

# ASSESSMENT OF ENVIRONMENTAL CHANGES DURING MINING OF FELDSPAR DEPOSITS IN UKRAINE

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## Introduction

The relevance of assessing the impact of feldspar mining on the environment is associated with an increase in the scale of production. In Ukraine, dozens of deposits are mined for use in the construction and production of ceramics. Globally feldspar consumption has been gradually increasing in ceramics, glass industry for solar panels, housing, and building construction.

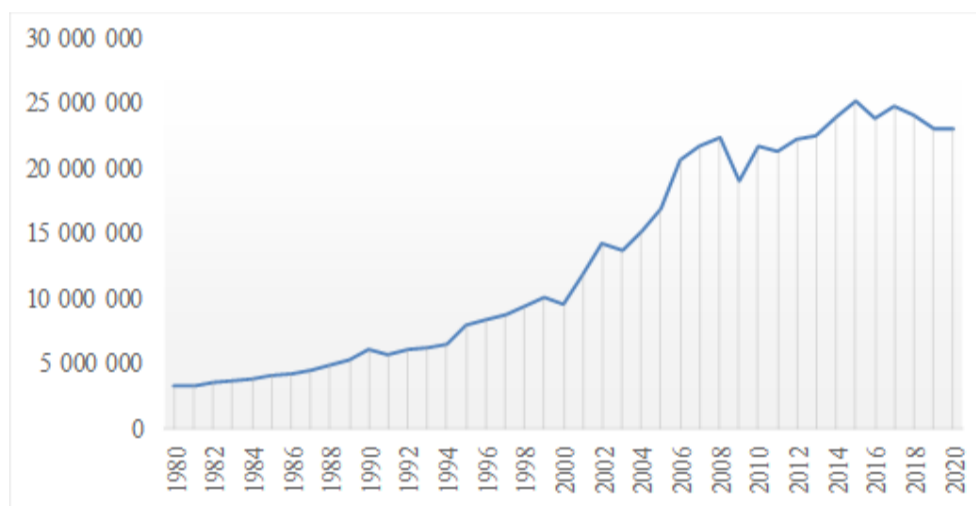


Figure 1. Feldspar global production dynamics in metric tons (according to statistical data usgs.gov)

The Total production of feldspar raw materials in Ukraine amounted to 634.63 thousand tonnes in 2019.

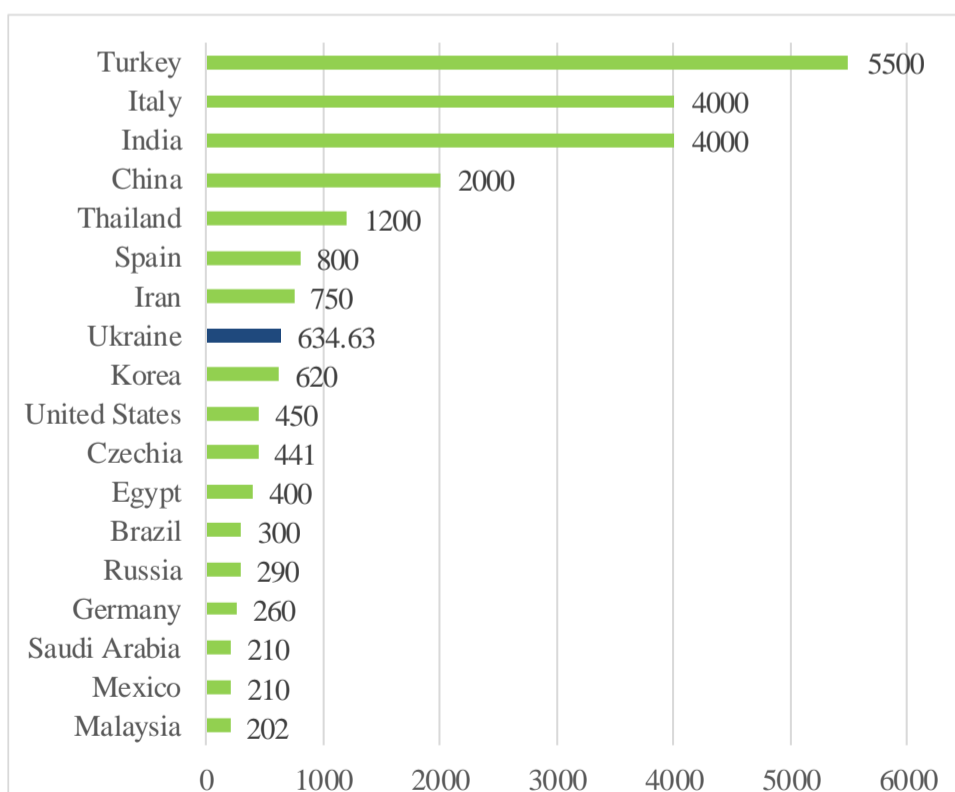


Figure 2. Feldspar production in 2019 by country (according to statistical data usgs.gov, and statistical data for Ukraine - State Information Geological Fund of Ukraine)

## Conclusion

Objects of negative impact for different types of deposits are highlighted:

- 1) for pegmatite deposits and deposits of crystalline rocks it is open-pit, drilling and blasting operations, crushing plant, overburden dumps;
- 2) for kaoline deposits it is (except for the above) processing plant for dry, wet, and electromagnetic separation, tailings;
- 3) for multicomponent deposits - underground mine, processing plant, tailings.

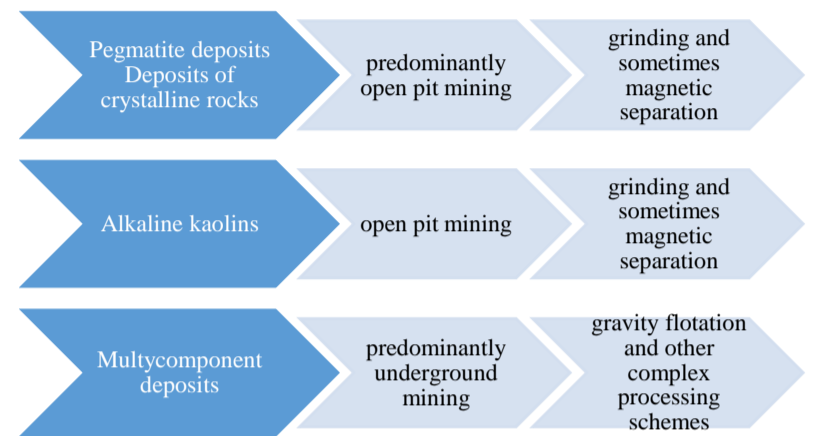


Figure 3. Features of mining methods and processing of feldspar raw materials by the type of deposits

Environmental impact assessment is mandatory in Ukraine for mining enterprises and for feldspar, deposits have their peculiarities. The main source of feldspar raw materials in Ukraine is multi-component deposits. These objects belong to different genetic and mining types, which determines the impact on the environment that occurs during development. The following diagram illustrates the features of mining methods and the processing of feldspar raw materials by the type of deposits (figure 3).

Table 1. Main objects of influence on the environment for feldspar deposit un Ukraine

Type of deposit	List of feldspar deposit un Ukraine	The main objects of influence on the environment
Pegmatite deposits	Bilchakivske, Ustia village, Hruzlivetske, Lozuvatske, Volodymyrivske, Balka Velykoho Taboru	Open-pit, drilling and blasting operations, crushing plant, overburden dumps
Deposits of crystalline rocks	trachytes of the Verbova site, microgranodiorites of the Dubrynetske deposit	
Alkaline kaolins	Prosvianivske, Pershozvanivske, Biliayivske, Katerynivske	Open-pit, crushing, and grinding plant, overburden dumps, processing plant for dry, wet, and electromagnetic separation, tailings
Multicomponent deposits	Bakhtyn (fluorite ores), Nosachivske (titanium-ilmenite ores), Perzhanske deposits of rare metals, Mazurivske (tantalum and niobium ores)	underground mine, processing plant (gravitation, flotation, and electromagnetic separation), tailings

Possible negative impacts on the environment during open-pit mining of feldspar deposits are air pollution, soil destructions, change of relief, a local decrease in groundwater level, pollution by sewage, and waste. For underground mines, important changes are disturbances in the rock mass and its stability, changes in the regime and composition of surface and ground waters. For all facilities where there are processing plants, the development and condition of tailing dumps and the possibility of processing waste are critical.

Important and effective measures for improving facilities are the reduction of disturbed mining areas and their early reclamation, backfilling during underground mining, the maximum extraction, and processing of all useful components of minerals, which reduces the amount of production waste.