

# Kelokorpi

**Occurrence type:** occurrence

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

Easting EUREF: 714989,411  
Northing EUREF: 6966240,532

Easting YKJ: 3715248  
Northing YKJ: 6969159

**Discovery year:** 1987

**Discovered by:** Geological Survey of Finland

**Province:** Ilomantsi (Au)

**District:** Hattu (Au)

**References:** 10, 11

## Mineral deposit type

**Group:** Metallogenetic deposit

**Main type:** Orogenic (metamorphic hydrothermal)

**Comments:** Precipitation of gold by desulphidation of fluid and, possibly, by decomposition of Au-bisulphide, -thiosulphide and -telluride complexes of fluid due to cooling and/or changes in pH and fO<sub>2</sub>. Probably, gold precipitated just below 500°C with sulphides due to reaction between the mineralising fluid and wall-rock (chiefly by sulphidation). The formation of the present low-temperature Te and Bi minerals probably took place as subsolidus reactions with cooling temperature.

**References:** 9

## Dimension

**Expression:** exposed

**Area (ha):** NA

**Form:** discordant

**Dip azim:** 115

**Shape:** NA

**Dip:** 80

**Length (m):** NA

**Plunge azim:** NA

**Width (m):** NA

**Plunge dip:** NA

**Thickness (m):** NA

**Orientation method:** NA

**Depth (m):** NA

**Dimension comments:** The occurrence comprises a set of subvertical lodes defined by sulphide-gold disseminations and auriferous quartz±tourmaline veinlets in intermediate volcanogenic metasedimentary rock and in tonalite. It probably is open along strike and at a shallow depth.

## Holder history

**Current holder:** Mineral Exploration Network (Suomi) Oy

**Years:** 2018

**Holding type:** Application for exploration permit

**Previous holders:**

Company	Years	Holding type	Comments
Outokumpu Oy	-2003	NA	NA
Geological Survey of Finland	NA	NA	NA
Mineral Exploration Network (Suomi) Oy	2014-2018	Exploration permit	NA
Mineral Exploration Network (Suomi) Oy	2011-2014	Application for exploration permit	NA
Endomines Oy	2006	NA	NA
Polar Mining Oy	2003-2006	NA	NA

## EXPLORATION ACTIVITY

### Endomines Oy

Years	Activity type	Geologist	Exploration result	Ref
2003-2011	detailed geophysics	Jaakko Liikanen	geophysical anomaly	3, 9
<i>Airborne low-altitude [VTEM] geophysical surveys were completed over the entire permit area during 2011</i>				

### Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1989-1993	detailed geophysics	Martti Damsten	key geological features	
<i>No response on magnetic, slingram or IP methods. Magnetic and electric methods do show the structural features of the area, including those which control gold mineralisation.</i>				

1989-1989	regional geophysics	NA	key geological features	2, 8
<i>Low-altitude airborne magnetic, electromagnetic and radiometric survey.</i>				

1987-1993	core drilling	Martti Damsten	NA	1, 2, 8, 10, 11
<i>Core drilling (reconnaissance drilling): 1 diamond-drill hole, total 150 m. "Best section" (Nurmri et al. 1991): 2.9 ppm Au, 0.405 ppm Ag, 58 ppm As, 594 ppm B, 674 ppm Ba, 0.7 ppm Bi, 24 ppm Co, 48 ppm Cu, &lt;5 ppb Hg, 16 ppm Mo, 148 ppm Ni, 4.0 ppm Pb, 130 ppm Rb, 5740 ppm S, 0.2 ppm Sb, 0.16 ppm Se, 135 ppm Sr, 0.320 ppm Te, 5.9 ppm Th, 2.4 ppm U, 200 ppm V, 3.0 ppm W, 214 ppm Zn</i>				
<b>Intersections</b>				
	HoleID	NA		
	From-To	NA		
	Length	5m		
	gold	2,5ppm		
	HoleID	NA		
	From-To	NA		
	Length	4m		
	gold	3,5ppm		

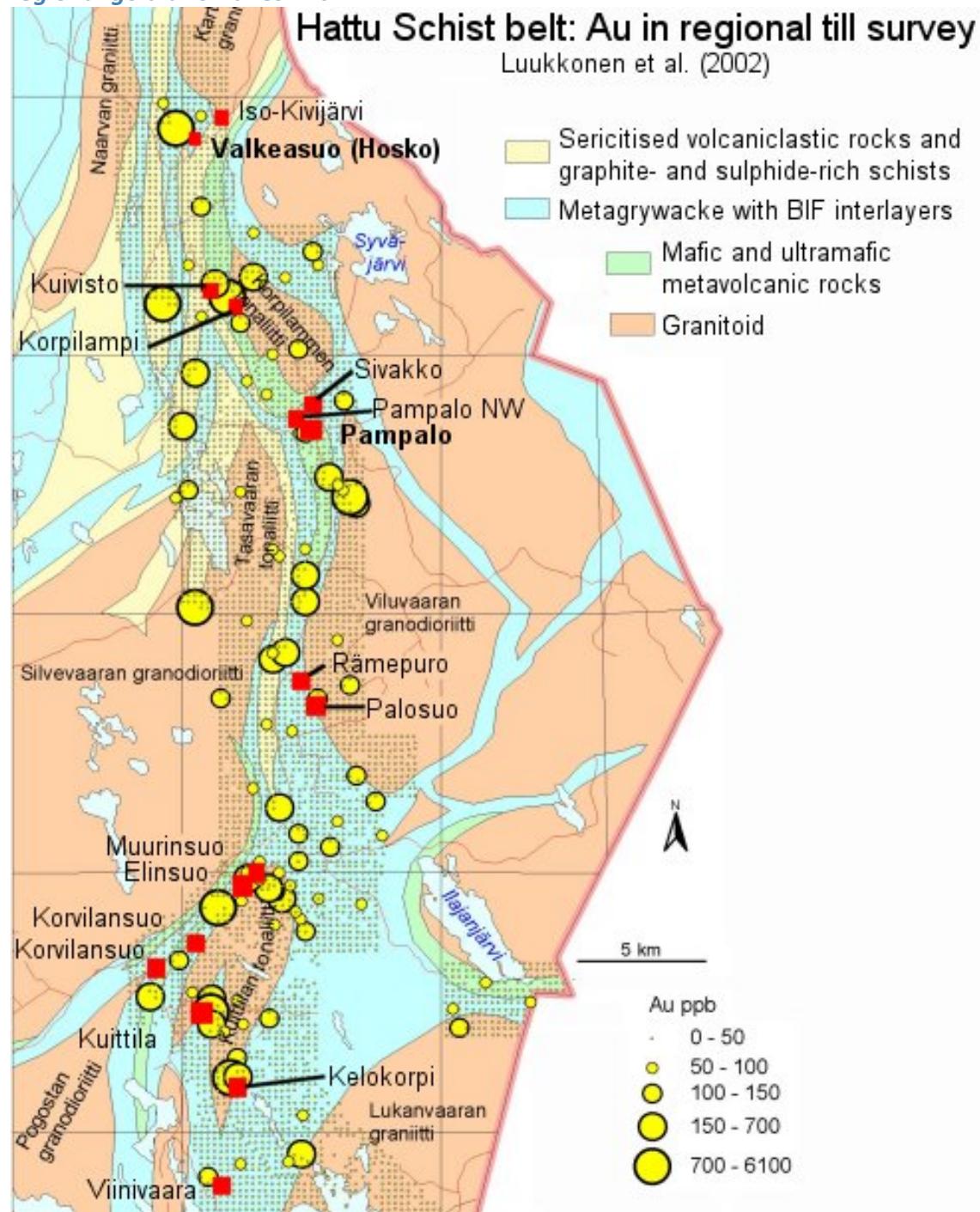
1987-1993	detailed geology	Martti Damsten	NA	1, 2, 4, 5, 8, 9, 12
<i>Au and Te show good correlation; Ag and Bi show moderate correlation with Au. No consistent chemical zoning found yet.</i>				

1987-1993	excavation	Martti Damsten	NA	1, 2, 4, 5, 8, 9, 12
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1983-1991	detailed geochemistry	Aimo Hartikainen	geochemical anomaly	1, 2, 4, 8, 9
<i>Till sampling in 250x250 grid m over the greenstone belt. Then till-bedrock interface geochemistry, samples collected across the Au anomaly in traverses 100 m apart. Regional Au, As and B till anomaly, local Au, Te and Bi anomaly. Au content within the till anomaly is from tens of ppb to &gt;1 ppm. Best combination for defining exploration targets: Au + Te + Bi - better than Au alone. A 0.5-1 km wide Au anomaly in till along the western-southwestern contact of the Kuittila tonalite.</i>				

### Figures

*regional gold anomalies in till:*



## GEOLOGY

**Host rock:** Intermediate tuff, Quartz vein, Porphyry, Tonalite

### Intermediate tuff (Host rock)

**Rock type:** Host rock

**Proportion:** major

**Grain size:** NA

**Color:** NA

**References:** 1, 5, 6, 7, 9, 12, 13

**Comments:** The occurrence is in the Kelokorpi shear zone. It is in metatuffite-tonalite contact and in the metatuffite. Lodes consisting of dissemination and auriferous quartz veinlets.

#### Ore minerals:

Mineral	Proportion	Mineral texture
Altaite	minor	
Argentopentlandite	minor	
Arsenopyrite	minor	
Bismuth	minor	
Chalcopyrite	minor	
Galena	minor	
Gold	minor	<i>Disseminated in host rocks and in quartz veinlets. Gold is associated with pyrrhotite in the metatuffite, with pyrite in the tonalite and with molybdenite, tourmaline, arsenopyrite, tellurides and pyrrhotite in the quartz-tourmaline veins. Fineness 82% Au, 14% Ag (one anal. Sample)</i>
Hedleyite	minor	
Ilmenite	minor	
Mackinawite	minor	
Molybdenite	minor	
Pentlandite	minor	
Pyrite	major	
Pyrrhotite	major	
Rutile	minor	
Sphalerite	minor	
Telluride	minor	
Tsumoite	minor	

#### Other minerals:

Mineral	Proportion	Mineral texture
Albite	present	
Biotite	present	
Calcite	present	
Chlorite	present	Alteration product
Garnet	present	
Muscovite	present	
Quartz	present	
Scheelite	present	
Titanite	present	
Tourmaline	present	

#### Textures

## Granoblastic

### Metamorphic description:

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	Min T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	Post		-550

*Comments: Progressive regional metamorphism on ca. 2750-2700 Ma, apparently peaked soon after gold mineralisation, at a temperature of about 550±50°C. Thermal peak was synchronous or outlasted deformation. A relatively strong, but unevenly distributed Palaeoproterozoic overprint; Albite-quartz-biotite-muscovite ± calcite, chlorite, rutile, tourmaline, epidote, titanite, zircon.*

### Geological age:

Geological era:	Max age - Min age (Ma):	Inferred age (Ma):	Age of mineralization:		
Neoarchean (2800-2500 Ma)	2708-2708	2708	Y		
Radiometric age:	Method:	Age:	Error (Ma):	Mineral:	Reference:
	U-Pb	2708		Titanite	

## Quartz vein (Host rock)

**Rock type:** Host rock

**Proportion:** minor

**Grain size:** NA

**Color:** NA

**References:** 5, 6

**Comments:** Auriferous quartz-tourmaline veinlets

### Ore minerals:

Mineral	Proportion	Mineral texture
Gold	trace	

### Other minerals:

Mineral	Proportion	Mineral texture
Quartz	major	
Tourmaline	present	

## Porphyry (Host rock)

**Rock type:** Host rock

**Proportion:** minor

**Grain size:** NA

**Color:** NA

**References:** 1, 6, 7, 9, 12, 13

**Comments:** The intermediate metatuffite is intruded by felsic porphyry dikes and by the Kuittila pluton.

### Metamorphic description:

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	Min T- Max T (°C)
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Regional	amphibolite metamorphic facies	medium metamorphic grade	Post	-550
<i>Comments: Progressive regional metamorphism on ca. 2750-2700 Ma, apparently peaked soon after gold mineralisation, at a temperature of about 550±50°C. Thermal peak was synchronous or outlasted deformation. A relatively strong, but unevenly distributed Palaeoproterozoic overprint.</i>				

### Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Neoarchean (2800-2500 Ma)	2726-2754		N

## Tonalite (Host rock)

**Rock type:** Host rock

**Proportion:** minor

**Grain size:** NA

**Color:** NA

**References:** 1, 6, 7, 9, 12, 13

### Metamorphic description:

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	Min T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	Post	-550	
<i>Comments: Progressive regional metamorphism on ca. 2750-2700 Ma, apparently peaked soon after gold mineralisation, at a temperature of about 550±50°C. Thermal peak was synchronous or outlasted deformation. A relatively strong, but unevenly distributed Palaeoproterozoic overprint.</i>					

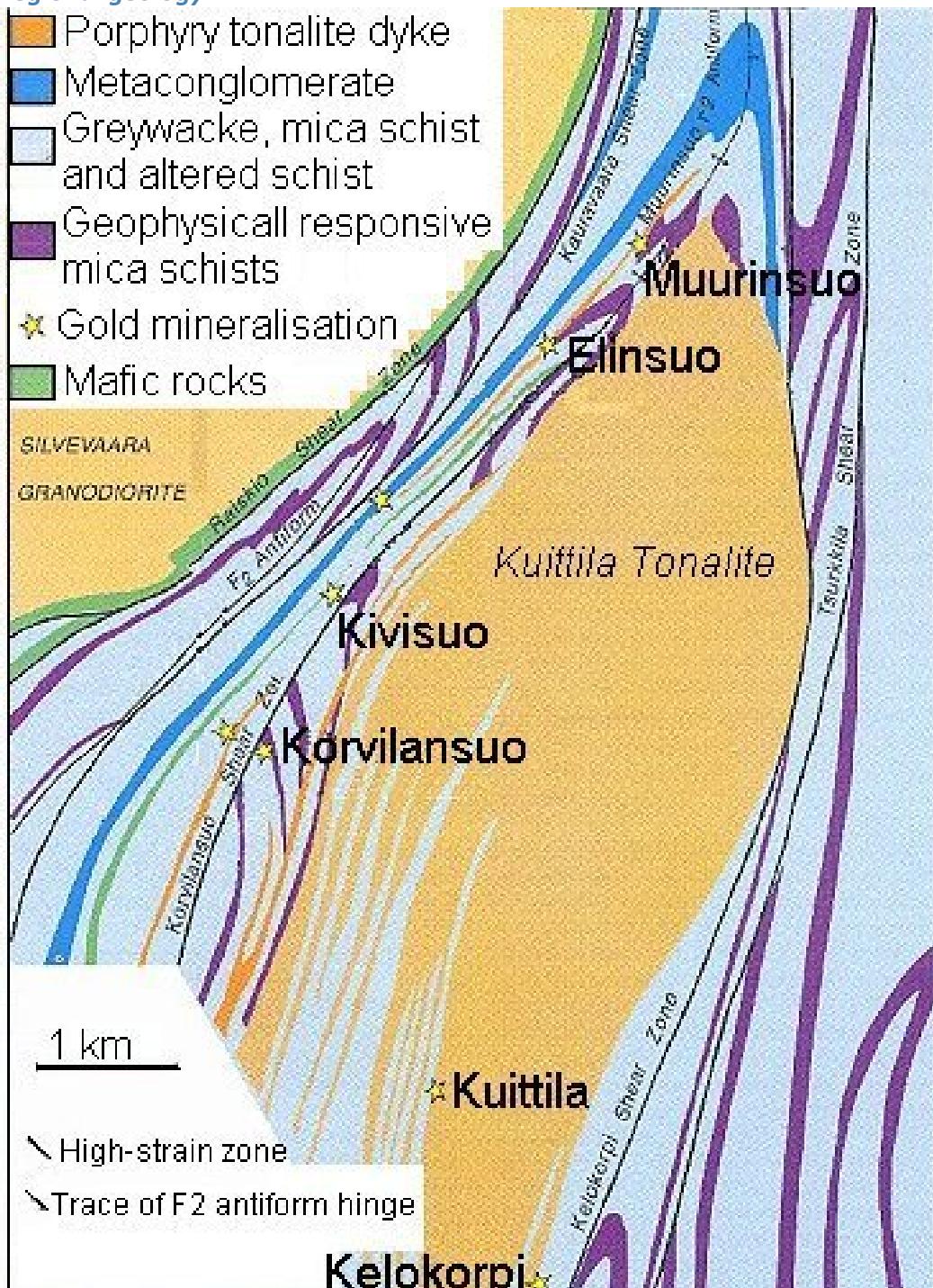
### Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Neoarchean (2800-2500 Ma)	2726-2754		N

## Figures

**Regional geology:**

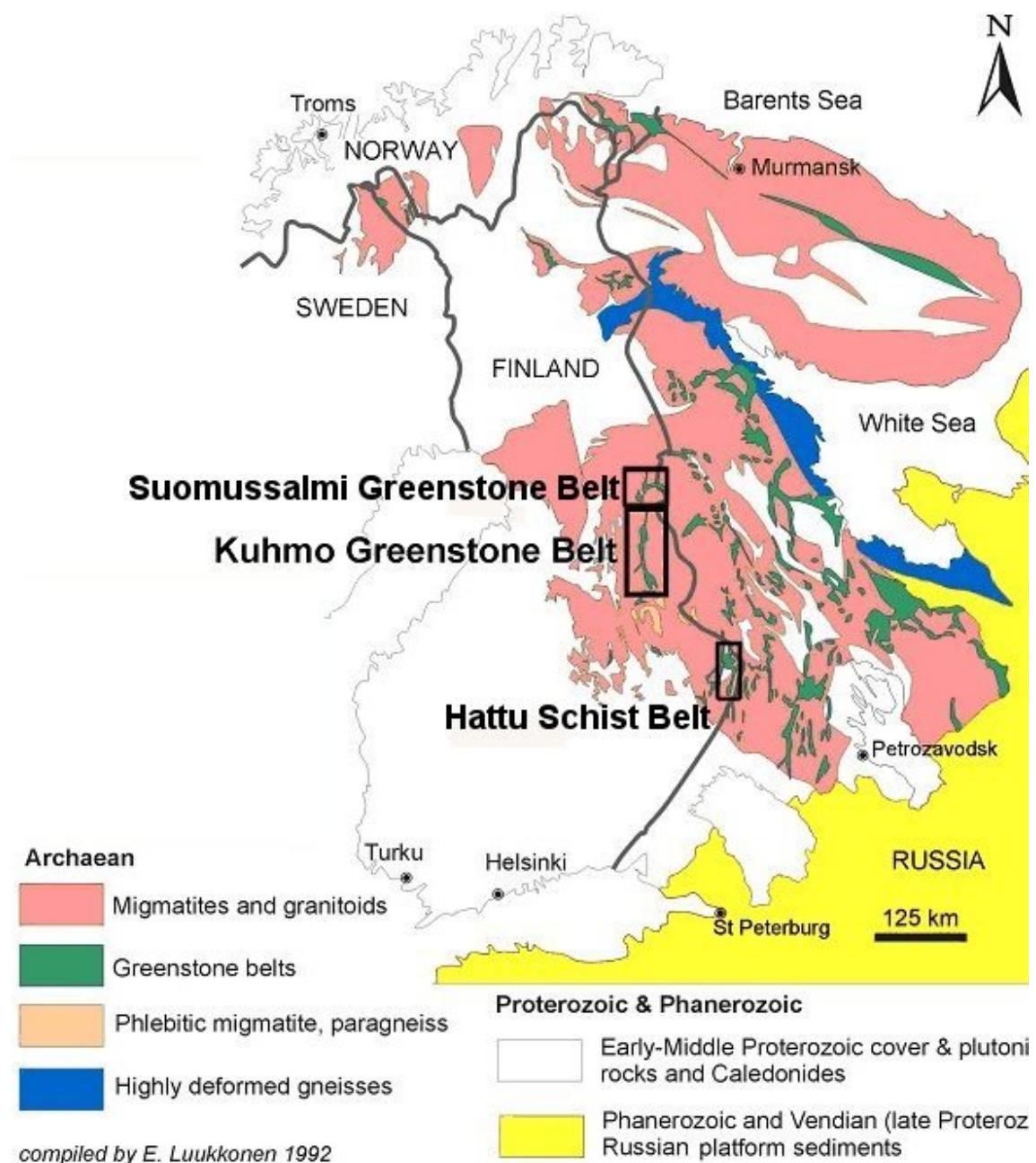
- [Orange square] Porphyry tonalite dyke
- [Blue square] Metaconglomerate
- [Light blue square] Greywacke, mica schist and altered schist
- [Dark purple square] Geophysicallly responsive mica schists
- [Yellow star] Gold mineralisation
- [Green square] Mafic rocks



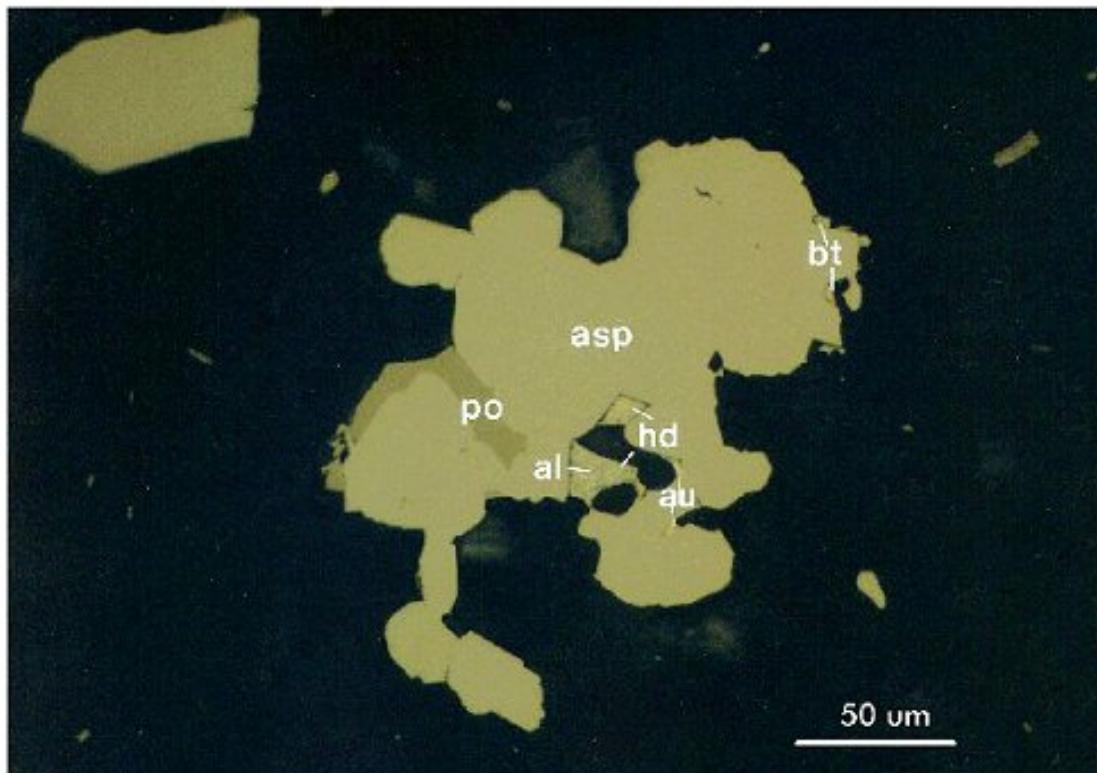
**Geology around the Kuittila Tonalite, Hattu schist belt, Ilomantsi.**  
After Sorjonen-Ward (1993)

Edited by  
P.Eilu (1999)

**Location in the Carelian craton:**



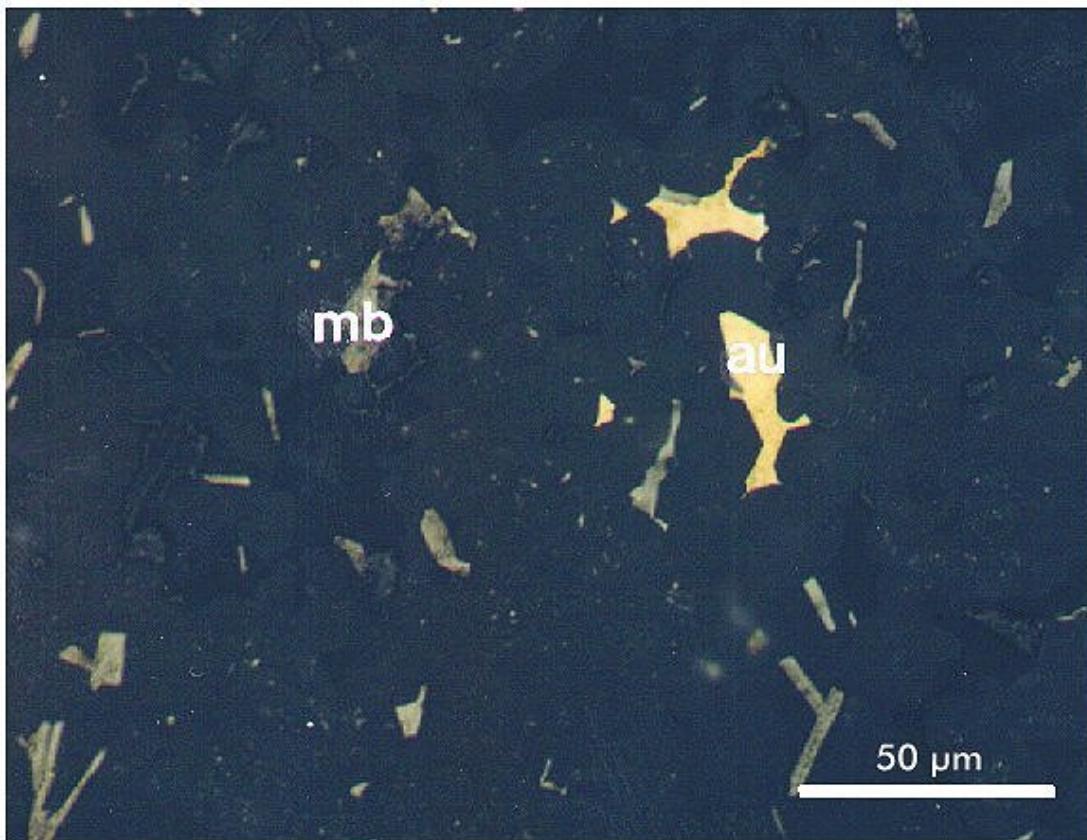
*Gold, tellurides, arsenopyrite:*



**Pb-tellurides (al), hedleyite (hd), Bi-tellurides (bt) and gold (au)  
as inclusions in arsenopyrite (asp), Kelokorpi, Ilomantsi.  
Ddh 329, depth 135.10 m. Parallel polarizers, reflected light.**

(from Kojonen et al. 1991)

**Gold, molybdenite:**



Native gold (au) associated with molybdenite (mb) in tourmaline-quartz vein in biotite-chlorite schist, Kelokorpi, Ilomantsi. Ddh 329, depth 135.10 m. Parallel polarizers, reflected light.

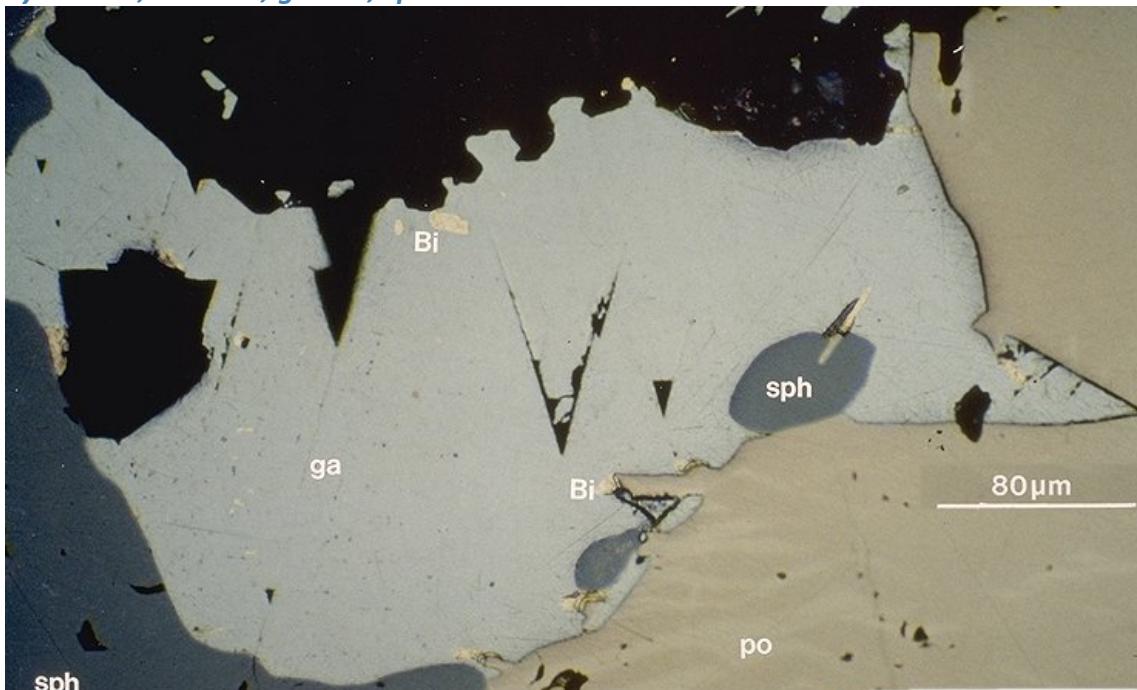
(from Kojonen et al. 1991)

*Gold, pyrrhotite:*



Gold (au) associated with tourmaline in a tourmaline-pyrrhotite (po) aggregate in a quartz vein at Kelokorpi, Ilomantsi. Parallel polarizers, reflected light, field of view 7.5 mm. From Kojonen et al. 1991.

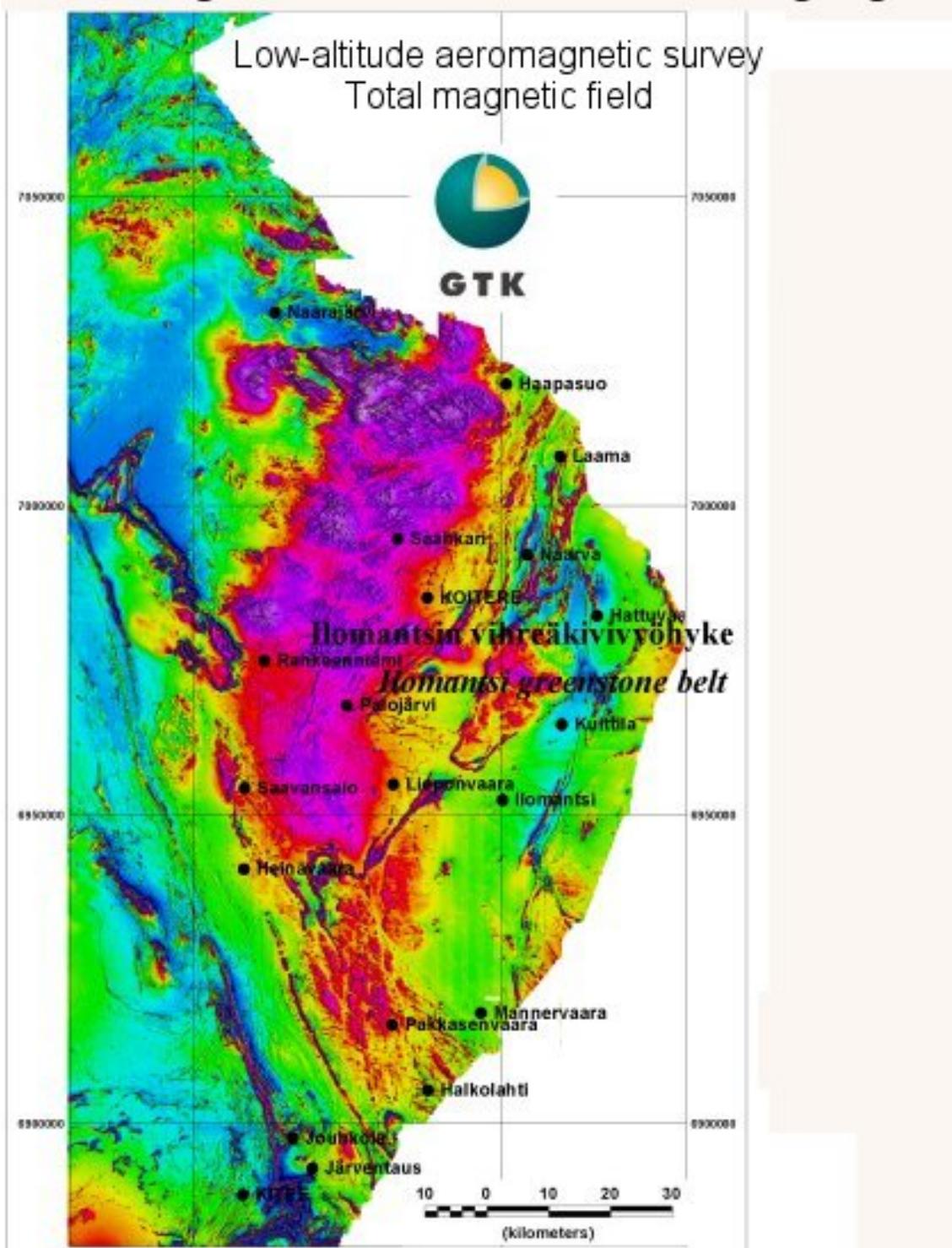
**Pyrrhotite, bismuth, galena, sphalerite:**



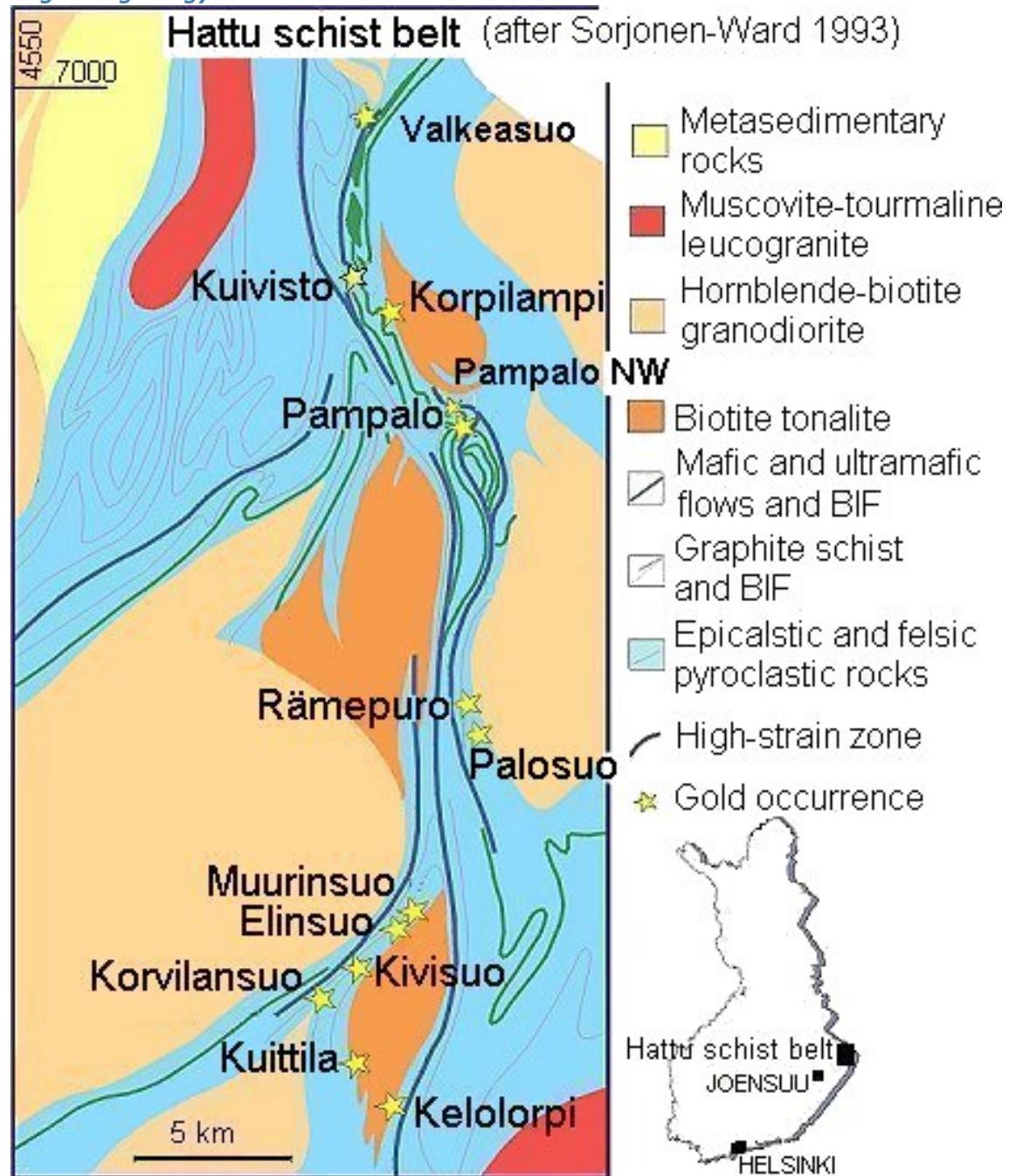
Bismuth (Bi), pyrrhotite (po), galena (gn) and sphalerite (sph) at Kelokorpi, Hattu Schist Belt, Ilomantsi. Sample ddh 329, 35.70 m. Photo Kari Kojonen

*Regional low-altitude airborne magnetic image:*

## Iломанци greenstone belt and surrounding region



*Regional geology:*



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