

Kuusamon Hanhilampi

Occurrence type: occurrence

Commodity	Rank	Total measure	Total production	Total resource	Importance
gold	1	NA	NA	NA	NA
cobalt	2	NA	NA	NA	NA

Easting EUREF: 598357,831
Northing EUREF: 7351619,951

Easting YKJ: 3598570
Northing YKJ: 7354695

Discovery year: 1990

Discovered by: Geological Survey of Finland

Province: Kuusamo-Kuolajärvi (Co, Au)

District: Kuusamo (Co, Au)

Comments: Discovery was guided by a till geochemical survey. The occurrence was found as a follow-up of exploration around the Juomasuo deposit

References: 3

Mineral deposit type

Group: Metallogenic deposit

Main type: Orogenic (metamorphic hydrothermal)

Sub type 1: Au-Co-Cu

Comments: The auriferous fluids were transported along deep, rift-tectonic faults up to the greenschist-metamorphic environment, concentrated on the antiform; these metals precipitated in structurally controlled sites close to impermeable dolerites and metavolcanic units or, rather, in the more competent sericite quartzite units between the more plastic mafic units.

References: 4, 5, 6, 7, 8, 9, 12

Dimension

Expression: exposed

Form: discordant

Shape: NA

Length (m): NA

Width (m): NA

Thickness (m): NA

Depth (m): NA

Area (ha): NA

Dip azim: NA

Dip: NA

Plunge azim: NA

Plunge dip: NA

Orientation method: NA

Dimension comments: The occurrence is a set of 1-3 m wide quartz veins in sericite quartzite. The extent of the auriferous veins is not reported.

Holder history

Current holder: Latitude 66 Cobalt Oy

Years: 2020-2027

Holding type: Exploration permit

Previous holders:

Company	Years	Holding type	Comments
Outokumpu Oy	-2003	NA	NA
Geological Survey of Finland	NA	NA	NA
Latitude 66 Cobalt Oy	2019	Application for exploration permit	NA
Polar Mining Oy	2010-2010	Claim reservation (old law)	NA
Polar Mining Oy	2003	NA	NA

EXPLORATION ACTIVITY

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1991-1991	core drilling	Erkki Vanhanen	mineral occurrences	10
<i>Core drilling (reconnaissance drilling): one diamond-drill hole, total 105.5 m.</i>				
Intersections				
	HoleID	NA		
	From-To	NA		
	Length	5m		
	gold	3ppm		

Lapin Malmi Oy

Years	Activity type	Geologist	Exploration result	Ref
1989-1990	core drilling	Osmo Inkinen	key geological features	2
<i>Three holes drilled, total 223 m. No significant metal grades detected</i>				

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1989-1989	regional geochemistry	NA	geochemical anomaly	
<i>Country-wide till-geochemical survey</i>				

Lapin Malmi Oy

Years	Activity type	Geologist	Exploration result	Ref
1989-1990	detailed geology	Osmo Inkinen	mineral occurrences	2
<i>Outcrop mapping and trench excavation: 13.3 ppm Au in a grab sample.</i>				
1989-1990	detailed geophysics	Osmo Inkinen	key geological features	2
<i>MAGnetic and slingram ground survey</i>				

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1986-1991	detailed geology	Erkki Vanhanen.	key geological features	1, 4, 5, 6, 7, 10
1986-1991	detailed geochemistry	Erkki Vanhanen.	mineral occurrences	11

	<i>Au anomaly in till.</i>			
1986-1991	detailed geophysics	Erkki Vanhanen.	key geological features	11
	<i>Mineralisatino has a good response on ground IP.</i>			
1986-1991	excavation	Erkki Vanhanen	mineral occurrences	1, 4, 5, 6, 7, 10
1984-1984	regional geophysics	Erkki Vanhanen	key geological features	1, 4, 5, 6, 7, 10
	<i>Low-altitude airborne magnetic, electromagnetic and radiometric survey</i>			

GEOLOGY

Host rock: Sericite quartzite

Wall rock: Dolerite

Sericite quartzite (Host rock)

Rock type: Host rock

Proportion: major

Grain size: NA

Color: NA

References: 4, 5, 6, 7, 9, 10, 12

Ore minerals:

Mineral	Proportion	Mineral texture
Pyrite	major	

Other minerals:

Mineral	Proportion	Mineral texture
Actinolite	present	Alteration product
Albite	present	Alteration product
Biotite	present	Alteration product
Chlorite	present	Alteration product
Chloritoid	present	Alteration product
K-Feldspar	present	Alteration product
Magnetite	present	Alteration product
Quartz	present	Alteration product
Sericite	present	Alteration product
Talc	present	Alteration product
Tremolite	present	Alteration product

Alteration:	Distribution:	Degree:	Relation to mineralization:
silicification	NA	NA	Post
albitic alteration	NA	Strong	Pre
<i>Comments: Locally intense Albitization of clastic sediments and spilitisation of volcanic units when the 2.206 Ga mafic sills and dykes heated the evaporite-bearing sequence and put hot brines into circulation.</i>			
biotite alteration	NA	NA	Syn
sulphidation	NA	NA	Syn
carbonate alteration	NA	NA	Syn
sericitic alteration	NA	NA	Syn
chloritic alteration	NA	NA	Syn

Metamorphic description:

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	Min T- Max T (°C)
Regional	greenschist metamorphic facies	low metamorphic grade	NA		
<i>Comments: 1-3 m wide quartz veins</i>					

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Paleoproterozoic (2500-1600 Ma)	1800-2050		Y
<i>Comments: Mineralisation between 2.05-1.8 Ga.</i>			

Dolerite (Wall rock)

Rock type: Wall rock

Proportion: minor

Grain size: NA

Color: NA

References: 10

Metamorphic description:

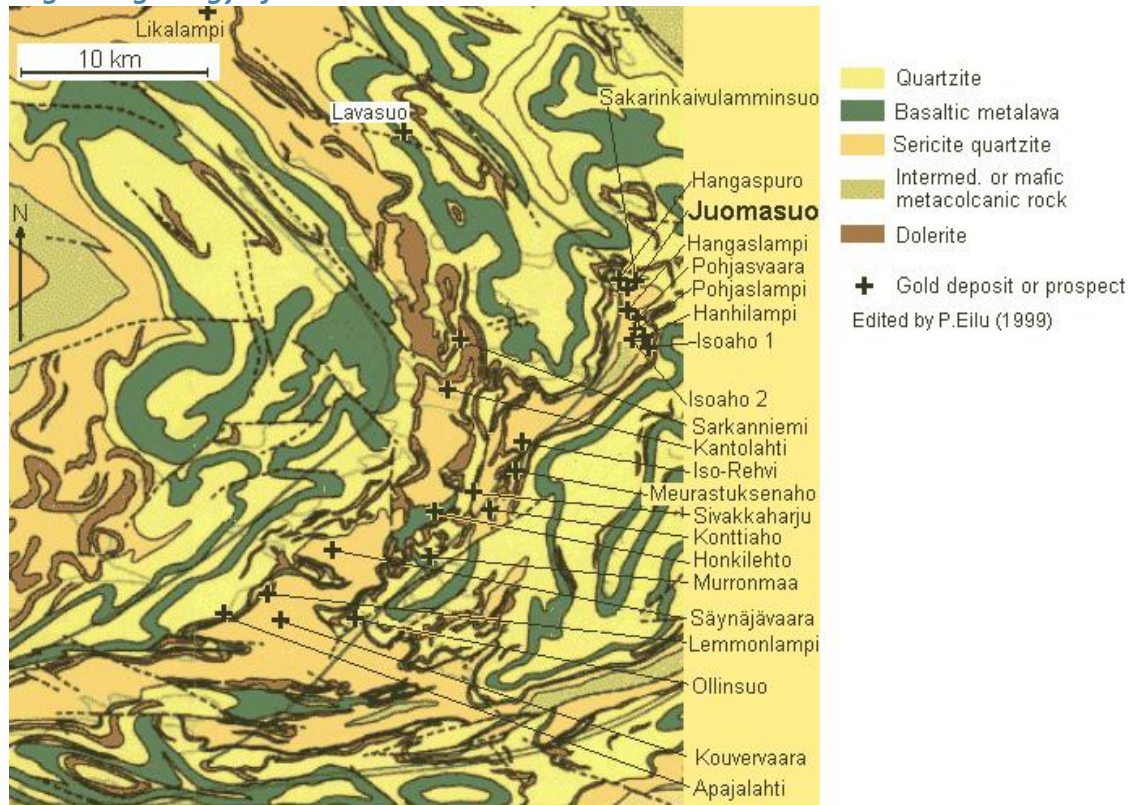
Other minerals:

Mineral	Proportion	Mineral texture
Actinolite	major	
Albite	major	
Epidote	minor	
Quartz	present	
Titanite	present	

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	Min T- Max T (°C)
Regional	epidote amphibolite metamorphic facies	low metamorphic grade			
<i>Comments: Metamorphic mineral assemblage: albite-actinolitic hornblende-epidote-opaques ± titanite, quartz</i>					

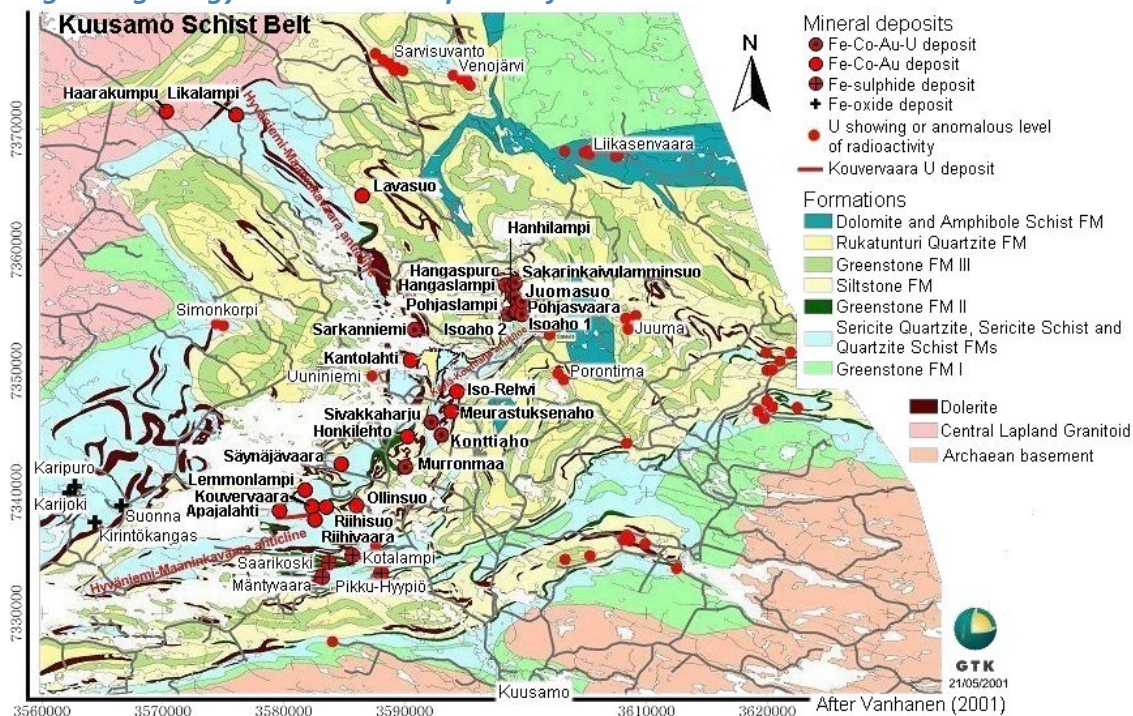
Figures

Regional geology of the Kuusamo area:



Deposits and prospects in the Kuusamo Schist Belt. Geology from Silvennoinen (1992). Solid and dashed, curved lines indicate boundaries between lithological units, faults and shear zones

Regional geology and mineral deposits of the Kuusamo area:



REFERENCES

1. Arkimaa, H. 1997. The fingerprints of known gold occurrences in the Kuusamo schist belt as shown by airborne gamma-ray spectrometric data. Geological Survey of Finland. Special Paper 23, 25-28. http://tupa.gtk.fi/julkaisu/specialpaper/sp_023_pages_025_028.pdf
2. Inkinen, O. 1991. Kaivoslain 19 pyk. mukainen tutkimustyöselostus: Kittilä, Hanhilampi 1, Hanhilampi 2 ja Hanhilampi 3, kaiv. rek. n:o 4481/1, 4481/2 ja 4516/1. Outokumpu Oy, Report 080/2732/OI/91.
3. Pankka, H. & Vanhanen, E. 2001. Personal communication 04/06/2001.
4. Pankka, H. 1992. Geology and mineralogy of Au-Co-U deposits in the Proterozoic Kuusamo volcanosedimentary belt, northeastern Finland. A dissertation. Geology. Michigan Technological University. 233 p.
5. Pankka, H. 1997. Epigenetic Au-Co-U deposits in an early Proterozoic continental rift of the northern Fennoscandian Shield: a new class of ore deposit? In: H. Papunen (ed.) Research and Exploration - Where Do They Meet? Proceedings of the Fourth Biennial SGA Meeting, Turku, Finland, 11-13 August 1997. 277-280.
6. Pankka, H. S. & Vanhanen, E. J. 1992. Early Proterozoic Au-Co-U mineralization in the Kuusamo district, northeastern Finland. Precambrian Research 58, 387-400.
7. Pankka, H., Puustinen, K. & Vanhanen, E. 1991. Kuusamon liuskealueen kulta-koboltti-uraaniesiintymät. Summary: Au-Co-U deposits in the Kuusamo volcano-sedimentary belt, Finland. Geological Survey of Finland, Report of Investigation 101. 53 p http://tupa.gtk.fi/julkaisu/tutkimusraportti/tr_101.pdf
8. Sorjonen-Ward, P. 1992. Kultamalmien rakennegeologiaa. Geological Survey of Finland, Report M10.2/- 92/1. 45 p. (in Finnish) http://tupa.gtk.fi/raportti/arkisto/m10_2_92_1_sorjonen_ward.pdf
9. Vanhanen, E. 1991. Cobalt-, gold- and uranium-bearing mineralizations and their relation to deep fractures in the Kuusamo area. Geological Survey of Finland, Special Paper 13, 91-97. http://tupa.gtk.fi/julkaisu/specialpaper/sp_013_pages_091_097.pdf
10. Vanhanen, E. 1992. Kuusamon Juomasuon kulta-kobolttiesiintymien lähiympäristön kultamalmitutkimukset vuosina 1986-1991. Geological Survey of Finland, Report M19/4613/- 92/1/10. 51 p. (in Finnish) http://tupa.gtk.fi/raportti/arkisto/m19_4613_92_1_10.pdf
11. Vanhanen, E. 1998. Personal communication 20/8/1998.
12. Vanhanen, E. 2001. Geology, mineralogy and geochemistry of the Fe-Co-Au-(U) deposits in the Paleoproterozoic Kuusamo Schist Belt, northeastern Finland. Geological Survey of Finland, Bulletin 399. 229 p. http://tupa.gtk.fi/julkaisu/bulletin/bt_399.pdf