



**ADRIATIC METALS PLC
VARES PROJECT
SOIL, CONTAMINATED LAND AND EROSION CONTROL
MANAGEMENT PLAN**

OCTOBER 2021

Contents

INTRODUCTION.....	1
1.0 Purpose and Scope.....	1
2.0 Legislative Requirements and Standards.....	3
2.1 National Legislation.....	3
2.2 International requirements	3
3.0 Roles and Responsibilities.....	4
4.0 Soil, Contaminated Land and Erosion Control Management Plan	5
4.1 General soil mitigation measures	5
4.2. Design specific mitigation measures.....	7
5.0 Monitoring and Audit	8
6.0 Training.....	10
7.0 Review and Update.....	10

SOIL, CONTAMINATED LAND AND EROSION CONTROL MANAGEMENT PLAN

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Version	Date	Authors	Reviewed	Pages
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ISSUED FOR: Design Construction Operations Other rehabilitation and
aftercare

INTRODUCTION

1.0 Purpose and Scope

Eastern Mining d.o.o. is owned and operated by Adriatic Metals PLC and located in Bosnia and Herzegovina (BiH). Eastern Mining d.o.o. is the holder of a concession for exploration and exploitation in Vareš (BiH). The ultimate goal is to revive the mining industry in the municipality of Vareš, by exploiting new and existing ore deposits. The project, named Vares Project is polymetallic mine, and has attracted reputable foreign investors in BiH. In many ways, this research project is unique in post-war BiH, both in terms of investment size and development potential.

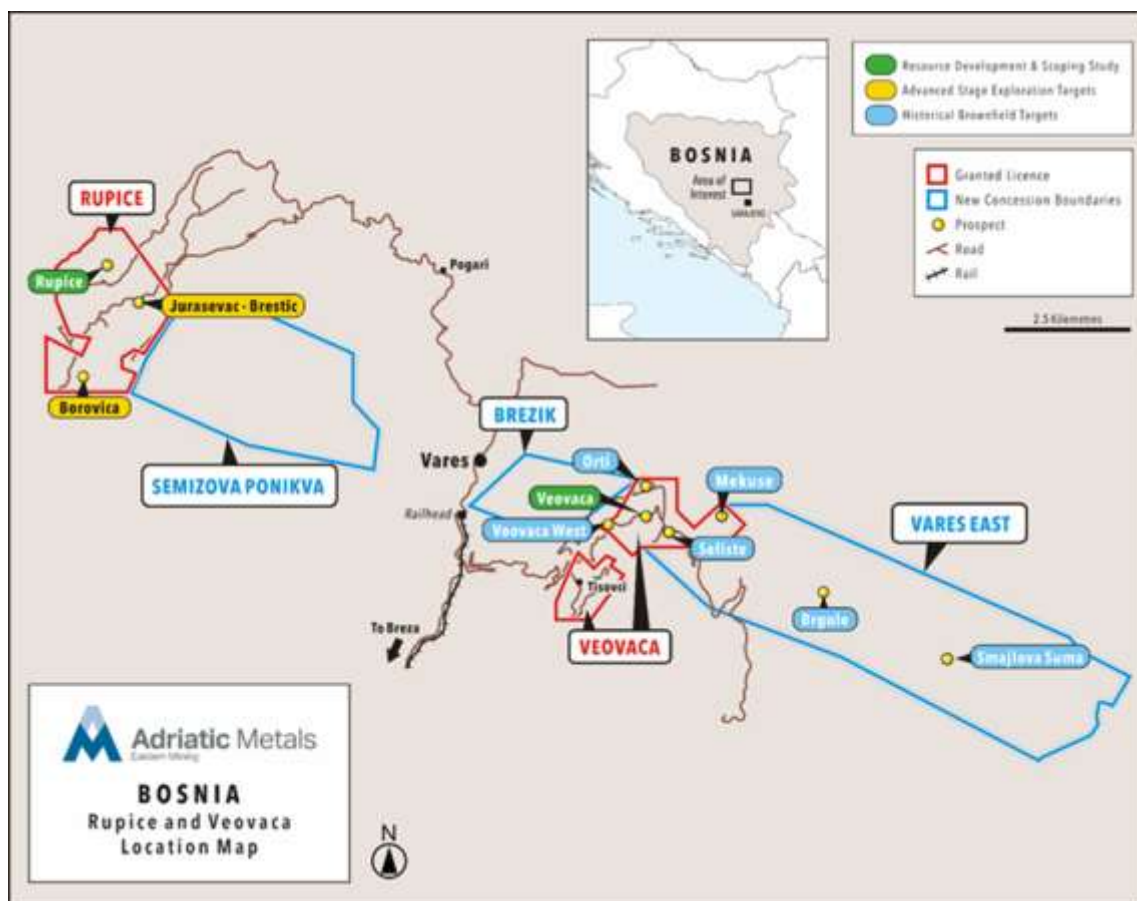


Figure 1.1. Map showing the location of the Vares Project

This Soil, Contaminated Land and Erosion Control Management Plan (SLECMP) is developed to provide further details on the measures to be implemented during the design, construction operational phase and rehabilitation and aftercare of Project to ensure that the actual

environmental impacts are consistent with those evaluated in the Environmental Social Health Impact Assessment (ESHIA).

The SCLECMP includes a number of clearly defined measures and actions whose role is to reduce soil contamination and control erosion in this area which is the centre of mining activities. The SCLEMP defines:

- All soil handling and storage requirements for the project; and
- An accurate soil volume balance based on the finalised design criteria of the project, specifically to include all ground workings and storage locations.

The SCLECMP provides a clear set of actions and responsibilities for the control and minimization of potential impacts on sensitive receptors within the Project area of influence. There are a number of linkages between this SCLECMP and other environmental plans as described below:

- The Emergency Preparedness and Response Plan contains procedures in case of emergencies such as spills, to reduce the potential impacts on soil contamination.
- The areas where the project will affect some sensitive habitats such as grasslands, which are limited to the haul route. Building this will involve widening existing tracks as well as constructing new haul road sections. The land is generally not in agricultural use but has value for its biodiversity. There is also the potential that soils adjacent to the haul road could become contaminated through deposition and spillage, during the operational phase of the mine. This could result in a long-term effect on the composition of the grassland. This is covered in the Biodiversity Action Plan.
- Erosion of soil due to rainfall and surface water flow can also contaminate watercourses through sedimentation, and when eroded by wind, soil can lead to a reduction in air quality. Soil erosion can lead to fugitive dust emissions during the removal of soil and overburden during earthworks; the impact of this has been considered in the Air Quality Management Plan.
- Soils may become compacted and lose structure as a result of handling, storage, frequent movement of traffic and compaction. There is an increased risk of loss of resources from erosion from degraded soils, which can result in secondary effects such as pollution of watercourses; the impact of this has been considered in the Water and Wastewater Management Plan.

The SCLECMP represent one component of the overall Environmental Social Management System (ESMS). The ESMS includes a number of commitments and component management plans which together form the basis for the ongoing design, construction and operations of the Eastern Mining Vares Project.

The Plan is developed in compliance with national legislation, permit requirements, requirements of international financing institutions (e.g. IFC Performance Standards, EBRD Performance Requirements) and other applicable good practices. This Plan is a living

document, and the responsibilities, procedures and compliance actions should be updated as appropriate.

2.0 Legislative Requirements and Standards

Eastern Mining intends to implement practices in accordance with international practices in addition to local legislation, respecting principles and policies of the European Bank for Reconstruction and Development (EBRD) and International Finance Corporation (IFC).

2.1 National Legislation

- Environmental Protection Law ("Official Gazette of the Federation of BiH", No. 15/21)
- Decree on the arrangement of the construction site, mandatory documentation on the construction site and participants in the construction ("Official Gazette of FBiH", No. 48/09)
- Law on agricultural land ("Official Gazette of Federation BiH" No. 52/09)
- Instructions on the procedure, actions and conditions for performing soil fertility control ("Official Gazette of Federation BiH" No. 72/09)
- Instruction on a unique methodology for classifying agricultural land into credit rating categories ("Official Gazette of Federation BiH" No. 78/09)
- Instructions on the obligatory unique methodology for the preparation of reclamation projects ("Official Gazette of Federation BiH" No. 73/09)
- Rulebook on determining the permitted quantities of harmful and dangerous substances in the soil and methods of their testing ("Official Gazette of Federation BiH" No. 72/09)
- Mining law ("Official Gazette of the Federation of BiH", No. 26/10)

2.2 International requirements

- European Bank for Reconstruction and Development (EBRD) Performance Requirement (PR) 1
- European Bank for Reconstruction and Development (EBRD) Performance Requirement (PR) 3
- European Bank for Reconstruction and Development (EBRD) Performance Requirement (PR) 6

3.0 Roles and Responsibilities

Principal roles and responsibilities for the implementation of this plan are outlined below.

Roles	Responsibilities
Executive Director	<ul style="list-style-type: none"> • Ensure adequate resources are provided for implementation of this Plan. • Ensure the Plan is distributed to all relevant Contractors and subcontractors. • Ensure Design specific mitigation measures are included in Main projects
Construction Manager	<ul style="list-style-type: none"> • Supervision of all construction and mining activities in the Rupice project area
Environmental and Social Manager	<ul style="list-style-type: none"> • Ensure technical support is provided to Contractors for implementation of the Plan. • Ensure related trainings are provided
Environmental and Social Management Associate	<ul style="list-style-type: none"> • As required, review and update the Plan • Implementation of monitoring and mitigation measures • Inspection of contractors and subcontractors on respecting mitigation measures

4.0 Soil, Contaminated Land and Erosion Control Management Plan

The monitoring plan determines the monitoring of all activities that may adversely affect soil quality and / or the occurrence of soil erosion. The aim of establishing a monitoring plan is to enforce legal provisions regarding the implementation of monitoring measures in order to reduce and eliminate negative impacts on the soil and the occurrence of erosion, and to take corrective and preventive measures.

4.1 General soil mitigation measures

- Properly store the top layer of soil in stockpiles is necessary to maintain soil quality and minimise damage to the soil's physical (structural) condition so that it can be easily reinstated once respread and to avoid contamination with rocks or other materials
- Strip in advance the soil to basal layer along haul routes and the operational footprint of the storage mound.
- The size and height of the stockpile will depend on several factors, including the amount of space available, the nature and composition of the soil, the prevailing weather conditions at the time of stripping and any planning conditions associated with the development. Make stocks 3-4 m high for the top layer of soil that can be stripped and stored in a dry place condition, but heights may be higher if storage space is limited.
- Dump trucks are only to stand and travel on the basal layer (unless raising the next level in multi-tier mounds).
- The machines are to only work when ground or soil surface conditions enable their maximum operating efficiency.
- Single-tier mounds are preferred to multi-tier mounds as it avoids the need for trafficking on the soil being stored.
- Raise the soil using only the excavator and maximise the mound height before trucks allowed to access upper surface.
- In the raising of multi-tier mounds, trafficking is to be confined to the upper surface of the lower tier.
- When performing activities such as soil handling, soil extraction, storage, and soil relocation, it is necessary that the surface part of the soil does not mix with other parts-
- Handle the soil during dry periods, so as not to affect its compaction, but avoiding very windy days
- Reduce the possibility of soil pollution from spills of materials, leaking oil and lubricants, improper waste disposal
- Handle and store the soil with appropriate strategies and rules to avoid soil erosion, pollution to watercourses or increase flooding risk to the surrounding area.

- Review land resources and develop a land resource plan that contains any restrictions that the soil may possess in terms of handling, removal and storage of stocks.

To minimise the wetting of soils:

- Site soil mounds in dry locations and protect from run-off from adjacent areas. Drain if a wet location.
- Raise the soil mound to maximum height progressively along the axis of the mound and shape the mound as it is being built to shed water and whenever stripping is suspended.
- Measures are required to protect the face of the soil layer from ponding of water and maintain the basal layer in a condition capable of supporting dump trucks.

The Storage Operation:

- The mounds should be sited on dry ground, not in hollows and should not disrupt local surface drainage. Where necessary mounds should be protected from run-off/ponding by a cut-off ditch which is linked to appropriate water discharge facilities. Where the storage mound is in a hollow due to the removal of surface soils, measures should be undertaken to ensure that water is not able to pond within the storage area.
- All machines must be in a safe and efficient working condition at all times. The machines are to only work when ground conditions enable their maximum operating efficiency. The operation is to be suspended before traction becomes a problem or the integrity of the basal layer and haul routes fails; haul routes must be maintained.
- The operation should follow a detailed soil stripping/storage plan showing soil units to be stripped and stored, haul routes and the phasing of vehicle movements. The soil units should be defined within the site with information to distinguish types and layers, with information about ranges of thickness. Detailed daily records should be kept of operations undertaken, and site and soil conditions.
- Remove topsoil and subsoil to basal layer from the haul routes, footprint of the storage mound and any other operating area in advance. These soils should be stored in their respective mounds.
- The dump trucks must only travel within the haul route and operational areas. The trucks should enter the storage area, reverse and back-tip the soil load starting at the furthest point of the mound from the point of access. The backacting excavator pulls up the soil into a mound of the required dimensions. The excavator bucket can be used to shape and firm the sides as the mound is progressively formed to promote the shedding of rain, particularly at the end of each day, but also on the onset of rain during the day. This should include any exposed incomplete surfaces.
- The process is repeated with the tipping of soil against the forming mound, and without wheels traversing onto previously tipped material. The operation continues progressively along the main axis of the mound.
- Without the trucks rising onto the soil mound, the maximum possible height is related to the boom reach of the excavator (typically 3-4m).
- To raise the mound higher, the trucks will have to travel on the upper surface of the mounded soils. A ramp will have to be provided for the trucks to rise onto the surface

of the first tier, which should be capable of trafficking without difficulty. The next tier would be formed repeating the process described above. If further tiers are required, the process would be repeated.

- Any exposed edges/surfaces should be shaped using the excavator bucket on the onset of rain during the day. All surfaces should be shaped to shed water at the end of the day. The final outer surface should be progressively shaped using the excavator bucket to promote the shedding of rain.
- Work should stop in wet conditions with measures undertaken to prevent ponding at the base of the mound and on the basal layer. At the start of each day ensure there is no ponding on the basal layers and operating areas.
- All measures will be part of the contracts with individual operators and an operating procedure will be developed for all contractors
- According to local construction law, each site must have a Site Organization Plan where subcontractors will be required to include these measures.

4.2. Design specific mitigation measures

- Soils at Rupice that are rich in clay- this type of soil should be handled only in the dry season
- It is necessary to reduce the potential for additional soil contamination when handling and storing materials from the VPP
- Soils in the Vares processing plant site that are contaminated (left from previous activities) will be treated as hazardous. Contaminated soils from within the Veovaca process plant site have been stripped and contained or capped / covered to contain the risk during the demolition process
- The top layer of soil from Veovaca TSF area and other areas around the site, such as new stretches of haul road and the areas around the Rupice mine portals and platforms will be removed and stored properly so that it can be reused
- Vegetation establishment on topsoil stockpiles will be encouraged in order to reduce erosion, but will be monitored for invasive species which will be removed
- Stockpiles will be maintained for the shortest time possible and used progressively to restore exposed areas such as road cuttings, to reduce erosion.
- Progressive rehabilitation of areas such as the waste rock stockpile and completed TSF lifts will be implemented
- A detailed soils balance will be maintained to ensure that sufficient soils remain for site closure
- At the TSF, the remaining subsoil will be compacted, to form an impermeable layer with basal drainage network to recirculate leachate to Vares plant site.
- The waste rock stockpile at Rupice will be a temporary stockpile and the material will be combined with tailings material and used as backfill for the mine. The area where it will be located has contained drainage which will divert any leachate to the water treatment plant to reduce the risk of contamination from leachate to surrounding soils.

- When closing the mine any remaining infrastructure or footprint will be contoured to minimize the risk of runoff, compacted and covered in subsoil and topsoil followed by revegetation. If the slope is more than 30 degrees, the area will require terracing before topsoil is spread and revegetation occurs.
- During operation of the mine the ore will be stored in ROM pads before being transported to VPP with all drainage contained reducing the risk of contamination to nearby soils.
- At the end of the operational phase of the project all ore will have been removed from Rupice and processed at VPP.

Erosion control measures:

- Clearing the smallest areas possible,
- Ensuring that diversion berms/channels and retention ponds are in place before extensive clearance starts (including tree felling as we have seen how that can impact water courses)
- Ensuring that retention ponds are cleaned out and maintained, Revegetating slopes around platforms and along road cuttings as quickly as possible
- Establish drainage structures at the foot of each slope to prevent the flow of sheet metal across the platform
- Prevent land degradation when arranging the location for machinery
- Prevention of spillage of fuel, oil and lubricants from transport and construction devices
- Store hazardous substances on covered and impermeable terrain
- Proper disposal of all types of waste in designated places
- Implement the measures described in the Waste Management Plan
- Phased implementation of measures for rehabilitation and rehabilitation of degraded areas
- All the above measures will be included in the design of the main project, like:
 - clearing the smallest areas possible,
 - ensuring that diversion berms/channels and retention ponds are in place before extensive clearance starts,
 - ensuring that retention ponds are cleaned out and maintained,
 - revegetating slopes around platforms and along road cuttings as quickly as possible, etc.

5.0 Monitoring and Audit

Auditing includes:

- Topsoil storage mounds will be inspected quarterly for signs of erosion, vegetation establishment and elimination of invasive species

- Carry out weekly inspections of slopes and exposed areas for erosion and stability, as well as after heavy rainfall during the construction phase and/or until vegetation is established on the slopes. After that, monthly check-ups. Keep a detailed record.
- 5 yearly assessments of soils in key locations and those that are at increased risk of contamination (including VPP and down gradient of the Tailings Storage Facility); and
- Guidelines for actions where there may have been a significant change to the baseline conditions

Closure:

- Prior to closure, sampling will be done to assess the change in the baseline conditions so that appropriate implementation of remediation measures can be implemented during the closure of the mine. Particular importance will be placed on locations which are particularly susceptible to human health or environmental pollution.

In addition to the above, the following activities will be performed:

- Respecting Site Organization Plan prepared according to local legislation (Decree on the arrangement of the construction site, mandatory documentation on the construction site and participants in the construction "Official Gazette of FBiH", No. 48/09)
- Revision of documentation for design specific mitigation measures
- Supervision of all activities through all phases of the project.

6.0 Training

Regular internal and external (when necessary) trainings will be made to ensure that the mitigation measures indicated in this plan are applied during project for all involved parties. Regular internal inspections will be made to ensure that the mitigation measures indicated in this Plan are applied during project.

7.0 Review and Update

The results of monitoring will be reported to responsible parties to ensure that the project activities comply with the national legislation and international standards. Depending on the monitoring results, the Soil, Contaminated Land and Erosion Control Management Plan will be reviewed and updated when necessary. Re-assessment of impact significance after mitigation is applied (assuming effective implementation of mitigation measures) will be undertaken to derive residual effects from Project activities. Appropriate risk analysis will continue based on the monitoring programme targeted to assess the effectiveness of the mitigation measures in reducing impacts.