Kaapelinkulma

Alternative Names: Perkoonsuo
Occurence type: deposit

Commodity	Rank	Total measure	Total production	Total resource	Importance
gold	1	0,86 t	0,24 t	0,62 t	Occurrence

Easting EUREF: 345598,321
Northing EUREF: 6791859,579
Easting YKJ: 3345706
Northing YKJ: 6794710

Discovery year: 1986
Discovered by: private prospector
Province: Pirkkala (Au)
Comments: Discovered by an amateur prospector. The deposit was found in outcrop.
References: 19, 20, 24, 25, 28, 29

Mineral deposit type

Group: Metallogenic deposit
Main type: Orogenic (metamorphic hydrothermal)
References: 29

Dimension

Expression: exposed
Form: discordant
Shape: irregular
Length (m): 180
Width (m): 5
Thickness (m): NA
Depth (m): 60
Area (ha): NA
Dip azim: 112
Dip: 35
Plunge azim: NA
Plunge dip: NA
Orientation method: NA
Dimension comments: A 900 m long Au-enriched zone. The main lode is ellipsoidal, a boudin(?), >180 m long, 1-10 m wide, and is open to the south and at the depth of 60 m. The high-grade zone is >200 m long. Two ore bodies identified: the southern is the larger of the two and is the location of the Kaapelinkulma open-pit operation since 2019.

Holder history

Current holder: Dragon Mining Oy
Years: 2016
Holding type: Mining concession (old law)

Previous holders:

Company	Years	Holding type	Comments
Polar Mining Oy	2003-2015	Exploration permit	NA
Polar Mining Oy	2000-2008	Claim (old law)	NA
Outokumpu Oy	1993-2003	NA	NA

Geological Survey of Finland	1986-1993	NA	NA

EXPLORATION ACTIVITY

Dragon Mining Oy

Years	Activity type	Geologist	Exploration result	Ref
2007	core drilling	Pentti Grönholm, Petri Saarela	positive feasibility study	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 15, 17, 18, 19, 20, 21, 22, 23, 24
	2020: 36 diamond-drill holes, in total 4818.75 m. 2022: 20 diamond holes			
	Intersections			
	HoleID	VK/KKU-229		
	From-To	81,3-83,1		
	Length	1,8m		
	gold	64,76ppm		
	HoleID	VK/KKU-233		
	From-To	286,4-287,2		
	Length	0,8m		
	gold	11,65ppm		

Polar Mining Oy

Years	Activity type	Geologist	Exploration result	Ref
2005-2005	core drilling	NA	NA	18, 19, 20, 21, 22, 23, 24
	8 diamond-drill holes, total 835 m. 2007: 35 diamond-drill holes, total 3128 m.			
	Intersections			
	HoleID	NA		
	From-To	NA		
	Length	4,2m		
	gold	5,14ppm		
	HoleID	NA		
	From-To	NA		
	Length	1,3m		
	gold	9,34ppm		
	HoleID	NA		
	From-To	NA		
	Length	11m		
	gold	6,83ppm		
	HoleID	NA		
	From-To	NA		
	Length	2,6m		
	gold	9,51ppm		
	HoleID	NA		
	From-To	NA		
	Length	2m		
	gold	7,6ppm		
	HoleID	NA		
	From-To	NA		
	Length	4,5m		
	gold	13,8ppm		
	HoleID	NA		

	From-To	NA
	Length	9,9m
	gold	46,28ppm
	HoleID	NA
	From-To	NA
	Length	1,5m
	gold	5,2ppm
	HoleID	NA
	From-To	NA
	Length	0,6m
	gold	6,4ppm
	HoleID	NA
	From-To	NA
	Length	0,9m
	gold	10ppm
	HoleID	NA
	From-To	NA
	Length	0,3m
	gold	5,7ppm
	HoleID	NA
	From-To	NA
	Length	0,6m
	gold	6,4ppm
	HoleID	NA
	From-To	NA
	Length	0,6m
	gold	6,4ppm
	HoleID	NA
	From-To	NA
	Length	0,9m
	gold	15,4ppm
	HoleID	NA
	From-To	NA
	Length	0,6m
	gold	7,01ppm

2003-2003	core drilling	NA	NA	18, 20, 21, 22, 23

2003-2003	excavation	NA	NA	18, 20, 21, 22, 23

2003-2003	percussion drilling	NA	NA	18, 20, 21, 22, 23

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1986-1991	detailed geology	Petri Rosenberg	NA	25, 26, 28, 29

1986-1991	core drilling	Petri Rosenberg	NA	28
	Core drilling (reconnaissance drilling): 27 diamond-drill holes, total 2026 m.			
	Intersections			
	HoleID	M52/2132/-88/R309		
	From-To	NA		
	Length	2,5m		
	gold	56,4ppm		
	HoleID	M52/2132/-88/R309		
	From-To	NA		
	Length	5m		
	gold	28,4ppm		

	HoleID	M52/2132/-88/R309
	From-To	NA
	Length	0,5m
	gold	242ppm
	HoleID	M52/2132/-88/R310
	From-To	NA
	Length	5,7m
	gold	14,7ppm
	HoleID	M52/2132/-90/R319
	From-To	NA
	Length	7,5m
	gold	16ppm

1986-1991	detailed geophysics	Petri Rosenberg	NA	28
	Weak response by IP.			

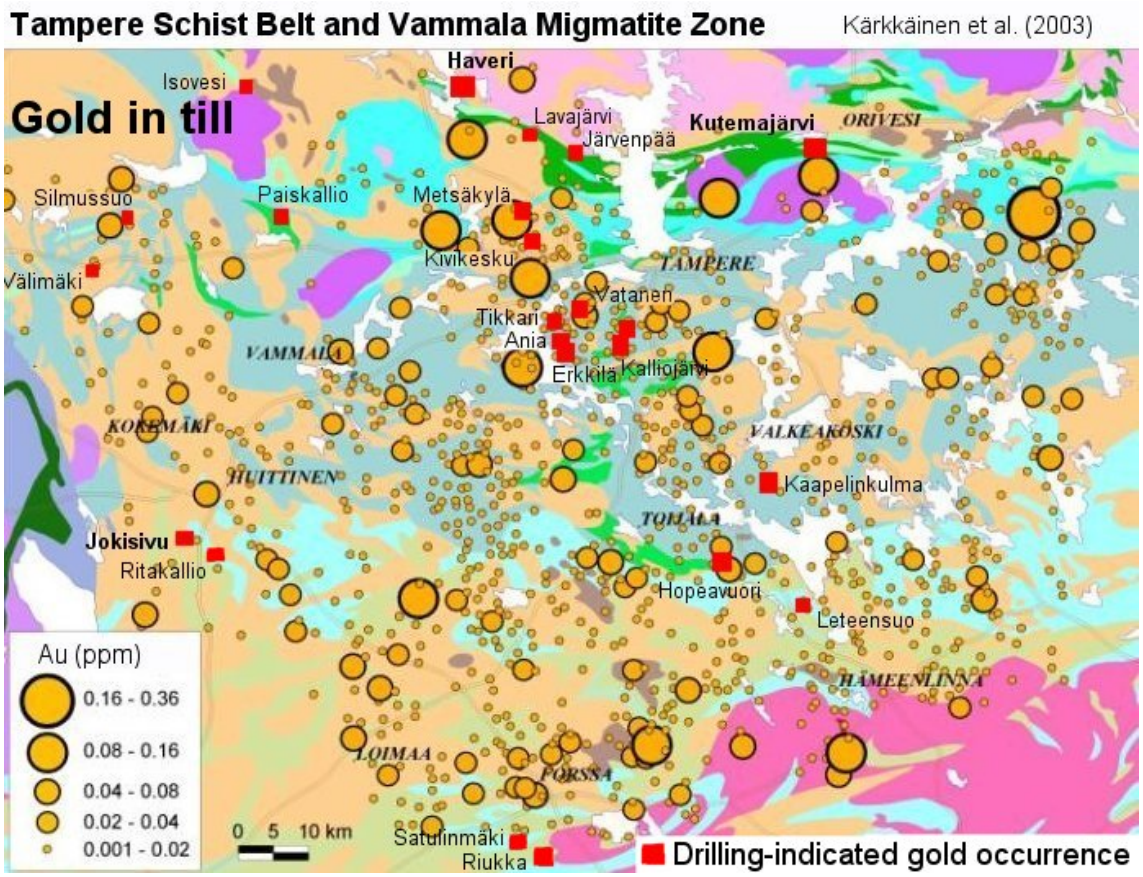
1986-1991	regional geochemistry	Petri Rosenberg	NA	25
	Regional and local Au and As anomalies in till envelop the deposit; the extent of the regional Au anomaly is 20x60 km.			

1986-1991	excavation	Petri Rosenberg	NA	25, 26, 28, 29

1983-1983	regional geophysics	NA	key geological features	
	Low-altitude magnetic, aeromagnetic and radiometric survey			

Figures

Secondary anomaly:



RESOURCES AND RESERVES

Most recent

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Dragon Mining Oy	2021	31.12.2021	JORC code	12, 16
	Comments: Mineral resources remain unchanged 31.12.2022. No ore reserves. Kaapelinkulma resources are distinguished in four parts in the source document: 1) North, 2) South - above sea level, 3) South - below sea level, 4) South - Butterfly Exclusion Zone Exc. Different cut-off grades are used for different parts.				
	Category:	**Measured mineral resource**			
	Tonnage:	**21000 t**			
	gold	1,9 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**41000 t**			
	gold	3,2 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**102000 t**			
	gold	4,4 ppm			
	Cutoff:	**NA**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**164000 t**			
	gold	3,78 ppm			
	Cutoff:	**NA**			

Previous calculations

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Dragon Mining Oy	2017	31.12.2018	JORC code	8
	Comments: Mineral Resources are reported inclusive of Ore Reserves. Mineral Resources remain the same 31.12.2018.				
	Category:	**Measured mineral resource**			
	Tonnage:	**76000 t**			
	gold	3,8 ppm			
	Cutoff:	**gold 1 ppm**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**59000 t**			
	gold	4,2 ppm			
	Cutoff:	**gold 1 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**34000 t**			
	gold	3 ppm			
	Cutoff:	**gold 1 ppm**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**169000 t**			
	gold	3,779 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:

Reserve	Dragon Mining Oy	2017	31.12.2018	JORC code	7
	Comments: Mineral Resources are reported inclusive of Ore Reserves. Reserves remain unchanged 31.12.2018.				
	Category:	**Proved ore reserves**			
	Tonnage:	**52000 t**			
	gold	3,9 ppm			
	Cutoff:	**gold 1,1 ppm**			
	Category:	**Probable ore reserves**			
	Tonnage:	**19000 t**			
	gold	4,3 ppm			
	Cutoff:	**gold 1,1 ppm**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**71000 t**			
	gold	4 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Dragon Mining Oy	2016	NA	JORC code	5
	Comments: 31.12.2016 Resources include reserves				
	Category:	**Indicated mineral resource**			
	Tonnage:	**123000 t**			
	gold	4,4 ppm			
	Cutoff:	**gold 1 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**34000 t**			
	gold	3 ppm			
	Cutoff:	**gold 1**			
	Category:	**Indicated and inferred mineral resource**			
	Tonnage:	**157000 t**			
	gold	4,097 ppm			
	Cutoff:	**gold 1**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Dragon Mining Oy	2016	NA	JORC code	6
	Comments: 31.12.2016 Reserve is inclusice of resources				
	Category:	**Probable ore reserves**			
	Tonnage:	**79000 t**			
	gold	3,5 ppm			
	Cutoff:	**gold 1,14 ppm**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Dragon Mining Oy	2015	NA	JORC code	4
	Comments: Mineral resource estimates as at 1.9.2015. Includes North and South bodies. Mineral resources are inclusive of ore reserves.				
	Category:	**Indicated mineral resource**			
	Tonnage:	**95000 t**			
	gold	5,3 ppm			
	Cutoff:	**gold 2 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**15000 t**			
	gold	4,9 ppm			
	Cutoff:	**gold 2 ppm**			
	Category:	**Indicated and inferred mineral resource**			
	Tonnage:	**110600 t**			
	gold	5,2 ppm			
	Cutoff:	**gold 2 ppm**			
	Comments: According to the press release, the total tonnage is 110 600 t, even though 95 000 + 15 000 = 110 000. In some sources (e.g., press release 25.11.2016 the total tonnage is 110 000 t).				

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Dragon Mining Oy	2015	NA	JORC code	17
	Comments: 1.9.2015.				
	Category:	**Probable ore reserves**			
	Tonnage:	**87000 t**			
	gold	3,4 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Dragon Mining Oy	2014	NA	JORC code	3
	Comments: 31.12.2014				
	Category:	**Indicated mineral resource**			
	Tonnage:	**84900 t**			
	gold	5,6 ppm			
	Cutoff:	**gold 2 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**37300 t**			
	gold	4,9 ppm			
	Cutoff:	**gold 2 ppm**			
	Category:	**Indicated and inferred mineral resource**			
	Tonnage:	**122200 t**			
	gold	5,386 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Dragon Mining Oy	2013	NA	JORC code	2
	Category:	**Indicated mineral resource**			
	Tonnage:	**84900 t**			
	gold	5,6 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**37300 t**			
	gold	4,9 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated and inferred mineral resource**			
	Tonnage:	**122200 t**			
	gold	5,173 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Polar Mining Oy	2009	NA	NA	1
	Category:	**Indicated and inferred mineral resource**			
	Tonnage:	**161000 t**			
	gold	6,2 ppm			
	Cutoff:	**gold 1 ppm**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Geological Survey of Finland	1997	NA	NA	28, 29
	Category:	**NA**			
	Tonnage:	**0,127 Mt**			
	gold	8,15 ppm			
	Cutoff:	**NA**			

MINING

Kaapelinkulma

Easting EUREF: 345598,321
Northing EUREF: 6791859,579
Status: Care and maintenance
Previous status: Operating continuously
Operating years: 2019-2021
Years in production: 3
Total ore mined: 103923 t

Total production:

Product	Product measure
gold	240 kg

Other materials:

Material type	Material measure
Waste rock	857192 t

Mining activity:

Year	Ore mined	Ore processed	Activity type	Production	Other material
2021	22795 t	22795 t	open-pit mining		
				gold 45 kg	Waste rock 29495 t
2020	52629 t	52629 t	open-pit mining		
				gold 115 kg	Waste rock 456385 t
2019	28499 t	28499 t	open-pit mining		
				gold 80 kg	Waste rock 371312 t

GEOLOGY

Host rock: Quartz diorite, Quartz vein, Tonalite

Quartz diorite (Host rock)

Rock type: Host rock
Proportion: major
Grain size: NA
Color: NA
References: 27, 28, 29

Ore minerals:

Mineral	Proportion	Mineral texture
Arsenopyrite	major	
Bismuth	minor	
Chalcopyrite	minor	
Gold	minor	
	Native free gold chiefly associated with quartz (locally visible to the naked eye), some gold associated with native bismuth and as inclusions in arsenopyrite.	
Löllingite	minor	
Pyrrhotite	major	

Other minerals:

Mineral	Proportion	Mineral texture
Calcite	present	
Hornblende	present	Alteration product
Quartz	present	
Rutile	present	Alteration product
Scheelite	present	
Tremolite	present	Alteration product

Structures
Sheared

Alteration:	Distribution:	Degree:	Relation to mineralization:
biotite alteration	Veins	Moderate	NA

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		
Comments: Plagioclase-hornblende-biotite-quartz.					

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:

Paleoproterozoic (2500-1600 Ma)	1600-2500		N

Quartz vein (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA
Color: NA
References: 29
Comments: Auriferous quartz veins

Tonalite (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA
Color: NA
References: 28, 29
Comments: The intermediate dike represents an early sub-volcanic intrusion suite followed by the emplacement of the tonalite.

Metamorphic description:

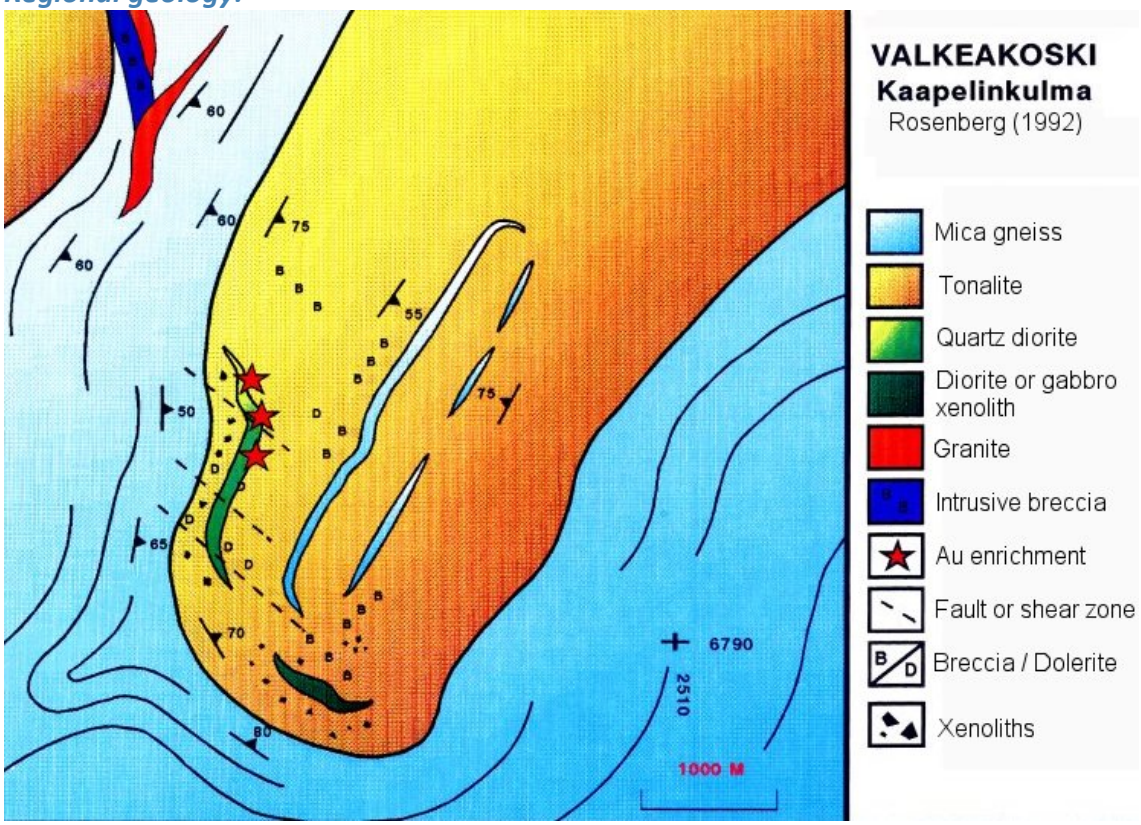
Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	NA		
Comments: Plagioclase-quartz-biotite-hornblende-diopside.					

Geological age:

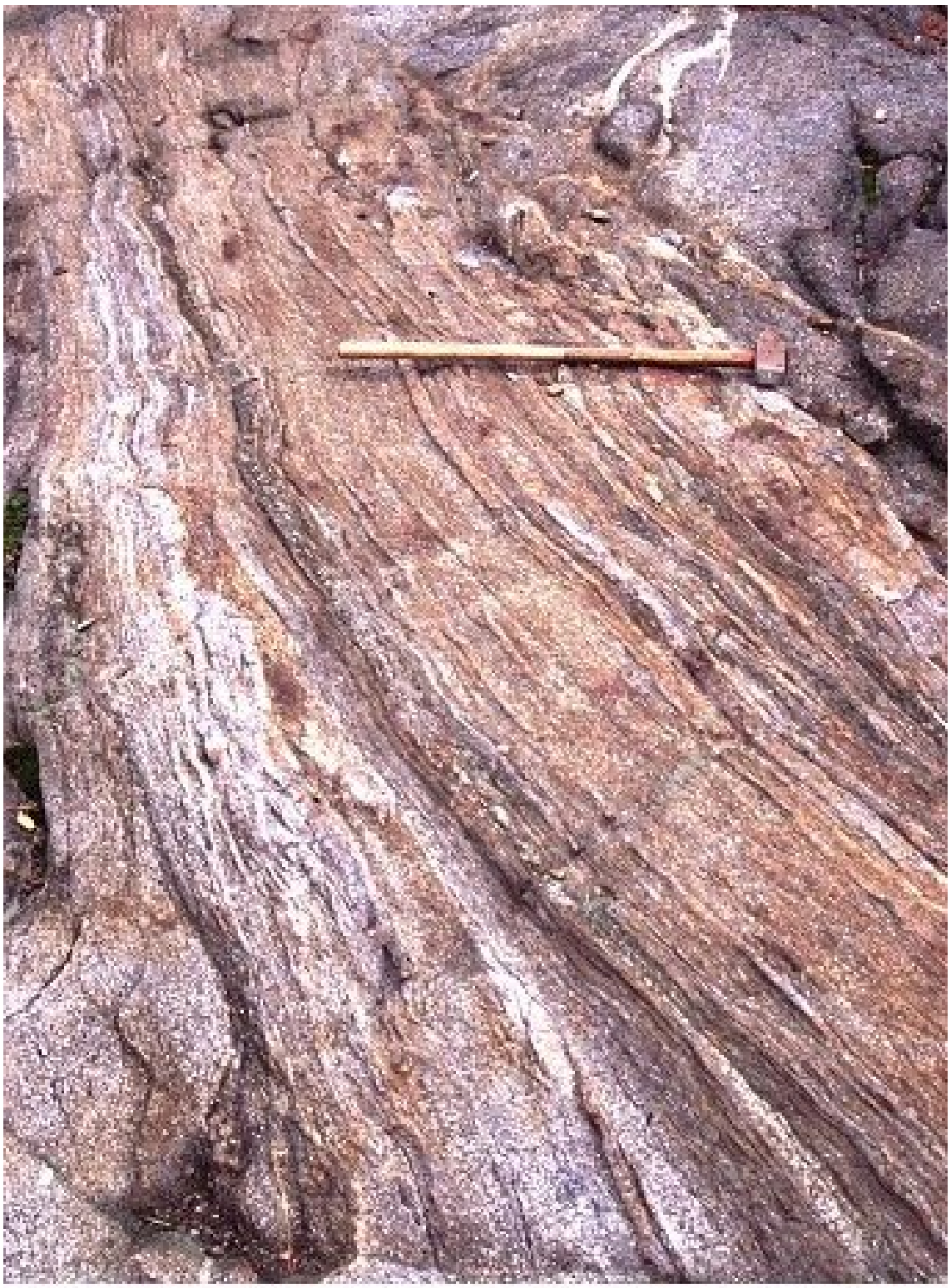
Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Paleoproterozoic (2500-1600 Ma)	1600-2500		N

Figures

Regional geology:



Structure:



Main mineralised shear zone at Kaapelinkulma, in quartz diorite. Hammer handle is 80 cm. Photo Pasi Eilu 15/10/1998.

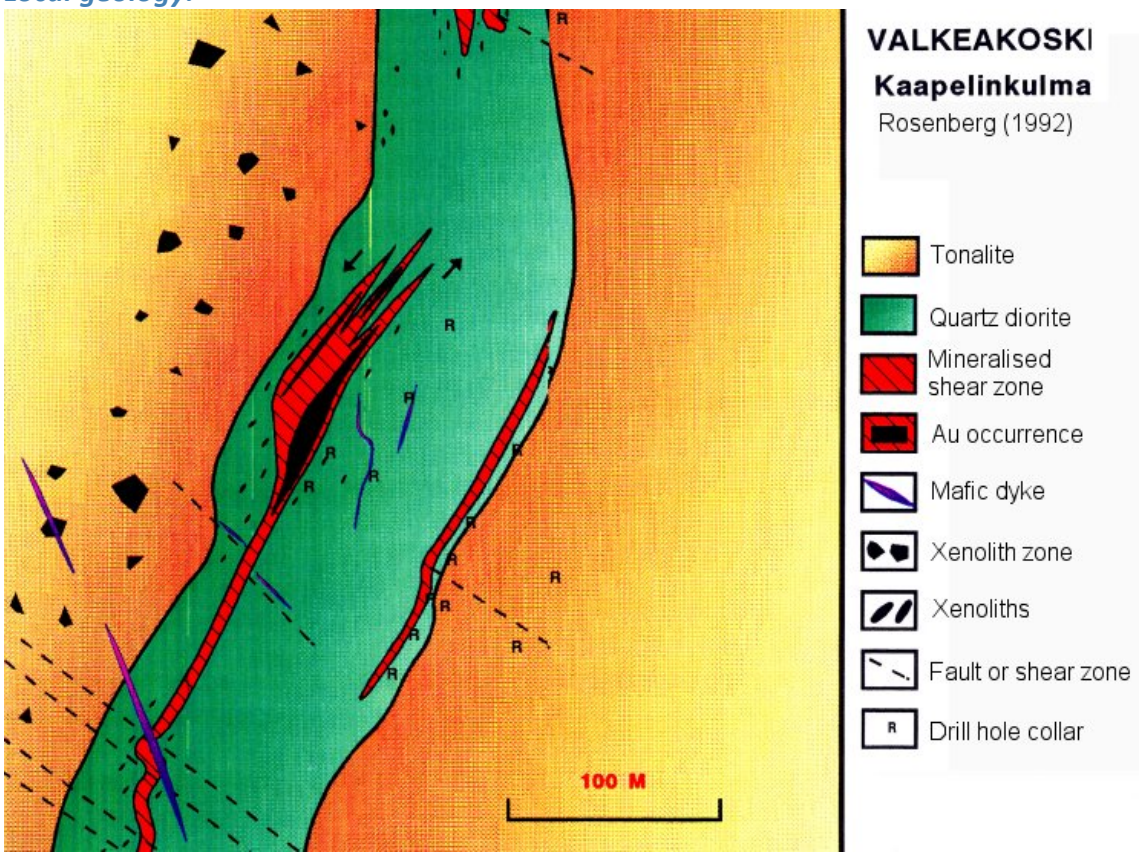
Structure:

A minor mineralised shear zone at Kaapelinkulma. Compass plate is 11 cm long. Photo Pasi Eilu 15/10/1998.

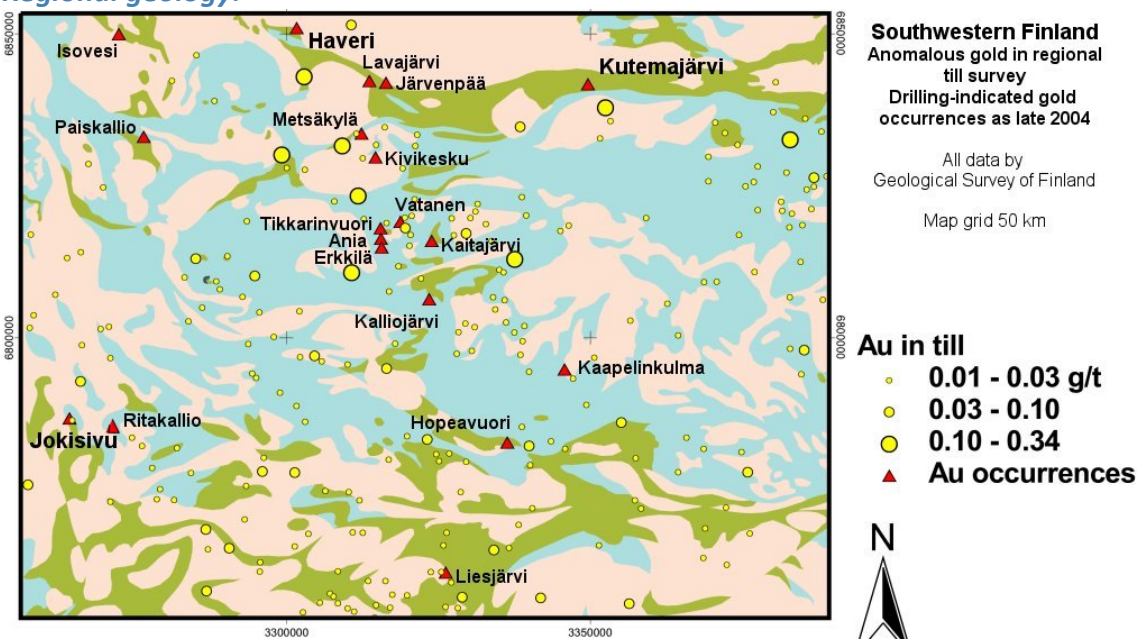
Structure:

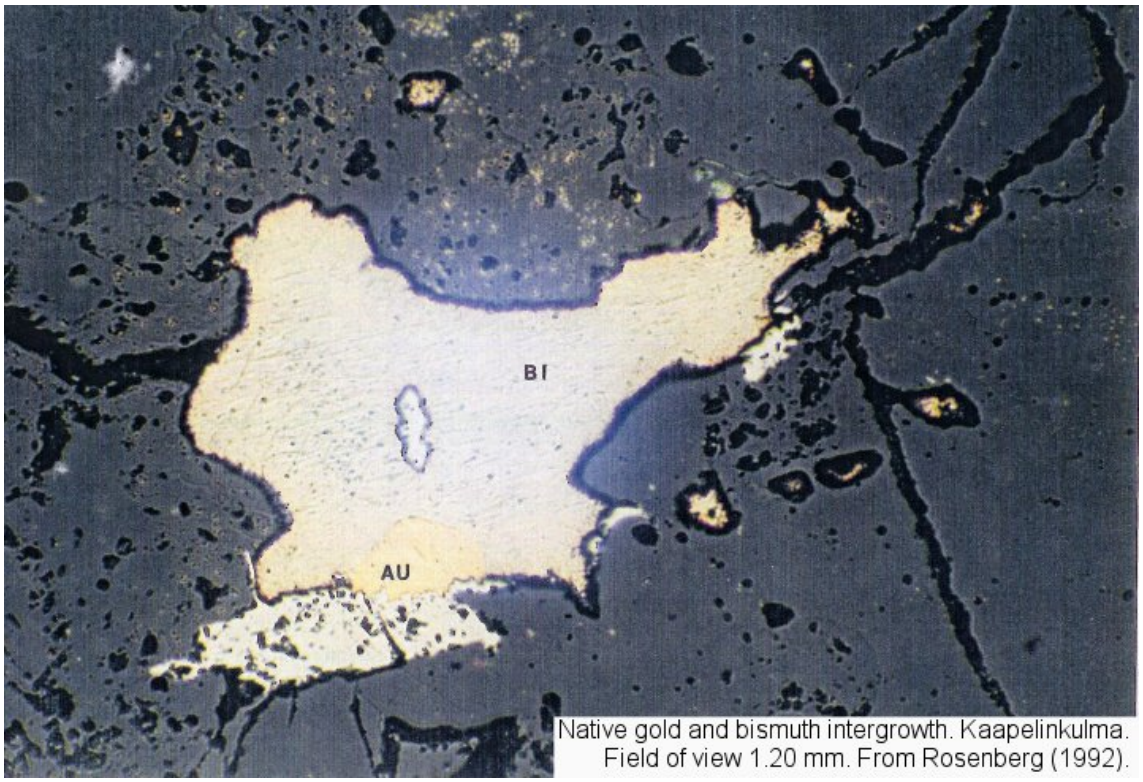
Close-up of the main mineralised shear zone at Kaapelinkulma. Post-gold crenulation is clearly visible. Compass plate is 11 cm long. Photo Pasi Eilu 15/10/1998.

Local geology:



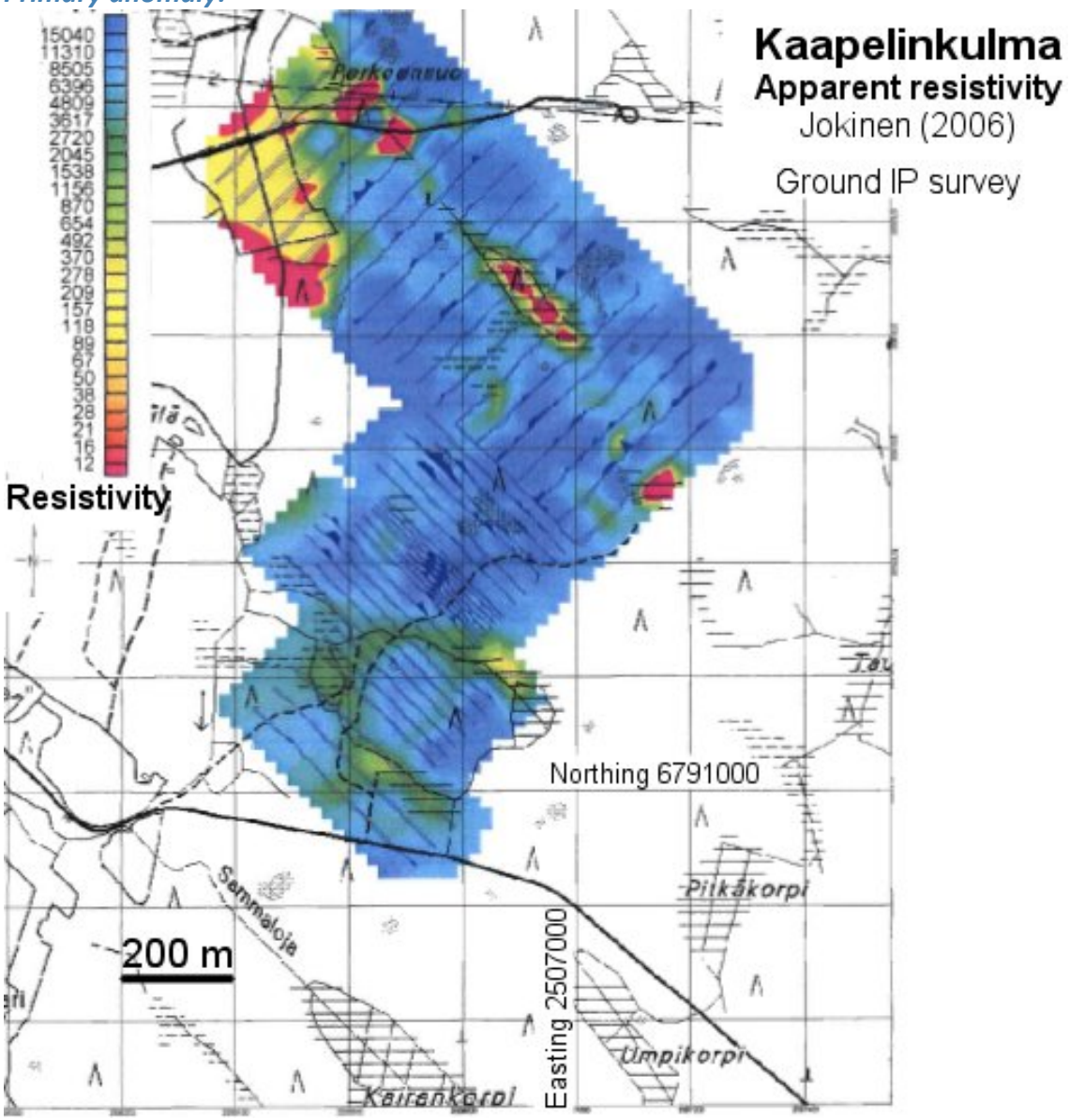
Regional geology:

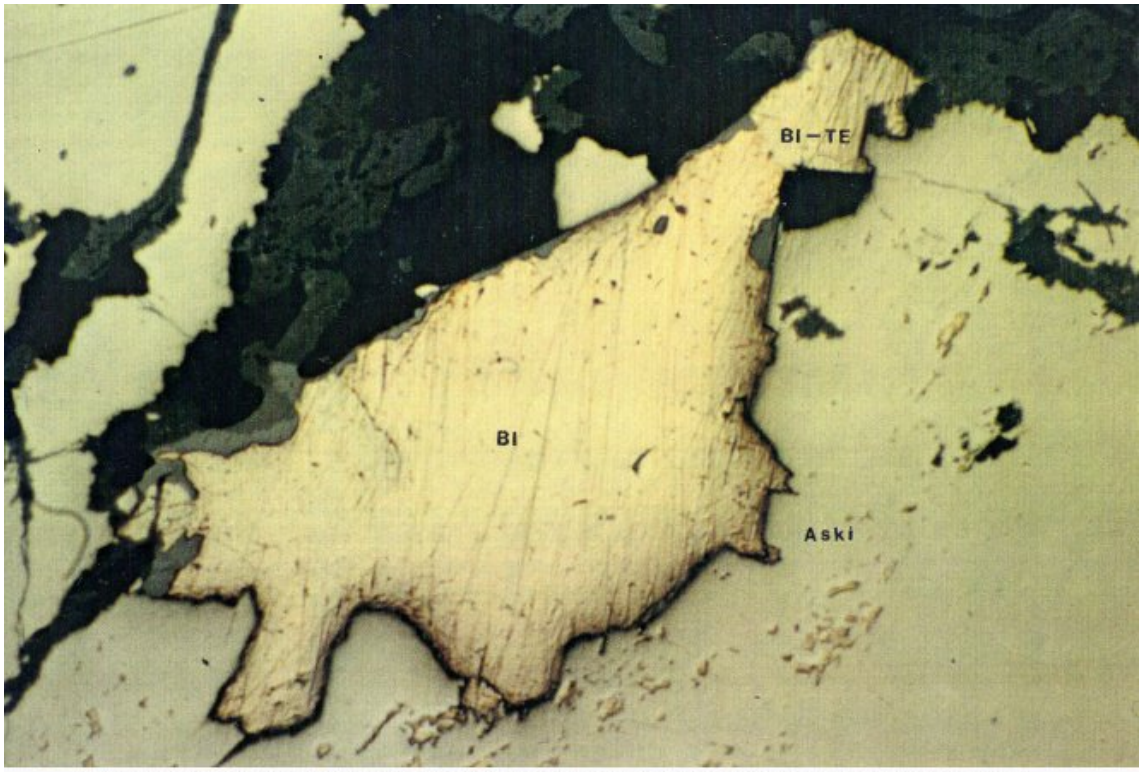




Native gold and bismuth intergrowth. Kaapelinkulma. Field of view 1.20 mm. From Rosenberg (1992).

Primary anomaly:





Native bismuth (Bi), Bi-telluride (Bi-TE) and arsenopyrite (Aski) at Kaapelinkulma.
Field of view 0.37 mm. From Rosenberg (1992).

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