ADRIATIC METALS PLC

VARES PROJECT

SOILS, CONTAMINATED LAND AND EROSION CONTROL MANAGEMENT PLAN

SEPTEMBER 2024

Contents

SOILS, CONTAMINATED LAND AND EROSION MANAGEMENT PLAN

This document has been developed/revised as indicated below and described in the revision record on the following page. Please destroy all previous revisions.

Version	Date	Authors	Reviewed	Pages
1.0	12/08/21	Danira Zanović	Vildana Mahmutović Kate Harcourt	8
2.0	October 2021	Danira Zanović	Vildana Mahmutović	10
3.0	October 2022	Midhat Mujezinović	Danira Zanović	16
4.0	September 2024	Angel G. Vega	Danira Zanović	9

ISSUED FOR: ☐ Design ☒ Construction ☒ Operations ☒ Closure & Rehabilitation

INTRODUCTION

1.0 Purpose and Scope

The company Adriatic Metals BH is the holder of concessions for the exploration and exploitation of polymetallic ore in Vareš (BiH). Based on the conducted research, the company developed a project for the exploitation and processing of polymetallic ore in Vareš (Vareš Project), which includes 3 spatial and technological units:

- Rupice mine, the footprint of the Rupice mine project is 103.92 ha;
- Tisovci ore processing plant, the footprint of the Tisovci plant project is 107.68 ha;
- Transport road Rupice - Tisovci (length 24.5 km).

The area of Vareš is historically known for the exploitation and processing of ore and the Vareš project represents the continuation of the traditional exploitation and processing of ore based on good industrial practices and the best available techniques. Preparatory works began in November 2021, and the construction of the underground mine, ore processing plant and transport road began in the summer of 2022 and continued during 2023.

The construction of project contents is in the final phase. During the development of the project and the constructive phase, changes were made to individual project solutions in order to apply better technical solutions, spatial positions of project parts, avoiding priority habitats and habitats of species of conservation importance. All changes in relation to the base project, as well as changes in the impact on the environment and society from them, have been communicated to the relevant interested parties.

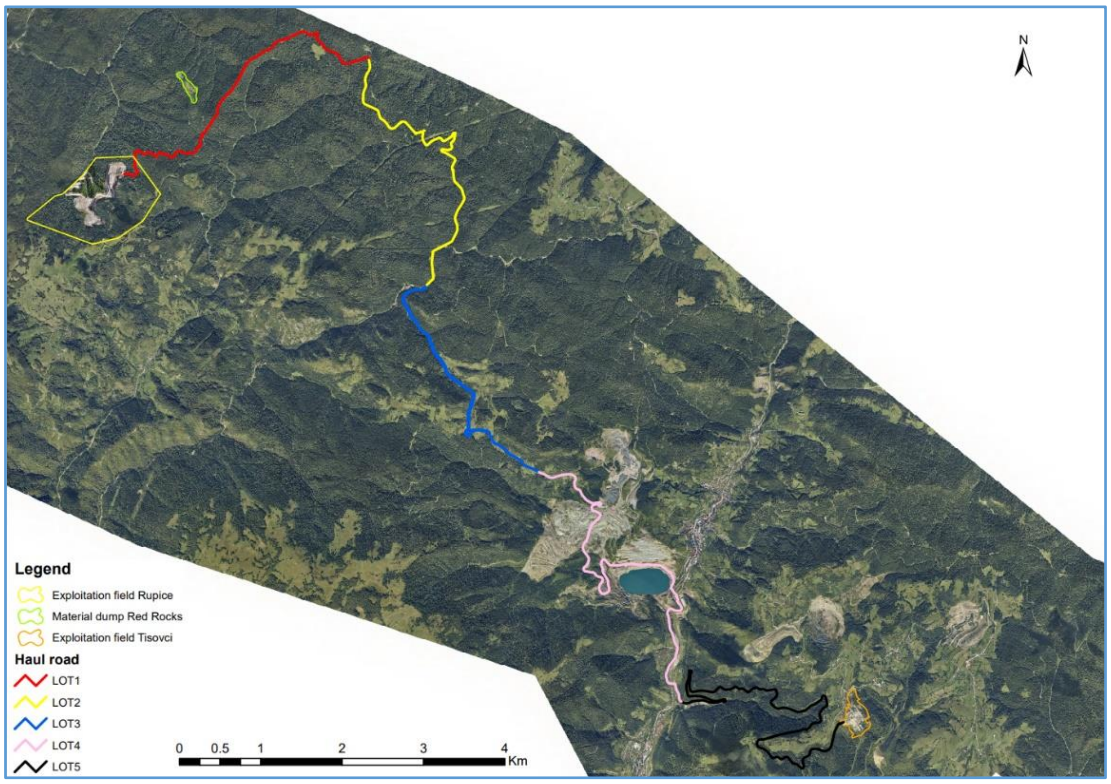


Figure 1. Map showing the location of the Vareš Project

The current version of the Soils, Contaminated Land and Erosion Control Management Plan (SCLECMP) is developed to provide further details on the measures to be implemented during the construction operational, closure and rehabilitation phases of the Project to ensure that the actual environmental impacts are consistent with those evaluated in the Environmental and Social Impact Assessment (ESIA).

2.0 Legal Framework and Standards

ADT is highly committed to implement practices in accordance with international practices in addition to local legislation, with due respect of guiding 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)
- Law on amendments to the Law on Environmental Protection ("Official Gazette of the Federation of BiH" No. 38/09)
- 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)
- Law on Waste Management ("Official Gazette of the Federation of BiH", No. 33/03, 72/09

2.2 International Requirements

- European Bank for Reconstruction and Development (EBRD)
  - Performance Requirement 1: Assessment and Management of Environmental and Social Risks and Impacts
  - Performance Requirement 3: Resource Efficiency and Pollution Prevention and Control
  - Performance Requirement 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
- World Bank - International Finance Corporation (WB-IFC)
  - Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts
  - Performance Standard 3: Resource Efficiency and Pollution Prevention
  - Performance Standard 6: Biodiversity Conservation and Sustainable Natural Resource Management
  - Environmental, Health and Safety Guidelines for Mining

- Best Practices
  - ICMM Principle 7: Contribute to conservation of biodiversity and integrated approaches to land use planning.
  - Global Industry Standard on Tailings Management (GISTM)

3.0 Roles and Responsibilities

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

Roles	Responsibilities
Operations GM	• Ensure adequate resources are provided for implementation of this plan (SCLECMP).

Head of Mining	• Ensure the plan is endorsed and fully implemented by peer and sub-units (i.e. construction projects, geology), contractors and sub-contractors in the Rupice Area.
	  • Topsoil salvage and stockpiling for future use
	  • Spill response

Head of Processing	• Ensure the plan is endorsed and fully implemented by Projects Department and sub-units, contractors and sub-contractors in the VPP Area.

Fleet Manager	• Ensure the plan is endorsed by fleet drivers.
	  • Due care to enable and allocate equipment for soil salvaging and stockpiling as necessary
	  • Spill response

Head of Sustainability	• Review and update the Plan through the different stages during the life of mine.

Environmental Manager	• Ensure technical support is provided to contractors for the implementation of this plan, including:
	  • Training
	  • Third-party reviews
	  • Guidelines
	  • Due diligence

Environmental Associate	• Implementation of monitoring and mitigation measures • Inspection of contractors and subcontractors on respecting mitigation measures • Mapping of topsoil savage areas

4.0 Soil, Contaminated Land and Erosion Control Plan

Mining may result in significant changes to soil characteristics, microclimate, topography, and hydrology. Propagation methods for some plant species originally present may be unknown. In addition, the innate characteristics of the site – in terms of nutrient status, slopes, water availability, and so on – may also profoundly influence the types of plant and animal communities that may ultimately be supported. These and other technical limitations need to be considered so that the biodiversity objectives set are achievable.

Activities that have the potential to cause soil contamination and/or increase erosion at the site, include exposure of soils during construction of mine infrastructure (i.e. during vegetation clearance, soil stripping and earthworks activities), ongoing mining activities involving clearing, and stripping and stockpiling mine materials.

The project and associated activities that have the potential to impact land and therefore soils within the project footprint include:

- Stripping and stockpiling of soil resources;
- Traffic on soils through use of mobile plant and equipment;
- Use and storage of chemicals;
- Stockpiling of tailings and waste rocks; and
- Deposition of dust from mining activities onto the surface of the soil, causing contamination over a period of time.

Further detail on the nature and extent of activities planned as part of the Vareš project is presented in the Project Environmental Impact Assessment (February 2022) and the current Mining and Processing Production Plans.

Figure 2 below depicts the footprint of the Vareš Project 3 spatial and technological units. Details of baseline land use and the locations of vegetation/habitat communities and other critical natural areas relevant to erosion and sediment control at the Vareš project are presented Appendix 2.

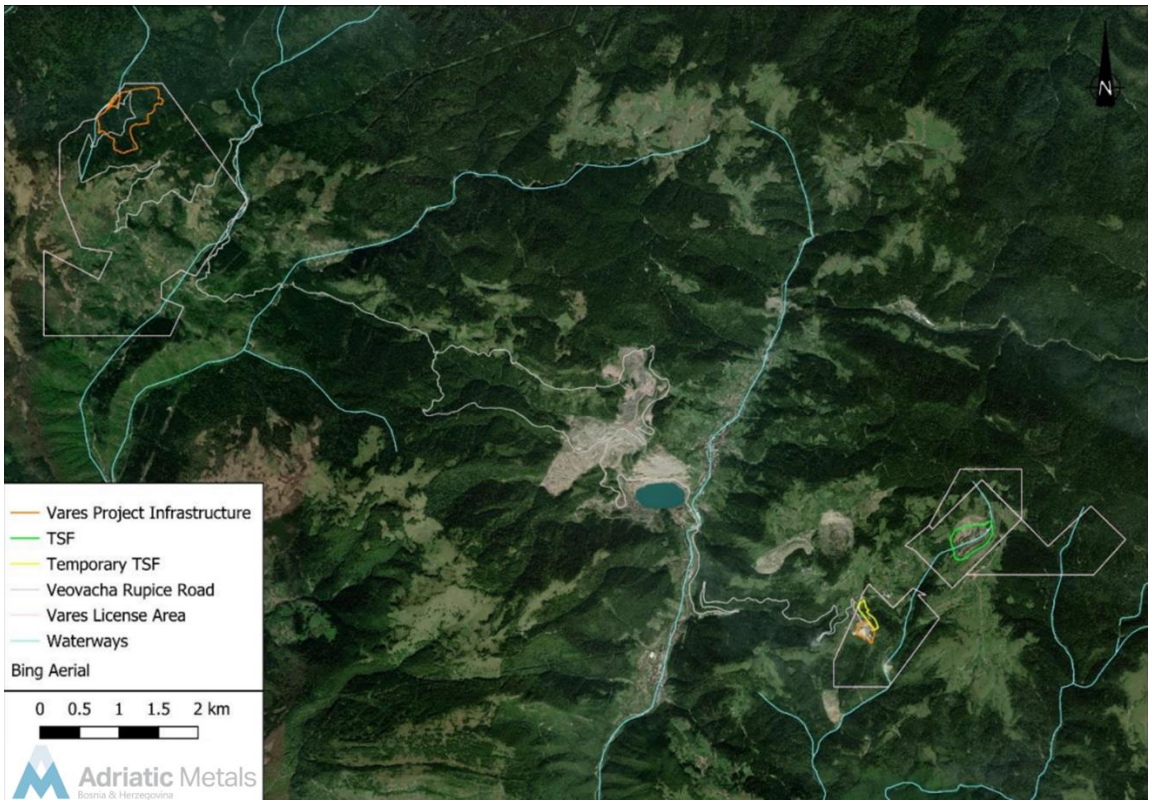


Figure 2. Overview of Vares' Project footprint areas

Controls and mitigation actions of potential impacts on sensitive receptors within the project area of influence are set in this SCLECMP, which 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.

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.
- Operations, both at Rupice and VPP, imply the generation of waste rock and tailings which are covered within the Surface Mineral Waste Disposal 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 Vares Project.

For the purpose of the baseline studies, soil samples were analysed, and results are archived in the Sustainability Department database. To the current version's effective date, the company has entered to a full operating stage. ~~*soils surveys undertaken in 2020 and tests reported for the baseline stage.~~

4.1 Soil

This includes both lands directly disturbed by Adriatic activities, lands that have supporting infrastructure and undisturbed lands held for other reasons such as buffers or biodiversity offsets.

To reduce soil degradation, including loss of bulk soil resources and loss of soil structure, all works involving the extraction, handling, moving and storage will be undertaken following appropriate soil salvage techniques.

These techniques are addressed to conserve the site's topsoil, which is essential for maintaining nutrient cycling, organic matter, soil biota and plant propagules. In some cases, subsoil (the second layer of soil material below topsoil) may also be salvaged in a second lift.

4.1.1 General mitigation measures

General good practice for salvaged soil handling includes:

- Not mixing topsoil and subsoil horizons;
- Large sites and windy conditions must be avoided: wind erosion;
- Soil salvage in wet conditions must not be carried out: high risk compaction, soil layer mixing, water erosion and soil structure degradation;
- Safeguarding the topsoil resource to avoid contamination with rocks or other materials that would impair soil functioning; and

Where soil storage mounds will be in situ for several years and not temporary (i.e. < 6 months), they will be seeded with vegetation to cover and help stabilise the bare soil.

This will decrease the risk of erosion from runoff and wind, and natural processes should maintain the soil quality. Topsoil will be stored in separate mounds to those containing subsoil. All mounds will be maintained, and vegetation mown annually, as a minimum.

Salvaged soil must be stockpiled until an area has been decommissioned and contoured, at which point the topsoil is spread back over the site. Stockpiling may degrade soil structure and decrease the viability of seeds and other propagules, but these risks can be managed using best practices as shown in Figure 3.

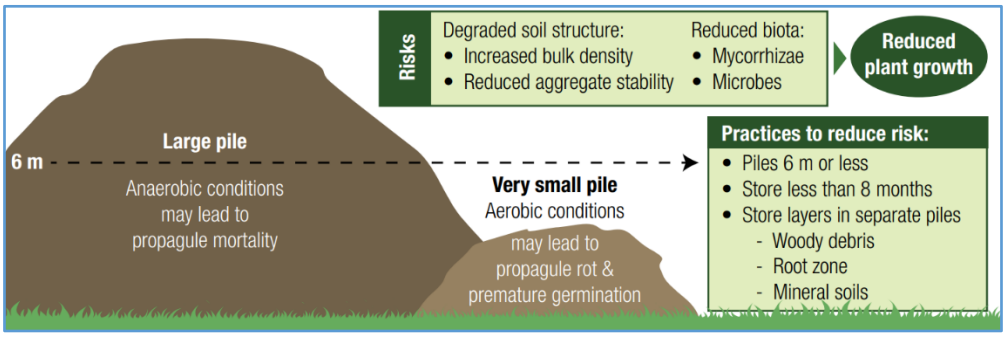


Figure 3. Practices to reduce the risk of stockpiling

4.1.2 Design specific mitigation measures

- **Rupice soils**: mostly natural and uncontaminated. During the construction stage, clear felling and stump removal resulted imminently in loss of soil resource. Remaining soils will be removed to the full depth of the profile and stockpiled after the removal of the tree stumps. Given the good mechanical characteristics, clay rich soils were used for the installation of the first buffers on Rupice's plateaus. The potential volume of good quality natural soil resource will be retained and stored in mounds to reuse in rehabilitation, providing visual screens for mining infrastructure, where appropriate.
- **VPP Plant:** contaminated soils in the Vares Processing Plant (legacy from past activities) were treated as hazardous and, as such, capped, isolated and removed for proper disposal.
- **Tailings Storage facilities:** topsoil saved in the construction of these facilities need to be salvaged and stockpiled nearby for concurrent closure as the lifts raise during the operational life. TSF's will be covered and vegetated progressively, to reduce the areas susceptible to erosion.

- **Waste rock stockpiles at Rupice:** drainage is contained, diverting any leachate to the water treatment plant to reduce the risk of contamination from leachate to surrounding soils. Should the water treatment plant be bypassed by an eventuality (e.g. halt or blockage), any acid generating material (i.e. PAG or sulphide waste rock) washed away reaching the running water will go through a secondary treatment implemented by the installation of lmestone rocks at the base of the stockpile as a neutralization measure. At the end of the project, any remaining infrastructure or footprint will be contoured to minimise the risk of runoff, compacted and covered in topsoil followed by revegetation. If the slope is more than 30 degrees, the area will require terracing before topsoil and revegetation occurs.
- **Haul roads:** the entire lots have been designed for the avoidance of surface erosion, these include, but are not limited to run-off cut-off drains, rock anchors, inclined batters & catchment berms. These measures are continuously monitored through weekly inspections (see Appendix 1, *Sedmična kontrolna lista - Monitoring tla i vegetacije*).

4.2 Erosion control

Exposure of bare soils tends as a factor to loss of soil structure and increased erosion. Therefore, rehabilitation of the project's footprint is to be completed concurrently to the most practicable extent, consistent with current and reasonably foreseeable future regulatory requirements, established rehabilitation success criteria and planned post-operational land use.

Erosion control techniques include:

- Vegetation acts as a protective layer or buffer between the atmosphere and the soil. This measure for soil conservation uses the protective effect of vegetation covers to reduce soil erosion.
- The use of geotextiles for vegetation is also a useful protection application for erosion control.
- Mechanical erosion control methods include contouring, contour bunds, terraces, waterways, stabilization structures and windbreaks.
- Stormwater drains, ditches, and stream channels will be protected against erosion through a combination of adequate dimensions, slope limitation techniques, and use of aggregate materials, multibarrier systems and lining.

a. Slope profiling

b. Gabion systems

c. Erosion control mats

d. Reinforcement mat

Figure 4. Practices to manage improve slope stability

4.3 Contaminated land

Contamination may arise from mining waste, rock fragments, contaminated water (e.g. acid rock drainage discharge, highly alkaline water discharges), vehicle fuel and oils (e.g. fuel refilling station for haul vehicles, along haul route between Rupice and VPP), and construction materials, among others.

In order to avoid oil and lubricant spillage, pouring is done on impermeable surfaces. In case of spillage of oil and lubricants, all subcontractors as well as company employees collect the contaminated soil and dispose of in containers properly labelled for hazardous waste. Procedures to reduce the potential for soil contamination are contained in the Emergency Preparedness and Response Plan.

Final disposition of contaminated soils is arranged and managed through certified service providers, whose records are maintained for auditing and regulatory purposes.

4.4 Closure and rehabilitation

Exposure of bare soils tends as a factor to loss of soil structure and increased erosion. Therefore, rehabilitation of the project's footprint is to be completed to the most practicable extent, consistent with current and reasonably foreseeable future regulatory requirements, established rehabilitation success criteria, and planned post-operational land use.

Concurrent rehabilitation is a sustainable practice to avoid unauthorised releases from disturbed areas, meet regulatory requirements, confirm rehabilitation practices, reduce closure liability, and manage other associated risks through the entire life of the project. Annual reviews will be conducted to define what areas will be subject for concurrent closure and remediation to include:

- Identification of topsoil stocks (salvaged or procured externally)
- Allocation of equipment (trucks, bulldozers, loader, etc.)
- Purchase and preparation of seeds
- Execution plans

Rehabilitation of all disturbed lands is addressed to beneficial post-mining land use lands in a safe, stable, self-sustaining manner avoiding any unauthorised emissions and/or releases.

4.5 Subsidence

Subsidence is the gradual sinking or settling of the ground surface, often resulting from natural processes (e.g. tectonic movements, dissolution of soluble rocks or compaction of sediments) or human activities (e.g. groundwater extraction, mining and construction).

Early detection of subsidence is key to mitigating damage and ensuring the safety and longevity of infrastructure. Hence. Adriatic conducts frequent drone surveys to identify displacements or level variations through time. Findings are subject to geotechnical assessment. Surveys are focused on the mining concession area. In the case of embankments, similar measurements are required and visual inspections are undertaken by environmental crews as part of the monitoring of the Surface Mineral Waste Disposal Plan.

Should geotechnical assessment identify displacement measurements, spot surveys and assessment will be required to confirm any subsidence. A specific checklist for reporting potential subsidence is detailed in Appendix 3.

5.0 Soils balance

An accurate soil volume balance based on the project design considered in the ESIA stage is summarized in Appendix 4. Based on this baseline information, the soils balance will be updated annually with the implementation of GIS mapping and models.

6.0 Training

Required number of training programs will be provided for the project personnel working with earthworks, construction as well as the environmental team, and relevant subcontractors.

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.

Subject to monitoring results, the current 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.

APPENDIX 1 - WEEKLY SOIL & VEGETATION MONITORING CHECKLIST

Sedmična kontrolna lista – Monitoring tla i vegetacije

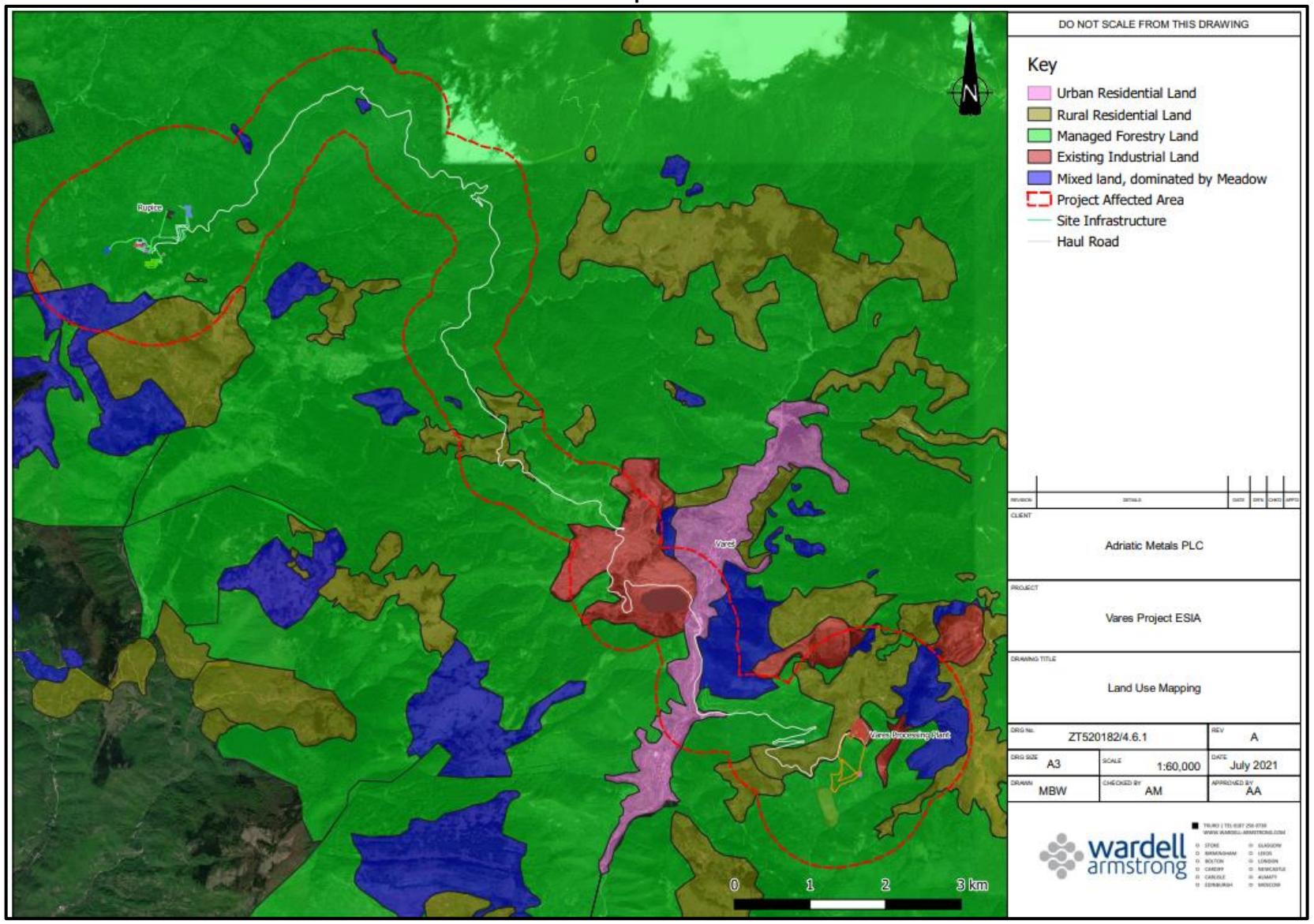
Datum: _____ Vrijeme: _____ Lokacija: _____ Vremenski uslovi: _____

Lokalitet	Da li su osigurani kanali/taložnici/ drenažni sistemi za odvodnju oborinskih voda? (DA/NE)	Da li se redovno održavaju drenažni sistemi, taložnici, kanalice? (DA/NE)	Da li postoji nekontrolisana degradacija zemljišta upotrebom mehanizacije? (DA/NE)	Da li se pravilno skladišti i čuva skinuti humus na predviđenim mjestima za rehabilitacije terena? (DA/NE)	Da li postoji kontaminacija tla prosipanjem ulja, goriva i maziva sa mehanizacije? (DA/NE)	Da li se pravilno skladište opasne tvari na natkrivenom i nepropusnom prostoru? (DA/NE)	Da li se pravilno odlaže otpad na za to predviđenim mjestima? (DA/NE)	Da li postoji opasnost od erozije tla? (DA/NE)	Da li su poduzete mjere za spriječavanje erozija? (DA/NE)	Da li se poduzimaju mjere suzbijanja emisija prašine? (DA/NE)	Da li je prisutna prirodna vegetacija? (DA/NE)
Kancelarije / Lager											
Radionica / workshop											
WTP / Laguna											
Eurofarm											
Donji portal											
Carmix / stara betonara											
Gornji portal											
Nova betonara											
Upper pad											
Trafo											
Stockpile											
Drobilica											
Backfill stari											
Backfill novi											
Bušotine											
Ostalo (navesti):											

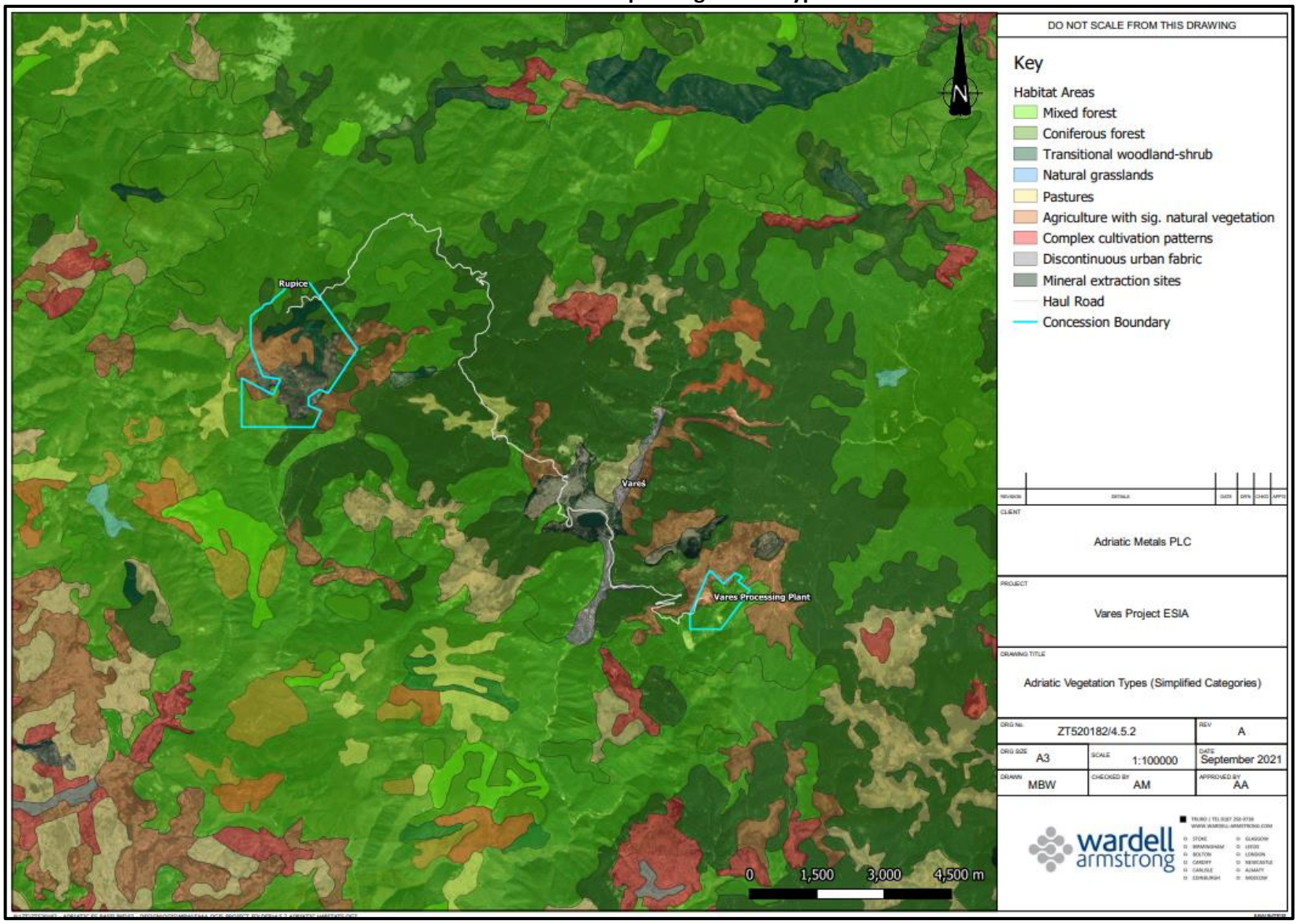
Kontrolu izvršio: _____ Odjel: _____

Datum formiranja izvještaja: _____ Potpis: _____

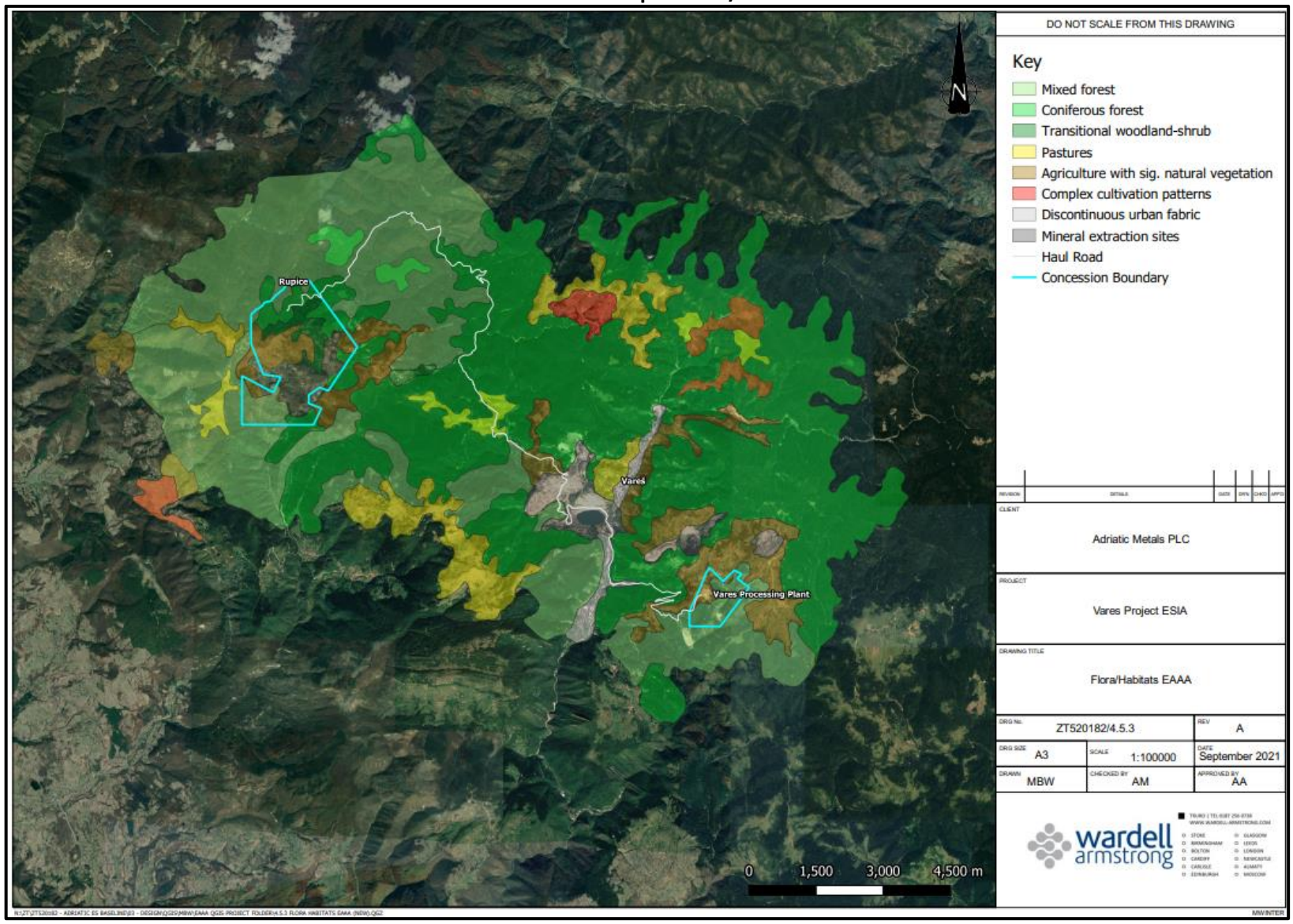
APPENDIX 2 - Map 1. Baseline Land Use



APPENDIX 2 - Map 2. Vegetation Types



APPENDIX 2 - Map 2. Flora/Habitats



APPENDIX 3 - SURFACE SUBSIDENCE REPORTING & MANAGEMENT

Subsidence refers to the sinking or downward movement of the ground, leading to the settling or tilting of structures built on it and leaving land prone to flooding.
Identifying the cause is essential in implementing the right remedial measures to minimize and/or control changes in terrain.

1. IDENTIFICATION

DATE | | | | **TIME** ..... **AREA** ☐ Rupice ☐ VPP ☐ Haulage road ☐ Other

DAY MONTH YEAR

Location details of the subsidence spot: *GPS coordinates, Google maps, picture or description of the spot.*

2. INDICATORS

Cracks ☐

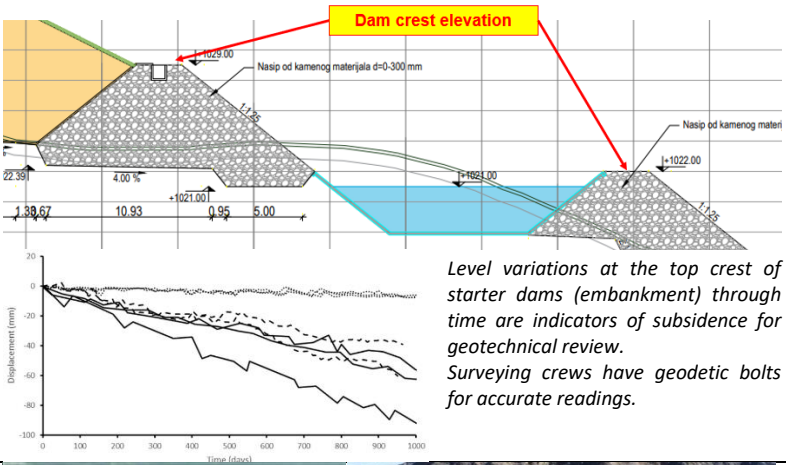
diagonal cracks on walls
wider at the top and slimmer at the bottom
3mm wide or thicker
visible internally and externally

Sinking floors/slabs ☐

Gaps in the slabs or sinking floors may indicate the ground is exposed to subsidence and collapse. Stability of foundations is subject to observation.

Level variations ☐

If applicable, check if copies of as-built drawings are available at the relevant office. Record the elevation for each bench.



Level variations at the top crest of starter dams (embankment) through time are indicators of subsidence for geotechnical review.
Surveying crews have geodetic bolts for accurate readings.

Sinkholes ☐

Sinkholes are topographic depressions, start small and continue growing

3. GEOTECHNICAL REVIEW

Geotechnical engineers will conduct a review and assessment of the initial findings and indicators reported in sections 1 and 2.

DATE | | | | **TIME** ..... **ACTIONS**

DAY MONTH YEAR

- ☐ Site Inspection
- ☐ Trial pits
- ☐ Borehole logging
- ☐ Survey
- ☐ Tilting/level monitoring
- ☐ Inclinometer survey
- ☐ Soil moisture monitoring
- ☐ Laboratory testing
- ☐ Other

Comments and recommendations: .....

.....

.....

4. ACTION PLAN

Detail of actions required.

.....

.....

5. CLOSURE

Upon implementation of the geotechnical assessment and actions, each individual case of subsidence report needs a sign-off and closure.

APPENDIX 4 - ESIA PROJECT FOOTPRINT AND ESTIMATED SOIL VOLUMES AFFECTED

Location	Infrastructure or area	Approximate total soil volume to depth of soil profile (m^3)	Notes	Estimated maximum volume to be removed during construction (m^3)	Estimated volume to be re-used (m^3)	Surplus soil volume (m^3)	Source (if applicable)
Haul Route	Upgrade to existing road 9 km and installation of new road 15.5 km.	93,000	Driving width of 5 m plus an additional 0.5 m pavement and 0.5 m embankment. Total road length is 24.5 km.	Topsoil Category 3 119,793 Subsoil Category 4 158,549 Subsoil Category 5 179,680	Topsoil reuse during road construction (for embankments) Category 3 120,864	157,478	Saraj Inzenjering - Preliminary design for the road from Rupice to VPP 25 km
	TOTAL	**93,000**		**278,000**	**121,000**	**157,000**	
Rupice	Administration, fuel station, lube and flammable storage	11,000	Assuming: Topsoil (approx 40 cm deep) is stripped. Subsoil is used for foundations and ground levelling.* Separation of topsoil and subsoil may be difficult where stumps have been removed and the profiles disturbed.	8,500	No specified design to reuse soils. Soils are not contaminated and will be stored in stockpiles which will also create a visual barrier for the plant during operation and then can be used for remediation during closure	0	Calculated from the proposed project footprint shapefiles and soil depths likely to be removed for construction and reused for remediation.
	Blasting accessories storage and emulsion	1,600		1,300			
	Crushing plant pad	37,000		29,000			
	Ore stockpile	3,000		2,400			
	Paste Plant	6,300		5,000			
	Stockpile pad	4,700		3,800			
	Ventilation decline	200		200			
	Waste rock stockpile	4,800		3,900			
	Water treatment plant and water tank	200		100			
	Remaining footpaths, roads and connectors	76,000		61,000	115,000		
	TOTAL	**144,000**		**115,000**	**115,000**	**TBC**	
VPP	Vares Processing Plant	22,000	Assuming: all soil is stripped and disposed of due to the high contamination levels	22,000	Soil is already heavily contaminated and will be treated as hazardous.	22,000	Calculated from the proposed project footprint shapefiles and soil depths likely to be removed for construction and reused for remediation
	Tailings Storage Facility (all phases)	110,000	Assuming: Topsoil (approx 15 cm deep) is stripped. Subsoil is used for foundations and ground levelling.* Separation of topsoil and subsoil may be difficult where stumps havebeen removed and the profiles disturbed.	34,000	Some signs of contamination, the design of the tailings storage includes drainage channels, soil under the stockpiles are at high risk of contamination. Stripped topsoil has been identified as a covering material in the Project Description (Chapter 3), additional subsoil may be required. 34,000	0	
	TOTAL	**132,000**		**42,000**	**34,000**	**22,000**	
TOTAL		**369,000**		**435,000**	**270,000**	**179,000**	

Excess subsoil can be used for the rehabilitation of the tailings storage facility at Vares. Values over 10,000 m^3 have been rounded to the nearest 1,000 m^3, values under 10,000 m^3 have been rounded to the nearest 100 m^3.
* Does not take into account the volume of tree stumps and roots in the soil, and is based on the depth sampled during the soil survey. This is likely to be an overestimate.