

CoalMine - Coal mining wastes: assessment, monitoring and reclamation of environmental impacts through remote sensing and geostatistical analysis.

J. Ribeiro¹, L. Duarte², J. Espinha Marques², C. Mansilha³, R. Fonseca⁴, A.C. Teodoro², J.A. Gonçalves⁵,
D. Flores²

¹Instituto Ciências da Terra - Pólo da Faculdade de Ciências da Universidade do Porto e Departamento de Ciências da Terra da Faculdade de Ciência e Tecnologia da Universidade de Coimbra, Portugal.

²Instituto Ciências da Terra - Pólo da Faculdade de Ciências da Universidade do Porto e Departamento de Geociências, Ambiente e Ordenamento do Território da Faculdade de Ciências da Universidade do Porto, Portugal.

³REQUIMTE, Universidade do Porto, Portugal.

⁴Instituto Ciências da Terra - Pólo da Universidade de Évora e Departamento de Geociências da Universidade de Évora, Portugal.

⁵CIIMAR e Departamento de Geociências, Ambiente e Ordenamento do Território da Faculdade de Ciências da Universidade do Porto, Portugal.

CoalMine is a research project approved by the FCT within the last call AAC nº 02/SAICT/2017, consisting of a consortium of two research units – ICT (Porto and Évora poles) and Requitme - combining geosciences, chemistry and surveying engineering expertise. This project was designed and planned following studies carried out aiming to contribute to the management of environmental problems associated with self-burning coal waste piles, involving continuous assessment and identification of evolution scenarios, looking at the implementation of corrective/preventive actions to minimize the impact of these natural combustion processes. The self-burning of coal mobilizes large amounts of pollutants, particulate matter, organic compounds, and toxic trace elements that can be emitted, released or leached to soils, waters and air of the surrounding environment. The comprehensive characterization of materials that constitutes the self-burning coal waste piles in Douro Coalfield, which is essential for the identification of the potential impacts caused in the environment, was already developed. The main goal of this project is the characterization and quantification of the impacts on surrounding environment, ecosystems and health of population living nearby São Pedro da Cova waste pile, located near a population centre and social infrastructures. The investigation of the impacts on soils, water and air of the surrounding area of the S. Pedro da Cova waste pile will allow the identification of elements that can be potentially hazardous for the ecosystems and human health. The geochemical composition of soils and water collected in the surrounding area of São Pedro da Cova waste pile will be determined and the combustion temperature and mass movements will be monitored through remote sensing techniques. The spatial distribution in the contaminated areas through the quantification of pollutants and analysis of pollution extent will be attained using spatial analysis and geostatistical algorithms improving the estimation of the exposure factors in the limited area and characterizing the environmental and health risks exploiting the derived geospatial data. The dissemination of the results is expected to contribute for scientific knowledge and to provide valuable information for decision makers about the mitigation or reclamation of environmental impacts.

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