



DELIVERABLE 4.1

LIST OF THE PEER-REVIEWED PUBLICATIONS

ENeRAG

Excellency Network Building for Comprehensive Research and Assessment of Geofluids

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Date: **7.12.2018**

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Deliverable administration				
Deliverable No. and title	D4.1 List of the peer-reviewed publications			
Work package	WP4			
Status of the document	Final	Due month	M2	Date 7.12.2018
Author(s)	Timea Havril			
Lead beneficiary	ELTE			
Dissemination level	Public (Open Research Data Pilot)			
Description of the related task and the deliverable	List of publications before the starting date of the project (published between 01.10.2015 – 30.09.2018)			
Participants	ELTE, GTK, UMIL			
Comments				
Version	Date	Author(s)	Description	
0.1	03.12.2018	Timea Havril	First Draft	
1.0	7.12.2018	Timea Havril	Final	

About the ENeRAG project

The 'Excellency Network Building for Comprehensive Research and Assessment of Geofluids'-ENeRAG project significantly strengthen research and innovation capacities in geofluids' research and aligned geological resource assessment of groundwater, geothermal energy and hydrothermal mineral resources at Eötvös Loránd University (ELTE, Hungary) by capacity enhancement through cooperation with Geological Survey of Finland (GTK) and University of Milan (UMIL, Italy), with 7 supporting stakeholders. The ENeRAG raises the research profile and excellence of ELTE in comprehensive understanding, tracing and modelling of geofluid systems focusing on their interrelationships through 4 staff exchanges, organisation of 5 sessions and attendance on 9 high-level international conferences; through joint open access publications (15 +1 special issue). It will ensure to fill networking gaps and deficiencies of ELTE, and enhance the S&T and innovation capacity in the field of sustainable development and eco-friendly exploitation of geofluids and their resources by 6 training workshops, 2 innovative video trainings, 1 summer and 1 winter school, expert visits, 3 laboratory and field trainings. Due to ENeRAG ELTE improves its innovative capability to gain national and international EU funding, and to furtherly widen cooperation through agreements with institutes and stakeholders. The ENeRAG contributes to improved knowledge transfer and to aligned interpretation and sustainable utilisation of geofluids in Hungary. The project and its resulted guideline strengthen the hands-on hands experience in geofluid research, legislation and exploitation. The ENeRAG guideline provides a missing novelty service, gives base for prioritization of geofluid-related resources in Hungary and in the EU. Consequently, ENeRAG improves stakeholder experience, legislation and contribute to the dissemination of knowledge toward the scientific community and the society on national and EU level.



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1. PEER-REVIEWED PUBLICATIONS OF GTK

Author(s), Year, Title, Journal	DOI
Arola T. Witick I. Kouvo J. Kuusela J. 2018. Preliminary research of eight possible groundwater energy utilisation sites in Southern Finland. Proceedings of the IGSHPA Research Track, Stockholm September 18-20, 2018. Conference publication.	doi: 10.22488/okstate.18.00005
Arola T. 2015. Groudwater as an Energy Resource in Finland. 2015. University of Helsinki – A36. Doctoral thesis. Unigrafia. Helsinki Finland.	
Arola T. Okkonen J. Jokisalo J. 2016. Groundwater utilisation for energy production in the Nordic environment: an energy simulation and hydrogeological modelling approach. Journal of Water Resource and Protection 8, 642-656.	doi: 10.4236/jwarp.2016.86053
Benkó, Z., Mogessie, A., Molnár, F., Severson, M.J., Hauck, S.A., Raic, S. (2015): Partial melting processes and CU-Ni-Pge mineralization in the footwall of the South Kawishiwi intrusion at the Spruce Road deposit, Duluth Complex, Minnesota. Economic Geology, 110, 1269-1293.	doi: 10.2113/econgeo.110.5.1269
Bianchi, M., D. Pedretti (2017) "Geological entropy and solute transport in heterogeneous porous media". Water Resour. Res. 53 (6), pages 4691-4708,	doi: 10.1029/2018WR022827
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Blackmore, S., D. Pedretti, K.U. Mayer, L. Smith, R.D. Beckie (2018) "Evaluation of single- and dual-porosity models for reproducing the release of external and internal tracers from heterogeneous waste-rock piles", Journal of Contaminant Hydrology 214, pages 65-74,	10.1016/j.jconhyd.2018.05.007
Drake, H., J. Suksi, E.-L. Tullborg, and Y. Lahaye, 2017. Quaternary redox transitions in deep crystalline rock fractures at the western margin of the Greenland ice sheet. Applied Geochemistry 76: 196-209.	10.1016/j.apgeochem.2016.12.001
Guice, G.L., T. Törmänen, B.T. Karykowski, B. Johanson, and Y. Lahaye, 2017. Precious metal mineralisation in the Sotkavaara Intrusion, northern Finland: Peak Pt, Pd, Au and Cu offsets in a small intrusion with poorly-developed magmatic layering. Ore Geology Review 89: 701-718.	10.1016/j.oregeorev.2017.07.010
Huhma, H., Hanski, E, Kontinen, A., Vuollo, J., Mänttari, I. & Lahaye, Y. 2018. Sm-Nd and U-Pb isotope geochemistry of the Palaeoproterozoic mafic magmatism in eastern and northern Finland. Geological Survey of Finland, Bulletin 405, 150 pages, 128 figures, 1 table and 11 appendices	https://doi.org/10.1016/j.gexplo.2018.01.012
Hulkki, H., Taivalkoski, A., Lehtonen, M., 2018. Signatures for Cu (-Au) mineralization reflected in inorganic and heavy mineral stream sediments at Vähäkurkkio, northwestern Finland. Journal of Geochemical Exploration 188 (156-171).	10.1016/j.gexplo.2018.01.012



Hölttä, P., E. Lehtonen, Y. Lahaye, and P. Sorjonen-Ward, 2016. Metamorphic evolution of the Ilomantsi greenstone belt in the Archaean Karelia Province, eastern Finland. Geological Society, London, Special Publications 449.	10.1144/SP449.7
Kara, J., M. Väisänen, Å. Johansson, Y. Lahaye, H. O'Brien, and O. Eklund, 2018. 1.90-1.88Ga arc magmatism of central Fennoscandia: geochemistry, U-Pb geochronology, Sm-Nd and Lu-Hf isotope systematics of plutonic-volcanic rocks from southern Finland. <i>Geologica Acta</i> , 16: 1-23.	10.1344/GeologicaActa 2018.16.1.1
Kiss, G., Molnár, F., Palinkas, L.A. (2016): Hydrothermal processes related to some Triassic and Jurassic submarine basaltic complexes in northeastern Hungary, the Dinarides and Hellenides. <i>Geologia Croatica</i> , 69, 39-64.	
Konnunaho, J.P., E.J. Hanski, T.T. Karinen, Y. Lahaye, and H.V. Makkonen, 2018. The petrology and genesis of the Paleoproterozoic mafic intrusion-hosted Co-Cu-Ni deposit at Hietakero, NW Finnish Lapland. <i>Bulletin of the Geological Society of Finland</i> 90: 109-136.	10.22488/okstate.18.0 00033
Krogerus, K. & Pasanen, A. (eds.), Kolhinen, V., Larkins, C., Vento, V., Hentinen, K., Pullinen, A., Luoma, S., Jakkila, J., Lerssi, J., Vehviläinen, B., Kaipainen, T., Mroueh, U-M., Majaniemi, J., Huttunen, M., Turunen, K., Korkealaakso, J., & Korppoo, M. 2016. Management of water balance in mining areas – WaterSmart Final report. Finnish Environment Institute 39/2016.	https://doi.org/10.1111/1/jmi.12661
Käpyaho, A., Molnár, F., Sorjonen-Ward, P., Mänttari, I., Sakellaris, G., Whitehouse, M.J. (2017): New U-Pb age constraints for the timing of gold mineralization at the Pampalo gold deposit, Archaean Hattu schist belt, eastern Finland, obtained from hydrothermally altered and recrystallized zircon. <i>Precambrian Research</i> , 289, 48-61.	10.1016/j.precamres.2 016.11.004
Lahtinen, R., H. Huhma, Y. Lahaye, S. Lode, S. Heinonen, M. Sayab, and M.J. Whitehouse, 2016. Paleoproterozoic magmatism across the Archean-Proterozoic boundary in central Fennoscandia: Geochronology, geochemistry and isotopic data (Sm-Nd, Lu-Hf, O). <i>Lithos</i> 262: 507-525.	https://doi.org/10.1016/j.apgeochem.2018.01.005
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Li, Z.-K., J.-W. Li, D.R. Cooke, L. Danyushevsky, L. Zhang, H. O'Brien, Y. Lahaye, W. Zhang, and H.-J. Xu, 2016. Textures, trace elements, and Pb isotopes of sulfides from the Haopinggou vein deposit, southern North China Craton: implications for discrete Au and Ag-Pb-Zn mineralization. <i>Contributions to Mineralogy and Petrology</i> 171: 99.	doi:10.2136/vzj2016.0 5.0039.
Luolavirta, K., E. Hanski, W. Maier, Y. Lahaye, H. O'Brien, and F. Santaguida, 2018. In situ strontium and sulfur isotope investigation of the Ni-Cu-(PGE) sulfide ore-bearing Kevitsa intrusion, northern Finland. <i>Mineralium Deposita</i> .	10.1007/s00126-018- 0792-6
Luoma, S. 2016. Groundwater vulnerability of a shallow low-lying coastal aquifer in southern Finland under climate change. Geological Survey of Finland, Espoo. Thesis. Department of Geosciences and Geography, University of Helsinki.	https://doi.org/10.1007/s10040-016-1471-2



Maier, W.D., R.H. Smithies, C.V. Spaggiari, S.J. Barnes, C.L. Kirkland, S. Yang, Y. Lahaye, O. Kiddie, and C. MacRae, 2016. Petrogenesis and Ni-Cu sulphide potential of mafic-ultramafic rocks in the Mesoproterozoic Fraser Zone within the Albany-Fraser Orogen, Western Australia. <i>Precambrian research</i> .	10.1016/j.precamres.2016.05.004
Masetti, S. Pettinato, S.V. Nghiem, S. Paloscia, D. Pedretti, E. Santi (2018) "Combining COSMO-SkyMed satellites data and numerical modeling for the dynamic management of artificial recharge basins", <i>J. Hydrology</i> , vol. 567, Pages 41-50.	doi: 10.1002/2014WR016216
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Molnár, F., O'Brien, H., Lahaye, Y., Käpyaho, A., Sorjonen-Ward, P., Hyodo, H., Sakellaris, G. (2016): Signatures of multiple mineralization processes in the Archean orogenic gold deposit of the Pampalo Mine, Hattu schist belt, eastern Finland. <i>Economic Geology</i> , 111, 1659-1703	10.2113/econgeo.111.71659
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Niinikoski, P., Saraperä, S., Hendriksson, N., and Karhu, J.A. (2016). Geochemical and flow modelling as tools in monitoring managed aquifer recharge. <i>Appl. Geochem.</i> 74, 33-43.	10.1016/j.apgeochem.2016.09.001
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Nykänen, V., Niiranen, T., Molnár, F., Lahti, I., Korhonen, K., Cook, N., Skyttä, P. (2017): Optimizing knowledge-driven prospectivity model for gold deposits within Peräpohja Belt, northern Finland. <i>Natural Resources Research</i> , DOI:	10.1007/s11053-016-9321-4
O'Brien, H. (2015). Chapter 4.1 - Introduction to carbonatite deposits of Finland. In W. D. M. L. O'Brien (Ed.), <i>Mineral deposits of Finland</i> (pp. 291-303) Elsevier.	http://dx.doi.org/10.1016/B978-0-12-410438-9.00011-X
O'Brien, H., & Hyvönen, E. (2015). Chapter 4.2 - The Sokli carbonatite complex. In W. D. M. L. O'Brien (Ed.), <i>Mineral deposits of Finland</i> (pp. 305-325) Elsevier.	http://dx.doi.org/10.1016/B978-0-12-410438-9.00012-1
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O'Brien, H. (2015). Chapter 4.4 - Kimberlite-hosted diamonds in Finland. In W. D. M. L. O'Brien (Ed.), <i>Mineral deposits of Finland</i> (pp. 345-375) Elsevier.	http://dx.doi.org/10.1016/B978-0-12-410438-9.00014-5
Parviainen, A., Loukola-Ruskeeniemi, K., Tarvainen, T., Hatakka, T., Härmä, P., Backman, B., Ketola, T., Kuula, P., Lehtinen, H., Sorvari, J., Pyy, O., Ruskeeniemi, T., & Luoma, S. 2015. Arsenic in bedrock, soil and groundwater - the first arsenic guidelines for aggregate production established in Finland. <i>Earth-Science Reviews</i> . Vol. 150, 709-723.	https://doi.org/10.1016/j.earscirev.2015.09.009
Pedretti, D., R.D. Beckie (2015), "Stochastic evaluation of simple pairing approaches to reconstruct incomplete rainfall time series, <i>Stochastic Environmental Research and Risk Assessment</i> , 30 (7), pages 1-14.	doi: 10.1007/s00477-015-1195-1
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Pedretti, D., M. Bianchi (2018) "Reproducing tailing in breakthrough curves: are statistical models equally representative and predictive?", <i>Advances in Water Resources</i> , 113, Pages 236-248.	doi: 10.1016/j.advwatres.2018.01.023
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Pohjolainen, E., Molnár, F., O'Brien, H., Huhma, H., Tiljander, M., Sorjonen-Ward, P., Lukkari, S., Johanson, B., Talikka, M. (2017): U-Pb geochronology of monazite from the Hangaslampi gold deposit in the Paleoproterozoic Kuusamo schist belt, northern Finland: implications for dating multi-stage mineralizing events. Proceedings of the 14th Biennial SGA Meeting, 20-23 August 2017, Québec City, Canada, 3, 1039-1042.	http://www.vtt.fi/inf/pdf/technology/2016/T266.pdf
Punkkinen, H., Räsänen, L., Mroueh, U-M., Korkealaakso, J., Luoma, S., Kaipainen, T., Backnäs, S., Turunen, K., Hentinen, K., Pasanen, A., Kauppi, S., Vehviläinen, B., Krogerus, K. 2016. Guidelines for mine water management, VTT Report. Espoo. Finland.	
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Raju, P.V., E. Hanski, and Y. Lahaye, 2015. LA-MC-ICP-MS dating of zircon from chromitite of the Archean Bangur gabbro complex, Orissa, India – ambiguities and constraints. <i>Geologica Acta</i> , 13, 325-334.	10.1344/GeologicaActa2015.13.4.5
Ranta, J.-P., E. Hanski, N. Cook, and Y. Lahaye, 2016. Source of boron in the Palokas gold deposit, northern Finland: evidence from boron isotopes and major element composition of tourmaline. <i>Mineralium Deposita</i>	10.1007/s00126-016-0700-x
Ranta, J.P., Molnár, F., Hanski, E., Cook, N. (2018): Epigenetic gold occurrence in a Paleoproterozoic meta-evaporitic sequence in the Rompas-Rajapalot Au system, Peräpohja Belt, northern Finland. <i>Bulletin of the Geological Society of Finland</i> . <i>Bulletin of the Geological Society of Finland</i> , 90, 69-108.	https://doi.org/10.1016/j.gexplo.2017.10.017
Richard, A., Banks, D.A., Hendriksson, N. and Lahaye, Y. (2018). Lithium isotopes in fluid inclusions as tracers of crustal fluids: An exploratory study. <i>J. Geochem. Expl.</i> 184 A, 158-166.	https://doi.org/10.1130/G38074.1
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Smart, K. A., Cartigny, P., Tappe, S., O'Brien, H., & Klemme, S. (2017). Lithospheric diamond formation as a consequence of methane-rich volatile flooding: An example from diamondiferous eclogite xenoliths of the Karelian craton (Finland). <i>Geochimica Et Cosmochimica Acta</i> , 206, 312- 342.	https://doi.org/10.17741/bgsf/90.1.002
Solismaa, S., Ismailov, A., Karhu, M., Sreenivasan, H., Lehtonen, M., Kinnunen, P., Illikainen, M., Räisänen, M.L., 2018. Valorization of Finnish mining tailings for use in the ceramics industry. Advance online publication of the <i>Bulletin of the Geological Society of Finland</i> , Volume 90 (1), 2018, pp. 33-54.	10.1016/j.ceramint.2018.11.180
Takács, Á, Molnár, F., Turi, J., Mogessie, A., Menzies, J.C. (2017): Ore mineralogy and fluid inclusion constraints on the temporal and spatial evolution of high-sulfidation epithermal Cu-Au-Ag deposit in the Recsk ore complex, Hungary. <i>Economic Geology</i> , 112, 1461-1481.	10.5382/econgeo.2017.4517
Thair, A. A., Molnár, F., Lintinen, P., Leinonen, S. (2018): Geology and Mineralogy of Rare Earth Elements deposits and occurrences in Finland. <i>Minerals</i> , 356, 1-39	10.3390/min8080356
Vanhanen, E., Cook, N.D.J., Hudson, M.R., Dahlenborg, L., Ranta, J.-P., Havela, T., Kinnunen, J., Molnár, F., Prave, A.R., Oliver, N.H.S. (2015): The Rompas prospect, Peräpohja schist belt, northern Finland. In: Maier, W.D., Lahtinen, R., O'Brien, H. (eds.), <i>Mineral deposits of Finland</i> . Elsevier, Amsterdam, Netherlands, 467-485	https://doi.org/10.5194/hess-2018-507
Wong, K.-H., M.-F. Zhou, W.T. Chen, H. O'Brien, Y. Lahaye, and S.-L.J. Chan, 2017. Constraints of fluid inclusions and in-situ S-Pb isotopic compositions on the origin of the North Kostobe sediment-hosted gold deposit, eastern Kazakhstan. <i>Ore Geology Review</i> . 81, Part 1: 256-269.	10.1016/j.oregeorev.2016.10.004
Woodard, J., P. Tuisku, A. Karki, Y. Lahaye, J.a. Majka, H. Huhma, and M.J. Whitehouse, 2016. Zircon and monazite geochronology of deformation in the Pielavesi Shear Zone, Finland: multistage evolution of the Archaean-Proterozoic boundary in the Fennoscandian Shield. <i>Journal of the Geological Society</i> .	10.1144/jgs2016-020
Wu, Y.-F., J.-L. Li, K. Evans, A.E. Koenig, Z.-L. Li, H. O'Brien, Y. Lahaye, K. Rempel, S.-Y. Hu, Z.-P. Zhang, and J.-P. Yu, 2018. Ore-Forming Processes of the Daqiao Epizonal Orogenic Gold Deposit, West Qinling Orogen, China: Constraints from Textures, Trace Elements, and Sulfur Isotopes of Pyrite and Marcasite, and Raman Spectroscopy of Carbonaceous Material. <i>Economic Geology</i> 113: 1093-1132.	10.5382/econgeo.2018.4583
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Zulauf, G., W. Dörr, J. Krahl, Y. Lahaye, V. Chatzaras, and P. Xypolias, 2016. U-Pb zircon and biostratigraphic data of high-pressure/low-temperature metamorphic rocks of the Talea Ori: Tracking the Paleotethys suture in central Crete, Greece. *International Journal of Earth Sciences*, 105, 7, pp 1901–1922. 10.1007/s00531-016-1307-2

2. PEER-REVIEWED PUBLICATIONS OF UMIL

Author(s), Year, Title, Journal	DOI
Eliades M., Bruggeman A, Lubczynski M.W., Christou A., Camera C., Djuma H., (2018). The water balance components of Mediterranean pine trees on a steep mountain slope during two hydrologically contrasting years. <i>J. Hydrol.</i> 562, 712-724.	10.1016/j.jhydrol.2018.05.048
Masetti M, Pettinato S., Nghiem S.V., Paloscia S., Pedretti D. Santi E. (2018). Combining COSMO-SkyMed satellites data and numerical modeling for the dynamic management of artificial recharge basins. <i>Journal of Hydrology</i> 567 41–50	10.1016/j.jhydrol.2018.09.067
Djuma H., Bruggeman A., Camera C., Eliades M., Kostarelos K., (2017). The impact of a check dam on groundwater recharge and sedimentation in an ephemeral stream. <i>Water</i> 9 (10), 813.	10.3390/w9100813
Pedretti D., Masetti M., Beretta G.P. (2017). “Stochastic analysis of the efficiency of coupled hydraulic-physical barriers to contain solute plumes in highly heterogeneous aquifers”. <i>Journal of Hydrology.</i> 553, 805–815.	10.1016/j.jhydrol.2017.08.051
Stevenazzi S., Bonfanti M., Masetti M., Nghiem S.V., Sorichetta A. (2017). A versatile method for groundwater vulnerability projections in future scenarios. <i>Journal of Environmental Management</i> 1-10.	10.1016/j.jenvman.2016.10.057
Berehanu B., Azagegn T., Ayenew T., Masetti M. (2017). “Inter-Basin Groundwater Transfer and Multiple Approach Recharge Estimation of the Upper Awash Aquifer System”. <i>Journal of Geoscience and Environment Protection</i> ,	10.4236/gep.2017.53007
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