Kettukuusikko

Alternative Names: Päivänenä, Ruostenenä, Lälleänvuoma
Occurence type: deposit

Commodity	Rank	Total measure	Total production	Total resource	Importance
gold	1	0,78 t	NA	0,78 t	Occurrence
copper	3	NA	NA	NA	NA

Easting EUREF: 421675
Northing EUREF: 7518470
Easting YKJ: 3421816
Northing YKJ: 7521612

Discovery year: 1977
Discovered by: Outokumpu Oy
Province: Kittilä (Au, Cu)
District: Sirkka (Cu, Au, Ni, Co)
Comments: The geochemical investigations performed by Outokumpu in the late 1970s pointed to significant copper-nickel-cobalt till anomalies, which then led to the discovery of the first gold deposit. Diamond drilled in 1986.
References: 1, 2, 7, 14, 15, 16, 18, 19, 21, 25, 27

Mineral deposit type

Group: Metallogenic deposit
Main type: Orogenic (metamorphic hydrothermal)
Sub type 1: Au-Cu
Comments: Probably, an orogenic 'mesothermal' mineralisation, as are all gold deposits close to Päivänenä.
References: 7, 10, 11

Dimension

Expression: exposed
Form: discordant
Shape: NA
Length (m): 425
Width (m): 40
Thickness (m): NA
Depth (m): 155
Area (ha): NA
Dip azim: NA
Dip: 50
Plunge azim: 180
Plunge dip: 30
Orientation method: NA
Dimension comments: The mineralization occurs in three zones; Kettukuusikko South Zone (KSZ), Central Zone (KCZ) anf North Zone (KNZ). KNZ is over 50 m strike lenght, 15 m with and 100 m depth

Holder history

Current holder: B2Fingold Oy
Years: 2023-2026

Holding type: Exploration permit

Previous holders:

Company	Years	Holding type	Comments
B2Fingold Oy	2018-2023	Exploration permit	JV with Aurion Resources Oy
Tailtiu Oy	2014-2017	Exploration permit	NA
Tailtiu Oy	2008-2013	Claim (old law)	NA
Taranis Resources Inc	2004	NA	NA
Geological Survey of Finland	2002-2004	NA	NA
Terra Mining Oy	1998-2003	NA	Part of the area.
Outokumpu Oy	1985-1996	Claim (old law)	Part of the area during 1985-1990 and 1995-1996

Figures

The Lälleävuoma peat bog at Kettukuusikko (Päivänenä). View from south. 6 Aug. 2003. Photo Pasi Eilu.

View to the east from Kettukuusikko (Päivänenä) in 6 Aug. 2003. Photo Pasi Eilu.

EXPLORATION ACTIVITY

Taranis Resources Inc

Years	Activity type	Geologist	Exploration result	Ref
2011-2011	detailed geophysics	J. Gardiner	NA	
	SkyTEM geophysical survey; three lines were flown, one across each of the three zones			

2005-2007	excavation	J. Gardiner	NA	
	ten trenches were excavated			

2005-2010	core drilling	J. Gardiner	NA	15, 18, 19, 20, 21, 22, 23, 24, 25
	96 diamond drill holes, total 9278 m			
	Intersections			
	HoleID	K-28		
	From-To	67,5-69,9		
	Length	2,4m		
	gold	14,62ppm		
	Comments	*KNZ*		
	HoleID	K-29		
	From-To	118,2-138,6		
	Length	20,4m		
	gold	4,33ppm		
	Comments	*KSZ*		
	HoleID	K-46		
	From-To	123,1-134,8		
	Length	11,7m		
	gold	2,83ppm		
	Comments	*including 2.00 m @ 8.68 ppm Au from 129.05 m, KSZ*		
	HoleID	K-5		
	From-To	6,6-35,5		
	Length	28,9m		
	gold	1,39ppm		
	Comments	*including 2.38 m @ 4.56 ppm Au from 12,62 m, KSZ*		
	HoleID	K-70		
	From-To	16-17		
	Length	1m		
	gold	8,31ppm		
	Comments	*KCZ*		
	HoleID	K-9		
	From-To	22,8-42,3		
	Length	19,4m		
	gold	1,6ppm		
	Comments	*KSZ*		
	HoleID	KCZ		
	From-To	NA		
	Length	5,1m		
	copper	0,7%		
	HoleID	NA		
	From-To	NA		
	Length	1,7m		
	gold	6,93ppm		
	Comments	*KSZ*		

	HoleID	NA
	From-To	NA
	Length	1,8m
	gold	27,7ppm
	HoleID	NA
	From-To	NA
	Length	29m
	copper	0,24%
	HoleID	NA
	From-To	NA
	Length	10m
	copper	0,57%

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
2001-2003	detailed geophysics	V. Keinänen	NA	2, 7
	Altered and mineralised zone is a magnetic low, and a resistivity high indicated by direct-IP.			

2001-2003	core drilling	V. Keinänen	NA	2, 7, 8
	Core drilling (reconnaissance drilling): 62 diamond-drill holes			
	Intersections			
	HoleID	M274303R572		
	From-To	14,8-16,8		
	Length	2m		
	gold	2,88ppm		
	HoleID	M274303R574		
	From-To	21,4-24,4		
	Length	3m		
	gold	2,9ppm		
	HoleID	M274303R577		
	From-To	7,5-10,7		
	Length	3,2m		
	gold	2,57ppm		
	HoleID	M274303R580		
	From-To	43,6-47,7		
	Length	4,1m		
	gold	2,33ppm		
	HoleID	M274303R581		
	From-To	41,5-55,5		
	Length	14m		
	gold	2,28ppm		
	Comments	*including 4.00 m @ 4.15 ppm Au from 48.60 m*		
	HoleID	M274303R582		
	From-To	43,6-53,8		
	Length	10,2m		
	gold	1,2ppm		
	HoleID	M274386R1		
	From-To	48,5-53,7		
	Length	5,2m		
	gold	3,79ppm		
	Comments	*same as the old Outokumpu drill hole with id 86/PÄI-1*		
	HoleID	M274386R2		
	From-To	46,2-49,1		
	Length	2,9m		
	gold	6,14ppm		
	Comments	*same as the old Outokumpu drill hole with id 86/PÄI-2*		
	HoleID	M274386R4		

	From-To	32,2-36,5
	Length	4,3m
	gold	6,55ppm
	Comments	*same as the old Outokumpu drill hole with id 86/PÄI-4*
	HoleID	NA
	From-To	NA
	Length	31,4m
	gold	1,25ppm
	HoleID	NA
	From-To	NA
	Length	7m
	gold	5ppm
	HoleID	NA
	From-To	NA
	Length	28,9m
	gold	1,4ppm
	HoleID	NA
	From-To	NA
	Length	12,2m
	gold	1,75ppm

1999-2000	detailed geochemistry	V. Keinänen	NA	2, 7, 8

Outokumpu Oy

Years	Activity type	Geologist	Exploration result	Ref
1996-1996	core drilling	R. Hugg	NA	5
	Two RC holes, total 169m.			

1985-1986	core drilling	R. Anttonen, R. Hugg	NA	4, 5, 8, 13
	Core drilling (reconnaissance drilling): 6 diamond-drill holes, total 693 m.			
	Intersections			
	HoleID	PÄI-2		
	From-To	NA		
	Length	1m		
	gold	16,8ppm		

1984-1987	detailed geology	R. Anttonen, R. Hugg	NA	3, 4, 5, 7, 8, 13

1984-1987	detailed geophysics	R. Anttonen, R. Hugg	NA	2, 7
	Altered and mineralised zone is a magnetic low, and a resistivity high indicated by direct-IP.			

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1979-1979	regional geophysics	NA	key geological features	
	Low-altitude airborne mahnetic, electromagnetic and radiometric survey			

Outokumpu Oy

Years	Activity type	Geologist	Exploration result	Ref

1977-1987	detailed geochemistry	R. Anttonen, R. Hugg	NA	4, 5, 17
	Local As, Au, Cu anomalies in till.			

Atri Oy

Years	Activity type	Geologist	Exploration result	Ref
1940-1940	detailed geophysics	B. Ohlsson	NA	8, 9

1940-1940	detailed geology	B. Ohlsson	NA	8, 9

RESOURCES AND RESERVES

Most recent

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Taranis Resources Inc	2011	NA	NI 43-101	15, 26
	Category:	**Indicated mineral resource**			
	Tonnage:	**390000 t**			
	gold	1,76 ppm			
	Cutoff:	**gold 1,2 ppm**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**50000 t**			
	gold	1,9 ppm			
	Cutoff:	**gold 1,2 ppm**			
	Category:	**Indicated and inferred mineral resource**			
	Tonnage:	**440000 t**			
	gold	1,776 ppm			
	Cutoff:	**NA**			

GEOLOGY

Host rock: Quartz vein, Komatiite

Quartz vein (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA
Color: NA
References: 2, 7
Comments: Auriferous stockworks of quartz-carbonate veins

Komatiite (Host rock)

Rock type: Host rock
Proportion: major
Grain size: NA
Color: NA
References: 2, 4, 5, 6, 7, 8, 10, 12, 17, 20, 22, 23, 25
Comments: The occurrence is hosted by komatiitess in a sequence of basaltic and komatiitic metavolcanic rocks and fine-grained metasedimentary rocks.

Ore minerals:

Mineral	Proportion	Mineral texture
Chalcopyrite	minor	
Galena	minor	
Gold	present	
	Gold is free milling and occurs in grain boundaries, as inclusions and fracture fill, it is as small free grains in the host rock and as inclusions and fracture fillings in pyrite.	
Pyrite	major	
Telluride	minor	
Tetrahedrite	minor	

Other minerals:

Mineral	Proportion	Mineral texture
Albite	present	
Calcite	present	
Fuchsite	present	Alteration product
Quartz	present	
Rutile	present	Alteration product
Scheelite	present	
Sericite	present	
Talc	present	
Tourmaline	present	

Alteration:	Distribution:	Degree:	Relation to mineralization:
albitic alteration	NA	NA	NA
carbonate alteration	NA	NA	NA
hematitic alteration			
sulphidation			

Comments: pyrite up to 15 volume% in the mineralized zones, usually < 5 volume%
hydration
Comments: talc and chlorite

Metamorphic description:

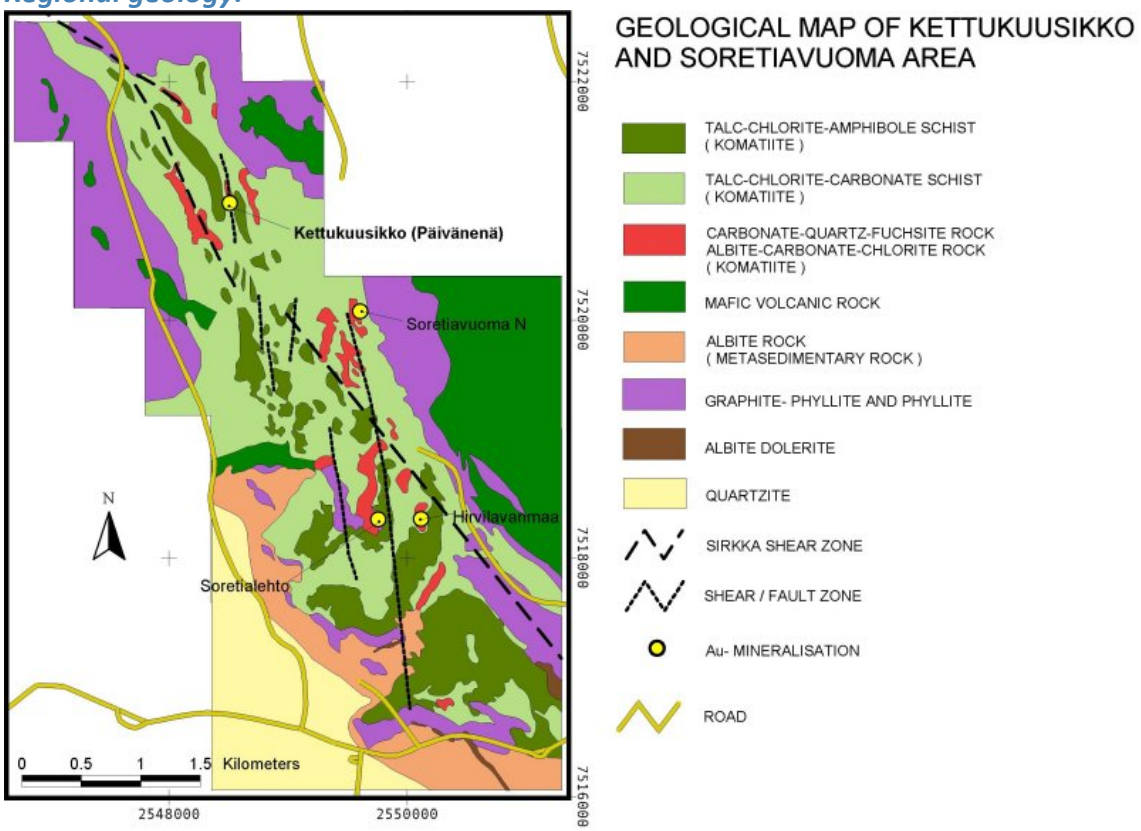
Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	greenschist metamorphic facies	low metamorphic grade	NA		
Comments: Metamorphic peak during D2, thrusting during D3 was at least partly post-peak, late metamorphic.					

Geological age:

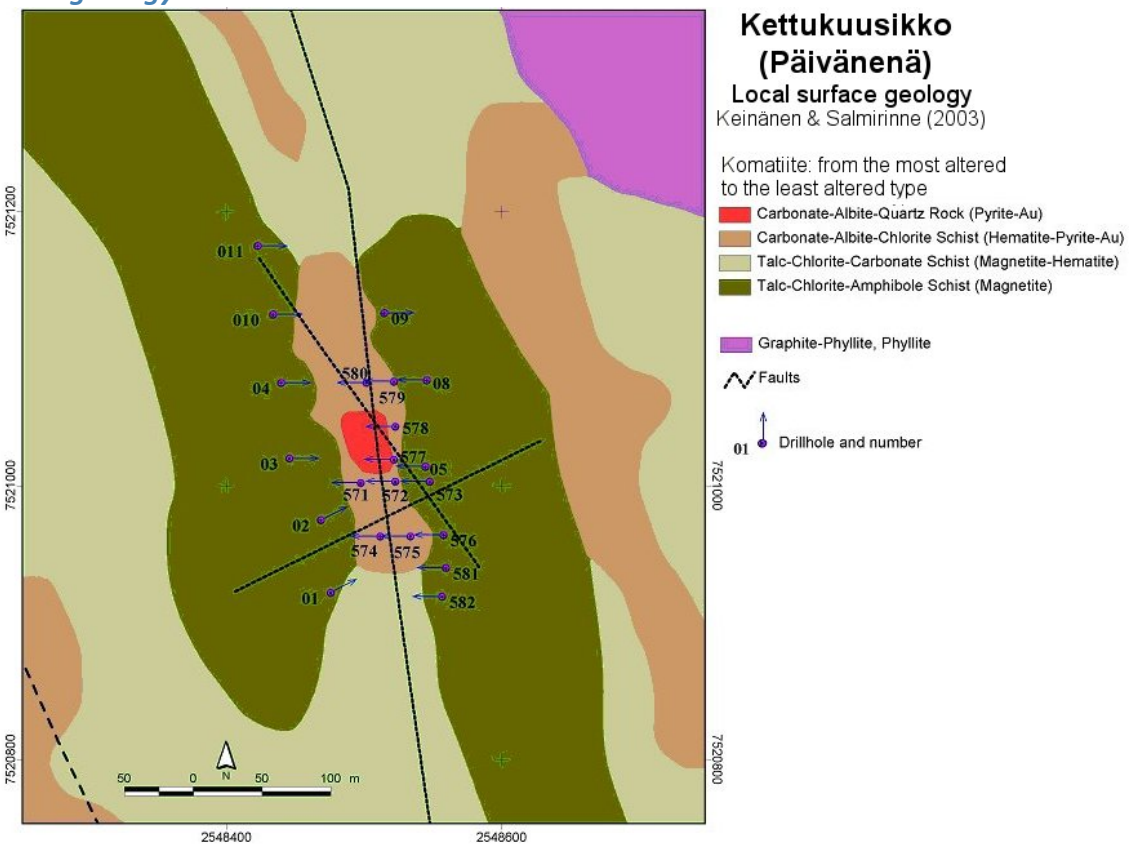
Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Paleoproterozoic (2500-1600 Ma)	2050-2500		N
Comments: The gold mineralisation in the Kuotko-Kiistala-Soretiavuoma area probably took place between 1852-1890 Ma.			

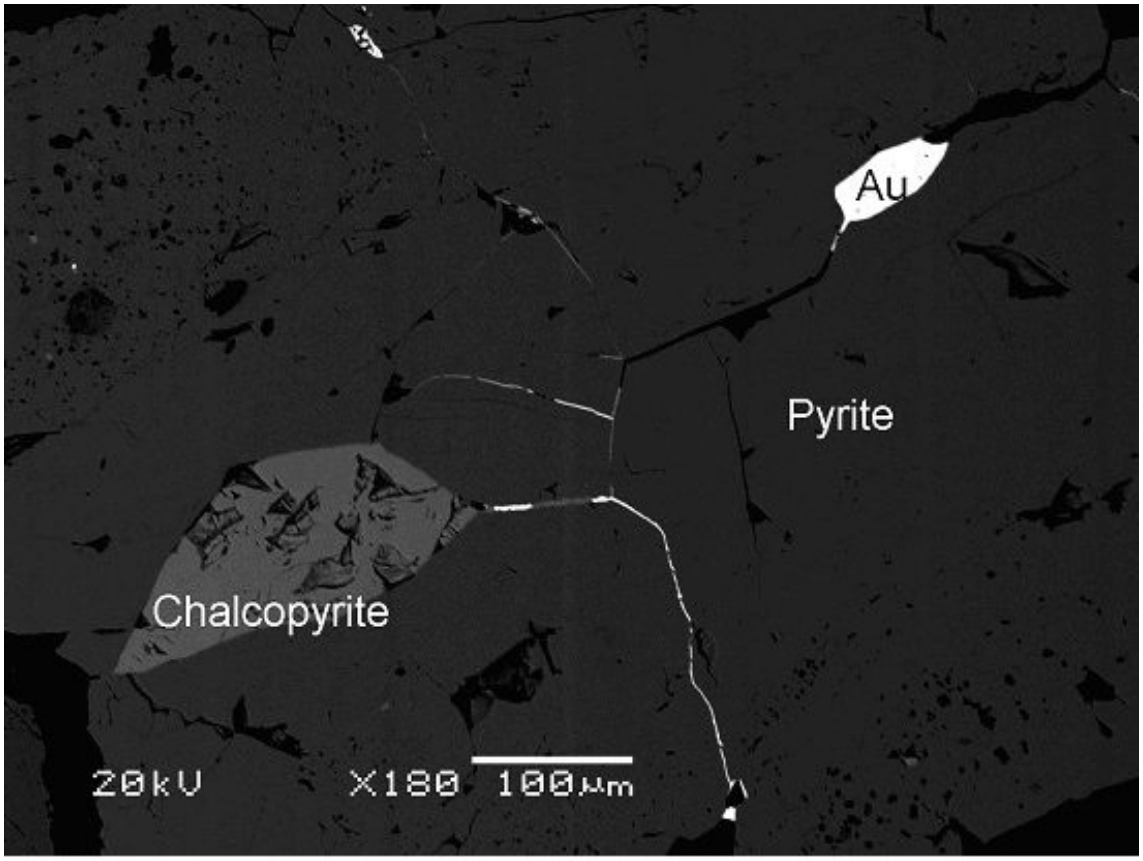
Figures

Regional geology:

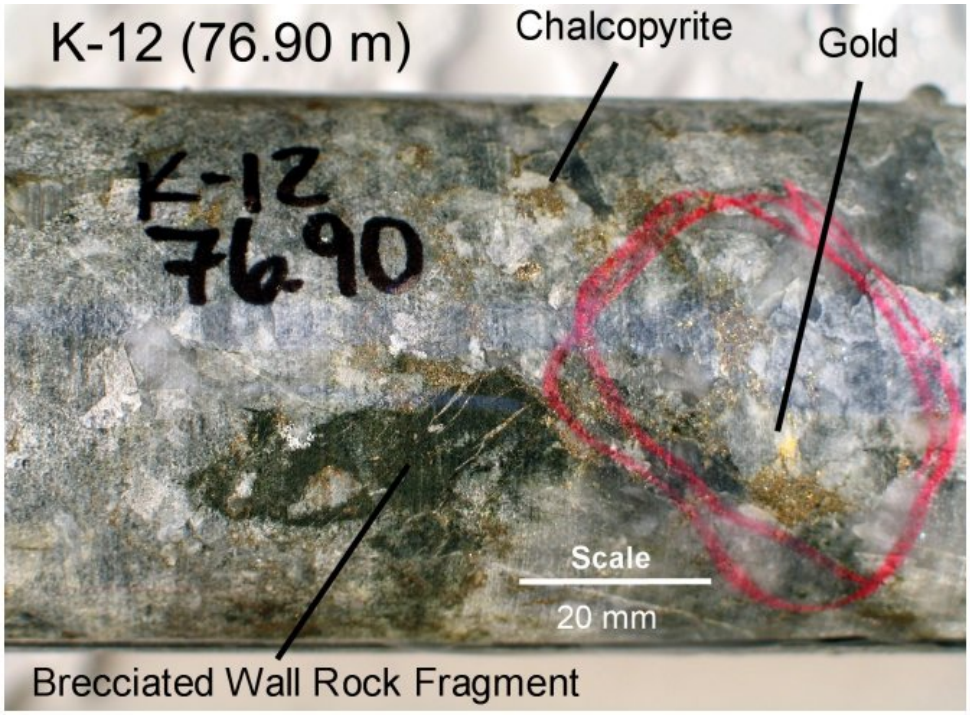


Local geology:



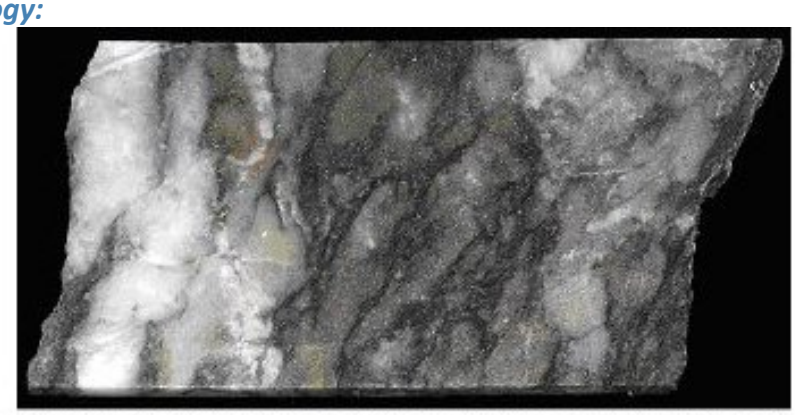


Gold and chalcopyrite inclusions and fracture fillings in pyrite. DH 576/ 52.0 m.
The SEM mage by Heli Lallukka.



Visible Gold located within heavily brecciated quartz-flooded zone (within red circle). Note presence of brecciated wall rock fragment (mafic volcanic/intrusive) that is brecciated and in-filled with pyrite. Over 55 grains of visible gold were identified in this piece of drill core. Core at 76.9 meters downhole.
www.taranis.us/Kettukuusikko.htm

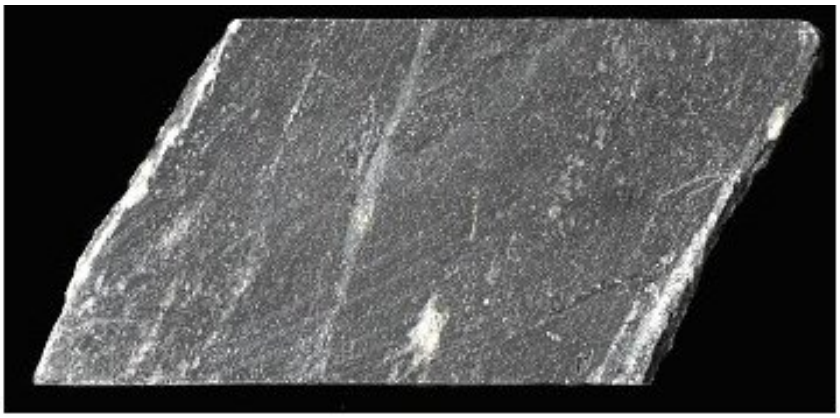
Prox Geology:



Kettukuusikko: proximal alteration in komatiitic volcanic rock: Carbonate- albite rock with pyrite dissemination and quartz-carbonate-talc veins. Sample DH 576/43.25 m. Image Veikko Keinänen.

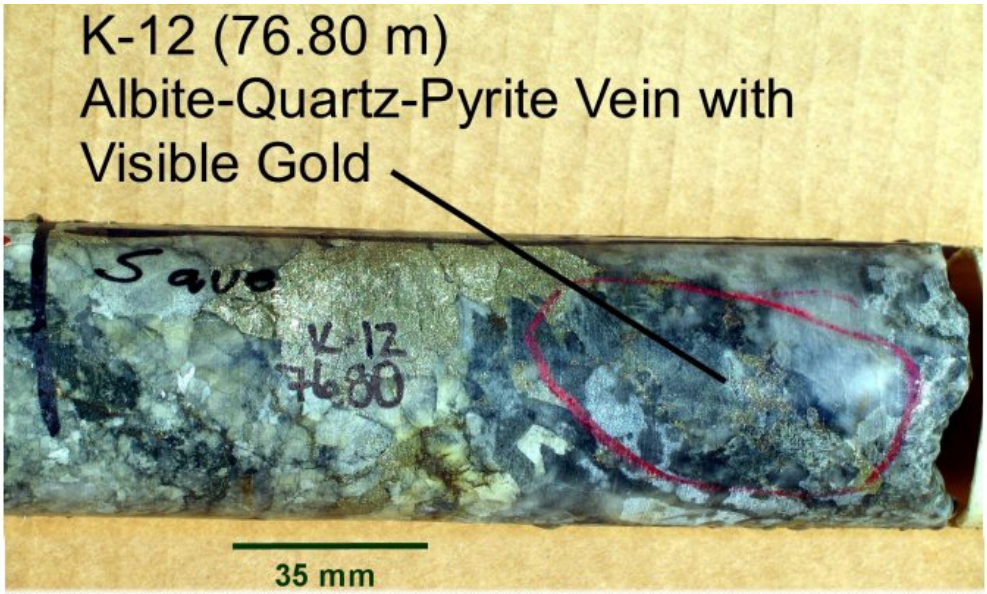
Intermed Geology:

Kettukuusikko: intermediate alteration in komatiitic volcanic rock:
Folded chlorite- talc- carbonate- rutile schist.
Sample DH 576/74.40 m. Image Veikko Keinänen.



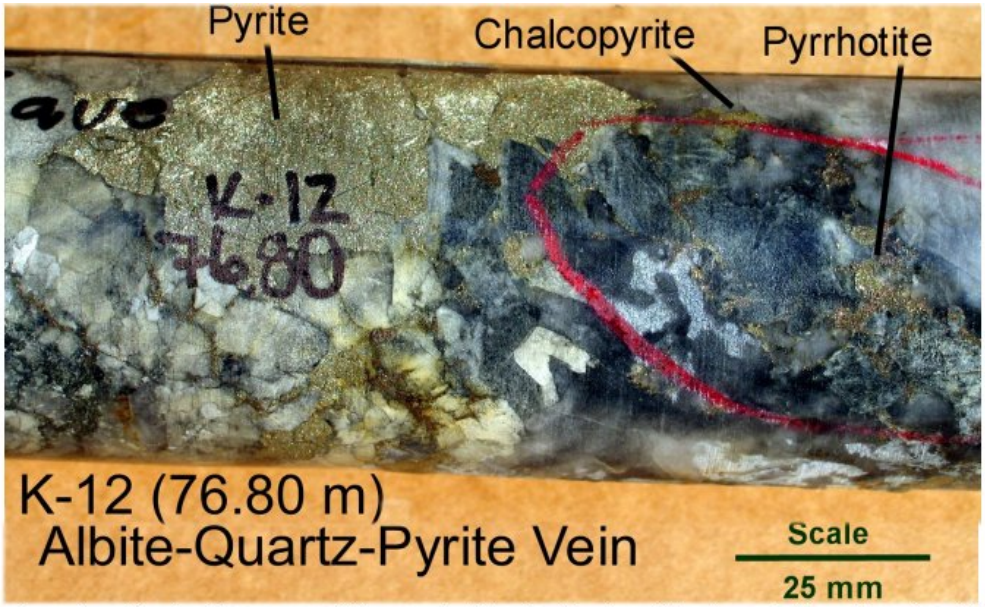
Kettukuusikko: least altered (distal alteration) komatiitic volcanic rock:
Talc schist with magnetite dissemination and small carbonate veinlets
and porphyroblasts. Sample DH 579/ 25.90 m.
Image Veikko Keinänen.

Again, at 86.4 meters, total destruction of the original protolith arising from heavy albite/quartz/tourmaline alteration.
This interval is just up-hole from ultramafic volcanics (talc-chlorite schist.)



Zone of pervasive albite alteration accompanied by massive blobs of pyrite. Iron sulfide phases include pyrite and pyrrhotite (no arsenopyrite). Quartz flooding consists of a light grey colored type and a darker black color. Visible gold is found within the red circle and accompanies chalcopyrite. Core 76.8 meters downhole.

www.taranis.us/Kettukuusikko.htm

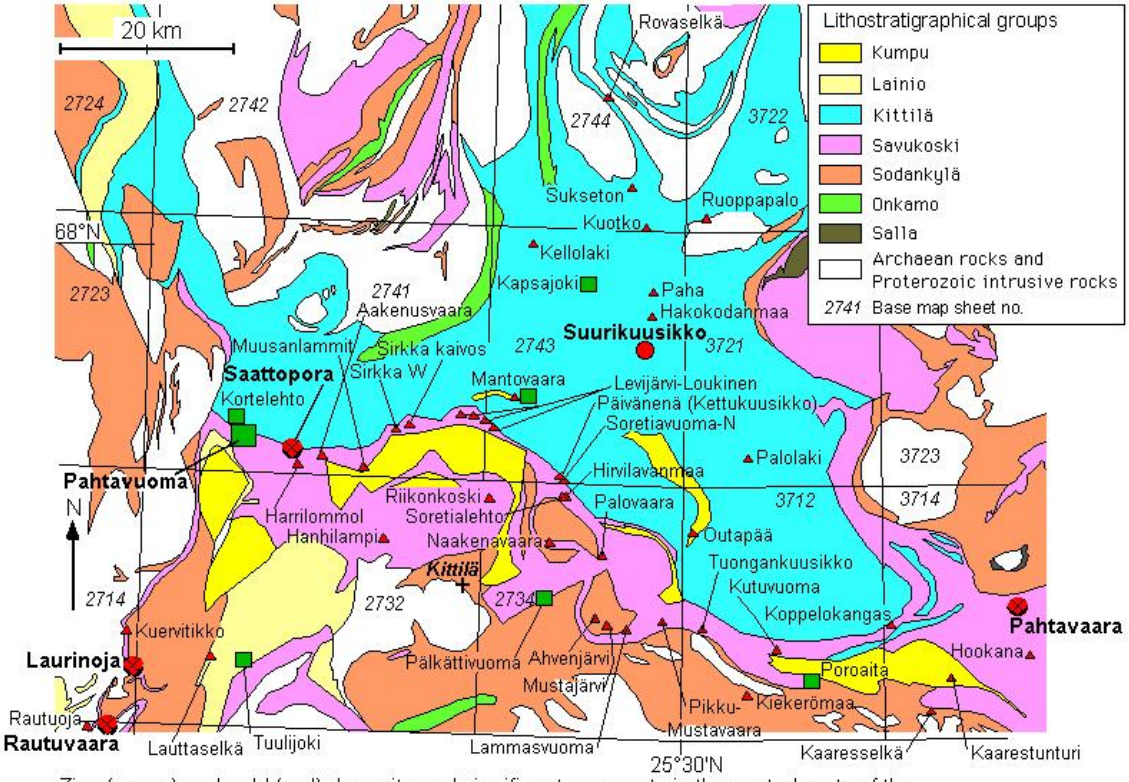


Zone of pervasive albite alteration accompanied by massive blobs of pyrite. Iron sulfide phases include pyrite and pyrrhotite (no arsenopyrite). Quartz flooding consists of a light grey colored type and a darker black color. Visible gold is found within the red circle and accompanies chalcopyrite. Core 76.8 meters downhole.
Close-up showing chalcopyrite, pyrite and pyrrhotite blobs within dark black colored quartz-flooded areas.

www.taranis.us/Kettukuusikko.htm

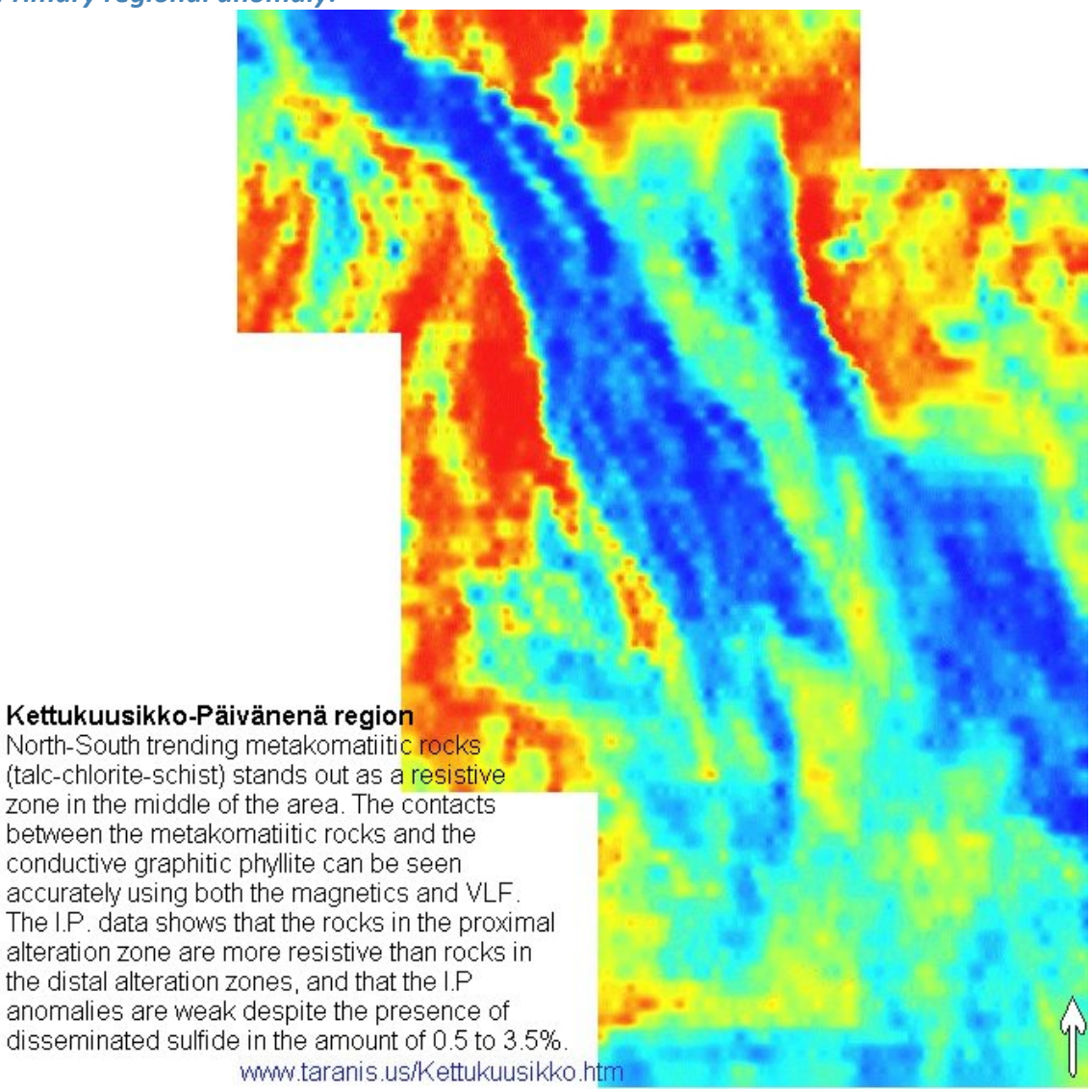
The drill hole shows heavy alteration outside of the area that has the visible gold mineralization. This photograph is from 83.1 meters downhole and shows coarse grained albite-quartz alteration within the mafic volcanic/intrusive rocks. There is also heavy green chlorite alteration accompanying the quartz flooded areas. www.taranis.us/Kettukuusikko.htm

Regional geology:

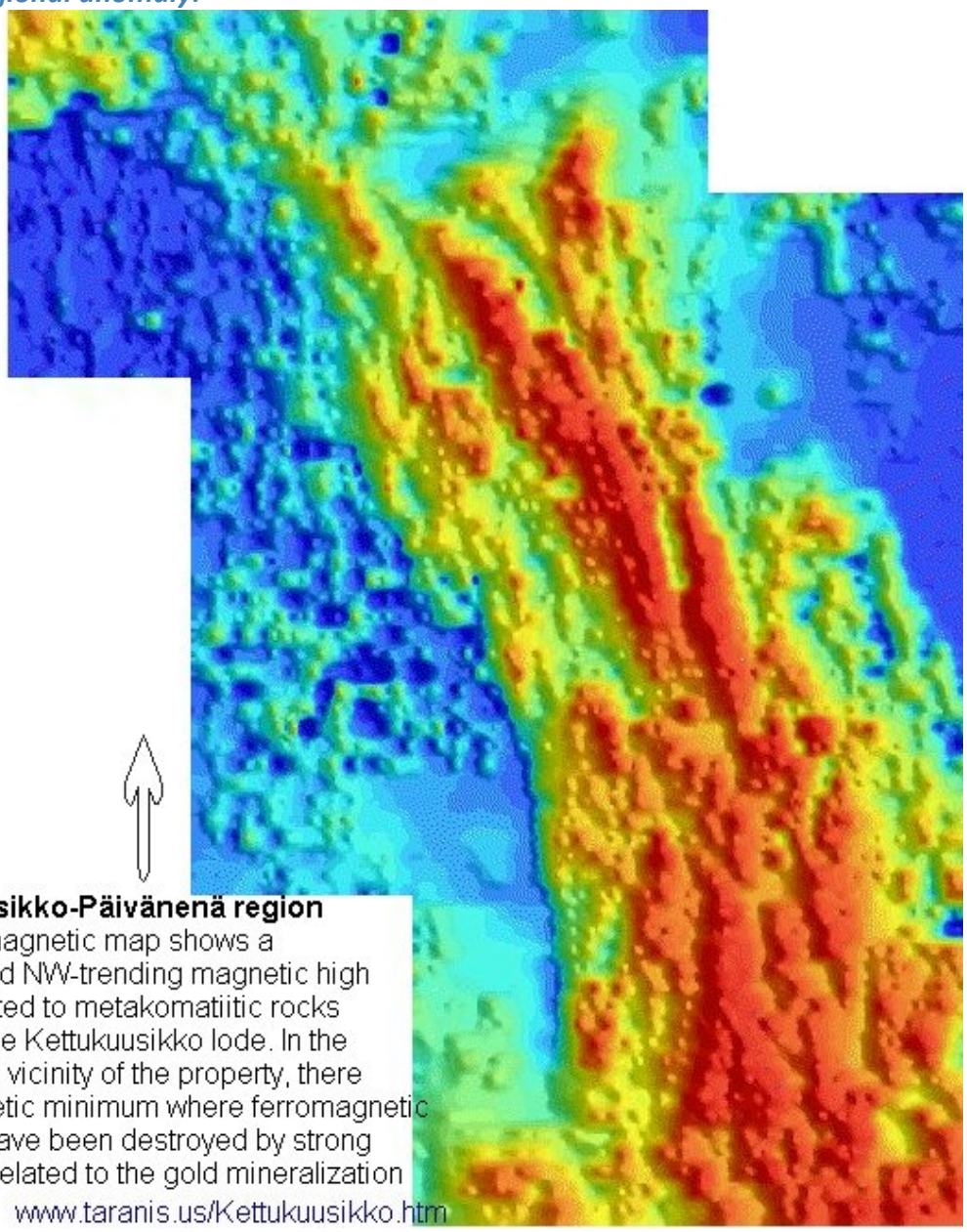


Zinc (green) and gold (red) deposits and significant prospects in the central parts of the Central Lapland greenstone belt. Lithostratigraphy from Lehtonen et al. (1998). Edited by P. Eilu (2007)

Primary regional anomaly:

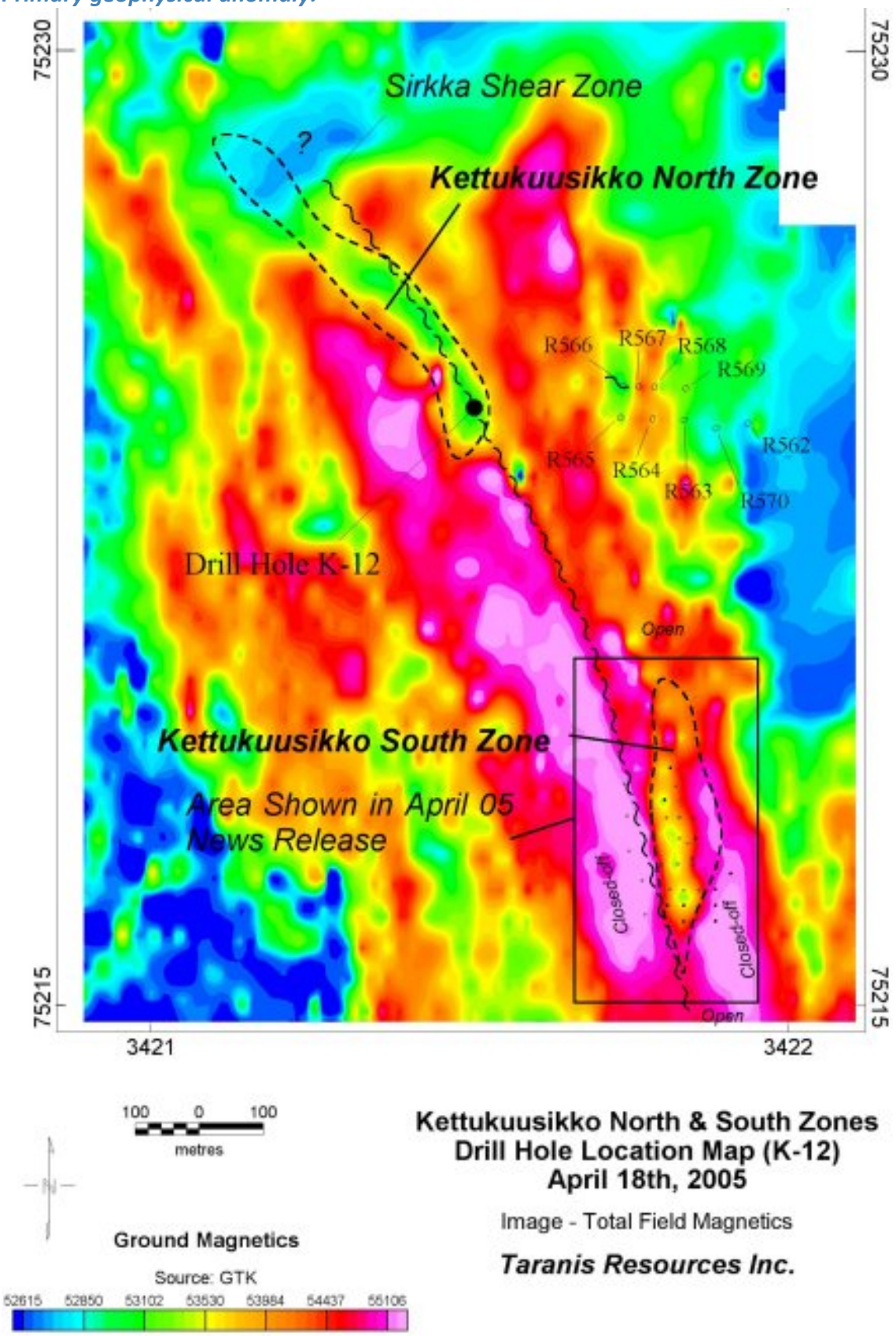


Primary regional anomaly:

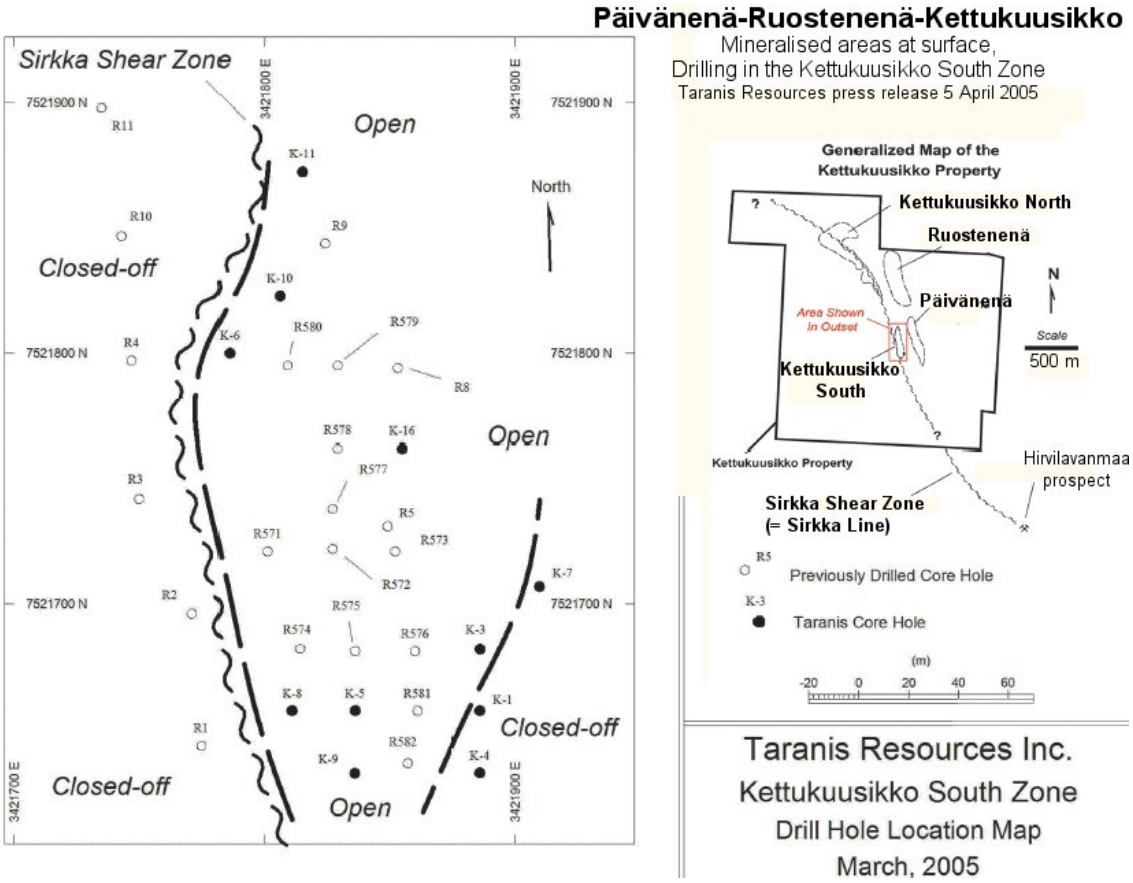


Kettukuusikko-Päivänenä region
The aeromagnetic map shows a pronounced NW-trending magnetic high that is related to metakomatiitic rocks that host the Kettukuusikko lode. In the immediate vicinity of the property, there is a magnetic minimum where ferromagnetic minerals have been destroyed by strong alteration related to the gold mineralization
www.taranis.us/Kettukuusikko.htm

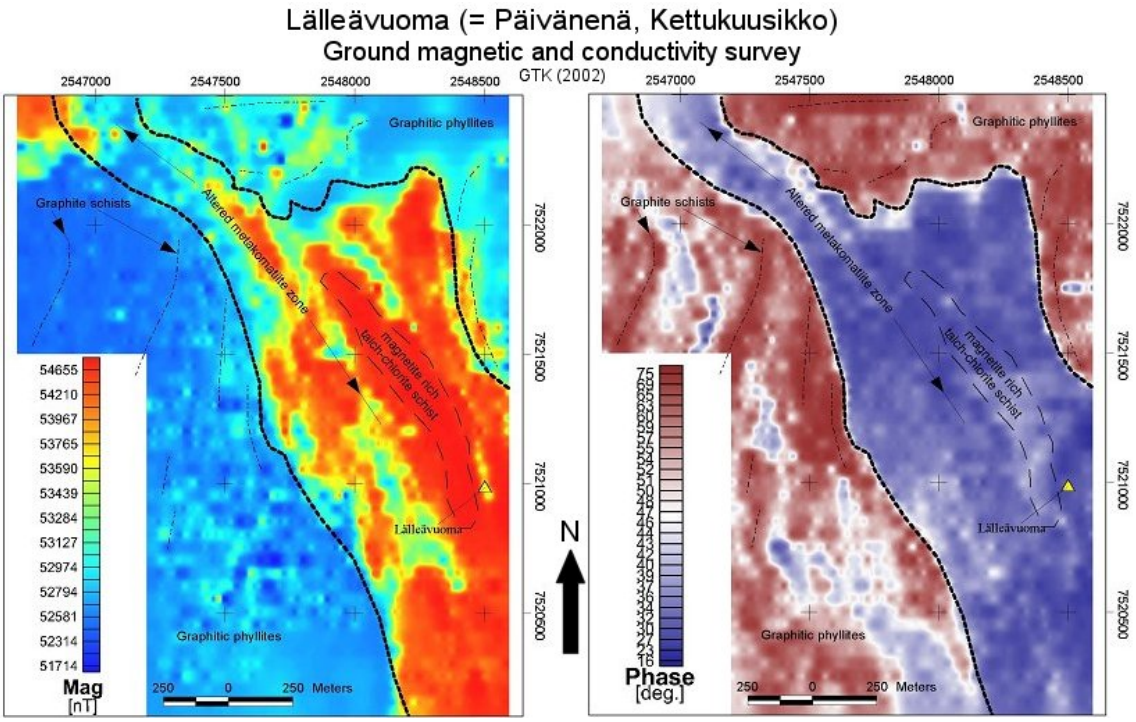
Primary geophysical anomaly:



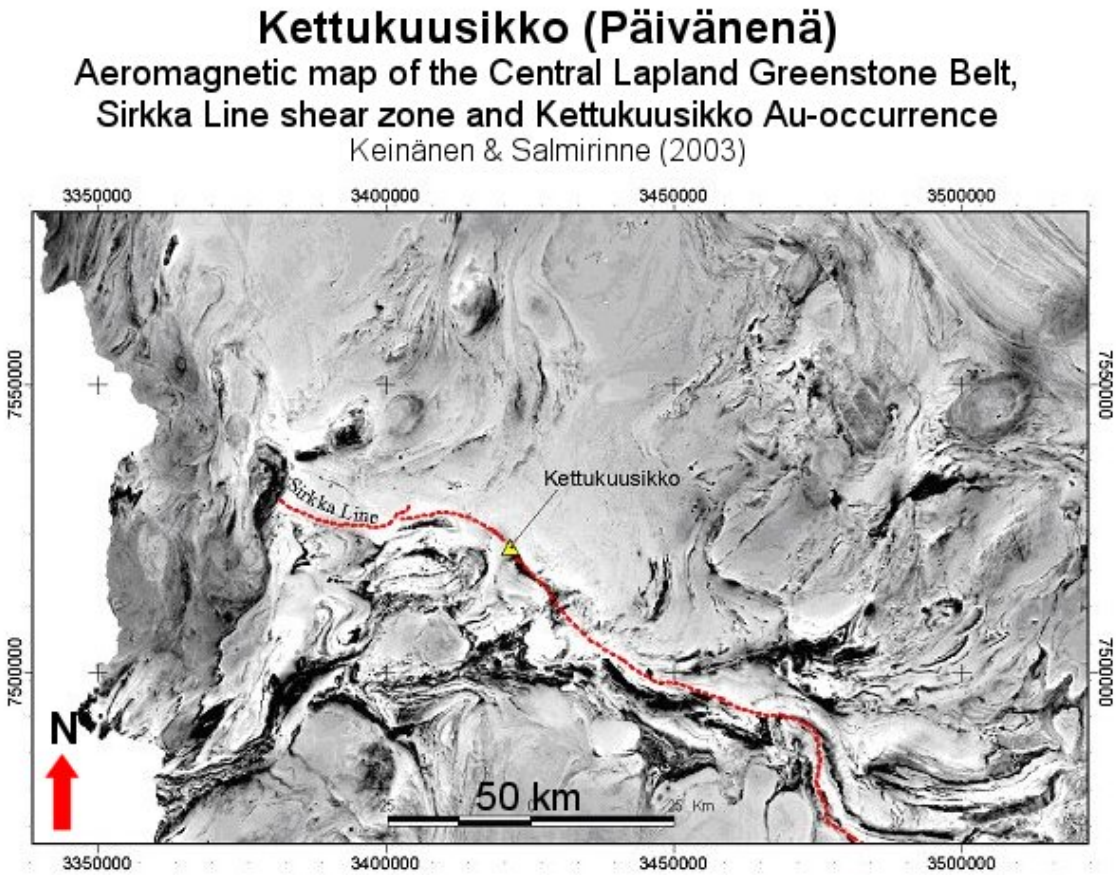
Plan view:

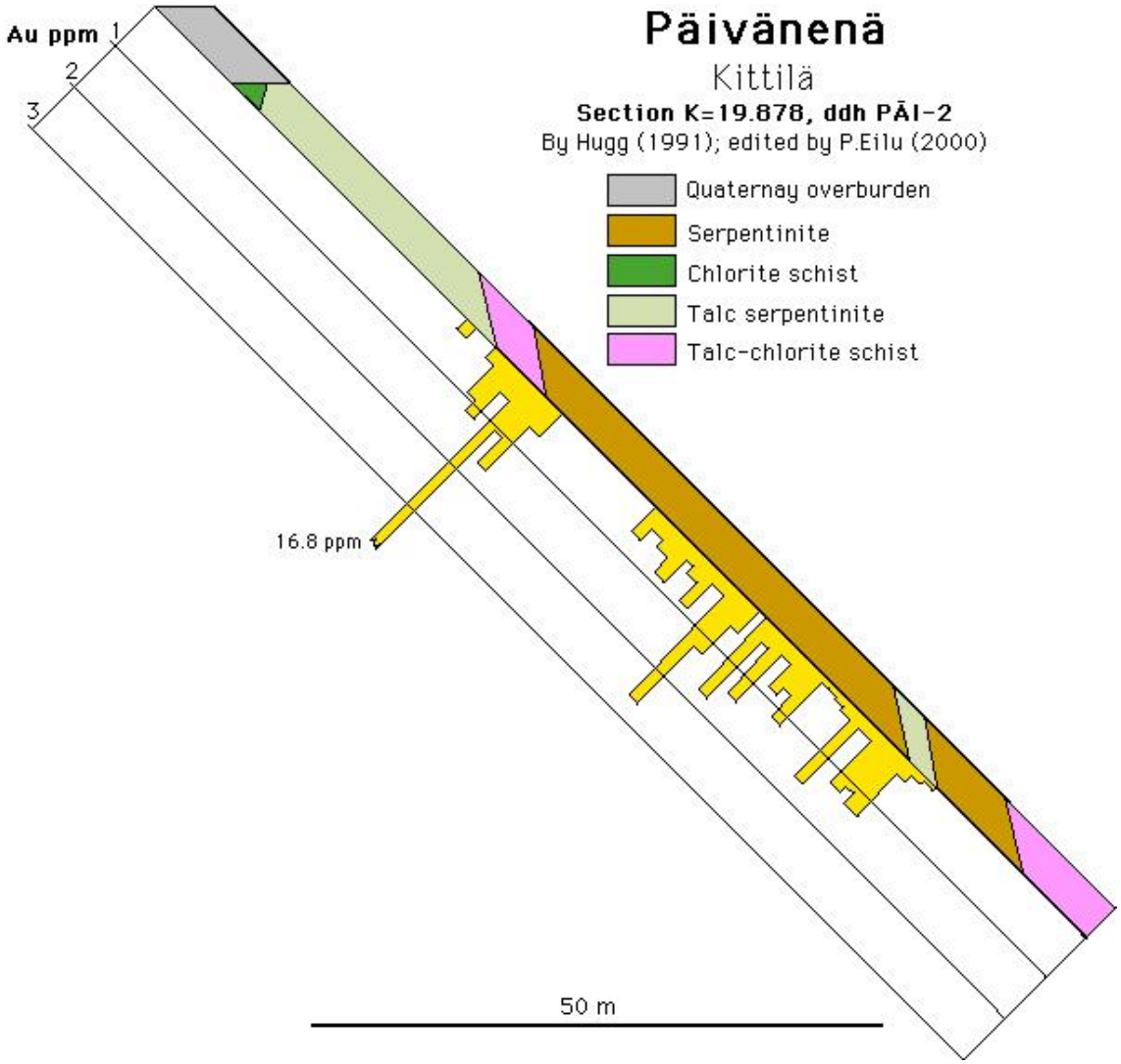


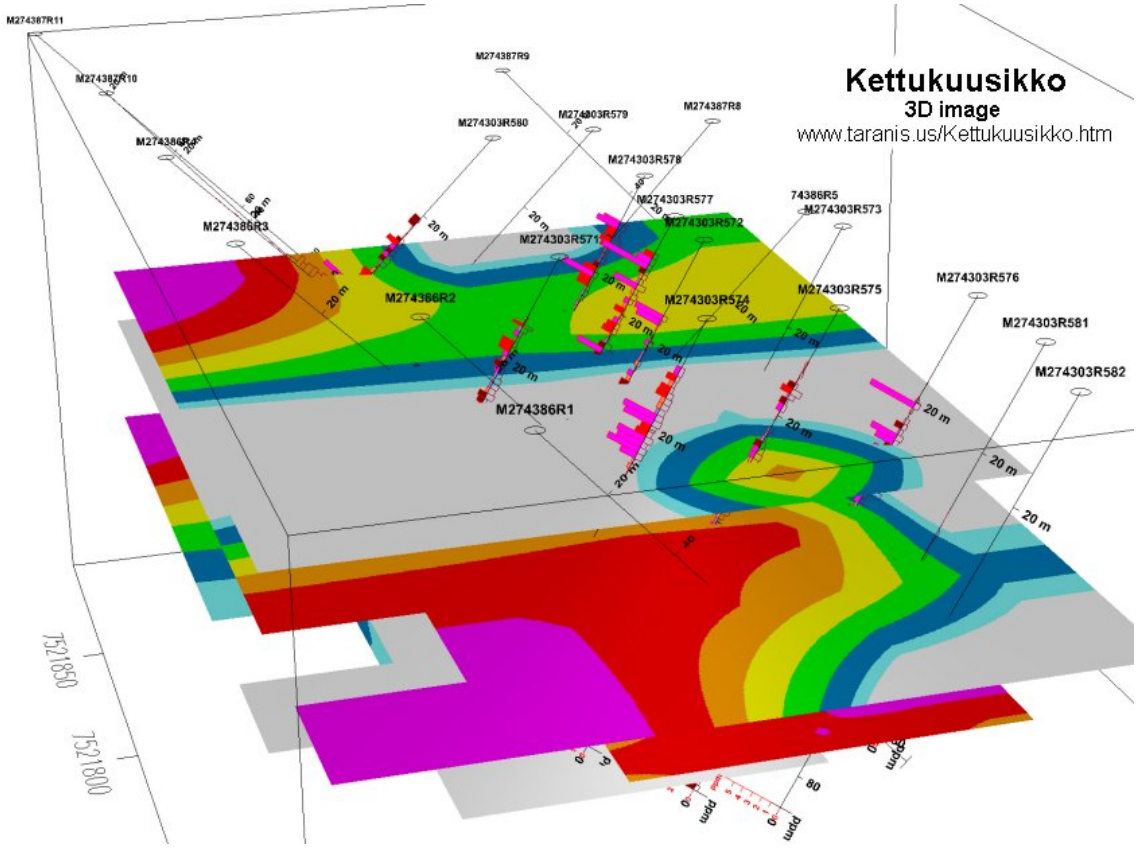
Primary anomaly:



Primary anomaly:




Au ppm
1
2
3
Päivänenä
Kittilä
Section K=19.878, ddh PÄI-2
By Hugg (1991); edited by P.Eilu (2000)
Quaternay overburden
Serpentinite
Chlorite schist
Talc serpentinite
Talc-chlorite schist
16.8 ppm
50 m


Kettukuusikko
3D image
www.taranis.us/Kettukuusikko.htm
M274387R11
M274387R10
M274387R9
M274387R8
M274303R580
M274303R579
M274303R578
M274303R577
M274303R572
M274303R571
M274303R574
M274303R575
M274303R576
M274303R581
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20 m
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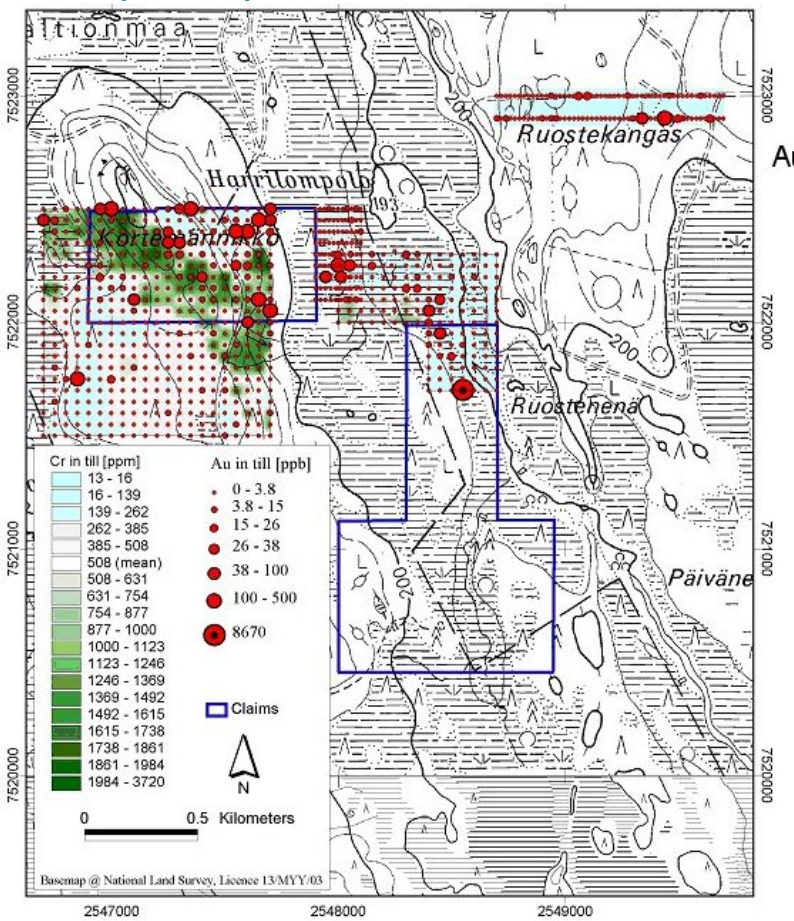
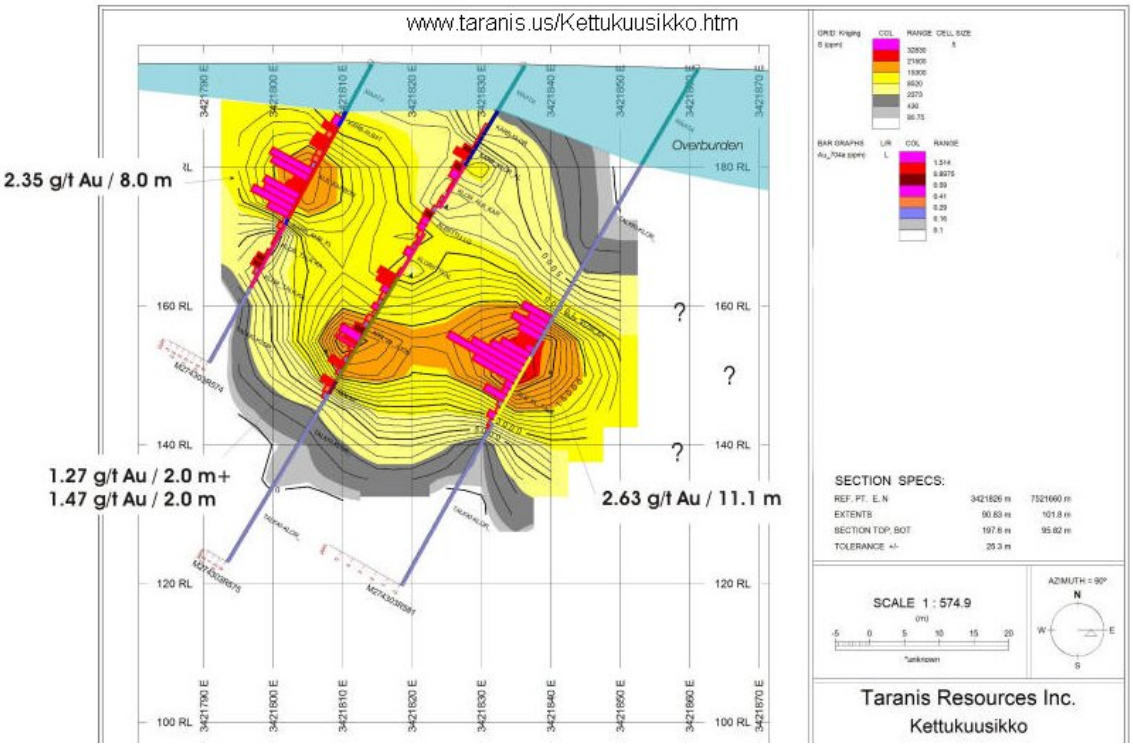
7521800

Secondary anomaly:



Cross-Section Through Kettukuusikko Project Looking North
Showing Sulfur and Gold Content



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