

NEWSLETTER

Nº1 | January 2020

Highlights

Kick-off of the project

Areas of Intervention

In Spain and Portugal

News

The first four months

In Agenda

Next events



Life
RIBERMINE
LIFE18 ENV/ES/000181

The **LIFE RIBERMINE** project "*Fluvial freshwater habitat recovery through geomorphic-based mine ecological restoration in Iberian Peninsula*", will develop for four and a half years (October 2019 to March 2024) and an AFTER-LIFE continuity period of five years.

This project has an overall budget of €2,941,280, being co-financed by the European Union in €1,613,979 (54.99% of the total eligible budget). It results from a partnership of 5 entities: 4 Spanish and one Portuguese.

It is coordinated by the "Dirección General de Transición Energética" which belongs to the "Consejería de Desarrollo Sostenible del Gobierno de Castilla-La Mancha" (Minas-JCCM), having as partners the CAOBAR, S.A. (Mining Company), the CCV Lousal (Associação Centro Ciência Viva do Lousal), the GEACAM, S.A. (Environmental Management of Castilla-La Mancha Gov.) and the UCM (Complutense University of Madrid).



The LIFE RIBERMINE project has been funded with the support of the **LIFE Programme of the European Union**.
This newsletter reflects the views only of the author/s, and the Commission cannot be held responsible for any use which may be made of the information contained therein.



Kick-off of the LIFE RIBERMINE Project

The **LIFE RIBERMINE** project (LIFE18 ENV/ES/000181) is integrated in the **Environment domain of the LIFE Programme of the European Union**. It aims to recover the natural hydro morphological conditions and the water quality, in two hydrographic basins of the Iberian Peninsula: Alto Tajo (Spain) and Sado (Ribeira de Corona, Portugal) through the restoration of two old mining sites. For this, a multidisciplinary approach is followed, based on ecological restoration and which includes the application of geomorphological restoration techniques, that combine pioneering mining restoration methods (*GeoFluvTM-Natural Regrade and Talus Royal®*) with models of landscape evolution (*SIBERIA*) and revegetation with autochthonous species, applying the Best Available Techniques (BAT). The recovery of the vegetation and the improvement of soil structure and functionality, will contribute to the retention of CO₂ and removal of the main sources of physical pollution from the aquatic ecosystems impacted by these activities, allowing them to recover their ecosystemic functions.

The main areas of intervention of the project are located in Spain, in a protected area, integrated in the Natura 2000 Network, the “Parque Natural del Alto Tajo”, which includes a Special Protection Area (SPA ES ES0000092 Alto Tajo) and a Special Area of Conservation (SAC ES4240016 Alto Tajo). In this Natural Park, there are 3 Natural Habitats classified by the Natura 2000 Network: **Habitat 3140** - Hard oligo-mesotrophic waters with benthic vegetation of *Chara spp.*; **Habitat 3110** - Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*); **Habitat 92A0** - *Salix alba* and *Populus alba* galleries.

In Portugal, will be intervened an area affected by Acid Mine Drainage (AMD), related to the former Mine of Lousal, intending to correct the acidification of the waters, through the techniques of geomorphological restoration and revegetation developed in the project.

The proposed actions include the geomorphological restoration of the affected mining areas, the improvement of the soil quality and the revegetation with autochthonous species, in order to increase the recovery of natural habitats in situ, improve the hydro morphological conditions and the quality of water and freshwater communities downstream of the restored areas, and enhance the connectivity between the intervention areas and their environment.

AREAS OF INTERVENTION

Spain

The intervention will take place in the Municipal District of Peñalén, (Guadalajara) located in the Alto Tajo region. The intervention areas are located in the peripheral protection zone of the Alto Tajo Natural Park and within the SPA-SAC ALTO TAJO (ES4240016 and ES0000092).

The sites to intervene correspond to the old open pit kaolin mine, Mina Santa Engracia and its associated heaps. These heaps, made of easily erodible materials, feature steep slopes (>40 %) and the old exploitation fronts are up to 100 m high. Due to such characteristics, extremely high erosion rates occur (above 300 t/ha/year, being the normal values in this type of natural environment of 5-10 t/ha/year). In the surrounding river network, downstream, the recorded suspended sediment concentration values (CSS) of 390 g/L, are much superior than the baseline values of 24 g/L for the Tagus River.

The most important natural values of the Alto Tajo Natural Park are the quality of its waters, the species and aquatic communities and its fluvial hydro morphology. The eroded sediments in the areas affected by the old mining activity, which are dragged into the river network, negatively affect the natural habitats of the Natura 2000 Network that there occur.

In total, an approximate area of 30 ha will be intervened.

Santa Engracia outside heap:

Area: 5.6 ha

Land mobilization: 92,174 m³

Front of the road to Poveda:

Area: 6.7 ha

Land mobilization: 315,700 m³

Cemetery front:

Area: 1.5 ha

Land mobilization: 11,024 m³

Hoya Grande heap:

Area: 11.2 ha

Land mobilization: 8,483 m³

PORTUGAL

The intervention area is located in Lousal, in the Sado River Hydrographic Basin (Grândola, Portugal), near the “Ribeira de Corona”. This former Pyrite (iron disulfide, FeS₂) Mine, that operated to obtain sulphur used in the manufacture of fertilizers, was closed in 1988.

Due to the characteristics of this type of exploitation, in addition to the contamination of the groundwater, the sulphides present in the old tailing also oxidize when in contact with the rainwater and leaching of heavy metals such as Copper (Cu), Lead (Pb), Zinc (Zn) and Arsenic (As), causing the Acid Mine Drainage (AMD). The water drained from these areas presents an intense ochre colour, due to the high concentration of Iron, possesses heavy metals and several salts dissolved, what gives them an extremely low pH (an average pH 2.5). The occurrence of superficial AMD, together with intense erosive processes, impede the development of the native vegetation and affects the surrounding downstream watercourses through physical and chemical pollution, entailing a negative impact in the environment.

A pilot project will be implemented in Lousal, in an area of 1.5 ha. Here, the potential of the techniques applied in the project for mining places affected by chemical contamination, ADM, will be demonstrated.



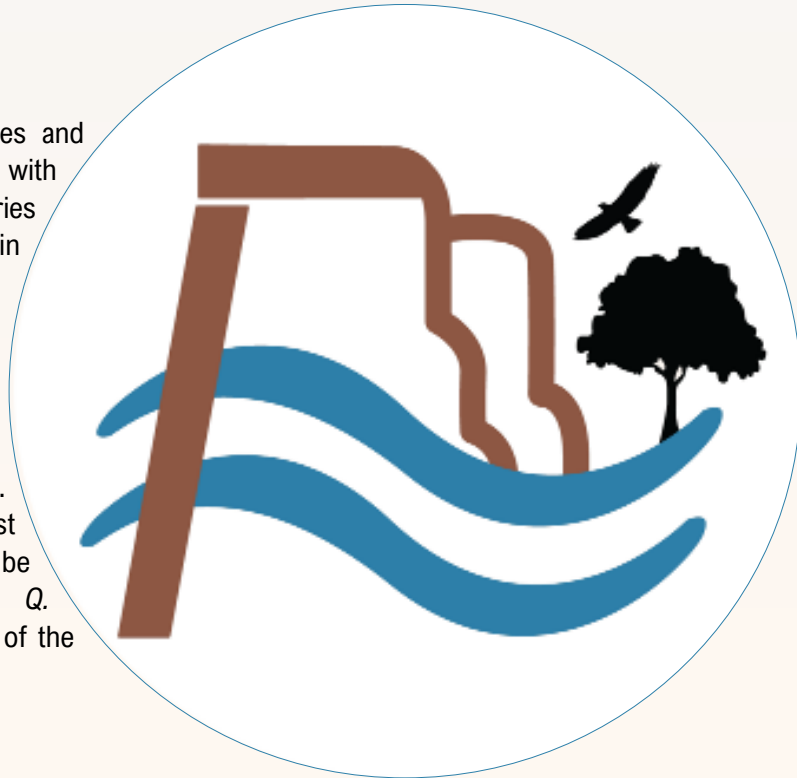
RIBERMINE

The acronym **RIBERMINE** emerges from the combination of several words and concepts that translate the spatial and conceptual scope of this project.

The term "**RIBER**", an apparent grammatical error generated by the exchange of V (from the word RIVER) with B, actually demonstrates, the symbol of the Iberian (IBER) efforts brought together for the same purpose. The term "**MINE**" indicates the global mining scope of the project, which focuses on maintaining the quality of river waters in landscapes and mining contexts.

The logo includes elements related with the two types of mining, where the **LIFE RIBERMINE** Project will be applied; open pit mining, in the Alto Tajo Natural Park in Spain, for the exploration of kaolin (non-metallic), and deep mining, in Lousal in Portugal, for the extraction of pyrite ores (metallic). Thus, each element of the logo has a specific meaning:

- ♦ The "**cut**" outdoor profile, represented by the slopes and cliffs of the Alto Tajo Natural Park in Spain, merged with the emblematic structure of the "**shoring**" of the galleries from the in-depth exploitation practiced in Lousal in Portugal.
- ♦ These graphic elements combine with the element "**water**" of the riverine habitats (represented by two dynamic waves) and with the component "**life**" (revealed by the silhouette of specimens of the flora and fauna characteristic of both regions). Therefore, can be observed one of the most emblematic trees of the Iberian Peninsula (which can be identified as a Quercinea, *Quercus suber* or *Q. rotundifolia*), as well as a bird of prey in the vicinity of the rupicolous habitat (rocky slopes).



Thus, the design of this logo aims to represent the sustainability of the mining activities in harmony with nature, promoting the recovery of the riverside habitats and environmental quality, fostering biodiversity and the existence of species of high value for nature conservation.

Kick-off meeting of LIFE RIBERMINE Project

October, 2nd, 2019



Kick-off meeting of the LIFE RIBERMINE project consortium. From the left to the right: José Francisco Martín Duque (UCM), Jorge Manuel Rodrigues de Sancho Relvas (CCV Lousal), Álvaro Manuel Madureira Pinto (CCV Lousal), Mónica Cristina Martins (CCV Lousal), Javier de la Villa Albareda (Minas-JCCM), Cristina Martín Moreno (UCM), Lázaro Sánchez castillo (CAOBAR), Javier Martínez Fernández (GEACAM), José Carlos Pérez Edrosa (guest), Javier Barrado Gozalo (GEACAM) and Ramón Sánchez Donoso (UCM).

The first coordination meeting of the recently awarded LIFE RIBERMINE (*Fluvial freshwater habitat recovery through geomorphic-based mine ecological restoration in Iberian Peninsula*) project was held, on October the 2nd, 2019, at the premises of the Faculty of Geological Sciences of the Complutense University of Madrid (UCM).

In this meeting, representatives of all partners (CAOBAR, S.A., CCV Lousal, GEACAM, S.A. and UCM), guided by the coordinating partner (JCCM-Minas) laid the foundations to the outset works of this ambitious project. LIFE RIBERMINE is focused on the recovery of ecosystems and river courses affected by mining activities in Alto Tajo (Spain) and Lousal (Portugal) through the restoration of degraded mining areas and applying the best available mining restoration techniques available.

Essential aspects regarding the beginning and development of the works, were discussed. Following this, guidelines were established on the formats and deadlines for the delivery of administrative and financial documentation, remembering the planned actions and tasks distributed according to the schedule of commitments assumed in the project. At this meeting, the partnership agreement

for this Portuguese-Spanish association was also signed.

The consortium that participates in this project is very excited and eager to start working, it can be said that the starting shot was already fired!

Personnel from the Swedish company LKAB, owner of the Kiruna mine, visit the LIFE RIBERMINE scenarios in Alto Tajo

October, 8th, 2019



Personnel from the Swedish Kiruna mine, in front of the Santa Engracia mine (Peñalén, October 2019)

In the last 8th of October, 2019, personnel from the mining and environmental planning departments of the Swedish company LKAB, owner of the largest iron ore mine in Europe (Kiruna, Sweden), visited the Spanish scenery

(Santa Engracia mine, Peñalén, Guadalajara) of the LIFE RIBERMINE project. The visiting group also included consultants from the company's Future Terrains (United Kingdom) and Cedervall (Sweden), specialized in mining restorations.

The reason for the visit was to be informed about the actions that will be carried out by LIFE RIBERMINE, so that they can be applied at the Kiruna mine. At this meeting, an annual visit by this group to the Santa Engracia mine was agreed, to perform a detailed monitoring of the application of different mining restoration techniques on the different sceneries.

"...the first time in the world that both methods are integrated to build a mining restoration."

Start of studies for the application of the Talus Royal® method in the Santa Engracia mine (Peñalén, Spain)

December, 5th and 6th, 2019

Paul Royal, owner of the company Gènie Gèologique sarl (<https://www.2g.fr/>) and inventor of the Talus Royal® method, visited, between the 5th and the 6th of December, the different scenarios of LIFE RIBERMINE in Alto Tajo



José Francisco Martín Duque (UCM) and Paul Royal (Gènie Gèologique sarl) in one of the LIFE RIBERMINE project sceneries in the Alto Tajo.

(Spain) to initiate the necessary studies for the application of this method within the framework of this project. The expert was accompanied by José Francisco Martín Duque (UCM).

Paul Royal made the relevant field observations and annotated the characteristics of the exploitation fronts of the Santa Engracia mine where the Talus Royal® method will be applied together with the GeoFluv™ method. The application of both methods combined is a great achievement for this project, as it will be the first time in the world that both methods are integrated to build a mining restoration.

Coordination of LIFE RIBERMINE visits the Ciência Viva do Lousal Science Center (Portugal)

January, 15th, 2020



Coordination meeting with members of the Portuguese team of the LIFE RIBERMINE project. On the right: Jorge Manuel Rodrigues de Sancho Relvas (CCVL), Javier de la Villa Albares (Minas-JCCM), Alvaro Manuel Madureira Pinto (CCVL). On the left: Monica Cristina Martins (CCVL), Mafalda Time to go Abrunhosa e Sousa (CCVL) and Ana Margarida Coelho Lucas Bica Pereira (CCVL).

The Ciência Viva Lousal Science Center (CCV Lousal), received, on January the 15th, 2020, Javier de la Villa Albares (Minas-JCCM), member of the coordination of the LIFE RIBERMINE project. This was an occasion for the Spanish coordinator to get to know better the only Portuguese partner and to

exchange ideas and clarify practical aspects regarding the internal workings, procedural and administrative actions of the project.

A pilot area will be established in Lousal, applying the techniques of ecological restoration based on geomorphological processes to correct the effects of Acid Mine Drainage (AMD). CCV Lousal will also play an important role in the dissemination and disclosure of LIFE RIBERMINE and its results, namely in the creation of the website and social networks of the project, organization of technical workshops and promotion of various environmental education actions, addressed to different audiences.

“...ecological restoration [...] to correct the effects of The Acid Mine Drainage (AMD).”



Members of the CCVL team, Spanish delegation and coordination of the LIFE RIBERMINE project at the beginning of fieldwork in Lousal.

Starting of the fieldwork in Lousal: collection of aerial images, surveys of soil, water and flora

January, 16th, 2020

The fieldwork at Lousal began on January the 16th, 2020. For two days, a multidisciplinary group of Spanish scientists was on site, with the aim of characterizing the abiotic and biotic environment. Several

samples were collected from different types of soil, waters with different characteristics and species of flora occurring in the region.

It was intended to know the composition and other physical and chemical characteristics of the topsoil, namely its levels of contamination with heavy metals, as well as to individually analyse the different layers of soil occurring along low depth profiles (from 2 to 3 m), until the rock layer is found. In the latter case, some excavations were made to collect the necessary samples, and closed again after it.

Several bodies of water existing in Lousal, namely the Red and Green Lagoons and Ribeira de Corona, as well as the water in the bioremediation tanks, were sampled, to further analysis of various parameters such as pH, the amount of dissolved heavy metals or the suspended solid charge.

The sampling of the flora was mainly aimed at knowing the existing species, as well as the amount of heavy minerals that they accumulate and are present in their organisms.

These samplings will allow to know the reference situation in Lousal before the intervention.

An aerial survey of the physiography and topography of the terrain was also carried out, using a drone. These records are essential for the application of the GeoFluv™-Natural Regrade method and modelling of the terrain to intervene.

The samplings carried out will allow to know the reference situation in Lousal before the beginning of the conservation actions of the LIFE RIBERMINE project.



Cataloging of superficial soil samples.

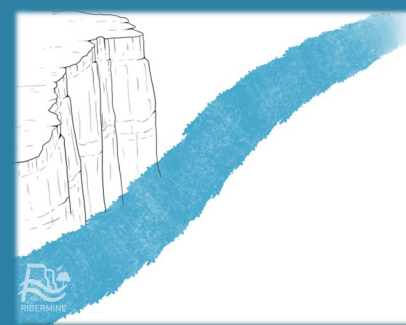


Exploration of Lousal subsoil

February, 2020

A specialized team will perform geophysical explorations of the subsoil of Lousal, using *Electrical Resistivity Tomography – ERT*.

CURIOSITIES



Watercolor karst

In the production of graphic materials, were made several drawings in which the lines of themes related with the LIFE RIBERMINE project are highlighted, like aspects of the intervention fronts, characteristic milestones in the field or the biodiversity.

This karst profile represents the Alto Tajo Natural Park. The carbonated rocks (CaCO_3), in this case limestone, are the most abundant rocks in the Natural Park, giving it this striking image.

Contacts:

Spain:

<https://mineriadclm.castillalamancha.es/>
+34 925 267 800
dgte.desarrollosostenible@jccm.es

Portugal:

www.lousal.cienciaviva.pt
+351 269 750 520 | +351 269 750 522
info@lousal.cienciaviva.pt

Follow us:



<https://liferibermine.com/>



<https://www.facebook.com/liferibermine/>



<https://www.instagram.com/liferibermine/>

CREDITS NEWSLETTER #1

Texts	Mónica Martins (CCVL); Cristina Martín (UCM); Ana Pereira (CCVL)
Design	Ana Pereira (CCVL)
Illustrations	Catarina Bizarro (CCVL)
Photography	© CCVL & UCM



The LIFE RIBERMINE project has been funded with the support of the **LIFE Programme of the European Union**.

This newsletter reflects the views only of the author/s, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

No part of the text or images of this newsletter may be used, sold, resubmitted or reproduced by individuals or organizations, without the express authorization of representatives of the LIFE RIBERMINE consortium.