Palovaara

Alternative Names: Palo
Occurence type: occurrence

Commodity	Rank	Total measure	Total production	Total resource	Importance
gold	1	NA	NA	NA	NA
zinc	3	NA	NA	NA	NA

Easting EUREF: 599692,278
Northing EUREF: 7151317,795
Easting YKJ: 3599905
Northing YKJ: 7154312

Discovery year: 1987
Discovered by: Geological Survey of Finland
Province: Kuhmo (Ni, Ag, Au)
District: Kuhmo (Au)
References: 2, 3, 4, 7, 9, 10

Mineral deposit type

Group: Metallogenic deposit
Main type: Orogenic (metamorphic hydrothermal)
Comments: Orogenic "mesothermal" deposit formed during late-Archaean cratonisation.
References: 5

Dimension

Expression: NA
Form: NA
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: Dimensions not known; the occurrence is open along strike and at a shallow depth

Holder history

Current holder: Magnus Minerals Oy
Years: 2023
Holding type: Application for exploration permit

Previous holders:

Company	Years	Holding type	Comments
Magnus Minerals Oy	2021	Application for reservation	NA
Oy Zawar Resources Finland Ltd	2016-2018	Reservation	NA

Mineral Exploration Network (Finland) Limited	2011-2013	Reservation	NA
Polar Mining Oy	2004	NA	NA
Ilmari Exploration Oy	2002-2003	NA	NA
Geological Survey of Finland	1987-1993	NA	NA

EXPLORATION ACTIVITY

Mineral Exploration Network (Finland) Limited

Years	Activity type	Geologist	Exploration result	Ref
2011-2013	regional reconnaissance	NA	NA	
	Assessment of previous work. Regional till geochemical survey (B horizon and basal til lsampling), glcaial erratic boulder sampling, ground magnetic and IP survey..			

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1990-2001	detailed geochemistry	Markku Tenhola	geochemical anomaly	1, 4
	Basal till (± bedrock surface) sampling in a grid 16 samples per 1 km2. Then more detailed till goechem. Zinc, copper, and Au-As anomalies in till in the area.			

1988-1993	excavation	Timo Heino.	key geological features	1, 4

1988-1993	detailed geology	Timo Heino	key geological features	1, 4

1988-1992	detailed geophysics	Timo Heino	geophysical anomaly	1, 4
	Ground magnetic, electromagnetic, IP and VLF survey. The BIF gives the most intense magnetic anomaly in the area, and can be followed for 10 km along strike			

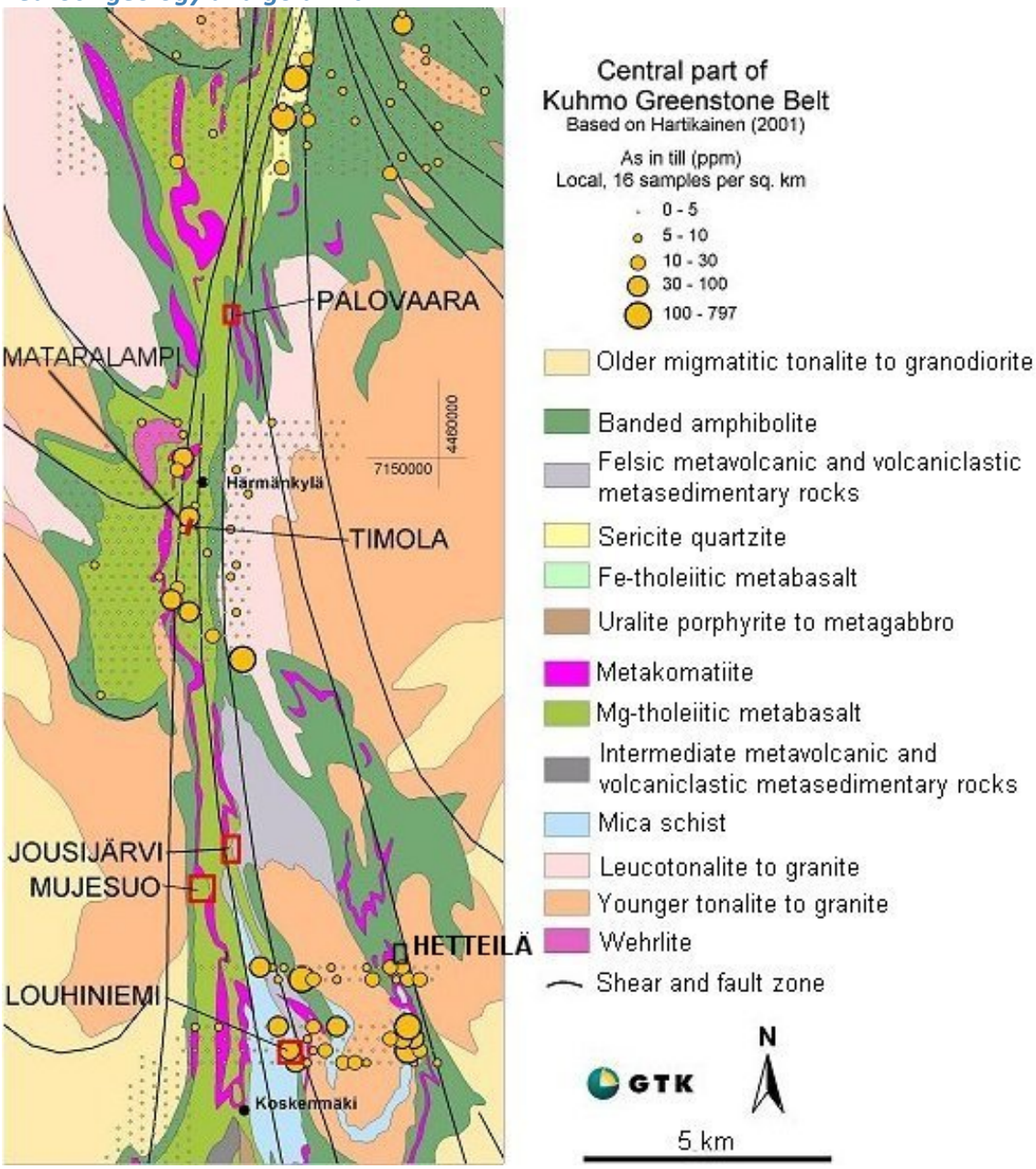
1988-1988	regional geochemistry	Markku Tenhola	geochemical anomaly	4
	Country-wide geochemical survey of till			

1987-1987	regional geophysics	NA	key geological features	
	Low-altitude airborne magnetic, electromagnetic and radiometric survey			

1987-1993	core drilling	Timo Heino	mineralized zone identified	1, 4, 5, 10
	Core drilling (reconnaissance drilling): 19 diamond-drill holes, total 1528 m.			
	Intersections			
	HoleID	NA		
	From-To	NA		
	Length	0,4m		
	gold	4,6ppm		
	Comments	*In BIF*		
	HoleID	NA		
	From-To	NA		
	Length	3m		
	zinc	1,3%		
	HoleID	NA		
	From-To	NA		
	Length	0,5m		
	gold	3,1ppm		
	Comments	*In BIF*		

Figures

Bedrock geology and gold in till:



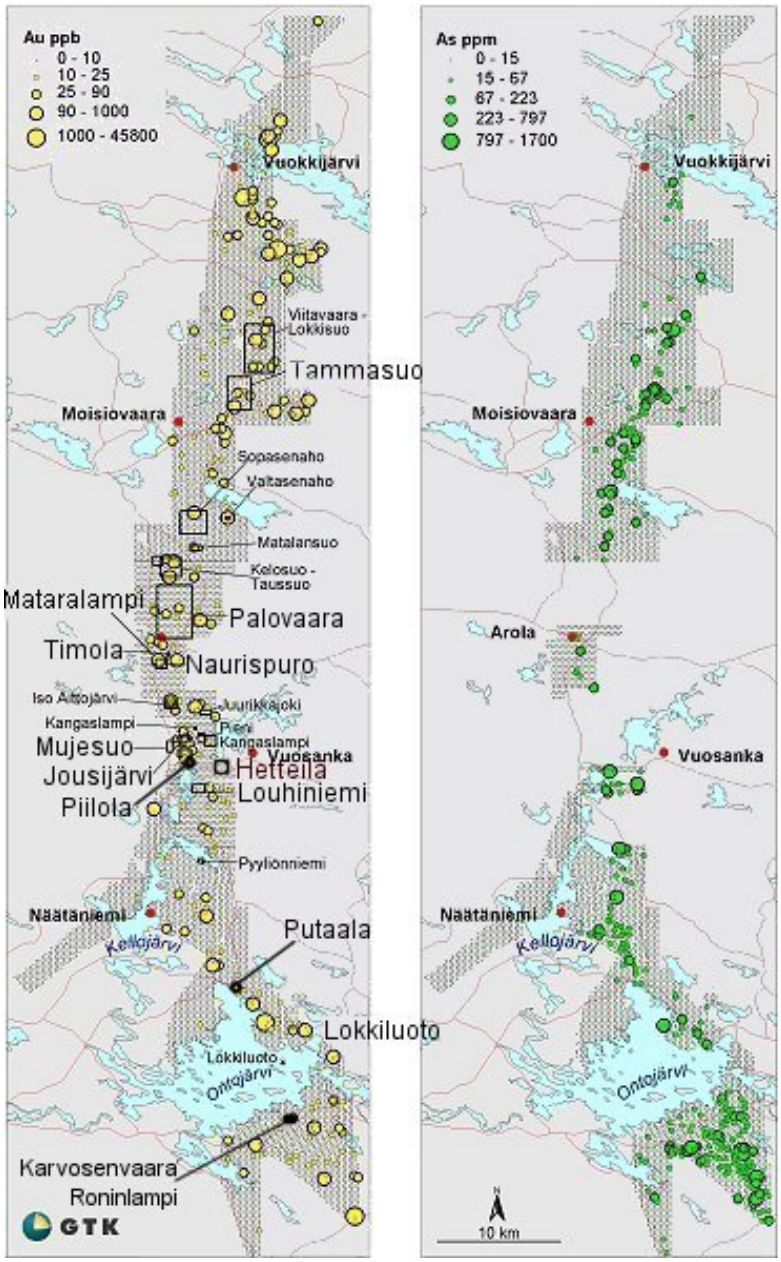
Outcrop photo:

Auriferous outcrop; mafic metavolcanic rock, Palovaara, Kuhmo greenstone belt.Photo Pasi Eilu.

Outcrop photo:

Auriferous outcrop; mafic metavolcanic rock, Palovaara, Kuhmo greenstone belt.Photo Pasi Eilu.

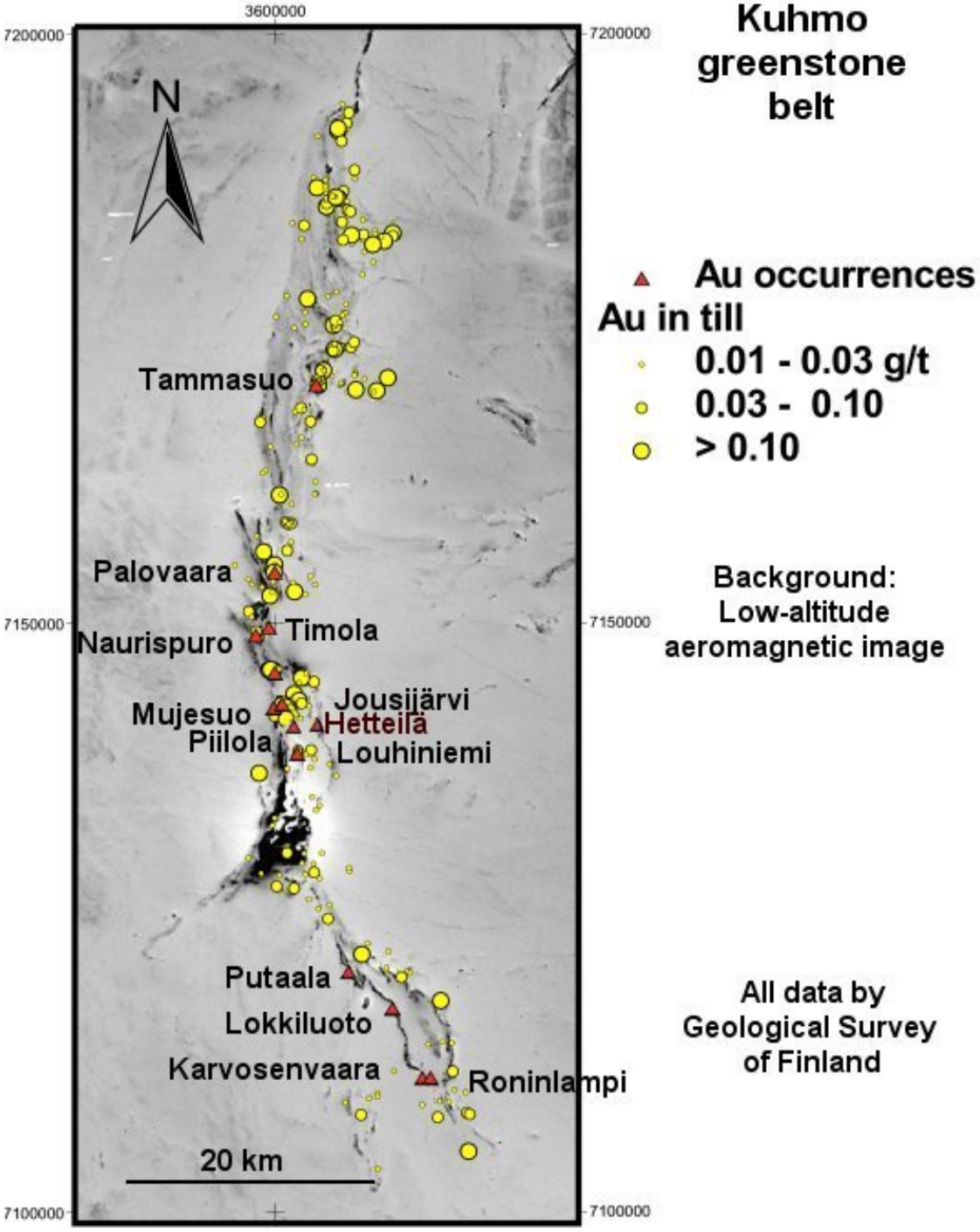
Kuhmo belt: Au and As in till:



Kuhmo greenstone belt

As (ppm) and Au (ppb) in till
(Luukkonen et al. 2002)

Secondary anomaly:



GEOLOGY

Host rock: Intermediate volcanic rock, Mafic volcanic rock, Banded ironstones
Wall rock: Paraschist, Felsic volcanic rock

Intermediate volcanic rock (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA
Color: NA
References: 8
Comments: Pre-gold epidote veins, syn-gold quartz veins, the latter all <20 cm wide

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	NA		

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Archean (4000-2500 Ma)	2500-4000	2790	N

Mafic volcanic rock (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA
Color: NA
References: 8
Comments: Pre-gold epidote veins, syn-gold quartz veins, the latter all <20 cm wide

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	NA		

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Archean (4000-2500 Ma)	2500-4000	2790	N

Banded ironstones (Host rock)

Rock type: Host rock
Proportion: major
Grain size: NA
Color: NA
References: 1, 8
Comments: Dominantly oxide-facies BIF, but locally also sulphide-facies seems to be present (unless the latter are a product of sulphidation related to mineralsiation!). Syn-gold quartz veins, the latter all <20 cm wide

Metamorphic description:
Ore minerals:

Mineral	Proportion	Mineral texture
Pyrite	major	
Pyrrhotite	major	
Sphalerite	major	

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

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Neoarchean (2800-2500 Ma)	2650-2700		Y

Paraschist (Wall rock)

Rock type: Wall rock
Proportion: minor
Grain size: NA
Color: NA
References: 8

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	NA		

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Archean (4000-2500 Ma)	2500-4000	2790	N

Felsic volcanic rock (Wall rock)

Rock type: Wall rock
Proportion: minor

Grain size: NA
Color: NA
References: 8

Metamorphic description:

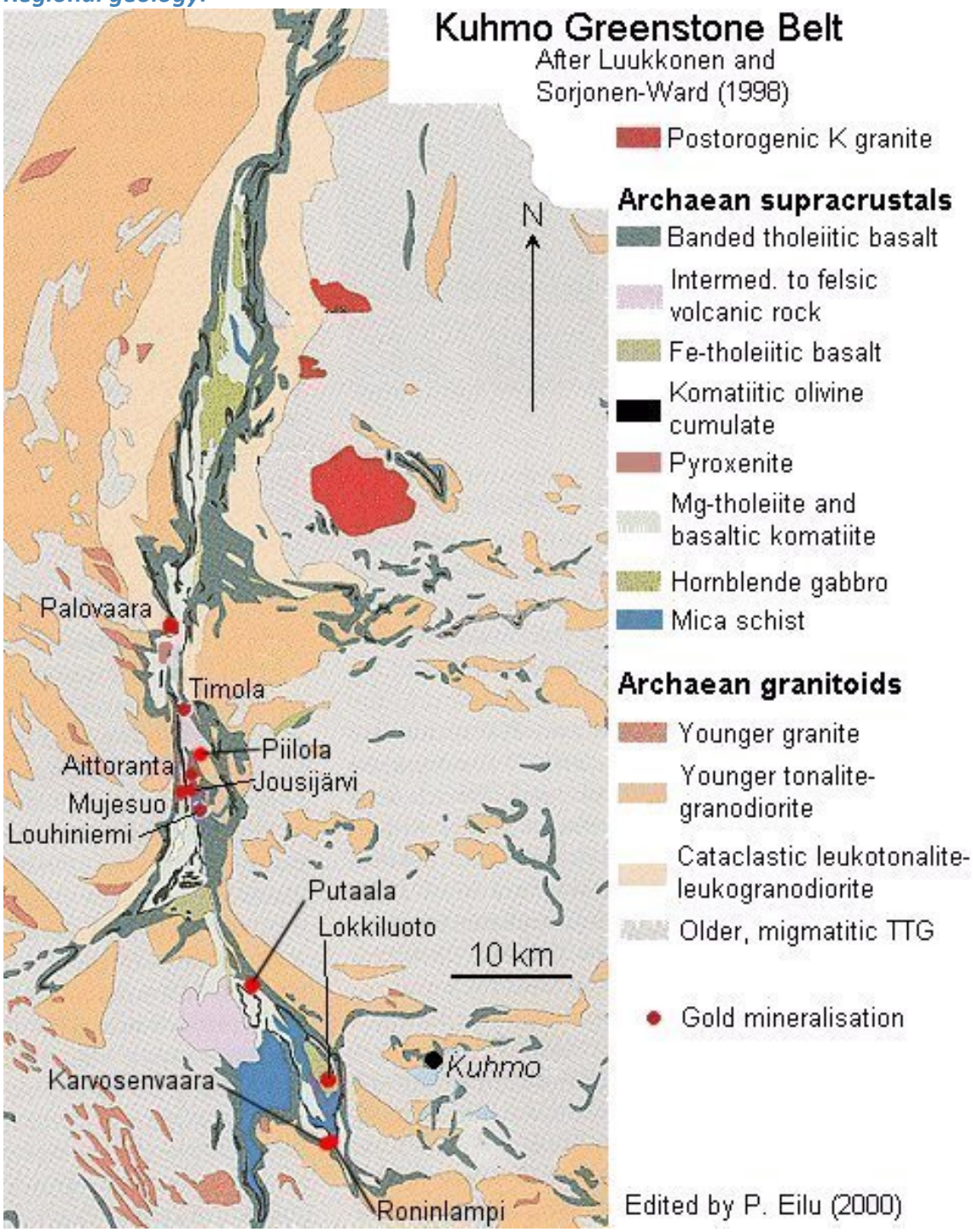
Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	NA		

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Archean (4000-2500 Ma)	2500-4000	2790	N

Figures

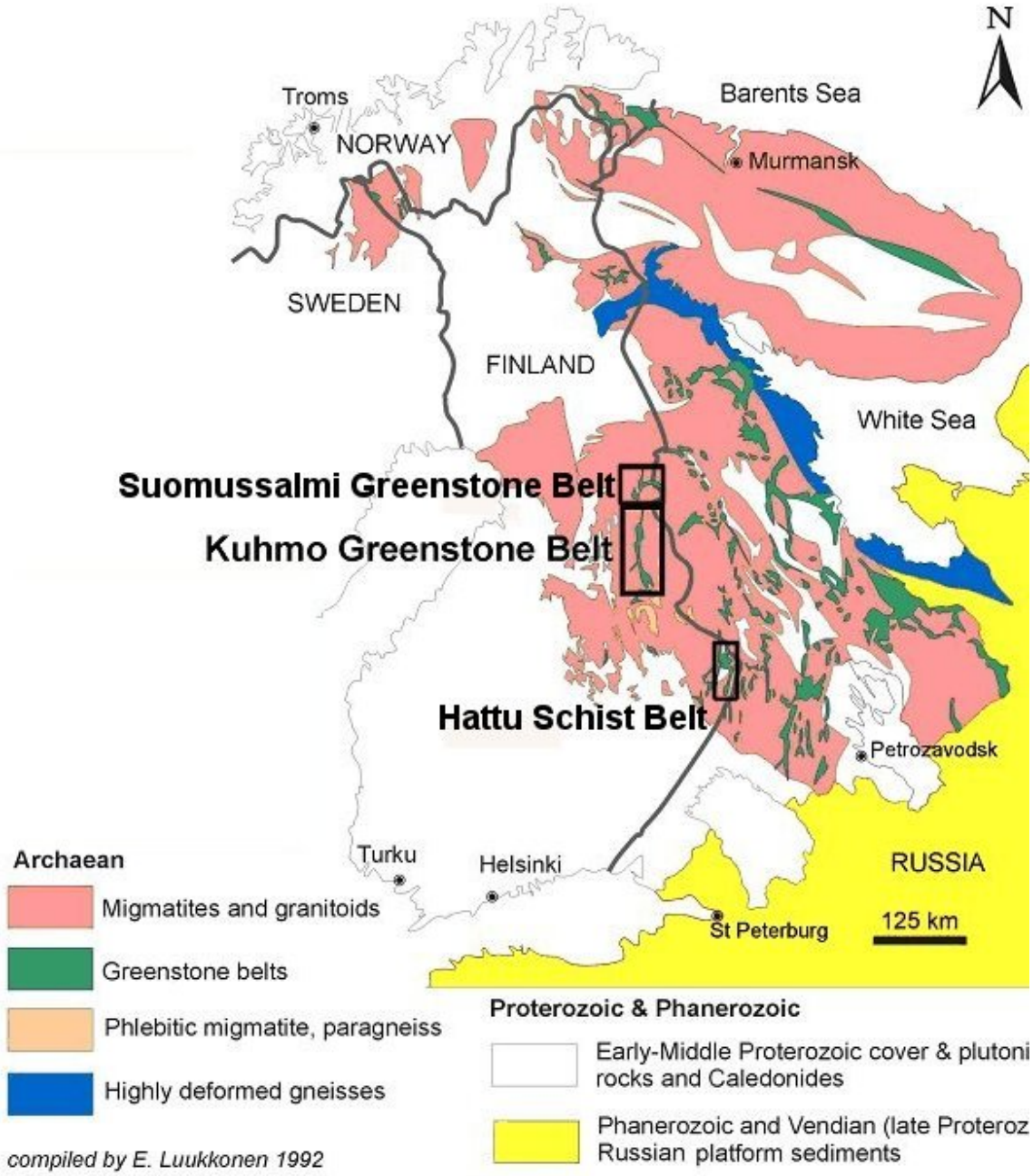
Regional geology:



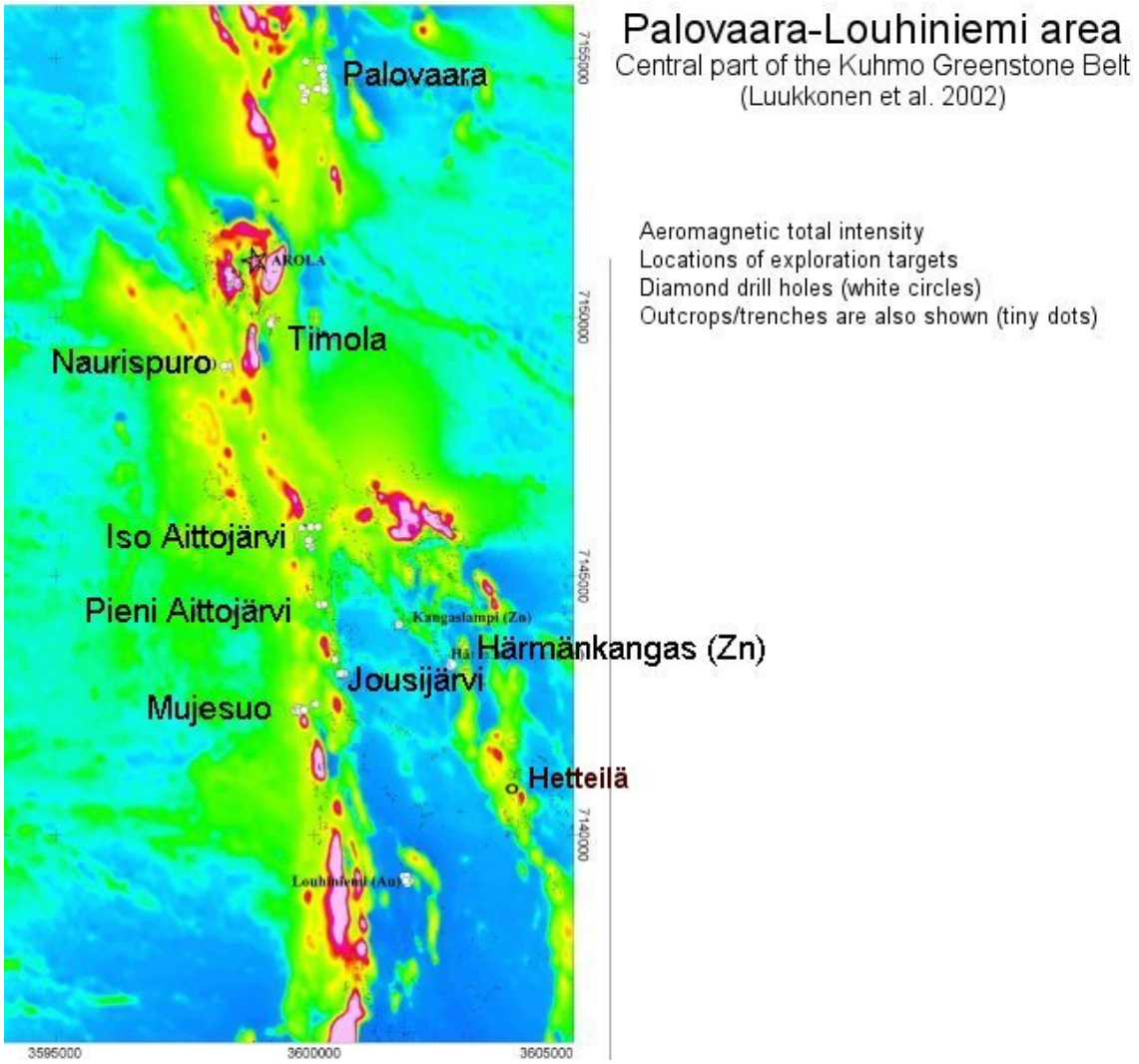
Aurifeous vein in outcrop:

Quartz veining, sulphidation in mafic metavolcanic rock, Palovaara, Kuhmo greenstone belt. Photo Pasi Eilu.

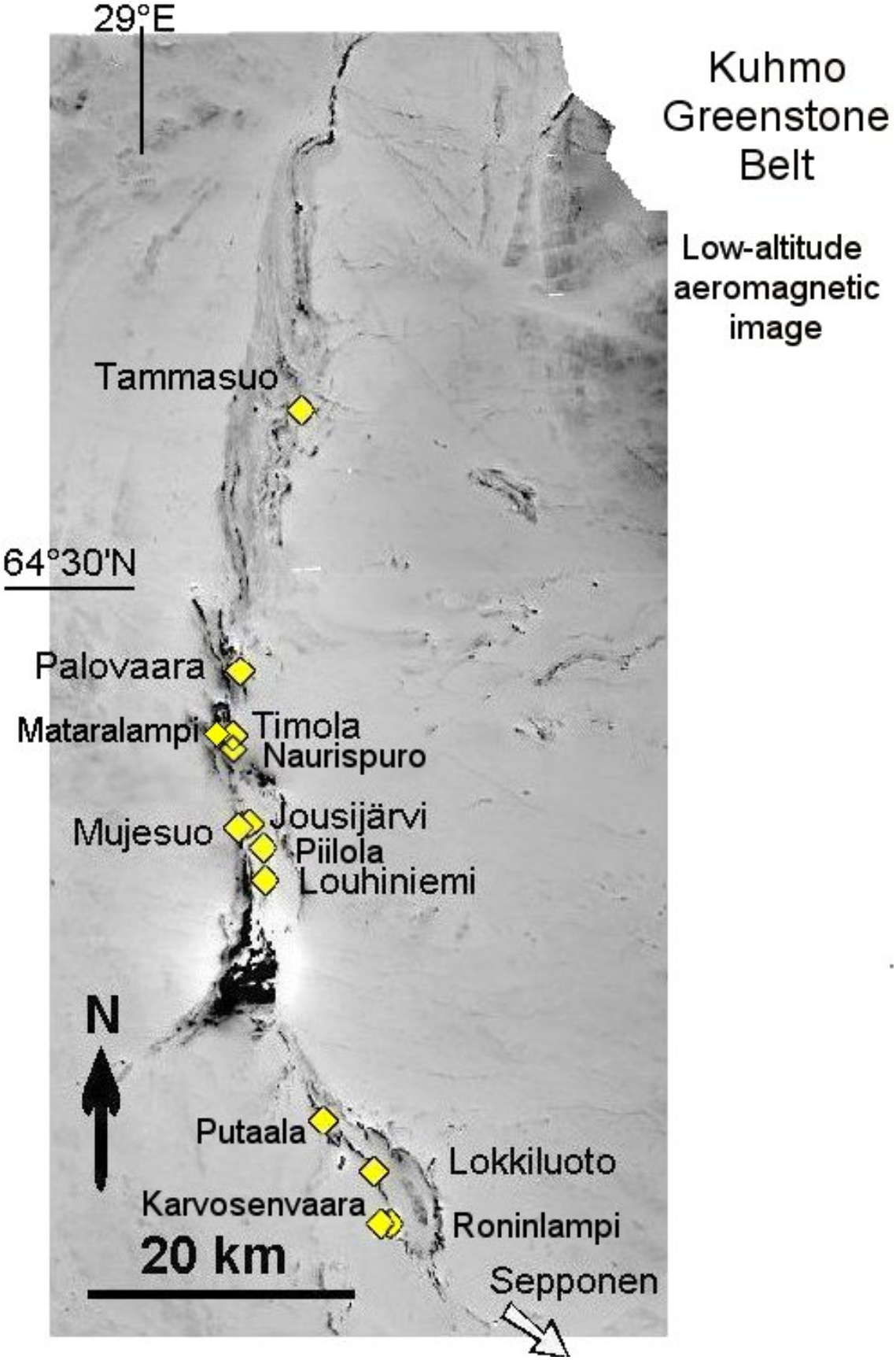
East Finland greenstone belts in the Archaean of Fennoscandia:



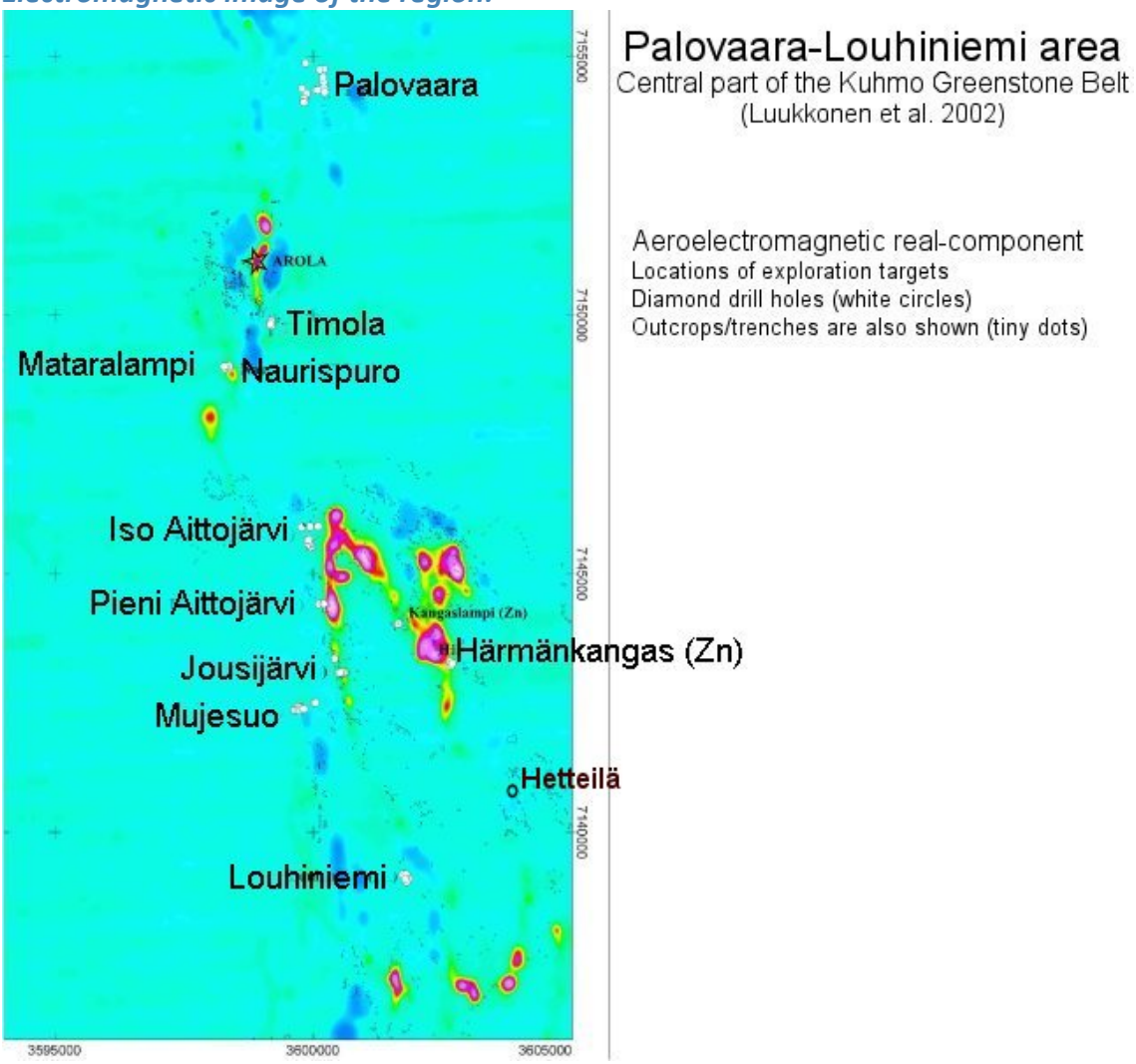
Aeromagnetic image of the region:



Auromagnetic image of the Kuhmo grrenstone belt:



Electromagnetic image of the region:



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