



FRAME

FORECASTING AND ASSESSING EUROPE'S
STRATEGIC RAW MATERIALS NEEDS

WP7 Historic Mine Sites revisited

Deposit Fact Sheet

Radzimowice

Authors: Stanisław Z. Mikulski



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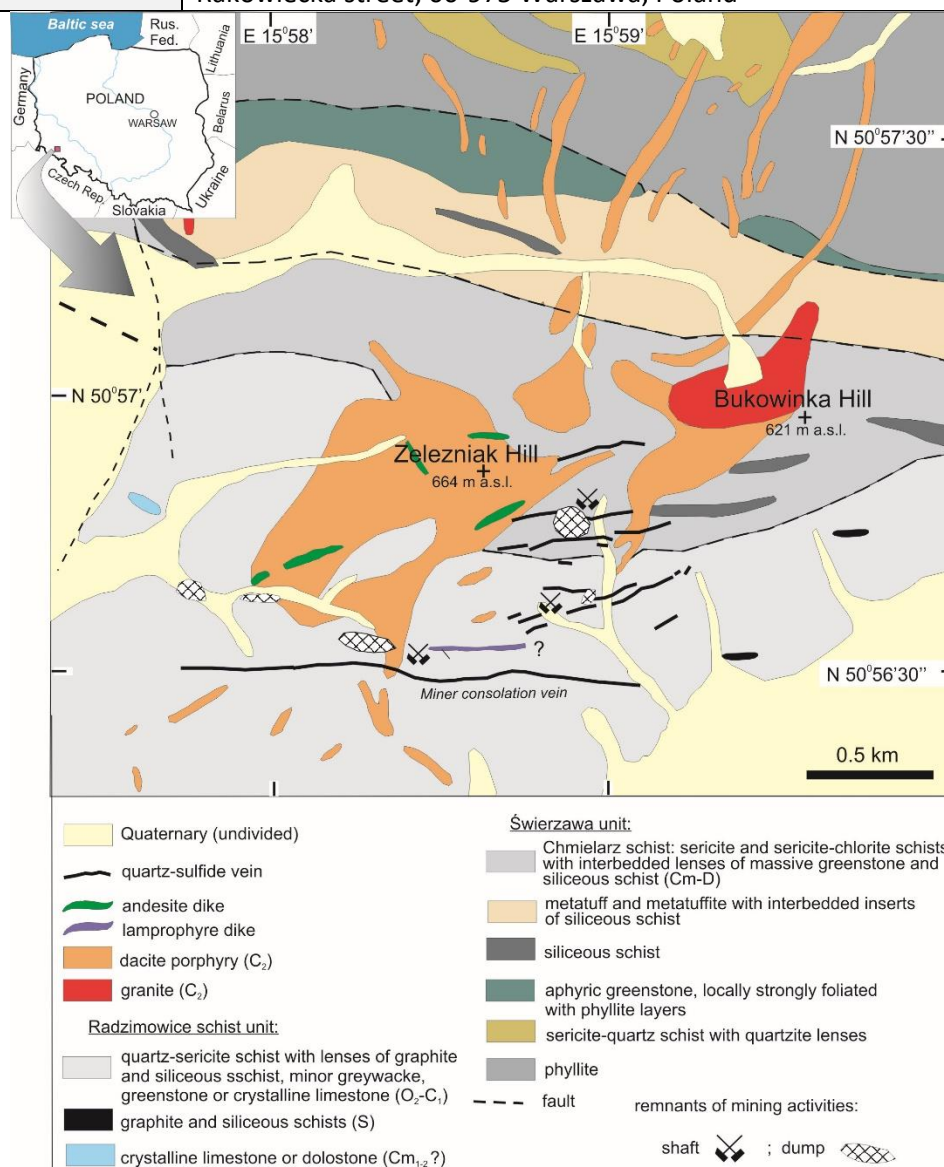




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Name of deposit	Radzimowice
Author	Stanisław Z. Mikulski Polish Geological Institute-National Research Institute (PGI-NRI), 4 Rakowiecka street; 00-975 Warszawa, Poland



(Source: <https://geojournals.pgi.gov.pl/asgp/article/view/20760/15031>)

Location	Country	(nearest) Town	Coordinates	
	Poland	Wojcieszów	Latitude	Longitude
			50.945313	15.979994



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Main Commodity/ies	As	Cu	Pb
By-products	Au	Ag	
CRM potential	Bi	Te	Co

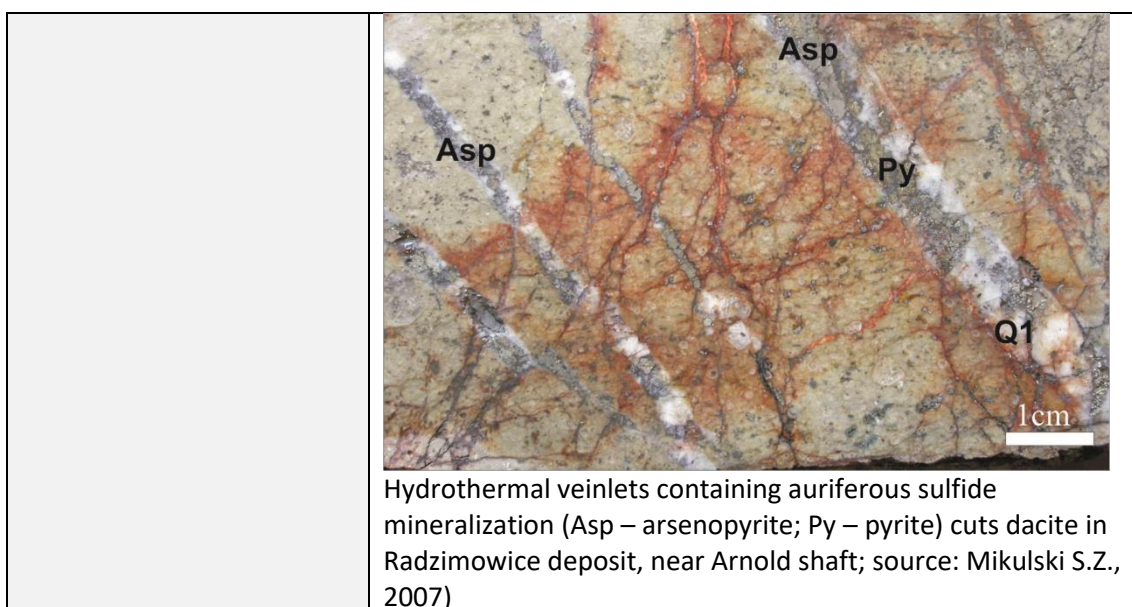
Type of deposit	Mine waste		
Mine Status	closed		
Period of activity	Start	End	
	Before 1300	1957	
Production	Cumulative historic production (period)	Tonnage	Type
	19 th -20 th century	ca. 0.5 Mt 12,500 t Cu 4.2t Au 40 t Ag 25,000 t As	Cu-As ores metal content

Regional Geology		
Host rock(s)	Age of host rock	
Dacite, rhyolite, quartz-sericite schists, graphite schist	Cambrian/Ordovician; Carboniferous/Permian	
Mineralization		
Ore forming minerals	Age of mineralization	Ore grade
Chalcopyrite, arsenopyrite, pyrie, sphalerite, galena, cobalite, electrum, Bi-Te minerals	Carboniferous	1-20 g/t Au, 39-306 g/t Ag, 2-60 kg/t Cu,
Deposit Type	Transition between porphyry and epithermal vein-type	



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Access restrictions	yes	no	unknown
		no	
	Type of restrictions		
Ownership	mine is closed		
	Type of owner	Name	
	State		

References	Literature	Links
	MIKULSKI S.Z. 2005. Geological, mineralogical and geochemical characteristics of the Radzimowice Au-As-Cu deposit from the Kaczawa Mts. (Western Sudetes, Poland) - an example of the transition of porphyry and epithermal style. <i>Mineralium Deposita</i> 39(8): 904-920. DOI: 10.1007/s00126-004-0452-x	https://link.springer.com/article/10.1007/s00126-004-0452-x

Remarks
High geological potential for new ore resources and CRM, access to underground workings, mine wastes



Summary of results from studies during the FRAME project

Type of activity/achievement	Method	Results
NEW FIELD WORK	Field work using portable XRF spectrometer for initial X-ray rock examination.	pXRF prospecting from the old mining wastes (10 samples): elevated concentrations of Cu, As, Zn, Fe, Au and Ag as well as critical elements, such as Bi, Te, Co, Sb and W.
NEW ANALYSIS AND RESEARCH APPLIED	(1) Portable XRF spectrometer; (2) Geochemical methods: (a) WD-XRF, (b) ICP-MS, and (c) GF-AAS; (3) ore microscopy in reflected and transmitted lights (NIKON ECLIPSE LV100 POL); (4) electron microprobe (EMPA) CAMECA SX-100; (5) electron microscope LEO-1430 (ZEISS) with EDS detector	5 selected ore samples from two biggest mining waste (areas near the Luis and Arnold shafts) were subject of complex geochemical and mineralogical studies. Ad. (a) The content of trace elements were determined in pressed powder 5 new samples (As, Ba, Bi, Br, Cd, Ce, Co, Cr, Cu, Ga, Hf, La, Mo, Nb, Ni, Pb, Rb, Sn, Sr, Th, U, V, Y, Zn, and Zr). Analyses were performed by wavelength dispersive X-ray fluorescence spectrometry (WD-XRF) method using a Philips PW-2400 spectrometer. ad. (b) The content of trace elements (Ag, In, Re, Sb, Se, Te, Tl, and W) were determined after decomposition with a full mixture of HCl, HNO ₃ , HF, and HClO ₄ acids using a Perkin Elmer ICP-MS Elan DRC II mass spectrometer by means of the inductively coupled plasma mass spectrometry (ICP-MS). ad. (c) Au, Pd, and Pt were measured using a Perkin Elmer model 4100 ZL spectrometer by graphite furnace atomic absorption spectrometry (GF AAS) method). Elevated concentrations of critical elements (Bi, Co, and Te) as well as Au and Ag and associated elements (As, Cu, Zn and Pb) were revealed in 5 representative samples collected from the post-mining heap waste near the Luis and Arnold shafts.



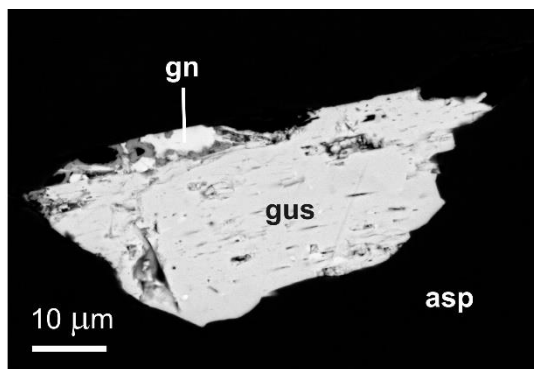
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NEW DATA

Identification of bismuth and tellurium minerals in polymetallic ores collected from mining wastes.

EMPA investigation revealed number minerals of Bi, Te, Ag, Pb and S (sulphur salts) associated with base metal sulphides and carbonates that overprinted an older and a high temperature ore mineralization represented by Cu-As-Fe sulphides and W-Ti oxides. Most gold occurs as refractory gold in Co-bearing arsenopyrite and pyrite. Besides, gold was also often found as micro-size particles within fractured arsenopyrite and pyrite. Critical elements such as Bi, and Te and Co formed own tiny minerals in size from a few up 100 microns in diameter. Cobalt, occurs commonly as a high admixture in arsenopyrite. However, small crystals of cobaltite were also found.

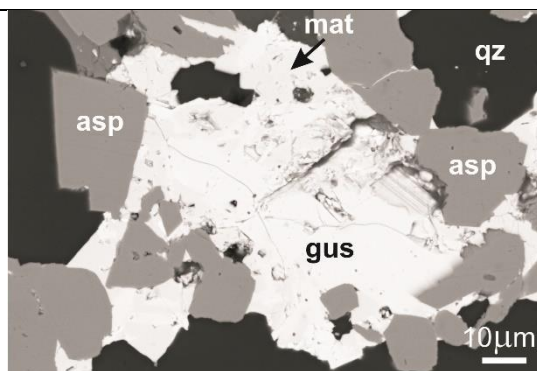


BSEI of gustavite (gus; $\text{AgPbBi}_3\text{S}_6$) with galena (gn) within fractured arsenopyrite crystal (asp). R4 ore sample from the mining waste near the Luis shaft in the Radzimowice historic deposit.



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BSEI of arsenopyrite replaced by gustavite (gus; $\text{AgPbBi}_3\text{S}_6$) and matildite (mat; AgBiS_2). R5 sample of As-Cu-Au ore from the mining waste near the Luis shaft in the Radzimowice historic deposit.