

Project title:	ROmania Serbia NETwork for assessing and disseminating the impact of copper mining activities on water quality in the cross-border area
Contract no:	116013 from 28/08/2019
eMS:	RoRS 337

REPORT NO.1 OF ALTERNATIVE ENVIRONMENTAL MONITORING

in the areas affected by pollution from the Tăușani - Boșneg mining waste deposit belonging to the former mining company MOLDOMIN Moldova Noua for extraction of the copper ore.

I. Purpose of alternative environmental monitoring.

Alternative monitoring, through voluntary activities, of environmental factors and biodiversity in the border area between Romania and Serbia affected by heavy metal pollution from the Tăușani - Boșneg mining waste deposit, belonging to the former mining company MOLDOMIN Moldova Noua is the main activities of the Nera Ecological Collaboration Group within the project „RoRS 337- ROmania Serbia NETwork for assessing and disseminating the impact of copper mining activities on water quality in the cross-border area (RoS-NET2)“.

Through this activity, the GEC Nera volunteers who work within the project, collect information on the state of environmental factors and biodiversity in these areas as well as on the extent of pollution phenomena. The information is perceived at the level of the basic human senses and the abilities to select this information, according to their relevance for the proposed purpose, have been acquired by volunteers following empowerment training on the alternative monitoring of the environment.

The collected information is recorded in monitoring files and based on them, GEC Nera prepares periodic reports, including conclusions on the state of environmental factors and recommendations on directions of action on stopping pollution and ecological reconstruction of the affected areas. Phenomenon location is embedded on maps that represent catches from www.google.com/maps and a complement to the phenomena presentation is done by making relevant images. When the Leader Beneficiary - West University Timisoara (WUT) requests, samples of water and soil are transmitted to the laboratories of the Faculty of Chemistry, Biology, Geography within the WUT.

The process of alternative monitoring of the environment represents, first of all, an activity of ecological education destined to the students by which they acquire abilities to collect useful information about the phenomenon of pollution with heavy metals of the water and the soil in the area of the unprotected deposit of mining waste Tăușani - Boșneg, left after the former mining company MOLDOMIN Moldova Nouă ceased its activity. The activity of monitoring the heavy metal pollution of the waters and the soil in the area of the Tăușani - Boșneg mining waste is deepened by the partners West University of Timisoara and Mining and Metallurgy Institute Bor in two scientific studies containing data about pollution resulted from copper mining activities in cross-border area of Romania and Serbia, remediation solutions and evaluation of impact of project implementation.



Cooperation beyond borders.

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Alternative environmental monitoring reports are posted on the project web page <http://www.elearning-chemistry.ro/rosnet2/> and are also distributed to the public authorities responsible for implementing environmental policies in this area. These reports are intended to provide alternative information in the area of civil society and to contribute to substantiating decisions to prevent and stop the pollution of heavy metal mining waste that is manifested as an aggression against the natural environment and human settlements.

II. Zones and monitoring periods

Between November 2019 - March 2020, the following alternative environmental monitoring missions were carried out:

- On November 11, 2019 the physical characteristics of the material from the Tăușani - Boșneag mining waste deposit were monitored at the observation point SOL 1 located in the outskirts of Moldova Nouă; of the water from the Radimna stream at the observation point APA 2, located in the outskirts of the locality of Pojejena and of the water from the Nera river in the Socol locality at the observation point APA 1. On this occasion, water samples were also taken.

- On January 6, 2020 the physical characteristics of the material from the Tăușani - Boșneag mining landfill, the water from the Radimna stream and the water from the Nera river were monitored at the same observation points taken into account on November 11, 2019.

- On March 3, 2020, the physical characteristics of the soil from an agricultural land located in the outskirts of the town of Vinci (Golubac commune) were monitored, at the observation point SOL 1 at a distance over the Danube of approx. 2.5 km from the Tăușani - Boșneag deposit and from an agricultural land located in the outskirts of the town of Veliko Gradište at the observation point SOL 2 at a distance over the Danube of approx. 5 km from the Tăușani - Boșneag deposit.

Both observation points are located on the right bank of the Danube on the territory of Serbia, at a distance of 20 m from the water's edge. At the same time, the physical characteristics of the water from the Danube were monitored, at the observation points APA 4 in Vinci and APA 5 in Veliko Gradište, both located near the water's edge.

The exact location of the observation points is included in the maps annexed to the monitoring files.



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III. Status of environmental factors and biodiversity in the monitored area.

a) Water

Turbidity	Temperature (° C)	Smell	Color	Visible pollutants in water	Spread of pollution phenomenon	Visible impact on biodiversity	Pollution source (identified or possible)	Remarks
Date: November 11, 2019								
- The Nera River offers visibility to objects submerged in water up to a depth of 55 cm at Socol.	9,7	-	natural color	-	-	No evidence of degraded biodiversity	-	-A Hanna Instruments thermometer was used. -During the period which observations were made, no relevant precipitation fell and there was no wind that would lead to dust particles of mining waste from the Tăușani - Boșneag deposit.
- Radimna stream offers visibility to objects submerged in water up to the bottom of the riverbed, at a depth of 60 cm at Pojejena.	8,6	-	natural color	-	-	idem	-	
- Boșneag stream offers visibility to the submerged objects in water up to the bottom of the riverbed, at a depth of 15 cm near the Tăușani - Boșneag mining waste deposit in Moldova Noua.	8,1	-	light gray	Fine sandy particles in suspension	The phenomenon occurs over the entire observed length of the watercourse (500 m about)	idem	The pollution comes from the washing of the polluted land with mining waste in the vicinity of the Tăușani - Boșneag deposit, through which the water stream flows.	
Date: January 16, 2020								
- The Nera River offers visibility to objects submerged in water up to a depth of 61 cm at Socol.	6,3	-	natural color	-		No evidence of degraded biodiversity		-A Hanna Instruments thermometer was used. -During the period which observations were made, no relevant precipitation fell and there was no wind that would lead to dust particles of
- Radimna stream offers visibility to objects submerged in water up to the bottom of the riverbed, at a depth of 64 cm at Pojejena.	6,6	-	natural color	-		idem		



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- Boşneag stream offers visibility to the submerged objects in water up to the bottom of the riverbed, at a depth of 16 cm near the Tăuşani - Boşneag mining waste deposit in Moldova Noua.	5,2	-	light gray	Fine sandy particles in suspension	The phenomenon occurs over the entire observed length of the watercourse (500 m about)	idem	The pollution comes from the washing of the polluted land with mining waste in the vicinity of the Tăuşani - Boşneag deposit, through which the water stream flows.	mining waste from the Tăuşani - Boşneag deposit.
Date: March 6, 2020								
- The Danube River offers visibility to objects submerged in water up to a depth of 18 cm at Veliko Gradište and up to a depth of 21 cm at Vinci.	6,6	In both observation points the water has the smell of sewage	Natural color altered by organic substances	Stains or strands of fuel / grease and plastic packaging	The phenomenon occurs over the entire observed length of the watercourse (1 km about)	No evidence of degraded biodiversity	Mainly, the sewerage of the upstream localities that do not have a sewage treatment plant and the waste water flows directly into the Danube	-A Hanna Instruments thermometer was used. -During the period which observations were made, no relevant precipitation fell and there was no wind that would lead to dust particles of mining waste from the Tăuşani - Boşneag deposit.

b) Soil

Name of pollutants identified at the point of observation or description of pollutants by easily recognizable characteristics when their nature is unknown.	The way pollution occurs.	Smell	Color	Spread of pollution phenomenon	Visible impact on biodiversity	Pollution source (identified or possible)	Remarks
Date: November 11, 2019							
-Material in the form of fine sand deposited on the entire surface of the former tailings pond Tauşani - Boşneag.	Dump on the surface of the pond of industrial water from the copper preparation plant and subsequently the evaporation of water.	Sulfur, mud	Yellow, brown, reddish	120 ha	Lack of vegetation on 90% of the pond surface. In the places where the water from the rainfall swells spontaneous vegetation has developed	The activities of the former mining company MOLDOMIN Moldova Nouă	During the observations, the wind did not blow to exfoliate dust particles from mining waste from the Tăuşani - Boşneag deposit. Information on how the pollution occurs and on the source of pollution was provided by the environmental service of the Moldova Nouă Municipality.



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Date: January 16, 2020							
-Material in the form of fine sand deposited on the entire surface of the former tailings pond Tăușani - Boșneag.	Dump on the surface of the pond of industrial water from the copper preparation plant and subsequently the evaporation of water.	Sulfur, mud	Yellow, brown, reddish	120 ha	Lack of vegetation on 90% of the pond surface. In the places where the water from the rainfall swells spontaneous vegetation has developed	The activities of the former mining company MOLDOMIN Moldova Nouă	During the observations, the wind did not blow to exfoliate dust particles from mining waste from the Tăușani - Boșneag deposit. Information on how the pollution occurs and on the source of pollution was provided by the environmental service of the Moldova Nouă Municipality.
Date: March 6, 2020							
- Agricultural land located in the village of Veliko Gradište and agricultural land located in the outskirts of the village Vinci polluted with sandy dust.	The transport by the wind, over the Danube, of the sandy dust from the surface of the Tăușani - Boșneag waste deposit.	-	Yellow,	4500 ha of degraded agricultural land on the territories of communes of Golubac and Veliko Gradište	Modification of soil composition and texture, 40% reduction of agricultural production on the affected lands according to information provided by local authorities.	Idem	During the observations, the wind did not blow to exfoliate dust particles from mining waste from the Tăușani - Boșneag deposit. Information on how the pollution occurs, the source of pollution and the magnitude of the phenomenon were provided by the environmental service of Golubac and Veliko Gradište City Councils.



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C) Air

During the monitoring period, on the site of the Tausani - Boșneag pond no dust storms were observed that pollute the air with particles of mining waste.

IV. Recommendations regarding the actions for preventing / mitigating / stopping the aggression with mining waste containing heavy metals against environmental factors in the area of the Tăușani - Boșneag deposit.

- Elaboration of a study on procedure to remove / neutralize copper and other heavy metals from waste waters and acid mine drainage streams by the West University of Timisoara and the Institute of Mining and Metallurgy and Bor. The measure was taken by the Western University of Timisoara and the Institute of Mining and Metallurgy and Bor through the implementation of RoRS 337 project.

- Implementation of measures to remove / neutralize copper and other heavy metals from waste waters and acid mine drainage streams.

- Implementation of ecological reconstruction measures of the polluted surfaces with heavy metal mining waste.

- Stopping the deflation of the material on the surface of the Tăușani - Boșneag deposit.

- The reintroduction in the agricultural circuit of the rehabilitated lands.



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ANNEX 1

Location on Google maps of the observation points within the alternative environment monitoring



General map of the observation points



Observation point APA 1 on the Nera River in Socol



Observation point APA 2 on the Radimna River
located on the outskirts of Pojejena



Observation points APA 3 on the Boșneag River and Observation points SOL 1 inside the
Taușani - Boșneag mining waste deposit on the outskirts of Moldova Nouă

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Observation points SOL 3 and APA 5 located on the outskirts of Veliko Gradiste (Serbia)



Observation points SOL 2 and APA 4 located on the outskirts of Vinci (Serbia)

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ANNEX 2

Relevant images during alternative environmental monitoring.



Mining wastes from the Tăușani -Boșneag deposit in Moldova Nouă



Degraded agricultural land in Vinci