style-type: none"> • Fuel and lubricants 	Where working near or in water course Effluent waters;	Laboratory analysis for - Copper	Monthly during the works or as	The Engineer of the Contract

Issue	Where is parameter to be monitored	How is parameter to be monitored	Frequency of measurement	Responsible for the measurement
<ul style="list-style-type: none"> • Contaminated water seepage from waste tips, tailing lagoons (Cu, Pb, Zn,) • Mine Water • Suspensions carried out by rain fall 	Monitoring points on receptor stream s and lakes and monitoring wells installed in Shafts, Open Pits and boreholes on Tailing Storage Facilities	<ul style="list-style-type: none"> - Lead - Zinc - Suspensions - Oil and grease as required by water monitoring program	specified in monitoring program	
B. POST CLOSURE				
i. water <ul style="list-style-type: none"> - heavy metals (Cu, Pb and Zn) - pH - Operation of Water Treatment Plants 	Affluent rivers and monitoring wells installed in Shafts, Open Pits and boreholes on Tailing Storage Facilities At discharge of cleaned water	Collection of samples and laboratory analysis for Heavy metals and pH as required by monitoring program	Monthly until the parameters become compliant with approved limits by the Governmental Decision 188/2002	Conversmin
ii. soil <ul style="list-style-type: none"> - heavy metals - pH 	Rehabilitated surfaces	Laboratory analysis for Heavy metals and pH as required by monitoring program	Yearly until the parameters become compliant with approved limits by the Order 756/1997 issued by Ministry of Waters Forestry and Environmental Protection	Conversmin
iii. vegetation <ul style="list-style-type: none"> - vegetation density - vegetation 	Cultivated and planted surfaces on curtilage, waste tips and tailings storage facilities	Visual	Yearly	Conversmin
iv. stability of waste tips or impoundments <ul style="list-style-type: none"> - settlement - erosion 	Stabilised or deposition areas	Visual and topographic survey	Yearly	Conversmin
v. Flora and fauna in Natural Reserve Areas	Re-establish a flora as required by the Reserve Administration	Visual	Yearly	Conversmin with support from Reserve Administration

Appendix 4

List of the most important acts of legislation constituting the basis for mine closure activities

LAWS :

The mining law no. 85/2003

- The motivation of activity cessation.
- The content of the Activity Cessation Plan.
- Approval of the Activity Cessation Plan by M.E.C and N.A.M.R. and final approval through Governmental Decision.

The 19/06.03.1995 Law regarding the change of the Governmental Ordinance no. 36/05.08.1994.

- Taking over the disposed lands.

Environment protection law no. 137/1995, republished.

- Drafting the Environmental Impact Assessment.

Law no. 213/17.11.1998 regarding the public property and its legal regime.

- Taking over the mining objectives with all the assets and technological annexes.

Law no. 10/1995.

- Check of the technical projects realised by specialists approved by Ministry of Public Works.

Law no. 50/29.07.1991 regarding the authorization of the constructions.

- Authorization for construction execution.

Water Law no. 107/1996.

- Regulations regarding waters.

Law No. 26/1996 Forestry Code

- Regulates the activity in forestry domain.

Law No.462/2003 Protection of Archeological Heritage

- Regulates the archeological findings.

GOVERNMENT DECISIONS AND ORDINANCES:

Governmental Decision 615/2004 regarding the approval of The Strategy for the mining sector

- Restructuring in the mining sector

Governmental Decision 1208/2003 regarding the approval of the Regulations for the application of the Mining Law.

- Approval for temporary closure

Governmental Decision no. 632/05.08.1999 regarding assets capitalizing.

- Taking over the mining objectives with all the assets and technological annexes.

Governmental Decision no. 418/26.05.1999 regarding the ensurance of the implementation conditions of the Mining Sector Restructuring Project.

- C.C.I.P., U.M.P. and U.I.P. are formed.

Governmental Decision no. 925/1995.

- Check of the technical projects realised by specialists approved by M.L.P.A.T.

Governmental Decision no. 592/1993 regarding the public acquisitions, republished

- Establishes rules and regulations for the procedures for awarding the public acquisitions contracts.

Regulations approved by the Governmental Decision no. 273/1994.

- Organizing the final and partial receptions.

Emergency Ordinance no. 60/2001 regarding the public acquisitions.

- Establishes rules and regulations for the procedures for awarding the public acquisitions contracts.

Governmental Ordinance no. 43/2000 regarding the protection of archeological heritage (approved and ammended by Law No. 462/2003).

MINISTRY ORDERS:

Order MIC no. 234/08.09.1999 regarding the approval of the directions for the application of the GD no. 632/1999.

- Capitalizing the assets (technological annexes and buildings.)

Order MIC no. 273/2001 regarding the approval of Mine Closure Manual

Order M.A.P.P.M no. 184/1997.

- Drafting the Environmental Impact Assessment

Order M.A.P.P.M. no. 860/2002 regarding the approval of the procedure for regulating the economic activities that have an impact on the environment.

- Conformity program.

NARM Order no. 187/2002 Technical specifications for Specific Health and Safety Norms

M.A.P.P.M. order no. 462/1993 for the approval of the technical conditions regarding air protection.

- Air quality survey.

STAS 12574/1987 Air in protected areas – quality conditions

- Air quality survey.

M.A.P.P.M. Order on. 756/1997.

- Soil quality survey.

Regulations regarding the assessment of the air pollution.

N.T.P.A. 001/2002 regarding the limits of polluting the used waters.

- Water quality survey.

Appendix 5

Information on legal grounds of, and basic document on mines closure and documents necessary for mine closure

In the mine closure process the following points must be met:

- I. planning the physical closure of the mine, environmental rehabilitation, social mitigation, including consulting the community;
- II. cease the activity and put the mine on care and maintenance;
- III. implementing the mine closure, environmental rehabilitation and the social protection program;
- IV. monitoring the closure and environmental rehabilitation works;
- V. transfer the fields which have become free of technological duties;
- VI. post - closure monitoring.

Stage I – Planning includes:

- a) **Activity Cessation Plan** is drafted by the mine operator, according to technical norms for mine closure, after consulting the community. The activity cessation plan comprises:
 - i) the reason for the closure based on a technical and economic documentation;
 - ii) the technical program for removing any activity, approved by Ministry of Economy and Commerce for the subordinated mining operators
 - iii) the social protection program for the personnel which is to be fired;
 - iv) the environmental rehabilitation plan
 - v) the procedure for clearing the land;

After approval by the specialized directorate within the Ministry of Economy and Commerce, the activity cessation plan will be submitted to National Agency for Mineral Resources for approval, which will issue a closure decision

b) Technical mine closure project

For the mine for which there it has been already issued an Government Decision to be closed, the responsibility for drafting the Technical mine closure plan rests with the Ministry of Economy and Commerce through the specialised directorate. For the others mines, the responsibility for drafting and updating the technical mine closure plan is mine operator's.

The designer who will draft the technical mine closure plan has the obligation of elaborating the necessary documentation and obtaining the following approvals and authorizations:

- a) **The Minute** for the technical mine closure plan checking drafted by specialists attested by Ministry of Public Works
- b) **The construction (removal) authorization** issued by the Local Council on the basis of the approvals issued by the utilities suppliers (telecommunications, power supply, gas, water, trains, public roads, etc) and by the Army's Joint Chiefs of Staff.
- c) **Authorization, approval, agreement or other environmental regulation** issued by the "local environmental authority" for the measures, works and deadlines for the environment rehabilitation as they are comprised in the technical mine closure plan
- d) **Approval for health and safety in work and anti-explosive protection** issued by the "authorized institution" - INSEMEX
- e) **Any other approvals, authorizations or agreements** requested according to the law.

The Technical mine closure plan is approved by the Technical-Economical Council of the Ministry of Economy and Commerce.

Stage II - The cessation of the mining activity

a) Care and maintenance

The obligation to execute the care and maintenance works according to the provisions from the "activity cessation plan" rest with CONVERSMIN S.A. (the company created to deal with mine closure process).

- b) **The transfer of the mine to Ministry or Economy and Commerce**, for contracting the mine closure works and selling the assets that have a value for the community

Stage III - The contract for works execution

Ministry of Economy and Commerce, through specialized directorate, has the obligation to prepare, on the basis of the technical mine closure plan, the bidding documents for the mine closure works and environmental rehabilitation.

Stage IV - Implementing and Monitoring the Contract

The selected contractor has to execute the works stated in the technical mine closure plan as he has engaged himself in the winning offer.

Ministry of Economy and Commerce has the obligation of monitoring the contract for mine closure works and environmental rehabilitation, by selecting a company specialized in monitoring who will have the task of monitoring the works (Engineer of the Contract).

Stage V - Handing over the field

Ministry of Economy and Commerce will hand over the fields, others than those fostered for forestry, made available by the mining activities which are to be use in agriculture in order to be made available for the Local law enforcement Commissions no. 18/1991, from the affected villas.

Ministry of Economy and Commerce will hand to the National Forests Authority the fields who were initially forests and were now made available and properly arranged.

Stage VI - Post-closure monitoring

Ministry of Economy and Commerce will draft the post-closure monitoring program for each that was signed off on the basis of the post-closure monitoring requests specified in the technical mine closure plan. The monitoring program will comprise the general and specific objectives, the measures and the monitoring actions for the assessment of the security situation of the buildings. The designed parameters for the closed mine have to be respected.

Appendix 6

Information on mine closure tasks - legal basis and specific documents required to carry out closure tasks

Detailed documents required for implementation of tasks under the closure programme and plans, plan of operations include relevant decisions and permits issued with respect to individual cases of structures, buildings and facilities or sites of the mine to be close or with respect to projects implemented in connection to the mine closure process. These includes, as follows:

- Decisions regarding demolition permits;
- Decisions on the future use of the land with respect to land reclamation;
- Land development decisions;
- Water management permits;
- Decisions approving the programme of hazardous waste management

The above decisions and permits are issued by the competent bodies, as provided by effective Romanian legislation and in certain cases following completion of community consultation, on the basis of prepared detailed designs or documents.

Each and every interference into the environment will have its legal basis in the form of decision, permit or acceptance, as issued in case of each scope of works, under the effective regulations and laws. Mine closure works may be undertaken exclusively following obtaining appropriate decisions, permits and approvals, as provided by the effective regulations in Romania.

Decisions, permits or approvals are issued on the basis of relevant applications submitted to relevant bodies of public administration, together with required attachments in the form of documentation, depending upon the type of the project.

With respect to decommissioning of surface facilities the basic documentation includes a design with description of demolition technologies, as supplemented, depending upon the scope of the works and type of a facility, by an environmental impact assessment.

With respect to decommissioning of machines and equipment, in case the project is likely to generate hazardous waste (specifically PCB containing oils and lubricants) the programme for hazardous waste management should include description of methods of rendering such waste harmless.

With respect to land reclamation the basic documentation includes the land reclamation design, as supplemented, if required due to size of the project, by the Environmental Impact Assessment and, potentially, by decision regarding recycling of waste, if such waste is used for the project purposes.

With respect to discharge of underground waters to surface watercourses the basic documentation includes the water management operational plan accompanied with hydro-geological documentation and the project environmental impact assessment report.

Appendix 7

Decision making diagram and the documents necessary for mine closure

No	Scope of environment use	Legal basis	Type of decision to allow implementation	Decision making body	Supervision body	Documents required to obtain decision	Responsible	Required community consultation by law
1	Demolition of buildings	Construction law	Demolition permit	Local Council	Construction Supervision Inspectorate	Technical plan	Design Institute	Required
2	Underground water discharge	Water Law	Water management permit	“Romanian Water” Supervision Agency Local Agency of Ministry for Environmental Protection	“Romanian Water” National Agency – Local Directorate	Water management plan hydrogeological documentation	Design Institute Design Institute	Required
3	Land reclamation	Forest Law Land Law	Environmental Agreement	Local Agency of Ministry for Environmental Protection	Local Agency of Ministry for Environmental Protection Local Forest Agency Local Council Land Committee	Land reclamation design	Design Institute	Required
4	Generation of dangerous waste	Environmental Protection Law and Government Decision on Waste Management	Approval of disposal program	Local Agency of Ministry for Environmental Protection	Local Agency of Ministry for Environmental Protection	Dangerous waste management programme	Design Institute	Required