EXPLORATION "MADE IN EUROPE" – THE GREENPEG TOOLSET AT A GLANCE

The GREENPEG toolset provides an integrated, multi-method/resource package for pegmatite exploration which can be tailored to the geology and broader characteristics and challenges of an exploration area, as well as specific customer needs in terms of goals, experience and budget. Exploration services and expertise offered by GREENPEG partners:

- Tools developed from knowledge, experience and innovations gained during the four-years EU-funded GREENPEG project, based on four active European pegmatite exploration areas.
- Complementary suite of adjusted conventional and newly invented methodologies, new data processing approaches, three technological innovations and two new databases.
- Individual tools provide vectors towards buried pegmatite-related mineralisation, such as lithium, high-purity quartz and tantalum, to maximise the success of subsequent more costly exploration.
- Tools are optimised for the target size, surface environment, depth, geological setting, mineralogy, chemistry and petrophysics of pegmatite ore deposits.
- Tool combinations can be used at province, district and/or prospect scale.

Interested in the toolset and its verified individual methods? Contact us!

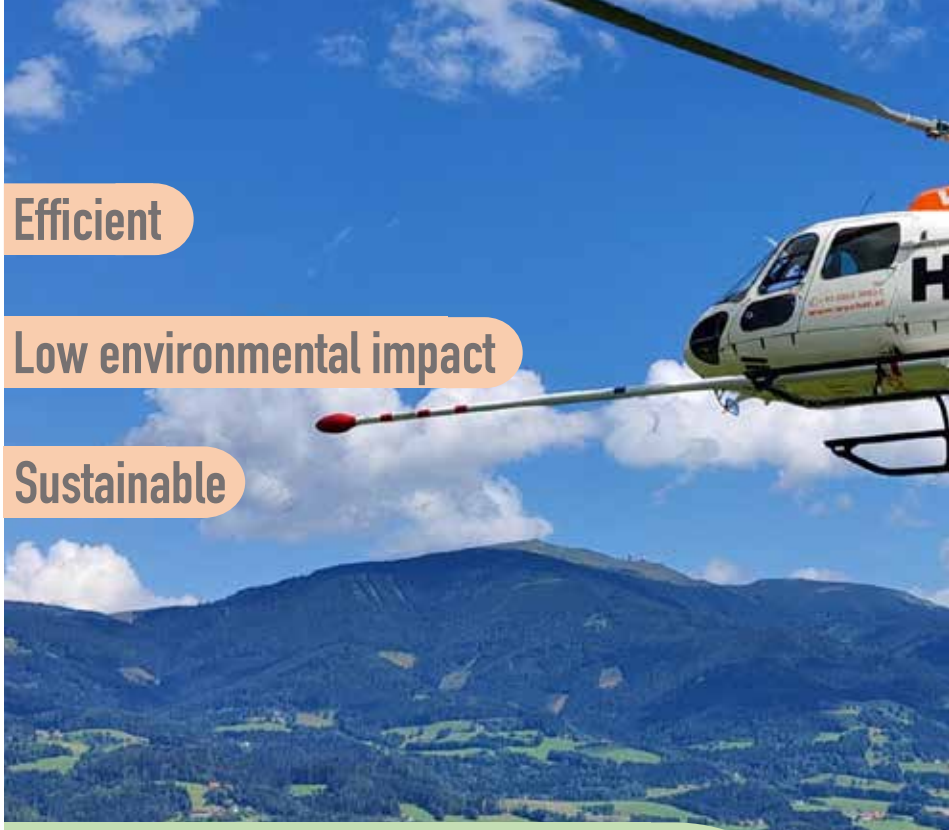
Prof Dr Axel Bernd Müller
Natural History Museum, University of Oslo
Email: a.b.muller@nhm.uio.no

GREENPEG®

Internet
https://www.greenpeg.eu

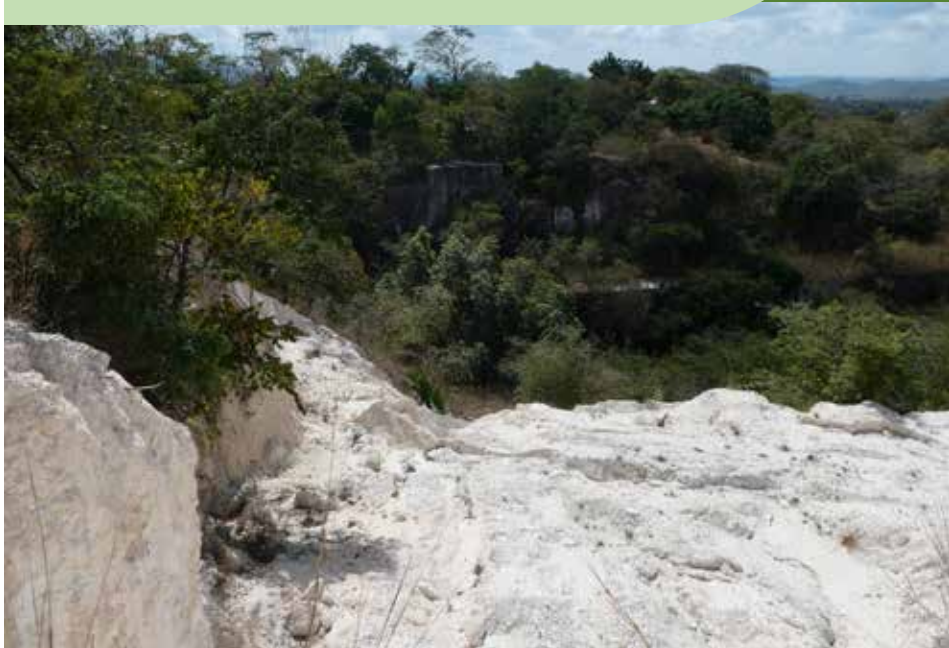
Layout and text: GKZ Freiberg eV Photos: terratec, UIO, NGU

Funded by the Horizon 2020 Framework Programme of the European Union GAP 869274



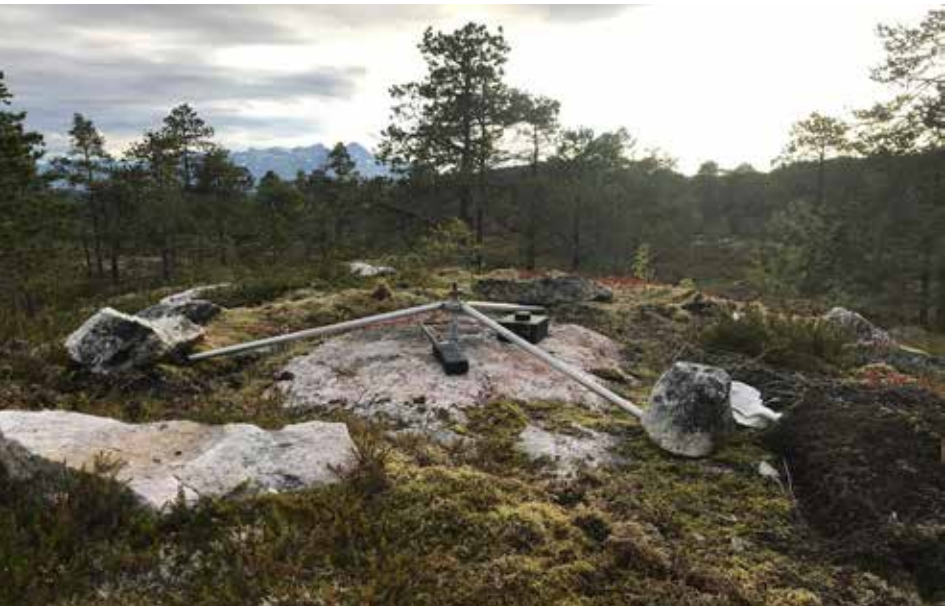
Reduced costs in pegmatite exploration

GREENPEG Toolset



KEY DEVELOPED AND/OR VERIFIED EXPLORATION METHODS

Scale	Exploration method validated
Province scale (500 – 10,000 km^2)	Spectral identification of outcropping pegmatites
	Morphological identification of pegmatites using laser imaging, detection and ranging
	Remote-sensing-supported analysis of regional structures
	Spectral library of pegmatite ores and their wall rocks
District scale (25 – 500 km^2)	Airborne high-resolution magnetics with nose stinger
	Airborne high-resolution radiometry with nose stinger
	Airborne high-resolution electromagnetics
Prospect scale (<25 km^2)	Drone-borne radiometry
	Drone-borne hyperspectrometry
	Electric Resistivity Tomography: Resistivity and Induced Polarization
	Ground magnetics
	Ground spectral radiometry
	Ground penetrating radar
	Ground gravimetry
	Piezoelectric seismograph
	Geological mapping
	Prospect scale structural analysis
	Bulk rock geochemical mapping
	LIBS halo mapping
	Wall rock halo mapping using bulk rock chemistry
	Trace-element-in-quartz mapping
	Stream sediment geochemical mapping
	Soil A- and C-horizon geochemical mapping
	Borehole logging
	Petrophysical database of European pegmatite ores and wall rocks
All scales	Environmental, social and governance best practice in exploration for pegmatites



STRUCTURE OF THE GREENPEG EXPLORATION TOOLSET

<table>
<tr><td>Knowledge development</td><td colspan="3">State-of-the-art in pegmatite definition and genetic models and environmental, social and governance best practices for exploration</td></tr>
<tr><td>Desk study</td><td colspan="3">Geological environment:
• Understanding of the geological and geographical setting of the target pegmatites
• Analysis of available datasets and application of the mineral systems approach

Exploration environment:
• Analyse the logistical, political and social environments of the exploration area
• Develop a community relations strategy
• Combine mappable desk study information using GIS

Financial environment:
• Evaluate financial limitations on which methods can be applied</td></tr>
<tr><td>Choice of exploration scale</td><td>Province scale</td><td>District scale</td><td>Prospect scale</td></tr>
<tr><td>Choice of exploration methods</td><td colspan="3">• Choose methods and method combinations using the GREENPEG flowchart
• Quantify the number and duration of activities for each method
• Assess the environmental and social impacts of the methods proposed
• Order of exploration activities
• Perform regular review of community consultation during method deployment</td></tr>
<tr><td>Data integration</td><td colspan="3">• Integration of desk study and exploration results at different scales
• Review of environmental, social and governance implications and benefits</td></tr>
</table>

The GREENPEG toolset will be published in 2024 in a Special Bulletin of Economic Geology of the Society of Economic Geologists.