Suurikuusikko

Alternative Names: Rouravaara, Korkeakuusikko, Vuomajärvi, Keuvaara, Kittilä Gold Project, Kittilä Mine
Occurence type: deposit

Commodity	Rank	Total measure	Total production	Total resource	Importance
gold	1	276,49 t	75,43 t	201,06 t	Large deposit
silver	3	3,4 t	3,4 t	0 t	Occurrence

Easting EUREF: 432458,921
Northing EUREF: 7532765,755
Easting YKJ: 3432604
Northing YKJ: 7535913

Discovery year: 1986
Discovered by: Geological Survey of Finland
Province: Kittilä (Au, Cu)
District: Suurikuusikko (Au)
Comments: Visible gold detected in a recent roadcut 4 km SSW of the Suurikuusikko deposit during regional gold exploration (by research assistant J. Valkama). This find and low-altitude airborne magnetic and electromagnetic survey directed detailed work to the shear zone, at the flank of a major fold, which also includes the Suurikuusikko area.

References: 18, 23, 24, 26, 27, 28, 33, 34, 36, 38, 39, 40, 43, 52, 53, 54, 58, 59, 60, 63, 65, 68, 70, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 87, 88, 89, 90, 92, 93, 98, 100, 103, 112, 113, 114

Mineral deposit type

Group: Metallogenic deposit
Main type: Orogenic (metamorphic hydrothermal)
Comments: Clearly epigenetic, orogenic gold mineralisation with a distinct structural control, as derived from data in references. Possibly, the Na-rich epigenetic fluids, which caused the complete albitisation of the host rocks after the first major stage of deformation, also were the mineralising fluids.
References: 39, 40, 50, 57, 62, 63, 66

Dimension

Expression: exposed
Form: discordant
Shape: lensoidal
Length (m): 4000
Width (m): 40
Thickness (m): NA
Depth (m): 2100
Area (ha): NA
Dip azim: 270
Dip: 85
Plunge azim: 360
Plunge dip: 45
Orientation method: NA
Dimension comments: Several lodes (open at depth): Ketola, Etelä, Main, C. Rouravaara, N. Rouravaara, Rimminvuoma, Sisar, Sisar Deep. The resource is open at the depth of 2100 m. The Sisar and Sisar Deep zones are 50 to 300 m east of the Main zone.

Holder history

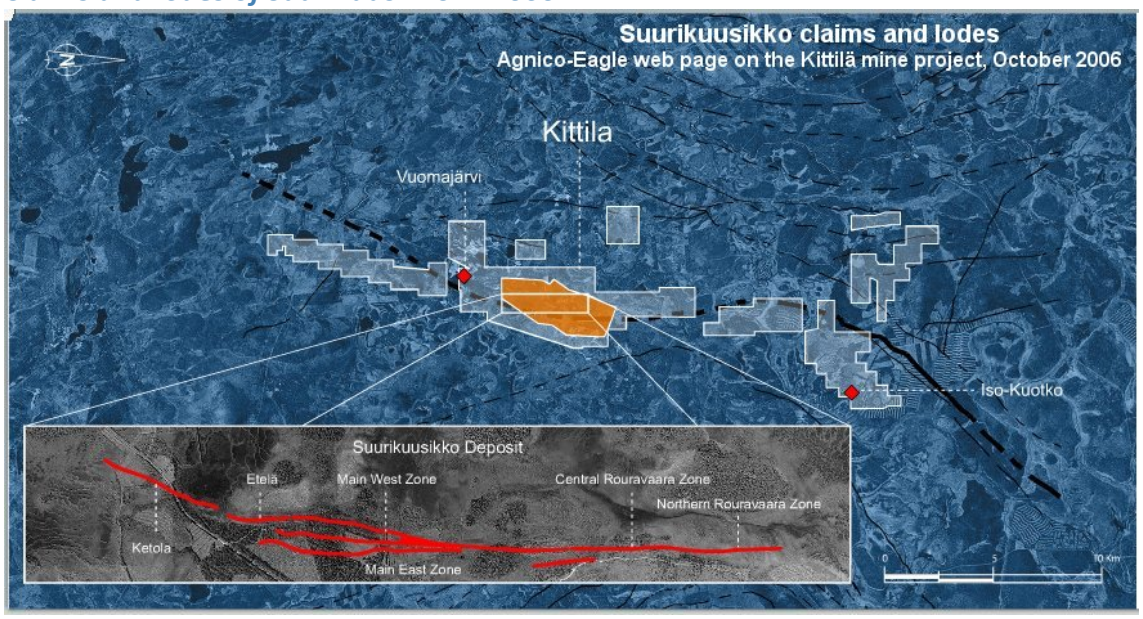
Current holder: Agnico Eagle Finland Oy
Years: 2005
Holding type: Mining concession (old law)

Previous holders:

Company	Years	Holding type	Comments
Riddarhyttan Resources AB	2002-2005	Mining concession (old law)	NA
Riddarhyttan Resources AB	1998-2005	Claim (old law)	NA
Geological Survey of Finland	1986-1998	Claim (old law)	NA

Figures

Claims and lodes of Suurikuusikko in 2006:



The lodes of Suurikuusikko:

EXPLORATION ACTIVITY

Agnico Eagle Finland Oy

Years	Activity type	Geologist	Exploration result	Ref
2021	core drilling	Jukka Välimaa	mineralized zone identified	16, 18, 19, 20, 22
	Mine-site drilling continues. Sisar zone indicated to continua to at least 1,957 m true depth and the intercepts at Main Roura indicate the extension along plunge of the main zone; both are open at depth. Plan to drill 69.6 km in 2022. 2023 drilling has extended the Rimpi Main Zone to the north, outside of the current mineral resources; Sisar Zone identified at 150 m depth in the Rimpi area.			
	Intersections			
	HoleID	RIE20-613		
	From-To	254-266		
	Length	12m		
	gold	5,2ppm		
	Comments	*Sisar Top, true depth 1085 m*		
	HoleID	RIE21-700C		
	From-To	1168,2-1179		
	Length	10,8m		
	gold	7,8ppm		
	Comments	*Sisar Deep, true depth 1957 m*		
	HoleID	RIE21-700E		
	From-To	1948-1961,6		
	Length	13,6m		
	gold	6,3ppm		
	Comments	*Depth of midpoint below surface 1948 m*		
	HoleID	RIE23-603		
	From-To	1094-1099,4		
	Length	5,4m		
	gold	5,7ppm		
	Comments	*Rimpi Area*		
	HoleID	ROD23-700		
	From-To	1152-1159,3		
	Length	7,3m		
	gold	7,5ppm		
	Comments	*Roura area outside the current mineral resources*		
	HoleID	ROU22-608		
	From-To	1106-1116,2		
	Length	10,2m		
	gold	13,2ppm		
	Comments	*Sisar Zone*		
	HoleID	RUG20-527		
	From-To	150-171,4		
	Length	21,4m		
	gold	5,1ppm		
	Comments	*Main Roura, extension along plunge, tru depth 1064 m*		
	HoleID	RUG20-529		
	From-To	166,3-195		
	Length	28,7m		
	gold	7,1ppm		
	Comments	*Main Roura, true depth 930 m*		
	HoleID	RUG21-1537		
	From-To	1097-1112,6		
	Length	15,6m		

	Comments	*Depth of midpoint below surface 1097 m*
	HoleID	RUG22-503
	From-To	1087-1097,3
	Length	10,3m
	gold	9,3ppm

2008-2020	core drilling	Jyrki Korteniemi, Jukka Välimaa	mineral reserve defined	9, 12, 13, 15, 30, 31, 33
	Diamond drilling at the mine site has been continuous. In 2019, drilling focused on extending the Main and Sisar zones northward, southward and at depth in the Roura and Rimpi areas to increase the mineral reserves in the large orebody; in total, 94 holes were drilled in 2019 (41,510 m). 2020: drilling in the Main, Sisar and Roura zones, in total 28,500 m.			
	Intersections			
	HoleID	RIE19-614		
	From-To	296-304,3		
	Length	8,3m		
	Comments	*Sisar Central*		
	HoleID	RIE19-702G		
	From-To	1065,9-1093		
	Length	27,1m		
	gold	4,7ppm		
	Comments	*Sisar Deep, midpoint of the intercept is at 1751 m below surface*		
	HoleID	RIE20-602		
	From-To	38,1-61		
	Length	22,9m		
	gold	8,9ppm		
	Comments	*Main Rimpi underground drilling, midpoint of the intercept is at 991 m below surface*		
	HoleID	ROD19-701		
	From-To	1077,7-1097		
	Length	19,3m		
	gold	13,8ppm		
	Comments	*Sisar Deep*		
	HoleID	VUG19-516		
	From-To	156-168		
	Length	12m		
	gold	7,3ppm		
	Comments	*Main Rimpi*		

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
2007-2009	detailed geochemistry	A. Taivalkoski, P. Sarala	NA	64
	Surficial geological, till geochemical and heavy mineral studies in the Kittilä Mine; the transport distance of till was estimated to be short in the bottommost till bed, while the upper beds are reflecting much longer transportation with no indication of underlying bedrock. The most suitable indicator elements besides of gold itself are As, K, Mn and Sb with the heavy minerals like arsenopyrite and pyrite.			

Agnico Eagle Finland Oy

Years	Activity type	Geologist	Exploration result	Ref
2006-2007	core drilling	Jyrki Korteniemi	NA	25, 26, 28, 37
	Agnico-Eagle diamond drilling in 2006: 53 km, in 2007: 54 km			
	Intersections			

	HoleID	NA
	From-To	NA
	Length	15,1m
	gold	8,3ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	15,3m
	gold	4,7ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	22,3m
	gold	8,1ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	4,9m
	gold	5,5ppm
	Comments	*Etelä*
	HoleID	NA
	From-To	NA
	Length	27,7m
	gold	9,1ppm
	Comments	*Rouravaara*
	HoleID	NA
	From-To	NA
	Length	9,3m
	gold	8,1ppm
	Comments	*Rimminvuoma*
	HoleID	NA
	From-To	NA
	Length	12m
	gold	9,4ppm
	Comments	*Rouravaara*

Riddarhyttan Resources AB

Years	Activity type	Geologist	Exploration result	Ref
1998-2005	core drilling	L-G Ohlsson	NA	37, 66, 68, 70, 72, 73, 74, 75, 78, 79, 82, 83, 88, 90, 94, 96, 97, 98, 99, 100
	393 diamond-drill and RC holes, total 136 km.			
	Intersections			
	HoleID	NA		
	From-To	NA		
	Length	7,8m		
	gold	11,8ppm		
	Comments	*Main deposit*		
	HoleID	NA		
	From-To	NA		
	Length	9,4m		
	gold	10,3ppm		
	Comments	*Main deposit*		
	HoleID	NA		
	From-To	NA		
	Length	28,6m		

	gold	11,9ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	36,7m
	gold	5,6ppm
	Comments	*Central Rouravaara*
	HoleID	NA
	From-To	NA
	Length	13m
	gold	5ppm
	Comments	*Central Rouravaara*
	HoleID	NA
	From-To	NA
	Length	7,4m
	gold	11,4ppm
	Comments	*Ketola*
	HoleID	NA
	From-To	NA
	Length	63m
	gold	4,4ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	12m
	gold	11ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	20,7m
	gold	7ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	14,6m
	gold	6,2ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	12,3m
	gold	8,6ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	8m
	gold	18,3ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	79m
	gold	8,4ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	46m
	gold	8,9ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	23m
	gold	10,2ppm

	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	18m
	gold	16,5ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	64m
	gold	5,9ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	20,4m
	gold	9,6ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	18m
	gold	8,8ppm
	Comments	*Main deposit*
	HoleID	NA
	From-To	NA
	Length	10,4m
	gold	8ppm
	Comments	*Main deposit*

1998-2005	percussion drilling	L-G Ohlsson	NA	37, 100
	393 diamond-drill and RC holes, total 136 km.			

1998-2005	detailed geophysics	L-G Ohlsson	NA	41, 42, 55, 65, 66, 67, 68, 69, 70, 71, 72, 93, 94, 95, 96, 97, 99, 100, 101, 102

Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1987-1997	core drilling	Ilkka Härkönen	NA	40, 41, 54
	1987-89 and 1995-97: 77 diamond-drill holes, total 9319 m, 300 m RC drilling			

1986-1997	detailed geology	Ilkka Härkönen	NA	38, 39, 40, 45, 46, 47, 48, 49, 51, 58
	Visible gold detected in an outcrop 4 km SSW of the Suurikuusikko deposit during regional gold exploration.			

1986-1997	mining pilot	Ilkka Härkönen	NA	38, 39, 40, 45, 46, 47, 48, 49, 51, 58

1986-1997	detailed geochemistry	Ilkka Härkönen	NA	38, 39, 40, 45, 46, 47, 48, 49, 51, 58

1986-1997	detailed geophysics	Ilkka Härkönen	NA	38, 39, 40, 45, 46, 47, 48, 49, 51, 58
	The graphitic, sulphide-bearing, tuffites or phyllites, i.e. the host rock types, give the major responses on both magnetic and electromagnetic methods. The Kiistala Shear Zone is indicted as a negative anomaly in magnetic maps and, due to abundant graphite vein network, by very low values in resistance maps			

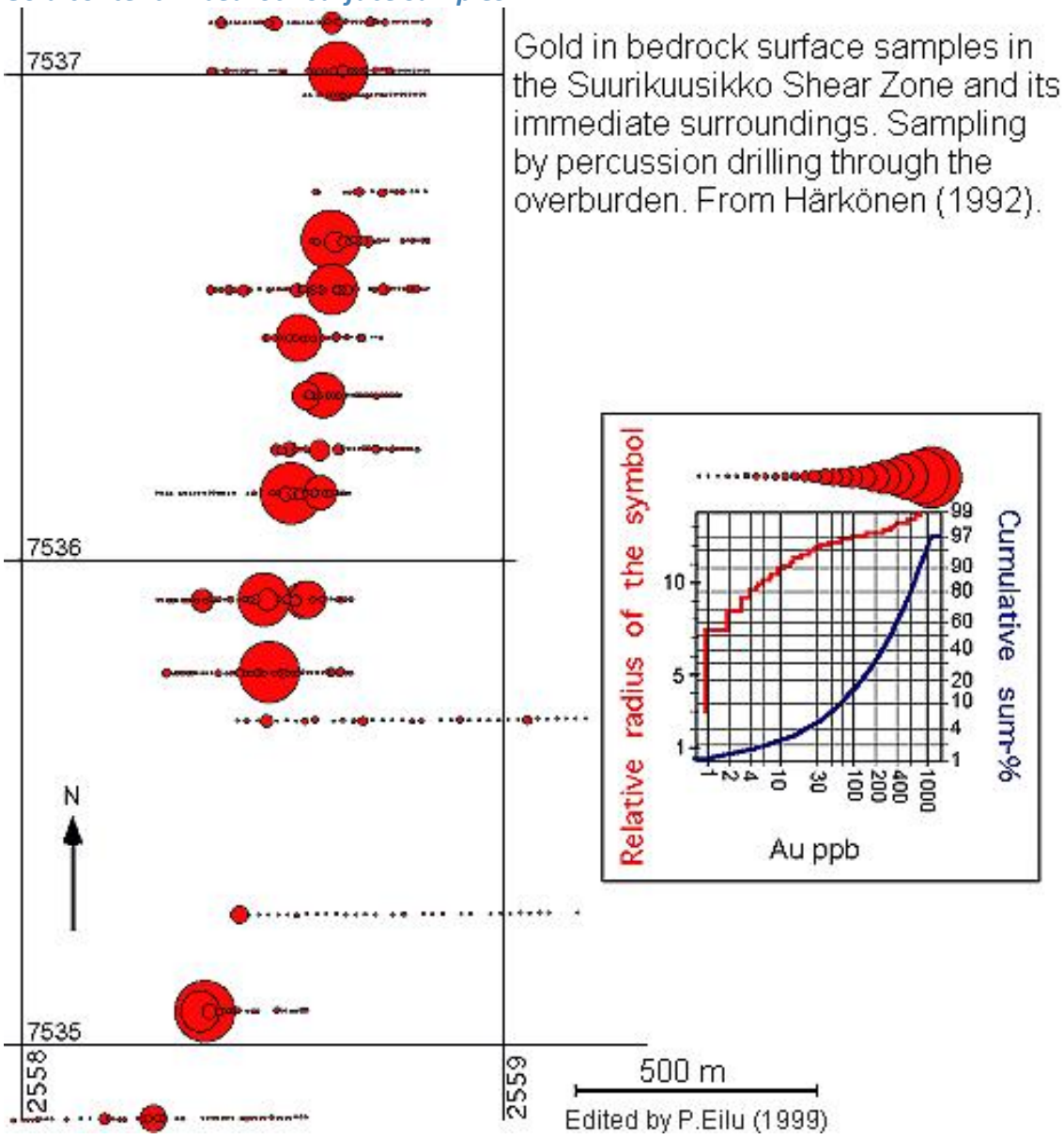
1986-1997	percussion drilling	Ilkka Härkönen	NA	40, 41, 54

1979-1979	regional geophysics	Ilkka Härkönen	key geological features	38, 39, 40, 45, 46, 47, 48, 49, 51, 58
	Low-altitude airborne magnetic, electromagnetic and radiometric survey; directed detailed work to the shear zone.			

1973-1977	regional geochemistry	NA	NA	38, 39, 40, 45, 46, 47, 48, 49, 51, 58
	Regional geochemical till survey			

Figures

Gold content in bedrock surface samples:



Drilling at Suurikuusikko:

Drilling at Suurikuusikko:

RESOURCES AND RESERVES

Most recent

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Agnico Eagle Finland Oy	2022	31.12.2022	NI 43-101	21
	Comments: Mineral reserves are not a subset of mineral resources.				
	Category:	**Measured mineral resource**			
	Tonnage:	**5,089 Mt**			
	gold	2,76 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**16,212 Mt**			
	gold	2,74 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**5,836 Mt**			
	gold	4,54 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**0,373 Mt**			
	gold	3,89 ppm			
	Cutoff:	**NA**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**27,51 Mt**			
	gold	3,141 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Agnico Eagle Finland Oy	2022	31.12.2022	NI 43-101	21
	Comments: Mineral reserves are not a subset of mineral resources.				
	Category:	**Proved ore reserves**			
	Tonnage:	**1,224 Mt**			
	gold	4,36 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**26,029 Mt**			
	gold	4,2 ppm			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**27,253 Mt**			
	gold	4,207 ppm			
	Cutoff:	**NA**			

Previous calculations

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Agnico Eagle Finland Oy	2021	31.12.2021	NI 43-101	17

	Comments: Mineral reserves are not a subset of mineral resources.	
	Category:	**Measured mineral resource**
	Tonnage:	**4,447 Mt**
	gold	2,59 ppm
	Cutoff:	**NA**
	Category:	**Indicated mineral resource**
	Tonnage:	**18,843 Mt**
	gold	2,6 ppm
	Cutoff:	**NA**
	Category:	**Indicated mineral resource**
	Tonnage:	**0,229 Mt**
	gold	3,41 ppm
	Cutoff:	**NA**
	Category:	**Inferred mineral resource**
	Tonnage:	**0,373 Mt**
	gold	3,89 ppm
	Cutoff:	**NA**
	Category:	**Inferred mineral resource**
	Tonnage:	**6,921 Mt**
	gold	4,89 ppm
	Cutoff:	**NA**
	Category:	**Measured, indicated and inferred mineral resource**
	Tonnage:	**30,813 Mt**
	gold	3,135 ppm
	Cutoff:	**NA**

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Agnico Eagle Finland Oy	2021	31.12.2021	NI 43-101	17
	Comments: Mineral reserves are not a subset of mineral resources.				
	Category:	**Proved ore reserves**			
	Tonnage:	**1,08 Mt**			
	gold	3,85 ppm			
	Cutoff:	**gold**			
	Category:	**Probable ore reserves**			
	Tonnage:	**26,754 Mt**			
	gold	4,26 ppm			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**27,834 Mt**			
	gold	4,244 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Agnico Eagle Finland Oy	2020	31.12.2020	NI 43-101	14
	Comments: Mineral reserves are not a subset of mineral resources.				
	Category:	**Measured mineral resource**			
	Tonnage:	**4748000 t**			
	gold	2,44 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**17999000 t**			
	gold	2,51 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**229000 t**			
	gold	3,41 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**373000 t**			

	gold	3,89 ppm
	Cutoff:	**NA**
	Category:	**Inferred mineral resource**
	Tonnage:	**11620000 t**
	gold	3,77 ppm
	Cutoff:	**NA**
	Category:	**Measured, indicated and inferred mineral resource**
	Tonnage:	**34969000 t**
	gold	2,94 ppm
	Cutoff:	**NA**

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Agnico Eagle Finland Oy	2020	31.12.2020	NI 43-101	14
	Comments: Mineral reserves are not a subset of mineral resources.				
	Category:	**Proved ore reserves**			
	Tonnage:	**2999000 t**			
	gold	4,23 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**27434000 t**			
	gold	4,15 ppm			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**30433000 t**			
	gold	4,158 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Agnico Eagle Finland Oy	2019	31.12.2019	NI 43-101	11
	Category:	**Measured mineral resource**			
	Tonnage:	**2895000 t**			
	gold	2,54 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**15022000 t**			
	gold	2,6 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**229000 t**			
	gold	3,41 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**373000 t**			
	gold	3,89 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**13447000 t**			
	gold	3,9 ppm			
	Cutoff:	**NA**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**31966000 t**			
	gold	3,162 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Agnico Eagle Finland Oy	2019	31.12.2019	NI 43-101	11
	Category:	**Proved ore reserves**			
	Tonnage:	**1444000 t**			

	gold	4,55 ppm
	Cutoff:	**NA**
	Category:	**Probable ore reserves**
	Tonnage:	**27481000 t**
	gold	4,4 ppm
	Cutoff:	**NA**
	Category:	**Proved and probable ore reserves**
	Tonnage:	**28925000 t**
	gold	4,407 ppm
	Cutoff:	**NA**

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Agnico Eagle Finland Oy	2018	31.12.2018	NI 43-101	8
	Comments: Mineral reserves are not a subset of mineral resources.				
	Category:	**Measured mineral resource**			
	Tonnage:	**1776000 t**			
	gold	2,62 ppm			
	Cutoff:	**gold**			
	Comments: Open pit and underground separately reported in the reference.				
	Category:	**Indicated mineral resource**			
	Tonnage:	**17030000 t**			
	gold	2,65 ppm			
	Cutoff:	**gold**			
	Comments: Open pit and underground separately reported in the reference.				
	Category:	**Inferred mineral resource**			
	Tonnage:	**8252000 t**			
	gold	3,84 ppm			
	Cutoff:	**gold**			
	Comments: Open pit and underground separately reported in the reference.				
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**27058000 t**			
	gold	3,011 ppm			
	Cutoff:	**gold**			
	Comments: Open pit and underground separately reported in the reference.				

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Agnico Eagle Finland Oy	2018	31.12.2018	NI 43-101	8
	Comments: Mineral reserves are not a subset of mineral resources.				
	Category:	**Proved ore reserves**			
	Tonnage:	**491000 t**			
	gold	4,12 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**30040000 t**			
	gold	4,5 ppm			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**30531000 t**			
	gold	4,494 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Agnico Eagle Finland Oy	2017	31.12.2017	NI 43-101	7
	Comments: Mineral reserves are not a subset of mineral resources.				
	Category:	**Measured mineral resource**			
	Tonnage:	**1592000 t**			
	gold	2,59 ppm			
	Cutoff:	**NA**			

	Category:	**Indicated mineral resource**
	Tonnage:	**18909000 t**
	gold	3,12 ppm
	Cutoff:	**gold**
	Category:	**Indicated mineral resource**
	Tonnage:	**229000 t**
	gold	3,41 ppm
	Cutoff:	**NA**
	Category:	**Inferred mineral resource**
	Tonnage:	**373000 t**
	gold	3,89 ppm
	Cutoff:	**NA**
	Category:	**Inferred mineral resource**
	Tonnage:	**8992000 t**
	gold	4,2 ppm
	Cutoff:	**NA**
	Category:	**Measured, indicated and inferred mineral resource**
	Tonnage:	**30095000 t**
	gold	3,426 ppm
	Cutoff:	**NA**

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Agnico Eagle Finland Oy	2017	31.12.2017	JORC code	7
	Comments: Mineral reserves are not a subset of mineral resources.				
	Category:	**Proved ore reserves**			
	Tonnage:	**971000 t**			
	gold	4,26 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**25894000 t**			
	gold	4,75 ppm			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**26865000 t**			
	gold	4,732 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Agnico Eagle Finland Oy	2016	NA	NI 43-101	6
	Comments: 31.12.2016 *Mineral reserves are not a sub-set of mineral resources.*				
	Category:	**Measured mineral resource**			
	Tonnage:	**1,607 Mt**			
	gold	2,45 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**18,885 Mt**			
	gold	2,95 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**229000 t**			
	gold	3,41 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**10,686 Mt**			
	gold	4,06 ppm			
	Cutoff:	**gold**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**373000 t**			

	gold	3,89 ppm
	Cutoff:	**NA**
	Category:	**Measured, indicated and inferred mineral resource**
	Tonnage:	**31780000 t**
	gold	3,312 ppm
	Cutoff:	**NA**

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Agnico Eagle Finland Oy	2016	NA	NI 43-101	6
	Comments: 31.12.2016 *Mineral reserves are not a sub-set of mineral resources.*				
	Category:	**Proved ore reserves**			
	Tonnage:	**1,148 Mt**			
	gold	4,19 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**28,907 Mt**			
	gold	4,65 ppm			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**30,055 Mt**			
	gold	4,64 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Resource	Agnico Eagle Finland Oy	2015	NA	NI 43-101	1
	Comments: 31.12.2015				
	Category:	**Measured mineral resource**			
	Tonnage:	**991000 t**			
	gold	2,58 ppm			
	Cutoff:	**NA**			
	Comments: Underground				
	Category:	**Indicated mineral resource**			
	Tonnage:	**14,935 Mt**			
	gold	3,05 ppm			
	Cutoff:	**NA**			
	Comments: Open pit + Underground				
	Category:	**Inferred mineral resource**			
	Tonnage:	**11,833 Mt**			
	gold	4,64 ppm			
	Cutoff:	**NA**			
	Comments: Open pit + underground				
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**27,759 Mt**			
	gold	3,71 ppm			
	Cutoff:	**NA**			

Type:	Company:	Year:	Date:	Calc Method:	Reference:
Reserve	Agnico Eagle Finland Oy	2015	NA	NI 43-101	1
	Comments: 31.12.2015 *Mineral reserves are not a sub-set of mineral resources.*				
	Category:	**Proved ore reserves**			
	Tonnage:	**1,059 Mt**			
	gold	4,28 ppm			
	Cutoff:	**NA**			
	Comments: Open pit + underground				
	Category:	**Probable ore reserves**			
	Tonnage:	**27,136 Mt**			

	gold	4,82 ppm			
	Cutoff:	**NA**			
	Comments: Open pit + underground				
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**28,195 Mt**			
	gold	4,8 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Agnico Eagle Finland Oy	2014	NA	NI 43-101	5
	Comments: Calculation date 31.12.2014				
	Category:	**Measured mineral resource**			
	Tonnage:	**0,82 Mt**			
	gold	2,78 ppm			
	Cutoff:	**gold**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**13,351 Mt**			
	gold	2,98 ppm			
	Cutoff:	**gold**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**8,892 Mt**			
	gold	4,3 ppm			
	Cutoff:	**gold**			
	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**23,063 Mt**			
	gold	3,482 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Agnico Eagle Finland Oy	2014	NA	NI 43-101	5
	Comments: Calculation date 31.12.2014.				
	Category:	**Proved ore reserves**			
	Tonnage:	**0,921 Mt**			
	gold	4,41 ppm			
	Cutoff:	**gold**			
	Category:	**Probable ore reserves**			
	Tonnage:	**27,614 Mt**			
	gold	4,95 ppm			
	Cutoff:	**gold**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**28,535 Mt**			
	gold	4,933 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Agnico Eagle Finland Oy	2013	NA	NI 43-101	3
	Category:	**Measured mineral resource**			
	Tonnage:	**0,511 Mt**			
	gold	2,69 ppm			
	Cutoff:	**NA**			
	Category:	**Indicated mineral resource**			
	Tonnage:	**10,519 Mt**			
	gold	2,79 ppm			
	Cutoff:	**NA**			
	Category:	**Inferred mineral resource**			
	Tonnage:	**7,522 Mt**			
	gold	4,12 ppm			
	Cutoff:	**NA**			

	Category:	**Measured, indicated and inferred mineral resource**			
	Tonnage:	**18,552 Mt**			
	gold	3,327 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Agnico Eagle Finland Oy	2013	NA	NI 43-101	3
	Category:	**Proved ore reserves**			
	Tonnage:	**1,104 Mt**			
	gold	4,27 ppm			
	Cutoff:	**NA**			
	Category:	**Probable ore reserves**			
	Tonnage:	**30,52 Mt**			
	gold	4,65 ppm			
	Cutoff:	**NA**			
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**31,624 Mt**			
	gold	4,637 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Agnico Eagle Finland Oy	2011	NA	NI 43-101	32
	Category:	**Indicated and inferred mineral resource**			
	Tonnage:	**23,64 Mt**			
	gold	2,44 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Agnico Eagle Finland Oy	2011	NA	NI 43-101	32
	Category:	**NA**			
	Tonnage:	**32,73 Mt**			
	gold	4,63 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Agnico Eagle Finland Oy	2009	NA	NA	31
	Category:	**Inferred mineral resource**			
	Tonnage:	**17,6 Mt**			
	gold	4,4 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Agnico Eagle Finland Oy	2009	NA	NA	31
	Category:	**Proved and probable ore reserves**			
	Tonnage:	**21,4 Mt**			
	gold	4,7 ppm			
	Cutoff:	**NA**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Agnico Eagle Finland Oy	2007	31.12.2007	CIM standards	29, 30
	Comments: Reserves are not a sub-set of resources.				
	Category:	**Indicated mineral resource**			
	Tonnage:	**5,416 Mt**			
	gold	3,03 ppm			
	Cutoff:	**NA**			

	Comments: cut-off: 1.5 ppm Au for open pit, 2.4 ppm for underground				
	Category:	**Inferred mineral resource**			
	Tonnage:	**10,832 Mt**			
	gold	3,39 ppm			
	Cutoff:	**NA**			
	Comments: cut-off: 1.5 ppm Au for open pit, 2.4 ppm for underground				
	Category:	**Indicated and inferred mineral resource**			
	Tonnage:	**16,248 Mt**			
	gold	3,27 ppm			
	Cutoff:	**NA**			
	Comments: cut-off: 1.5 ppm Au for open pit, 2.4 ppm for underground				

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Reserve	Agnico Eagle Finland Oy	2007	31.12.2007	CIM standards	29
	Comments: Reserves are not a sub-set of resources.				
	Category:	**Probable ore reserves**			
	Tonnage:	**18,205 Mt**			
	gold	5,12 ppm			
	Cutoff:	**NA**			
	Comments: cut-off: 2.0 ppm Au for open pit, 3.2 ppm for underground				

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Agnico Eagle Finland Oy	2006	NA	NA	25
	Category:	**NA**			
	Tonnage:	**22,131 Mt**			
	gold	4,9 ppm			
	Cutoff:	**gold 2 ppm**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Riddarhyttan Resources AB	2005	NA	NA	85
	Category:	**NA**			
	Tonnage:	**17,8 Mt**			
	gold	5,3 ppm			
	Cutoff:	**gold 2 ppm**			
	Category:	**NA**			
	Tonnage:	**21,5 Mt**			
	gold	4,6 ppm			
	Cutoff:	**gold 1 ppm**			
	Comments: Alternative				

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Riddarhyttan Resources AB	2005	NA	NA	91
	Category:	**NA**			
	Tonnage:	**24,3 Mt**			
	gold	4,75 ppm			
	Cutoff:	**gold 2 ppm**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Riddarhyttan Resources AB	2005	NA	NA	86
	Category:	**NA**			
	Tonnage:	**17,2 Mt**			
	gold	5,1 ppm			
	Cutoff:	**gold 2 ppm**			
	Category:	**NA**			
	Tonnage:	**19,7 Mt**			
	gold	4,6 ppm			

	Cutoff:	**gold 1 ppm**			
	Comments: Alternative				

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Riddarhyttan Resources AB	2002	NA	NA	70, 71, 101
	Category:	**Indicated and inferred mineral resource**			
	Tonnage:	**8,3 Mt**			
	gold	6,1 ppm			
	Cutoff:	**gold 1 ppm**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Riddarhyttan Resources AB	2000	NA	NA	96, 97
	Category:	**NA**			
	Tonnage:	**5 Mt**			
	gold	6,5 ppm			
	Cutoff:	**gold 2 ppm**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Riddarhyttan Resources AB	1999	NA	NA	93
	Category:	**NA**			
	Tonnage:	**3,52 Mt**			
	gold	7 ppm			
	Cutoff:	**gold 1 ppm**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Riddarhyttan Resources AB	1998	NA	NA	66
	Category:	**NA**			
	Tonnage:	**2,2 Mt**			
	gold	6,5 ppm			
	Cutoff:	**gold 1 ppm**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Geological Survey of Finland	1997	NA	NA	54, 58
	Category:	**NA**			
	Tonnage:	**1,5 Mt**			
	gold	5,9 ppm			
	Cutoff:	**gold 1 ppm**			

Type:	**Company:**	**Year:**	**Date:**	**Calc Method:**	**Reference:**
Resource	Geological Survey of Finland	1992	NA	NA	39
	Category:	**NA**			
	Tonnage:	**0,05 Mt**			
	gold	5,4 ppm			
	Cutoff:	**NA**			

MINING

Kittilä

Alternative Names: Suurikuusikko
Easting EUREF: 432458,921
Northing EUREF: 7532765,755
Status: Operating
Operating years: 2006-2022
Years in production: 17
Total ore mined: 20554402 t
Comments: Expected to be in production through 2034. Throughput rates will be increase to 2.0 Mt per annum from the current 1.6 Mt (Annual Report 2020)

Total production:

Product	Product measure
gold	75,43 t
silver	3399,3 kg

Other materials:

Material type	Material measure
Waste rock	44725772 t

Mining activity:

Year	Ore mined	Ore processed	Activity type	Production	Other material
2022	1799036 t	1925000 t	underground mining		
				gold 6748 kg silver 400 kg	Waste rock 661499 t
2021	2089535 t	2,05 Mt	underground mining		
				gold 7441 kg silver 340 kg	Waste rock 686661 t
2020	1848666 t	1,7 Mt	underground mining		
				gold 6473 kg silver 340 kg	Waste rock 1197212 t
2019	1760391 t	1,59 Mt	underground mining		
				gold 5788 kg silver 400 kg	Waste rock 1497878 t
2018	1636867 t	1,83 Mt	underground mining		
				gold 5878 kg silver 400 kg	Waste rock 1587389 t
2017	1563612 t	1,69 Mt	underground mining		
				silver 400 kg gold 6125 kg	Waste rock 1093103 t
2016	1652974 t	1667000 t	underground mining		
				silver 373 kg gold 6299 kg	Waste rock 873968 t
2015	1484655 t	1464000 t	underground mining		
				gold 5517 kg silver 342 kg	Waste rock 646056 t
2014	1168993 t	1156400 t	underground mining		
				gold 4408,18 kg silver 217,7 kg	Waste rock 324947 t
2013	1059819 t	934224 t	underground mining		

				gold 4553,69 kg silver 186,6 kg	Waste rock 376927 t
2012	1220061 t	1220061 t	open-pit and underground mining		
				gold 5,47 t	Waste rock 2189803 t
2011	1030173 t	1030173 t	open-pit and underground mining		
				gold 4,47 t	Waste rock 6218708 t
2010	1131000 t	960365 t	NA		
				gold 3924,98 kg	Waste rock 9409288 t
2009	796620 t	563238 t	open-pit mining		
				gold 2234,16 kg	Waste rock 9478000 t
2008	312000 t	312000 t	open-pit mining		
				gold 96,97 kg	Waste rock 5477000 t
2007	0 t	0 t	NA		
					Waste rock 2235000 t
2006	0 t	0 t	NA		
					Waste rock 772333 t

Figures

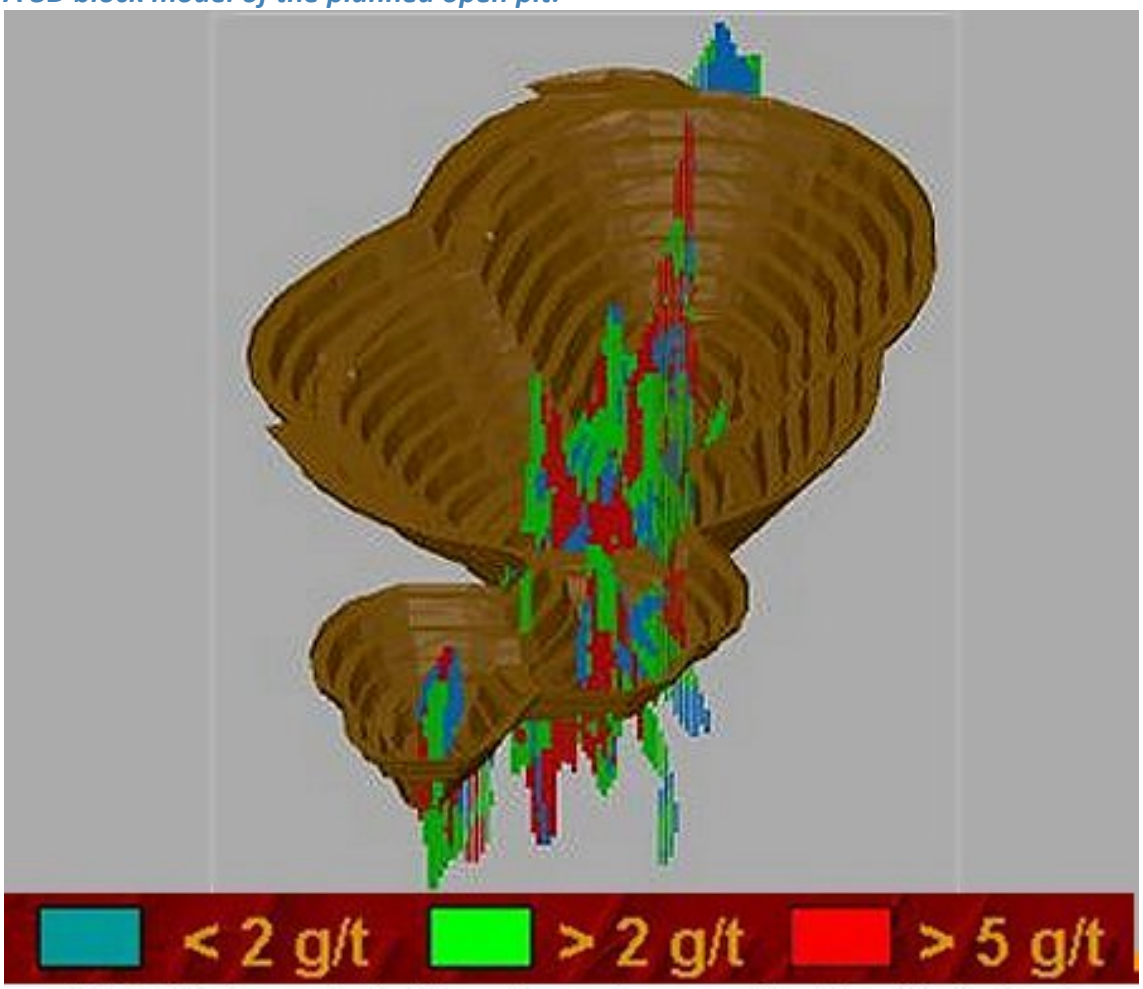
The Kittilä mine in 2007:

Suurikuusikko (Kittilä) mine in September 2007. The circular road indicates the final extent of the open pit. View to the north. Photo courtesy Agnico-Eagle Mines Limited.

The test pit of Suurikuusikko in 2005:

Suurikuusikko test pit in early 2005. Photo courtesy Riddarhyttan Resources.

A 3D block model of the planned open pit:

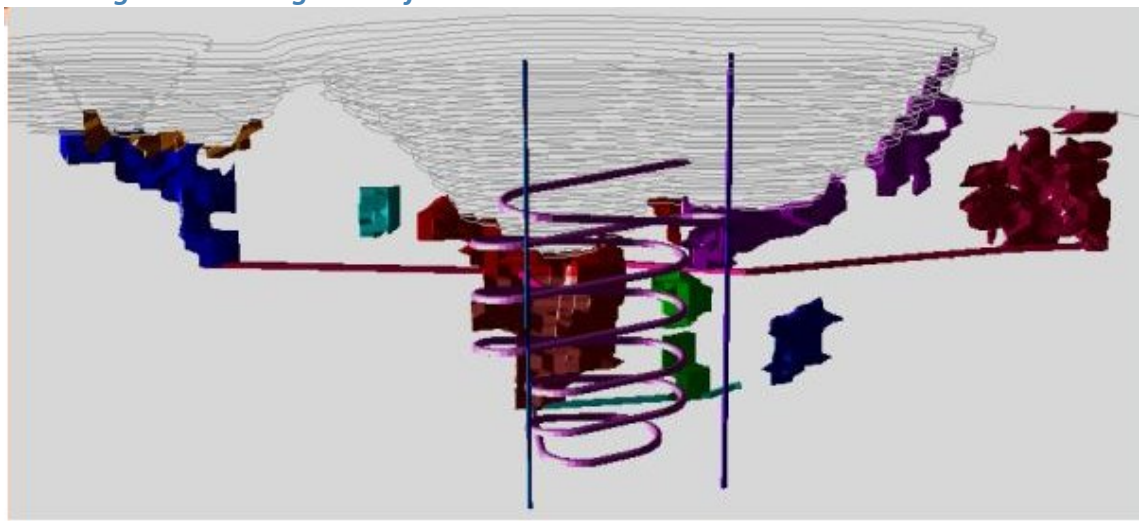


A 3D block model of the planned open pit at the Main Lode, Suurikuusikko. Legend indicates gold grades in the ore blocks.
Figure by Riddarhyttan Resources 2001.

The planned open pit in 2007:

360° panorama showing the planned open pit area of the Suurikuusikko deposit after removal of the till cover. Photo Juhani Ojala 2007.

An undeground mining model for the Main lode:



Underground mining model for the Main Lode, Suurikuusikko.
Figure by Riddarhyttan Resources 2001.

GEOLOGY

Host rock: Mafic volcanic rock, Banded ironstones, Intermediate graphite tuff, Porphyry, Tholeiitic basalt, Felsic volcanic rock, Phyllite

Mafic volcanic rock (Host rock)

Rock type: Host rock
Proportion: major
Grain size: Fine grained 0.2 - 1 mm
Color: Greenish
References: 34, 35, 38, 39, 40, 41, 44, 45, 47, 48, 57, 59, 61, 63, 100, 103
Comments: The mineralised host rock is a large interbed between Fe- and Mg-tholeiitic metavolcanic rocks, or these mafic lavas themselves. Seven main zones (areas). All of the main lodes consist of a set of parallel to en ecelon sublodes, and most of them are indicated to be interconnected, but generally there are three subparallel mineralised subzones in each area. Very thin (<<1 mm) graphite veins and up to 1-2 cm wide albite-carbonate ± sulphide veins brecciate the host rock.

Ore minerals:

Mineral	Proportion	Mineral texture
Arsenopyrite	major	
	Most of the gold in the deposit is refractory in arsenopyrite. pyrite+arsenopyrite±gersdorffite intergrowths are characteristic and these commonly form larger aggregates	
Bismuth	minor	
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz	
Bornite	minor	
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz	
Bournonite	minor	
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz	
Chalcocite	minor	
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz	
Chromite	minor	
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz	
Electrum	minor	
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz	
Galena	minor	
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz	
Gersdorffite	minor	
	pyrite+arsenopyrite±gersdorffite intergrowths are characteristic and these commonly form larger aggregates	
Gold	minor	
	Chiefly associated with arsenopyrite. Most of the gold is invisible, in the lattice of arsenopyrite and pyrite. Au-rich arsenopyrite and pyrite occur disseminated in microfractures, shear fabrics, and stylolitic features. Fineness; 45-85% Au, 1.5-54% Ag, 1-23.0% Hg	

Graphite	minor
	Amorphic
Maldonite	minor
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz
Pyrite	major
	pyrite+arsenopyrite±gersdorffite intergrowths are characteristic and these commonly form larger aggregates. Pyrite contains refractory gold, about 20 % of all gold in the deposit
Pyrrhotite	minor
	Pyrrhotite mostly occurs distal to the ore, seems to be replaced by pyrite during mineralisation. Minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz.
Rutile	minor
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz
Sphalerite	minor
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz
Talnakhite	minor
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz
Tetrahedrite	minor
	minor ore minerals commonly occur as inclusions or intergrowths with the major ore minerals and quartz

Other minerals:

Mineral	Proportion	Mineral texture
Albite	present	
Ankerite	present	
Calcite	present	
Chlorite	present	
Dolomite	present	Alteration product
K-Feldspar	present	
Muscovite	present	Alteration product
Quartz	present	
Sericite	present	
Siderite	present	
Tourmaline	present	Alteration product
Zircon	present	Alteration product

Structures
Sheared
Comments: E-W contraction related to the D1 thrusting. This was followed by a N-S shortening event (D2), where most of the strain was taken up by the northern and southern thrusts. Tectonic vectors then switched from N-S to NE-SW and, as a result, dextral strike-slip regime (D3) commenced along the KiSZ. A near-orthogonal switch of theregional stress regime to NW-SE flipped the kinematics of the KiSZ from dextral to sinistral (D4). The last deformation phase (D5) under E-W contraction.
Breccia

Comments: The controlling structure: The subvertical, compressional, Kiistala (or Suurikuusikko) Shear Zone, at least 25 km long, dominantly N-S trending, turning into a NE direction at the Ketola Lode to the south of known deposit. Movement along the KiSZ during D3 has dominantly been dextral strike-slip.

Textures
Massive
Granoblastic

Alteration:	Distribution:	Degree:	Relation to mineralization:
carbonate alteration	Pervasive	Total	NA
Comments: Ferrous dolomite in the ore, defines the proximal alteration. Calcite chracterises distal alteration and post-mineralisation veining.			
chloritic alteration	NA	Moderate	NA
Comments: Formation of chlorite probably relates to distal alteration.			
sulphidation	Pervasive	Total	NA
albitic alteration	Pervasive	Total	Pre
Comments: Albitisation seems to predate gold mineralisation throughout the hosting shear zone			

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; Metamorphic mineral assemblage; Albite-actinolite-epidote-chlorite-titanite ± quartz (in mafic rock), quartz ± carbonate, graphite, sulphides (in cherts), chlorite-tremolite-talc ± carbonate, augite, graphite (in metakomatiite)					

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Paleoproterozoic (2500-1600 Ma)	2000-2100		N
Comments: Mineralisation(?) at 1916±16 Ma (Re-Os age on auriferous arsenopyrite)			

Banded ironstones (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: Fine grained 0.2 - 1 mm
Color: Black
References: 38, 40, 41, 44, 45, 59, 63, 100
Comments: The main lodes are shear-controlled and the 'secondary' lodes controlled by contacts between lithological units. The mineralised sulphide-facies iron formation host is an interbed between Fe- and Mg-tholeiitic metavolcanic rocks, or these mafic lavas themselves.

Structures

Bedded

Textures
Granoblastic

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)	2000-2100		N

Intermediate graphite tuff (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: Compact <0.2 mm
Color: Black
References: 34, 38, 40, 41, 44, 45, 59, 63, 100
Comments: The main lodes are shear-controlled and the 'secondary' lodes controlled by contacts between lithological units. The mineralised host rock is a large interbed between Fe- and Mg-tholeiitic metavolcanic rocks, or these mafic lavas themselves.

Structures
Bedded

Textures
Granoblastic

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)	2000-2100		N

Porphyry (Host rock)

Rock type: Host rock
Proportion: minor
References: 56
Comments: Minor dykes in the Kiistala shear zone and surroundings

Textures
Porphyritic

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Paleoproterozoic (2500-1600 Ma)	1913-1921	1917	N
Comments: 1917±4 Ma (U-Pb age on zircon)			

Tholeiitic basalt (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA
Color: NA
References: 38, 40, 41, 44, 45, 59, 63, 100
Comments: The main lodes are shear-controlled and the 'secondary' lodes controlled by contacts between lithological units. The mineralised host rock is a large interbed between Fe- and Mg-tholeiitic metavolcanic rocks, or these mafic lavas themselves. What has been mapped as 'intermediate volcanic rock' probably is altered mafic volcanic rock ± minor volumes of porphyry dykes.

Textures
Granoblastic

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)	2000-2100		N

Felsic volcanic rock (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: NA

Color: NA
References: 38, 40, 41, 44, 45, 59, 63, 100
Comments: The main lodes are shear-controlled and the 'secondary' lodes controlled by contacts between lithological units. The mineralised host rock is a large interbed between Fe- and Mg-tholeiitic metavolcanic rocks, or these mafic lavas themselves.

Textures
Granoblastic

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)	2000-2100		N
Comments: Indirect age information only			

Phyllite (Host rock)

Rock type: Host rock
Proportion: minor
Grain size: Compact <0.2 mm
Color: Black
References: 38, 40, 41, 44, 45, 59, 63, 100
Comments: The main lodes are shear-controlled and the 'secondary' lodes controlled by contacts between lithological units. The mineralised host rock is a large interbed between Fe- and Mg-tholeiitic metavolcanic rocks, or these mafic lavas themselves.

Structures
Bedded

Textures
Granoblastic

Metamorphic description:

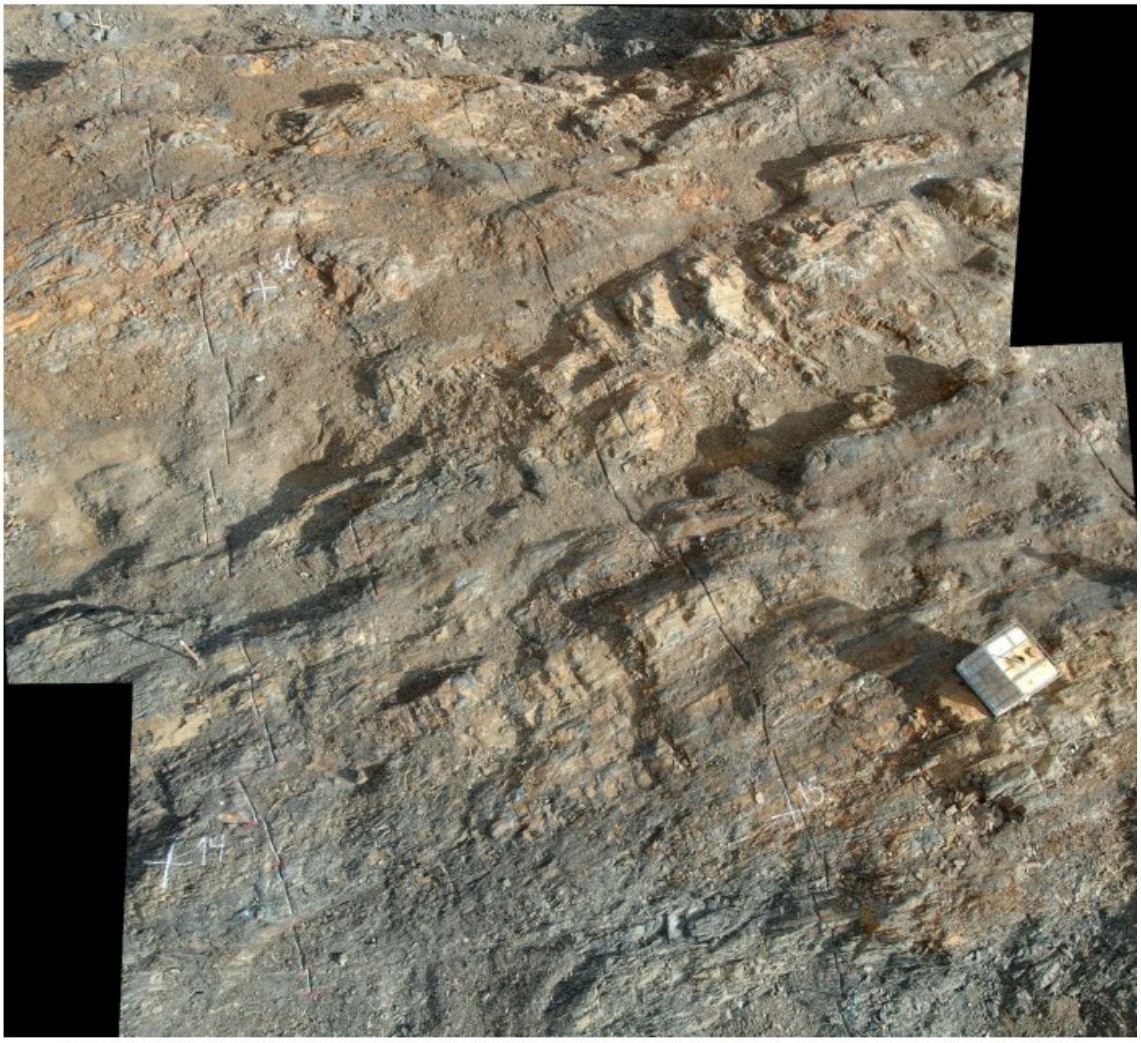
Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	MIn T- Max T (°C)
Regional	greenschist metamorphic facies	low metamorphic grade	NA		
Comments: Metamorphic peak during D2, thrusting during D3 was at least partly post-peak, late metamorphic.					

Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Paleoproterozoic (2500-1600 Ma)	2000-2100		N

Figures

The bedrock surface of the deposits:

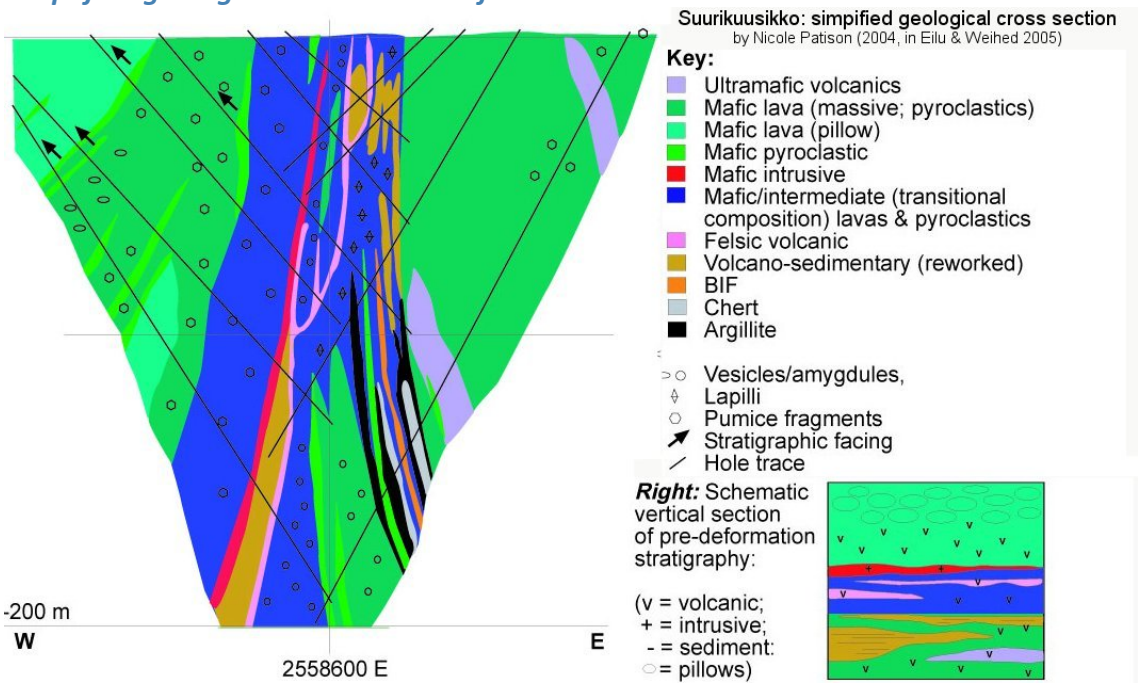


Photograp showing the oreoutcrop surface. Planview, north to left. Photo Juhani Ojala 2007.

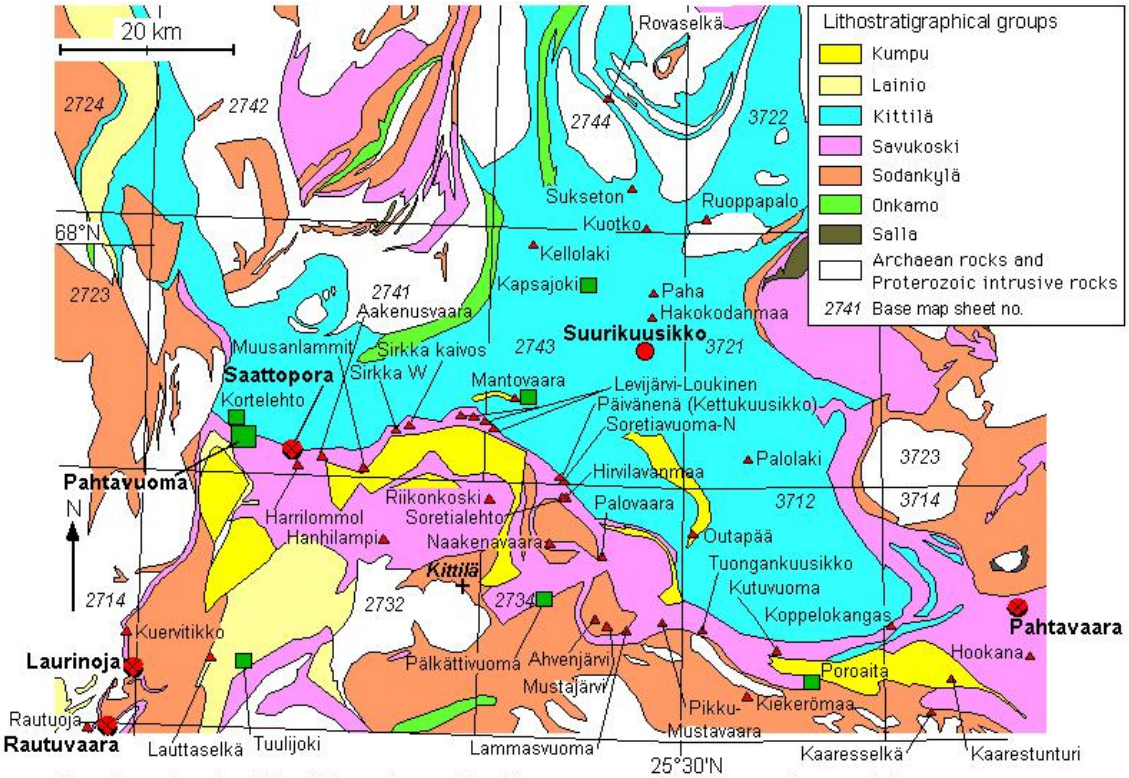
The bedrock surface of the deposits:

Panorama showing the exposed bedrock surface of the Suurikuusikko Au deposit. View looking north. Photo Juhani Ojala 2007.

Simplified geological cross section of Suurikuusikko:

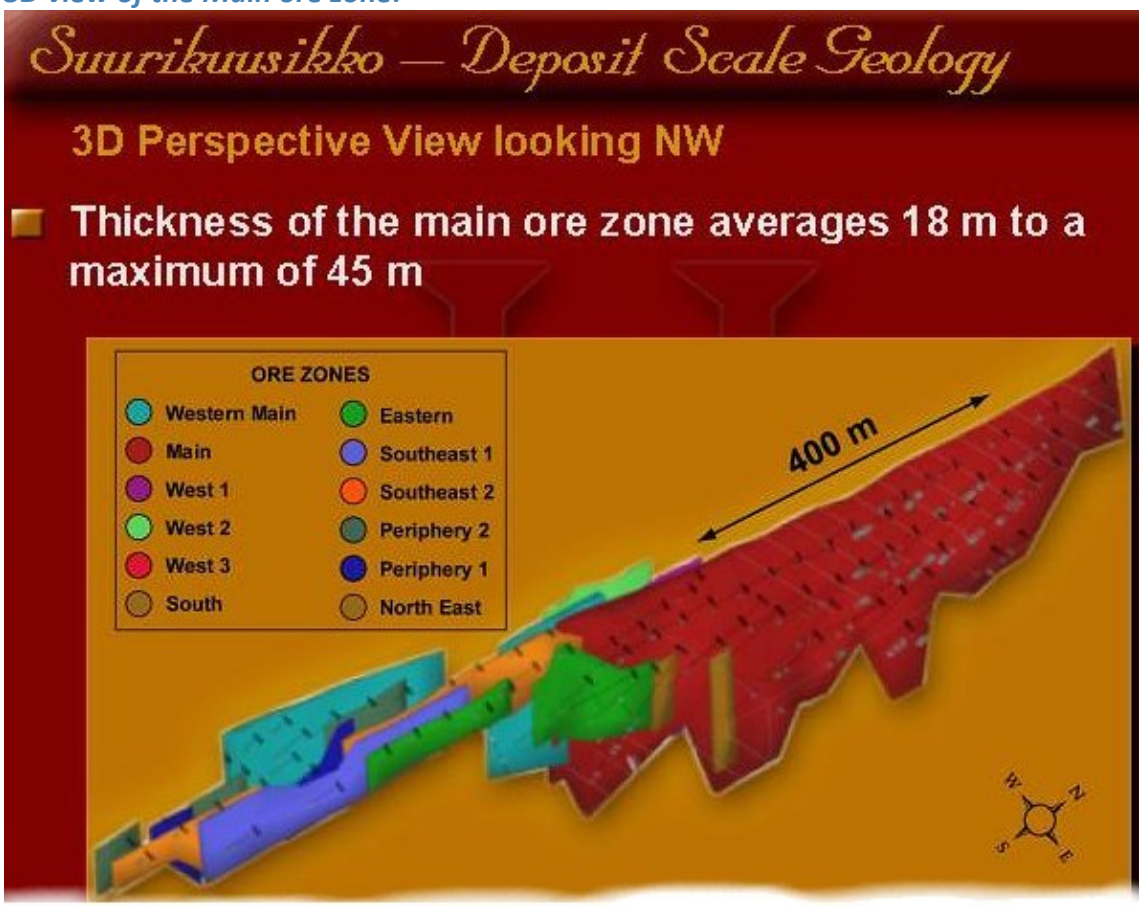


Regional geology:



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)

3D view of the Main ore zone:

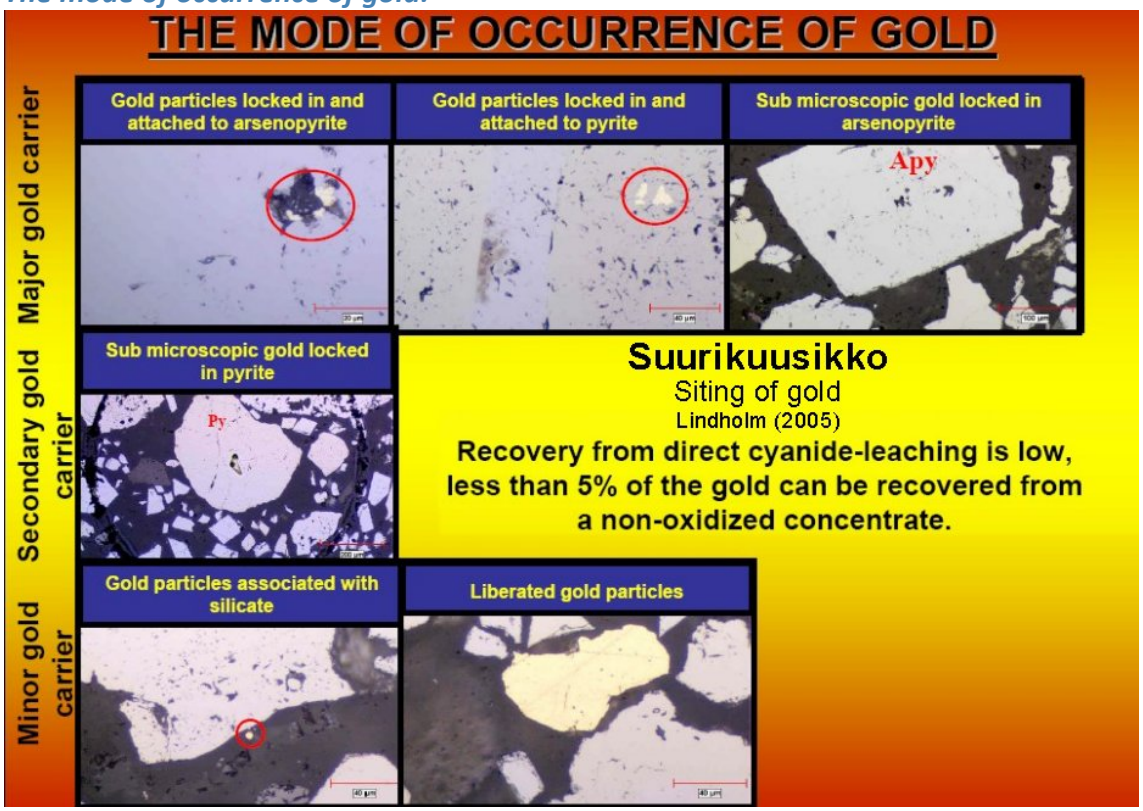


Sublodes (ore zones in the legend) of the Main Lode, Suurikuusikko.
Figure by Riddarhyttan Resources 2001.

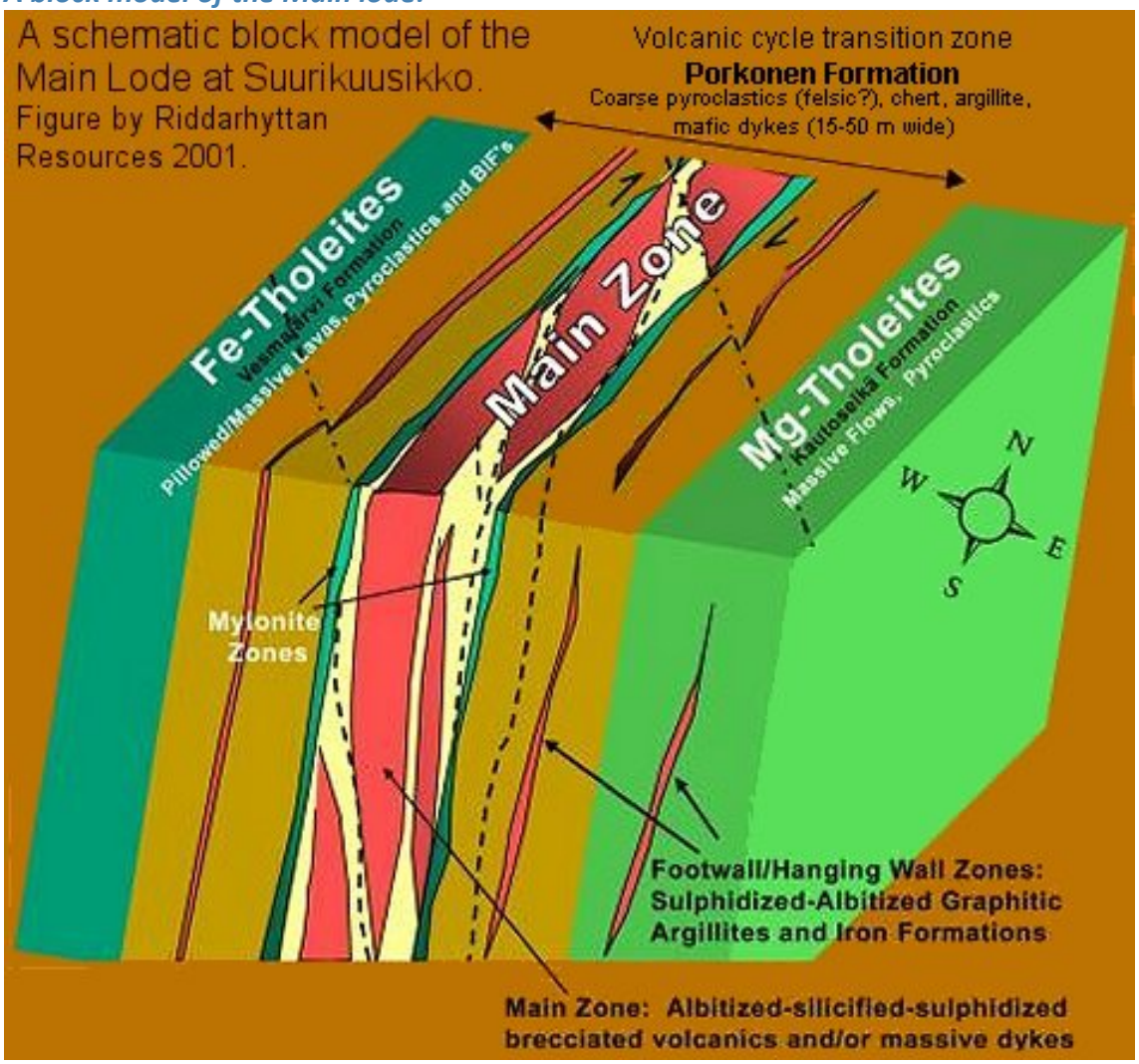
High-grade ore in graphitic phyllite:

Suurikuusikko, Kittilä. High-grade ore: intense multi-stage brecciation and bleaching, abundant arsenopyrite and pyrite. Host rock is a graphitic phyllite or graphitic tuffite of intermediate primary composition. Field of view 6 cm. Photo Jari Väätäinen.

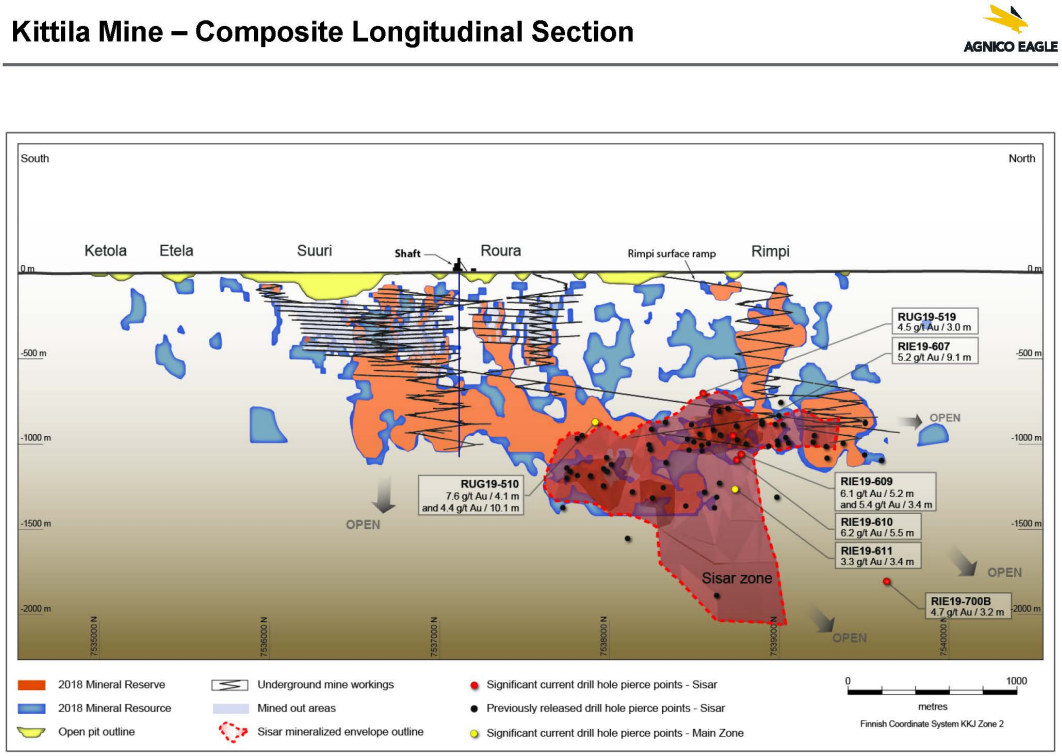
The mode of occurrence of gold:

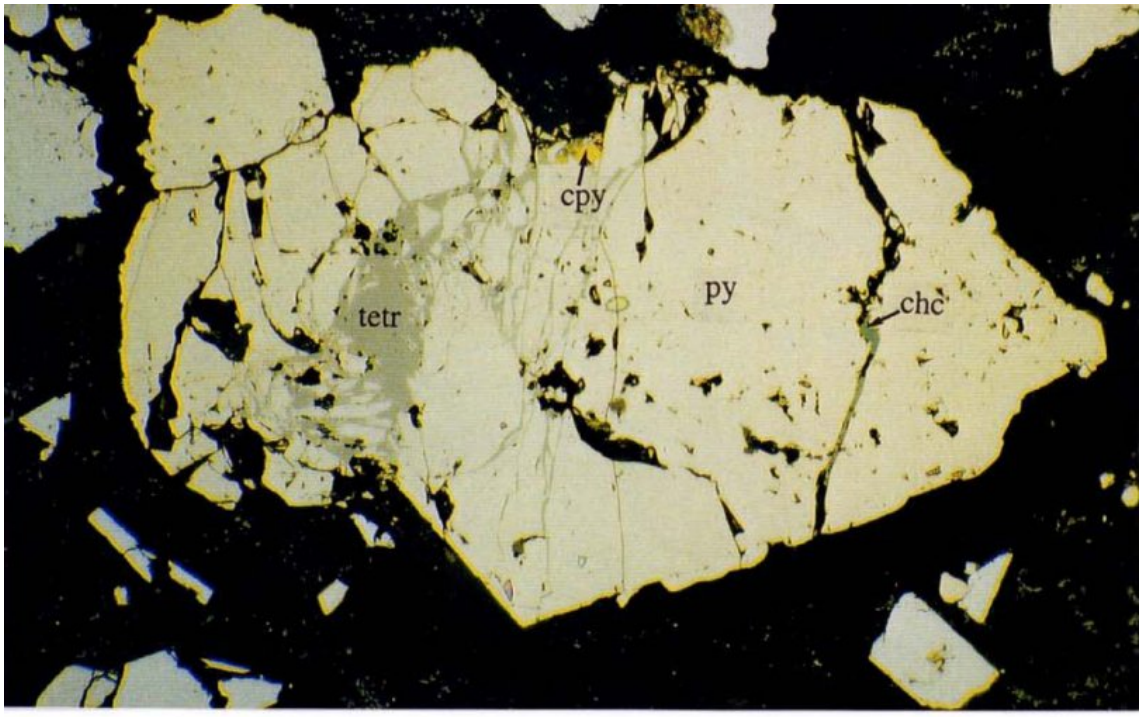


A block model of the Main lode:



Long section of the mine and ore bodies as of October 2019:





Intergrowth of pyrite and tetrahedrite, and tetrahedrite, chalcopyrite, chalcocite filling fractures in pyrite; Sample no. SuBo6 (17.8-17.9), length of the picture 0.6mm (chc = chalcocite, tetr = tetrahedrite) Chernet et al. (2000)

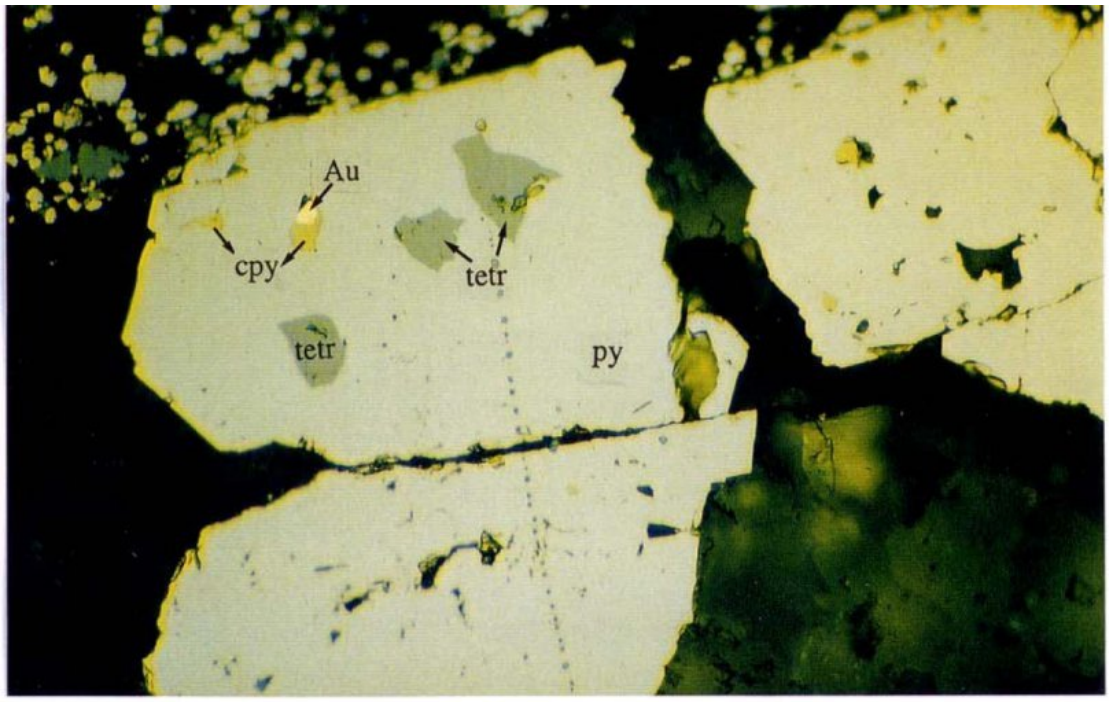
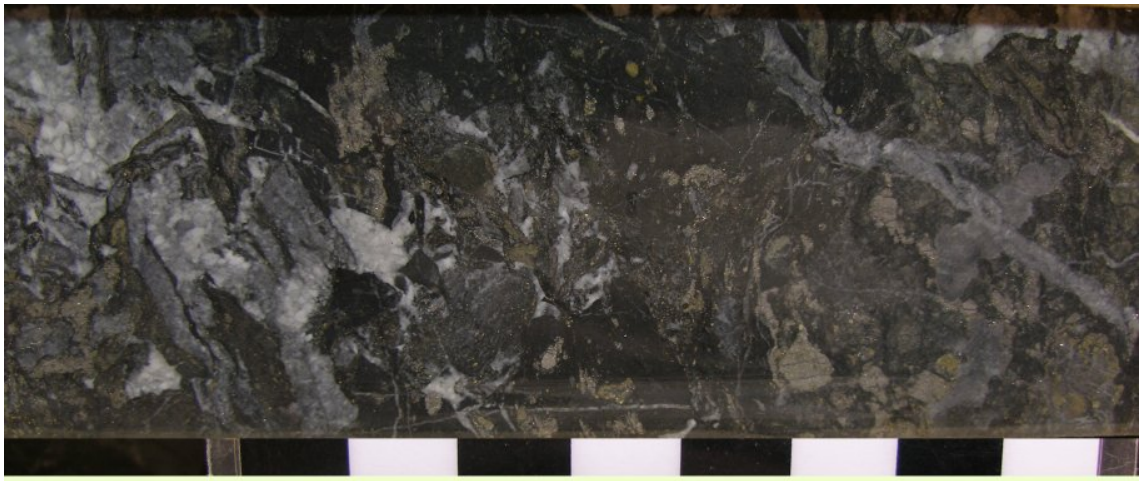


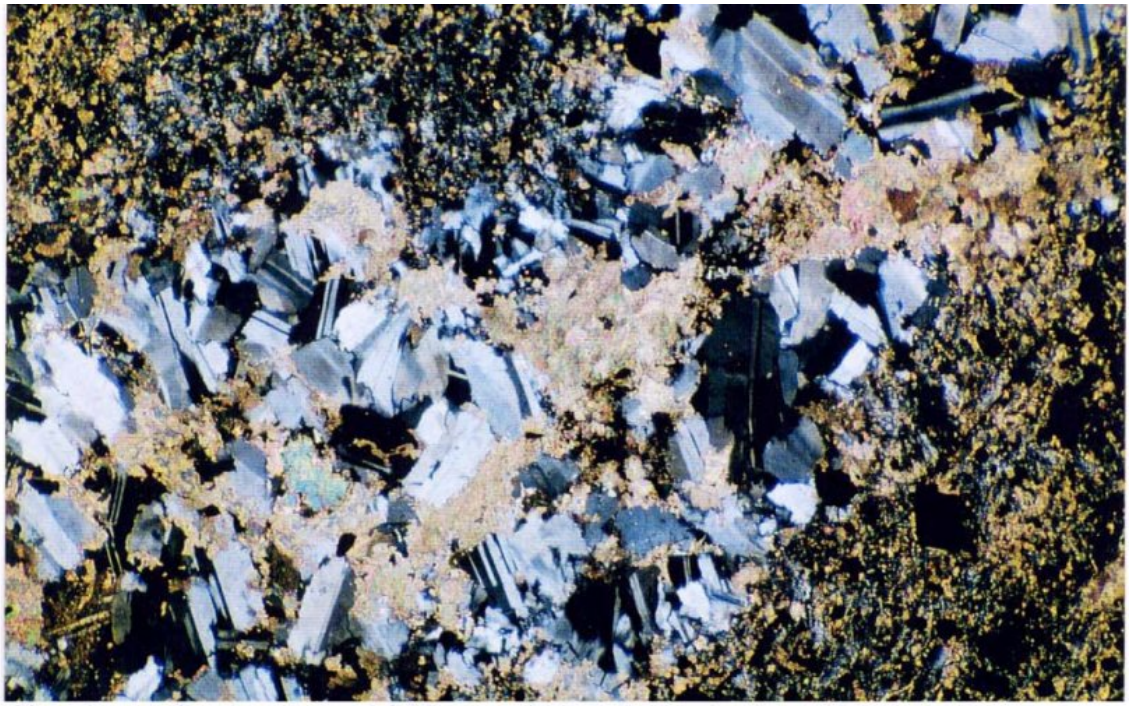
Fig. 1.4 Inclusion of native gold (electrum), tetrahedrite and chalcopyrite in pyrite, note the association of gold with tetrahedrite and chalcopyrite inclusions; Sample no. SuBo2 (19.4-19.5), length of the picture 0.25mm

Chernet et al. (2000)

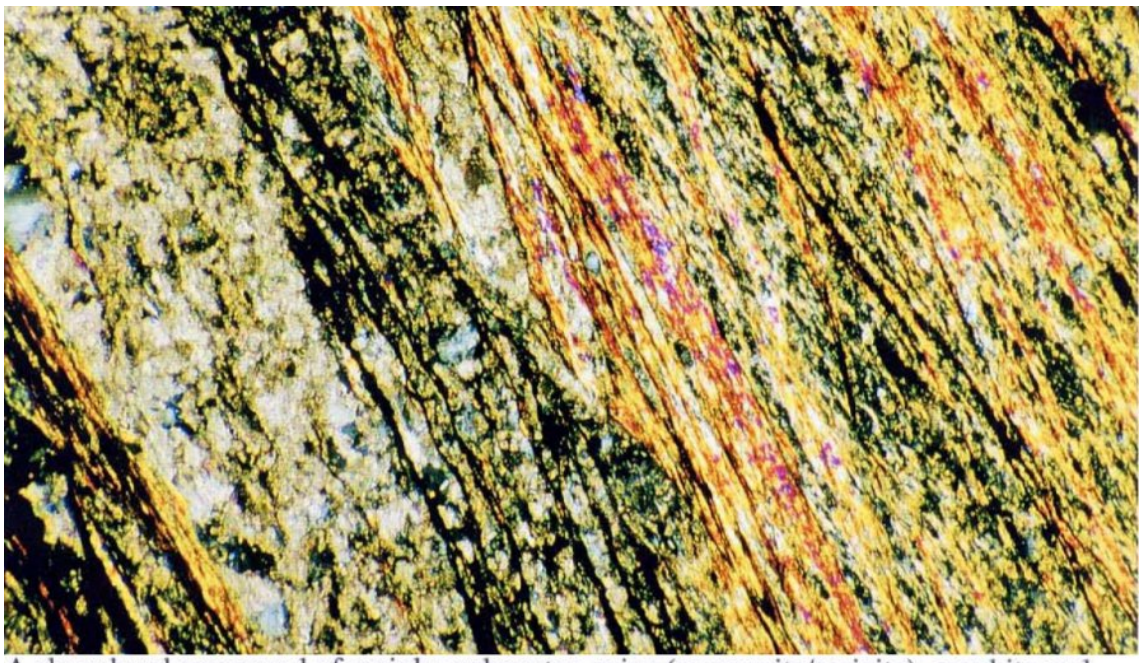
Structure:



Suurikuusikko: High-grade ore (44 ppm Au) in brecciated graphitic tuff(ite).
Drill hole 273496R479, 114.70 m down-holde depth. Scale in cm. Photo Pasi Eilu.

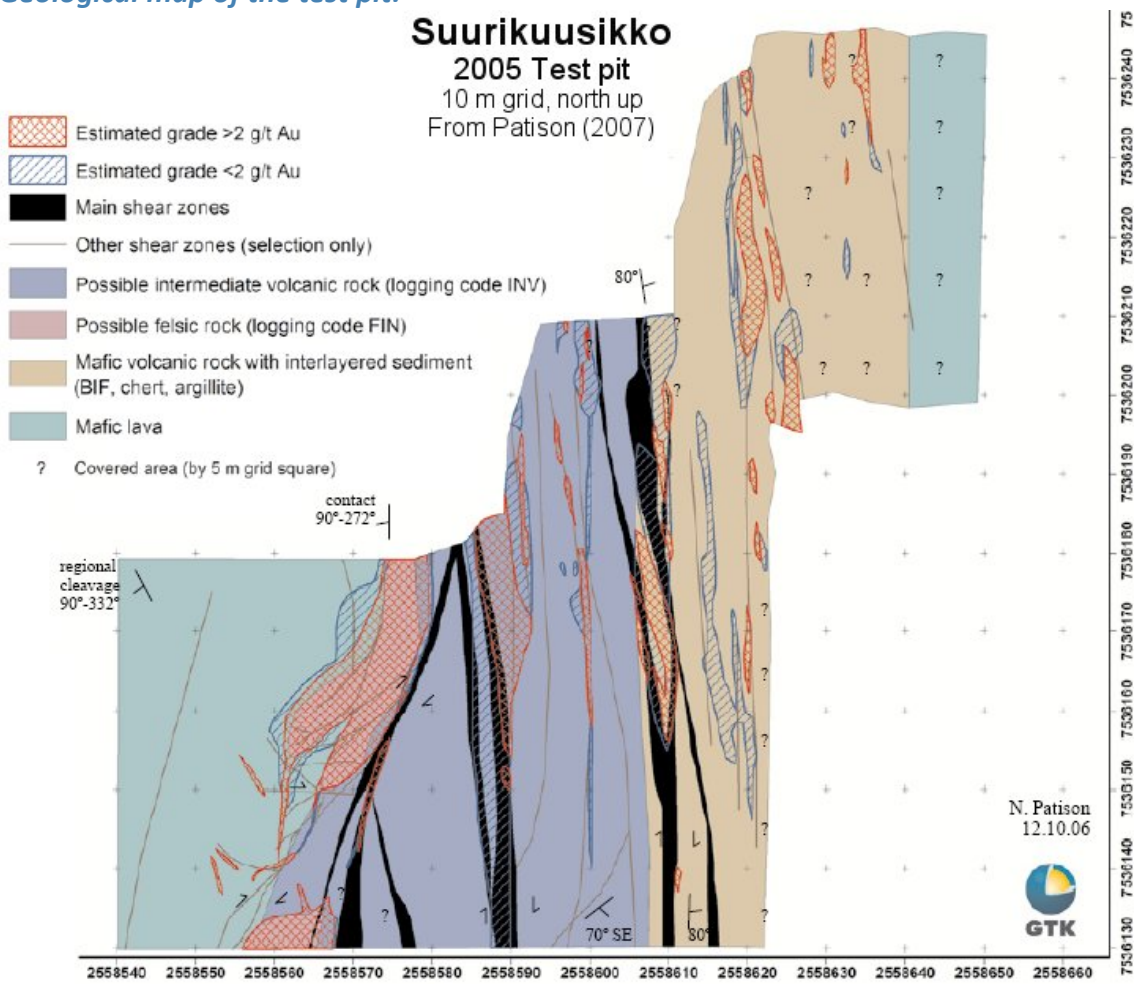


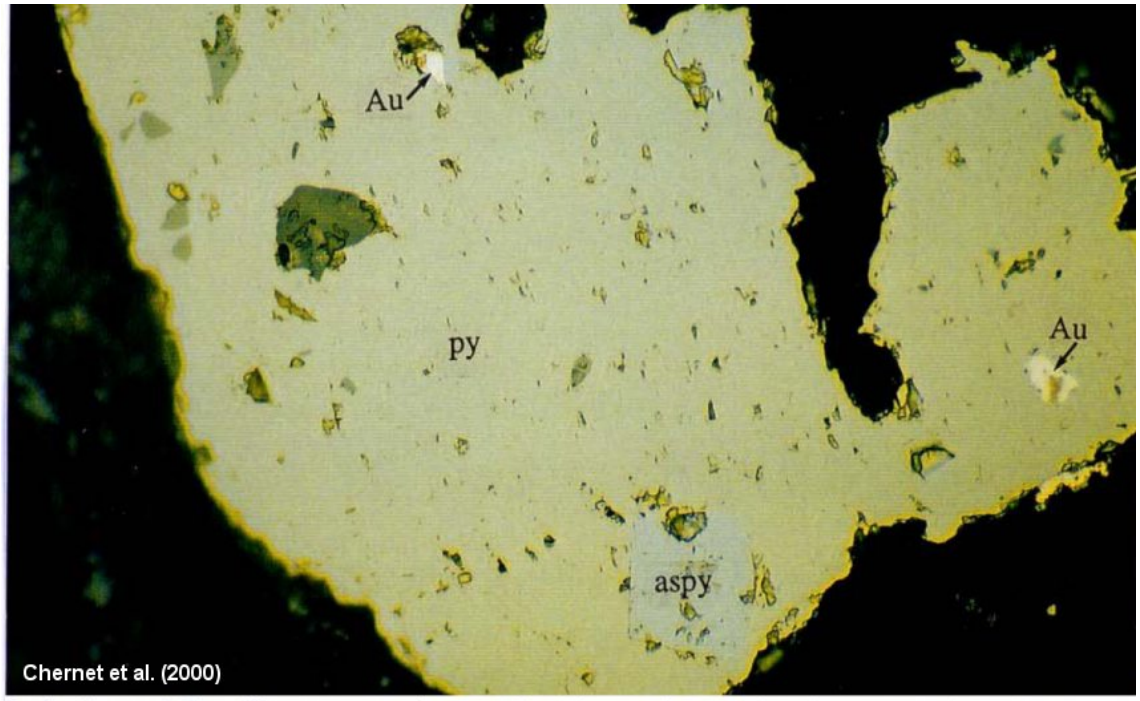
Short lense of carbonates and feldspars within a fine grained graphitic ground mass composed of carbonates, feldspars, mica and chlorite; Sample no.SuBo1 (8.15-8.25), length of the picture 3 mm.
Suurikuusikko. Chernet et al. (2000)



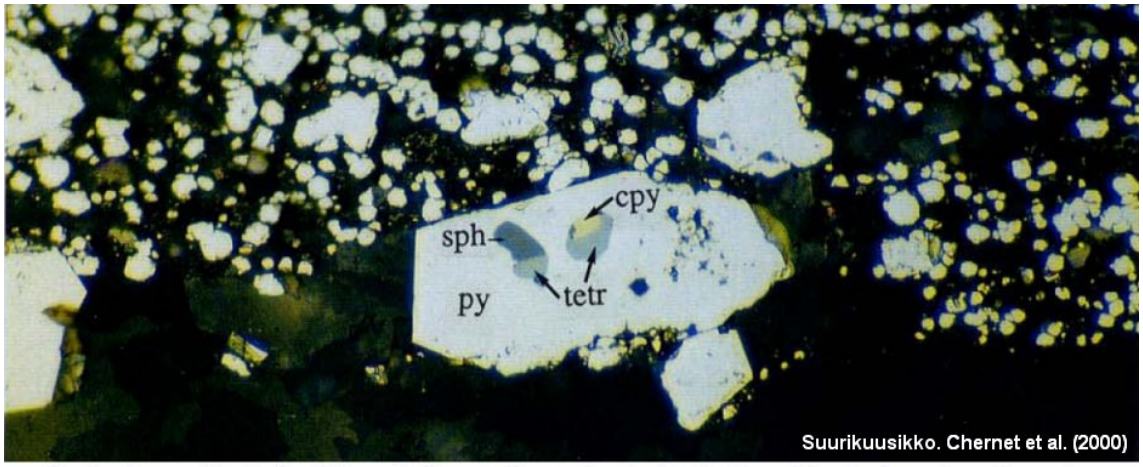
A shear band composed of mainly carbonates, mica (muscovite/sericite), graphite and chlorite; Sample no. SuBo2 (16.4-16.5), length of the picture 1.2mm.
Suurikuusikko. Chernet et al. (2000)

Geological map of the test pit:



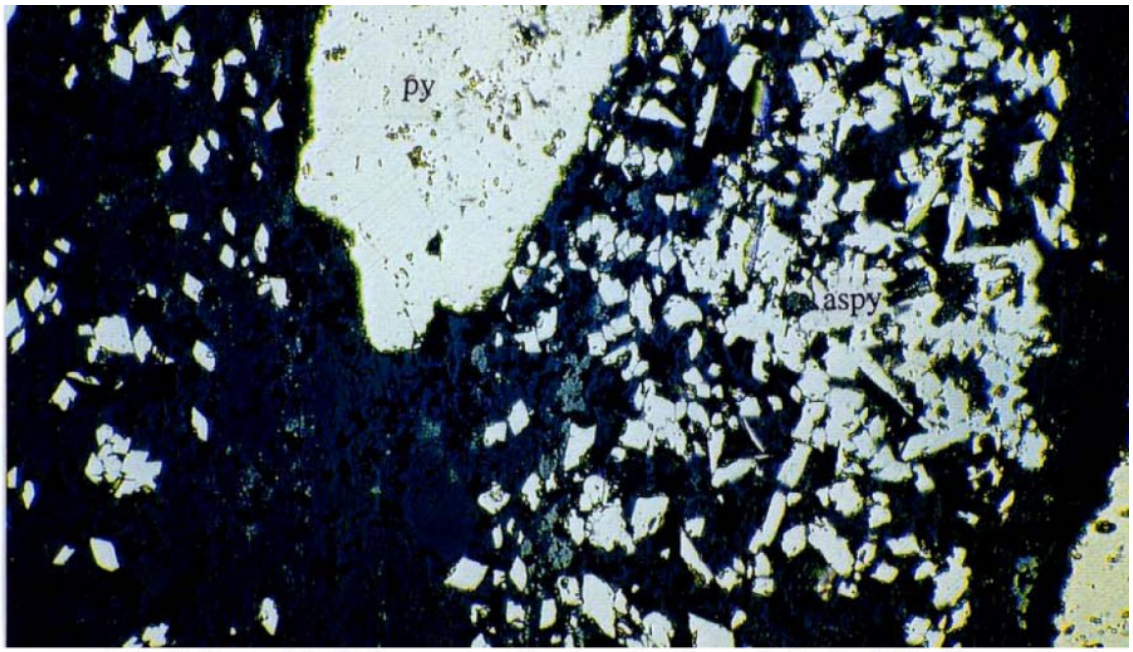


Inclusions of rhombic arsenopyrite, tetrahedrite, native gold and gangue minerals in subhedral pyrite; Sample no. SuBo7 (17.6-17.7), length of the picture 0.4mm.

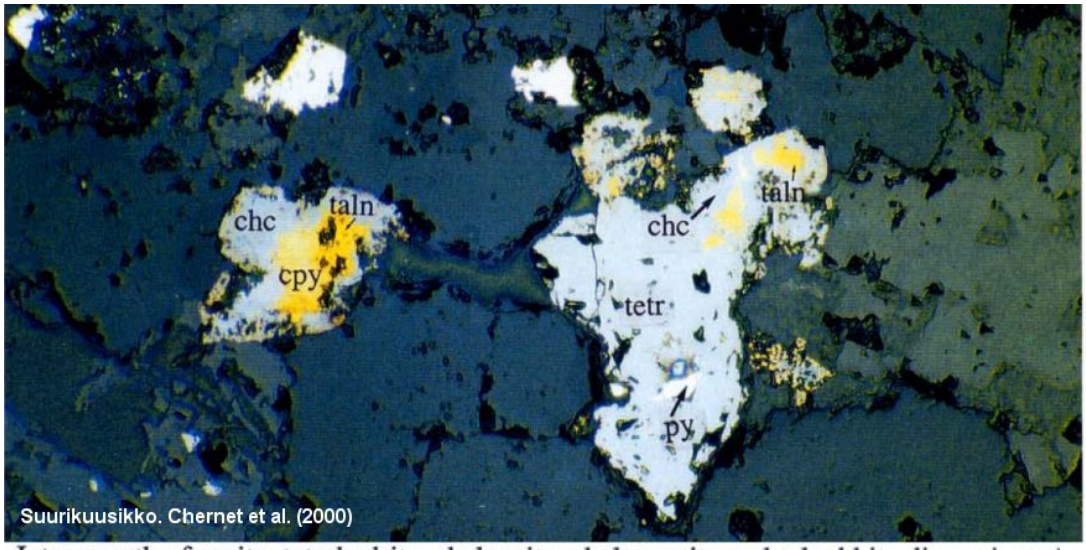


Inclusions of tetrahedrite, chalcopyrite and sphalerite in subhedral pyrite; Sample no. SuBo2 (19.4-19.5), length of the picture 0.25mm

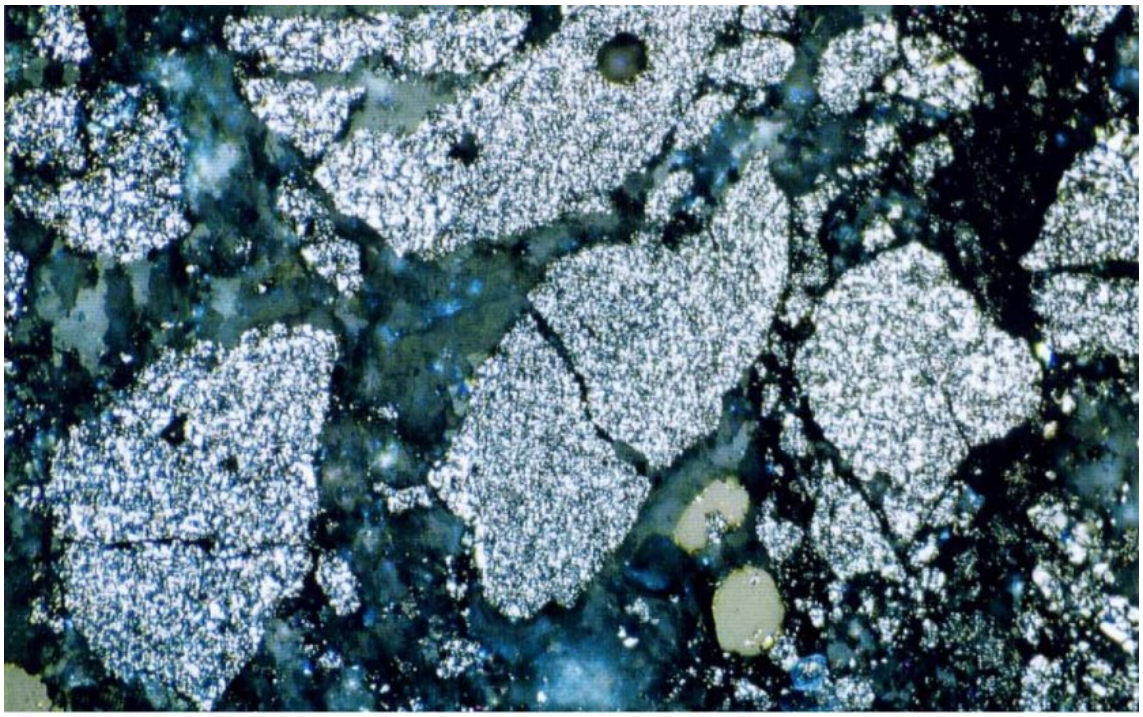
Aggregated pyrite grains aligned following the shearing structure of the rock; Sample no. SuBo1 (28.75-28.85), length of the picture 3.7mm.
Suurikuusikko. Chernet et al. (2000)



Anhedral to subhedral coarse-grained pyrite disseminated within fine-grained arsenopyrite mass; Sample no. SuBo7 (28.85-28.95), length of the picture 0.6mm.
Suurikuusikko. Chernet et al. (2000)

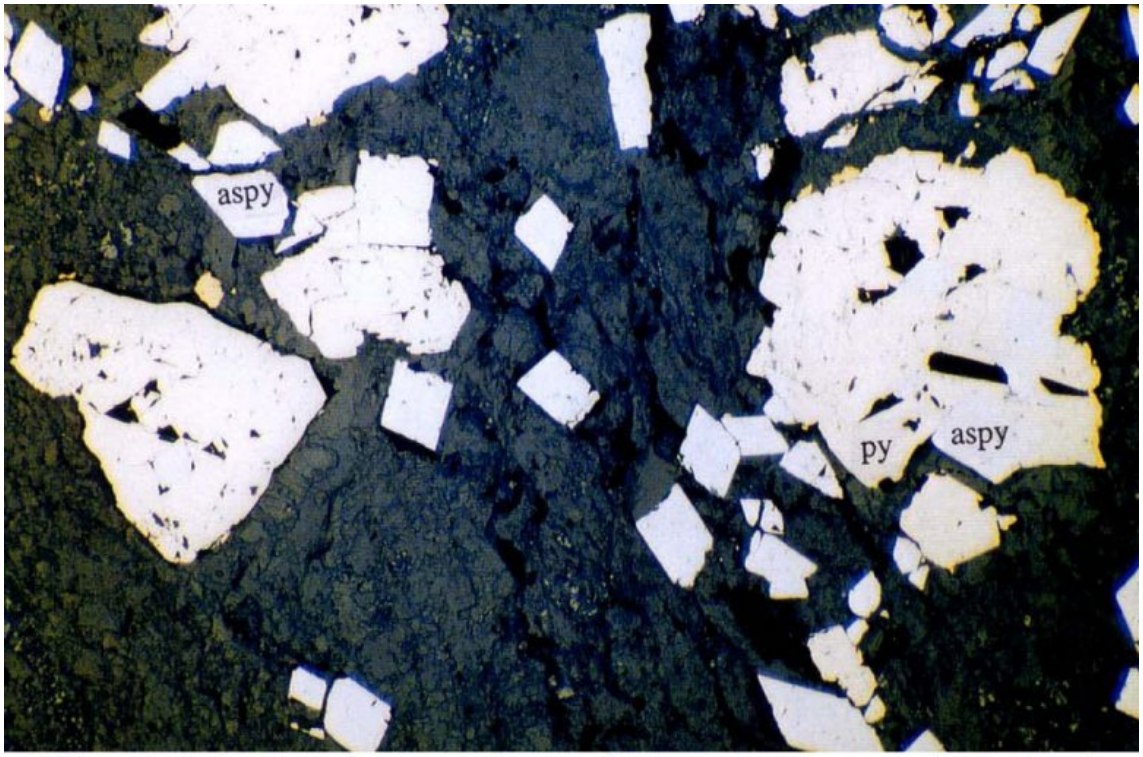


Intergrowth of pyrite, tetrahedrite, chalcocite, chalcopyrite and talnakhite disseminated within a coarse-grained carbonate and quartz lenses; note chalcocite and talnakhite replacing chalcopyrite and tetrahedrite; Sample no. SuBo6 (17.8-17.9), length of the picture 0.5mm.



Graphite in the form of very fine aggregated microcrystalline grains; reflected light; Sample no. SuBo2 (19.4-19.5), length of the picture 0.75mm.

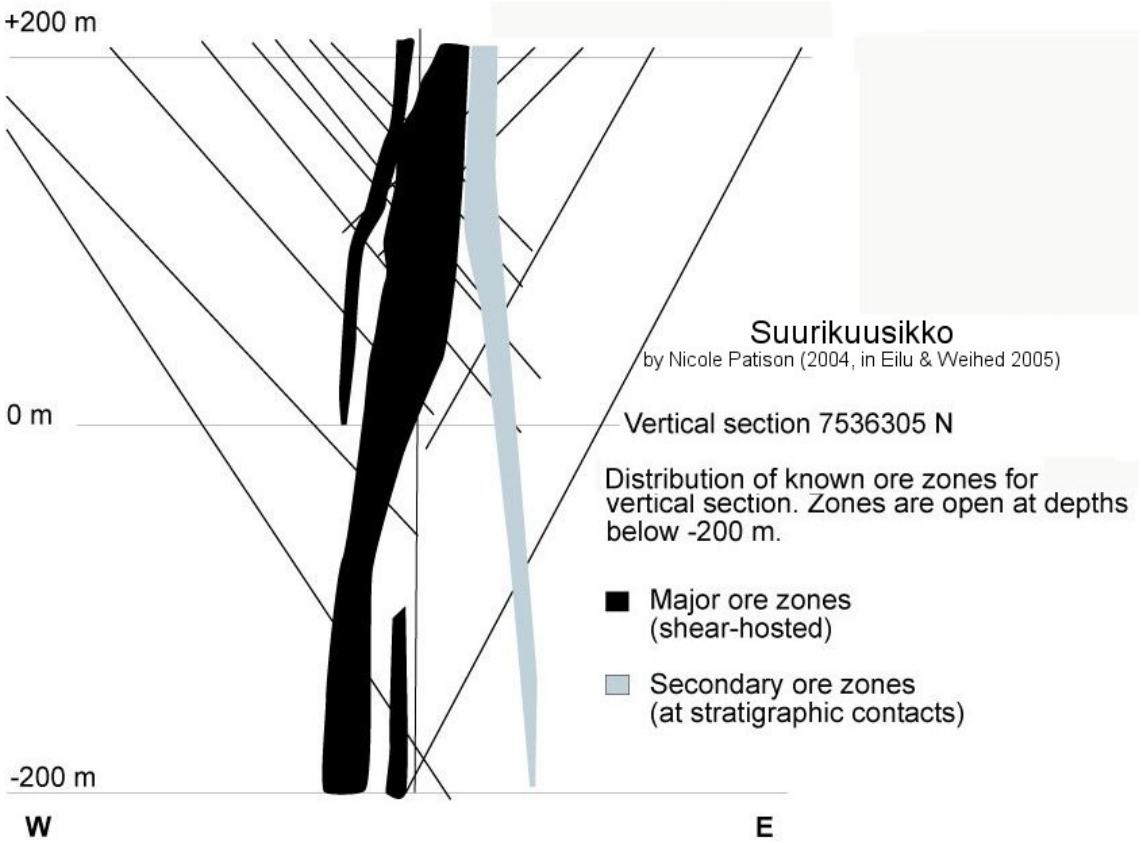
Suurikuusikko. Chernet et al. (2000)



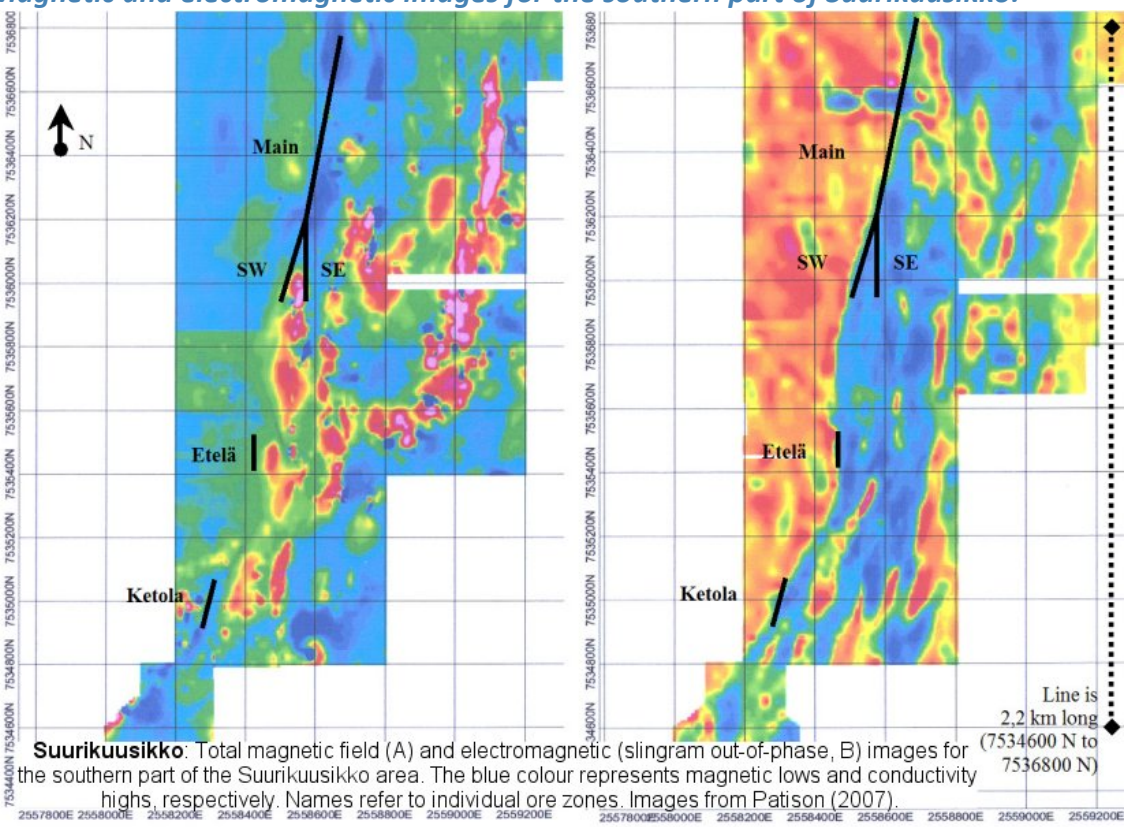
Disseminated pyrite and arsenopyrite, note the intergrowth between these minerals and arsenopyrite embedded in pyrite; Sample no. SuBo2 (27.45-27.55), length of the picture 1.2 mm **Suurikuusikko. Chernet et al. (2000)**

Brecciated ore:

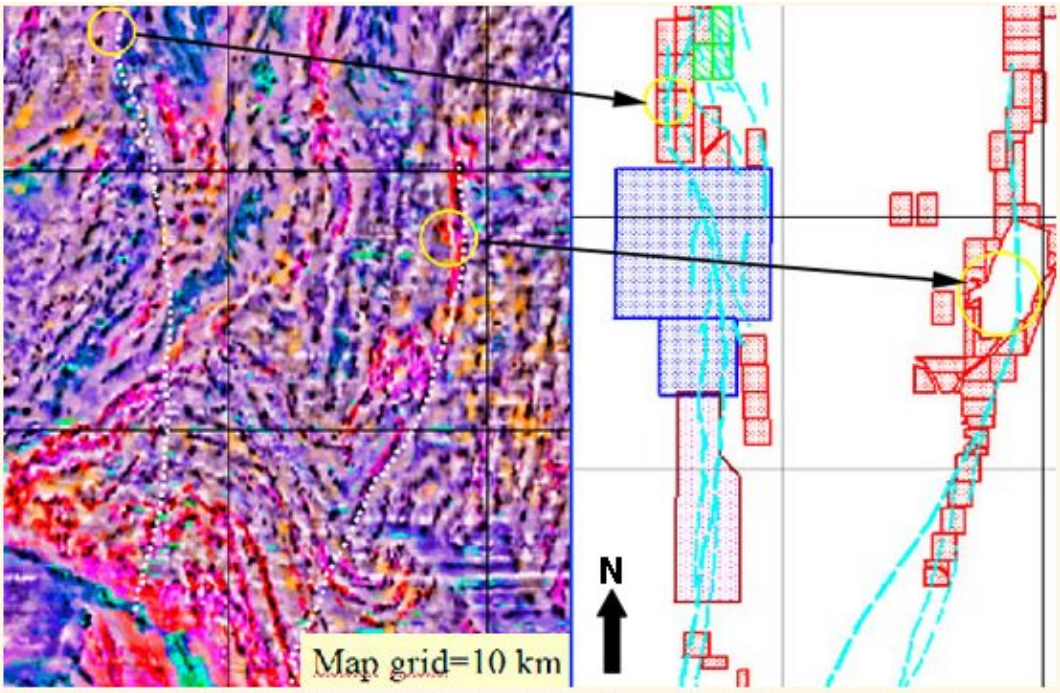
Typical brecciated ore at Suurikuusikko.
Photo Riddarhyttan AB 2002.



Magnetic and electromagnetic images for the southern part of Suurikuusikko:

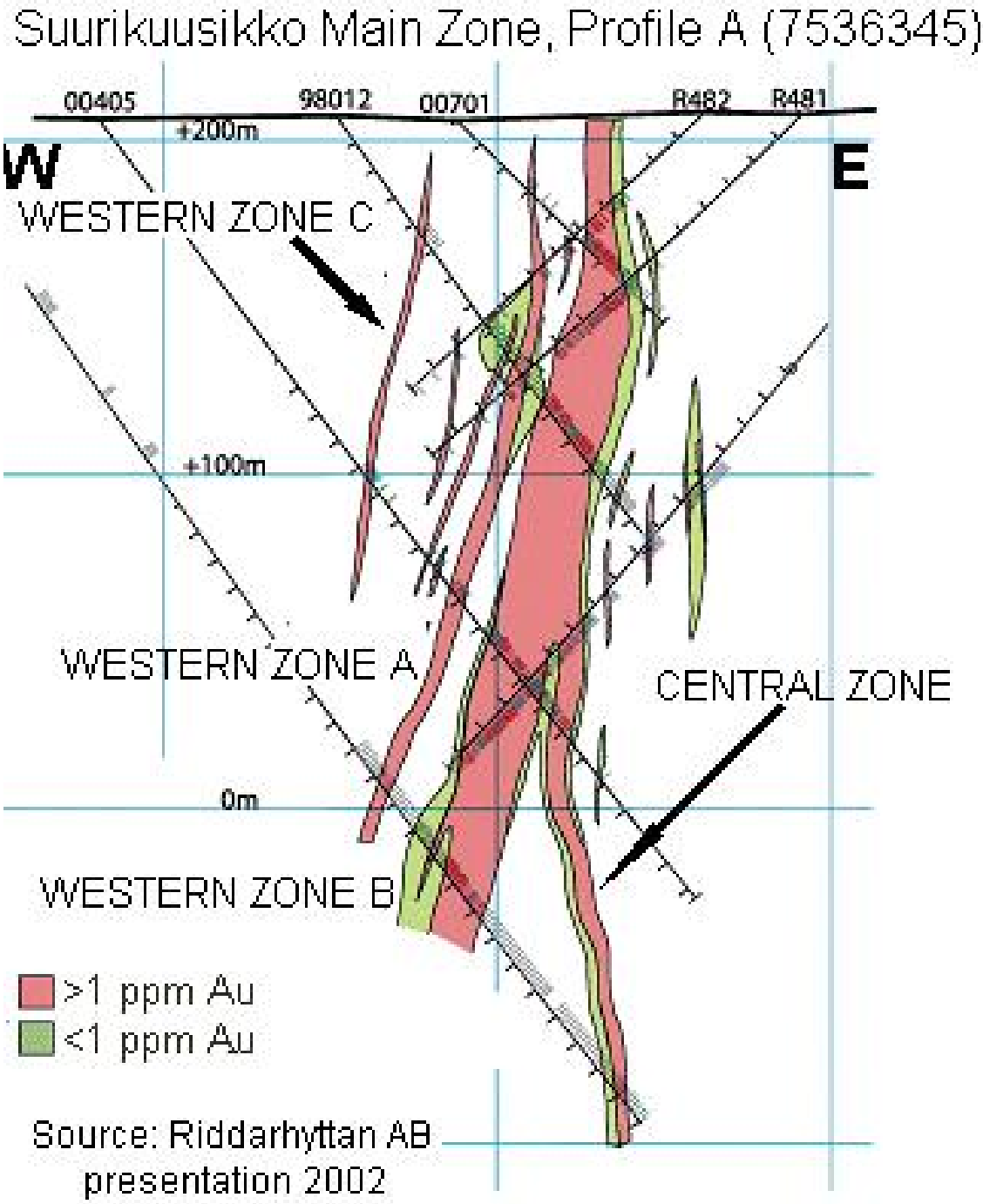


Suurikuusikko: Total magnetic field (A) and electromagnetic (slingram out-of-phase, B) images for the southern part of the Suurikuusikko area. The blue colour represents magnetic lows and conductivity highs, respectively. Names refer to individual ore zones. Images from Patison (2007).



Roughly N-S trending **Hanhimaa** (western) and **Suurikuusikko** (eastern) auriferous shear zones in Central Lapland greenstone belt. Exploration tenements for both zones shown in the drawing on left. Encircled: Kellolaki on right, Suurikuusikko on left.
Background map:processed magnetic + electromagnetic. From Goode (2004).

A cross section of the Main zone:



Longitudinal section of the eastern zone in the Main deposit:

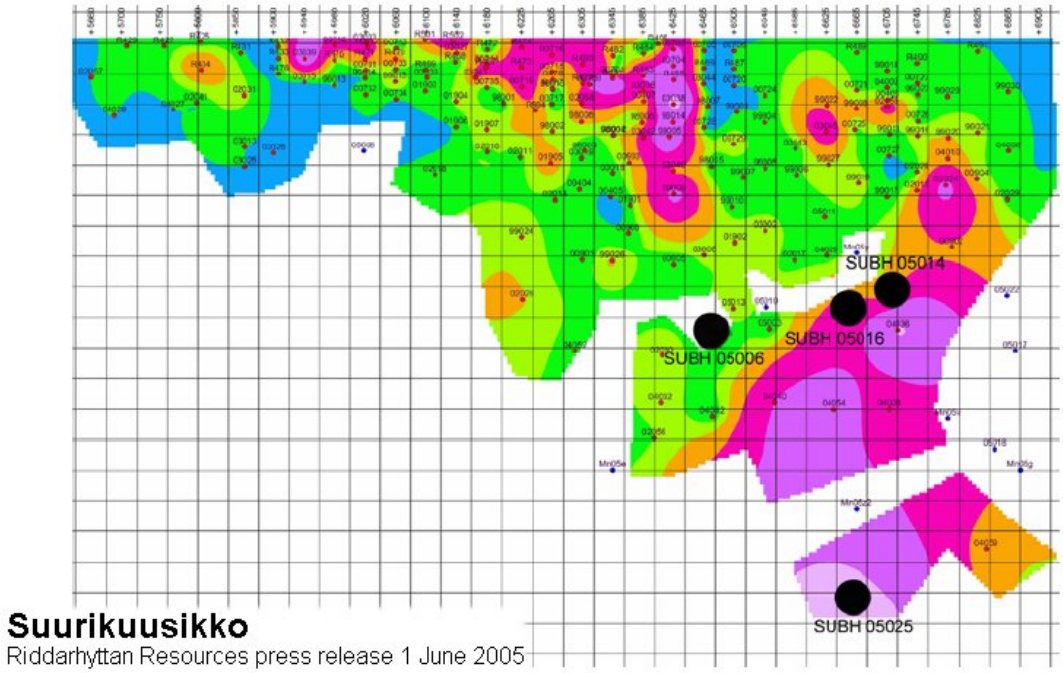


Figure 4.
Longitudinal section of the Eastern Zone in the Main Deposit showing the positions where drill holes SUBH 0500
SUBH 05014, SUBH 05016 and SUBH 05025 intersect the zone (big black circles).
Small blue circles represent ongoing or planned drill holes.

Longitudinal section of the Ketola and The Etelä zone:

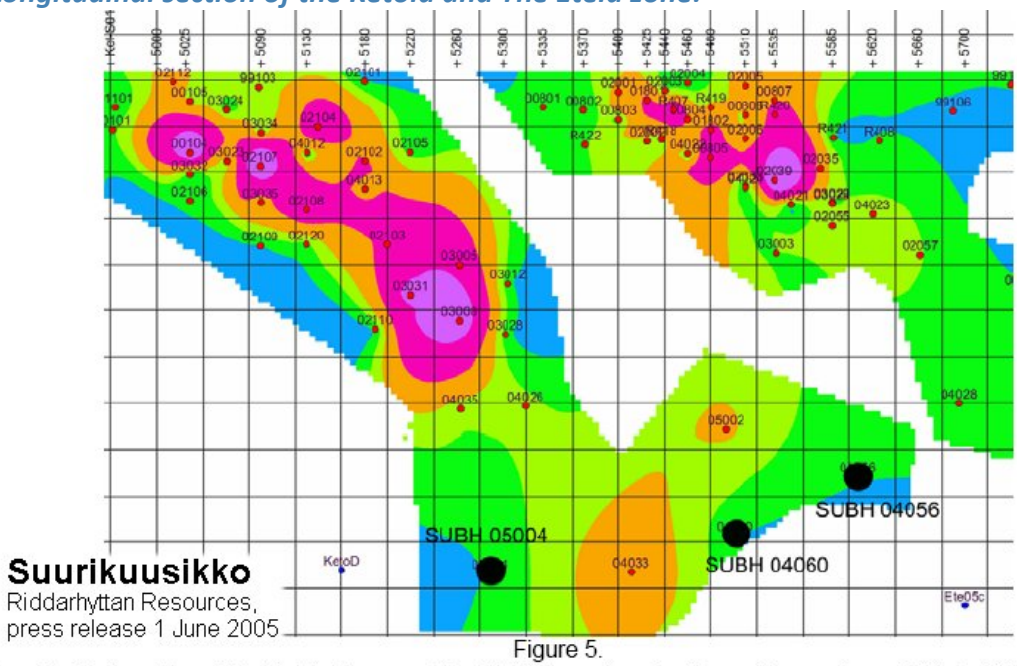


Figure 5.
Longitudinal section of the Ketola Zone and the Etelä Zone showing the positions where drill hole SUBH 04056,
SUBH 04060 and SUBH 05004 intersect the zones (big black circle).
Small blue circles represent ongoing or planned drill holes.

Longitudinal section of the northern part:

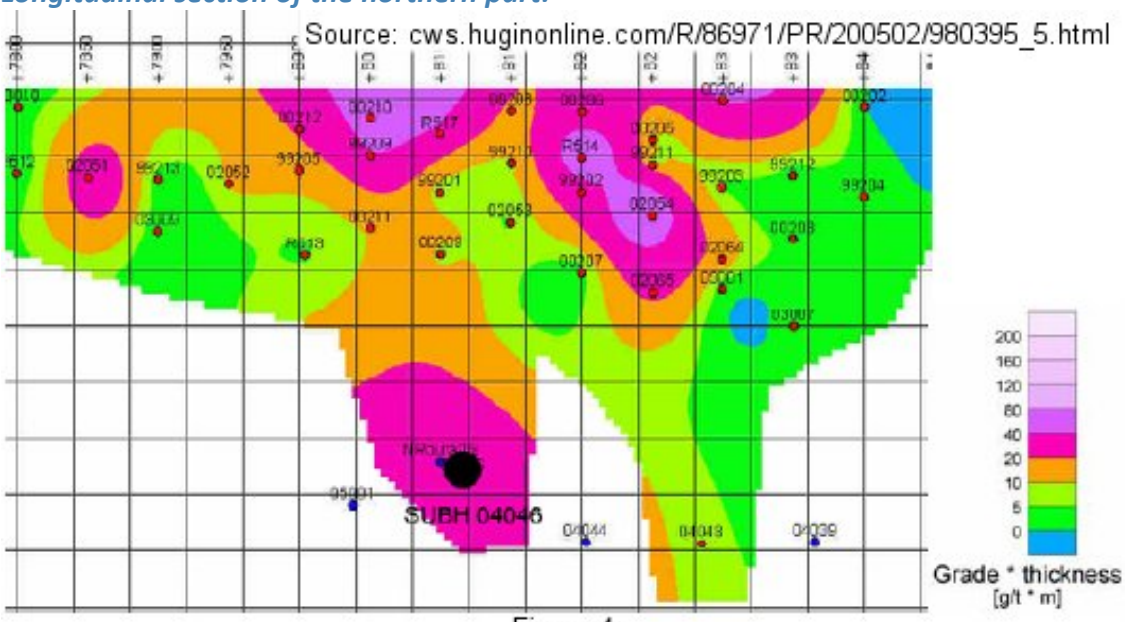
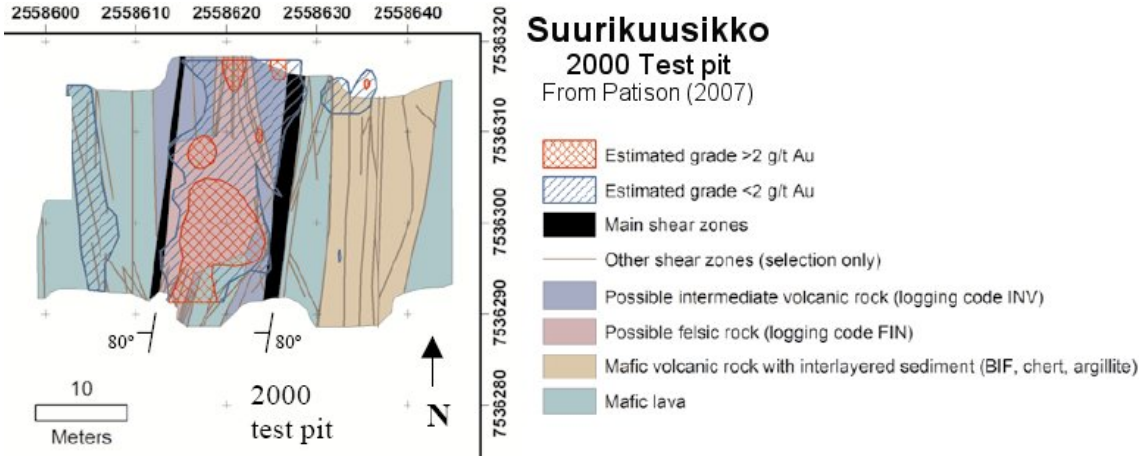
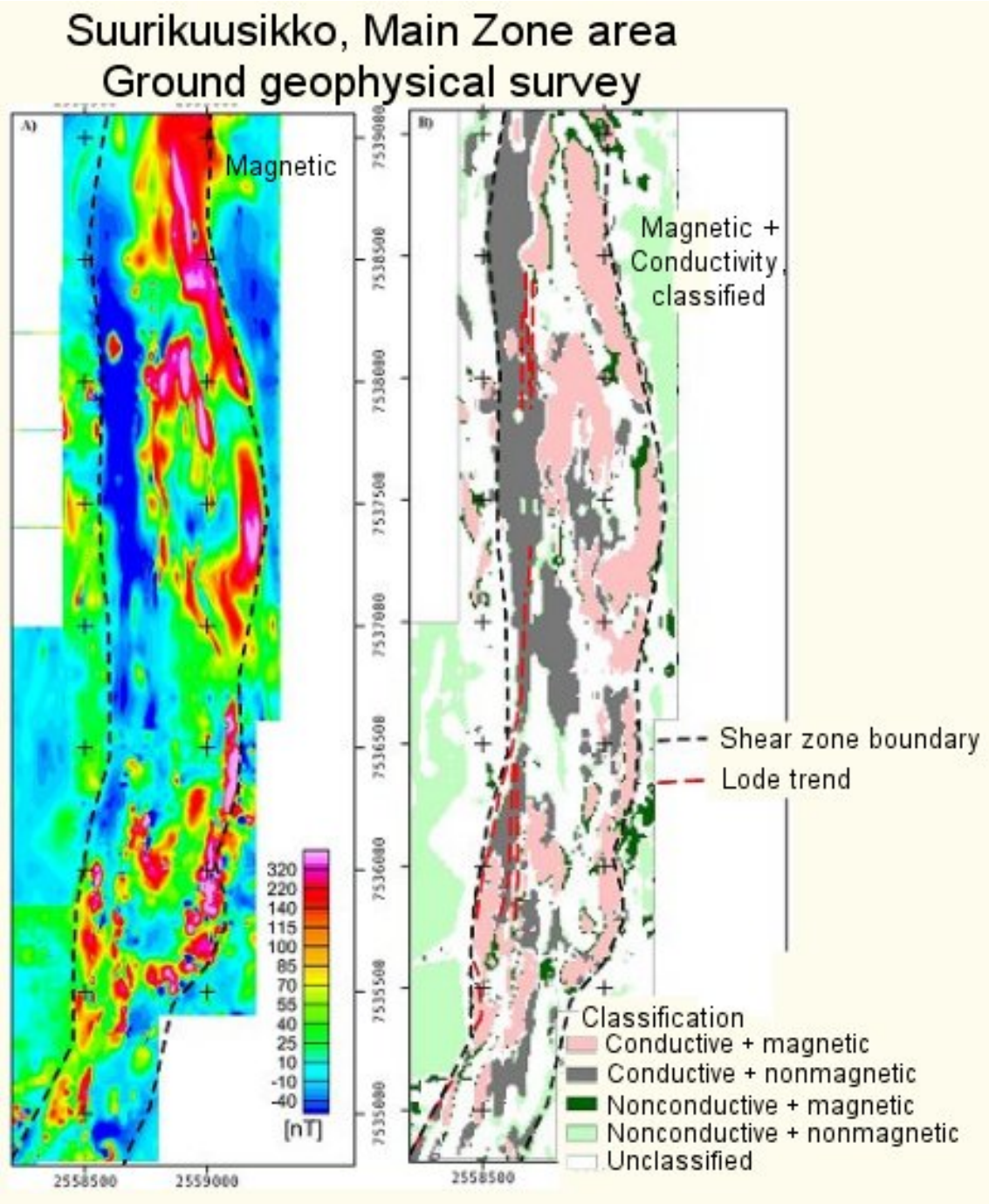


Figure 4.
Longitudinal sections of the Northern Zone.
Black circles show where the new holes intersect the zone.

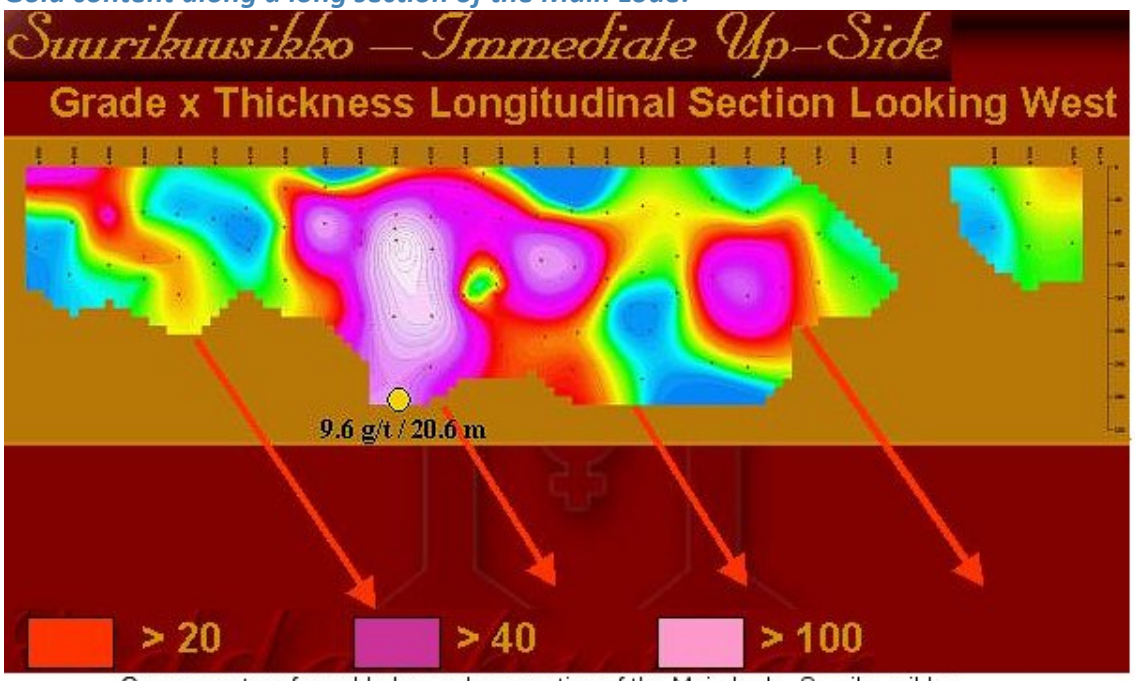
Geological map of the test pit:



Ground geophysics in Main Zone area:

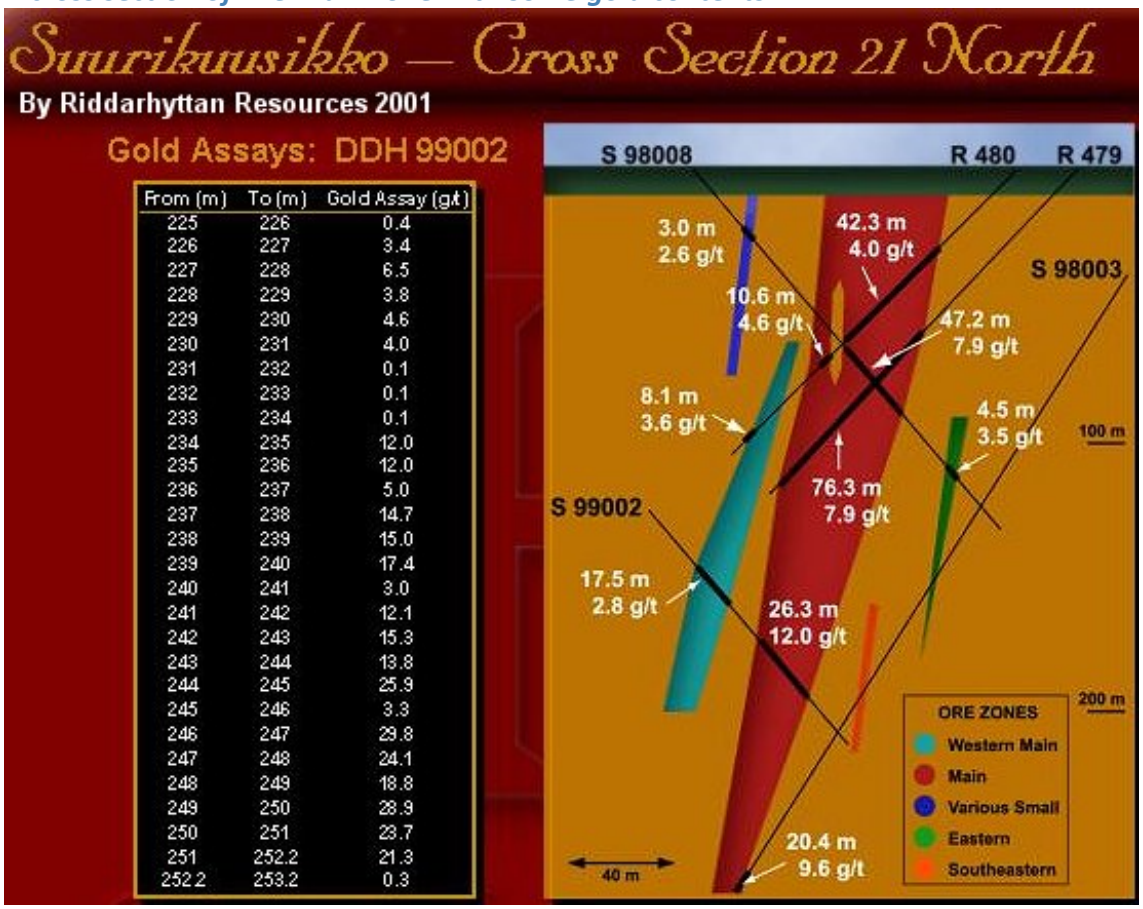


Gold content along a long section of the Main Lode:



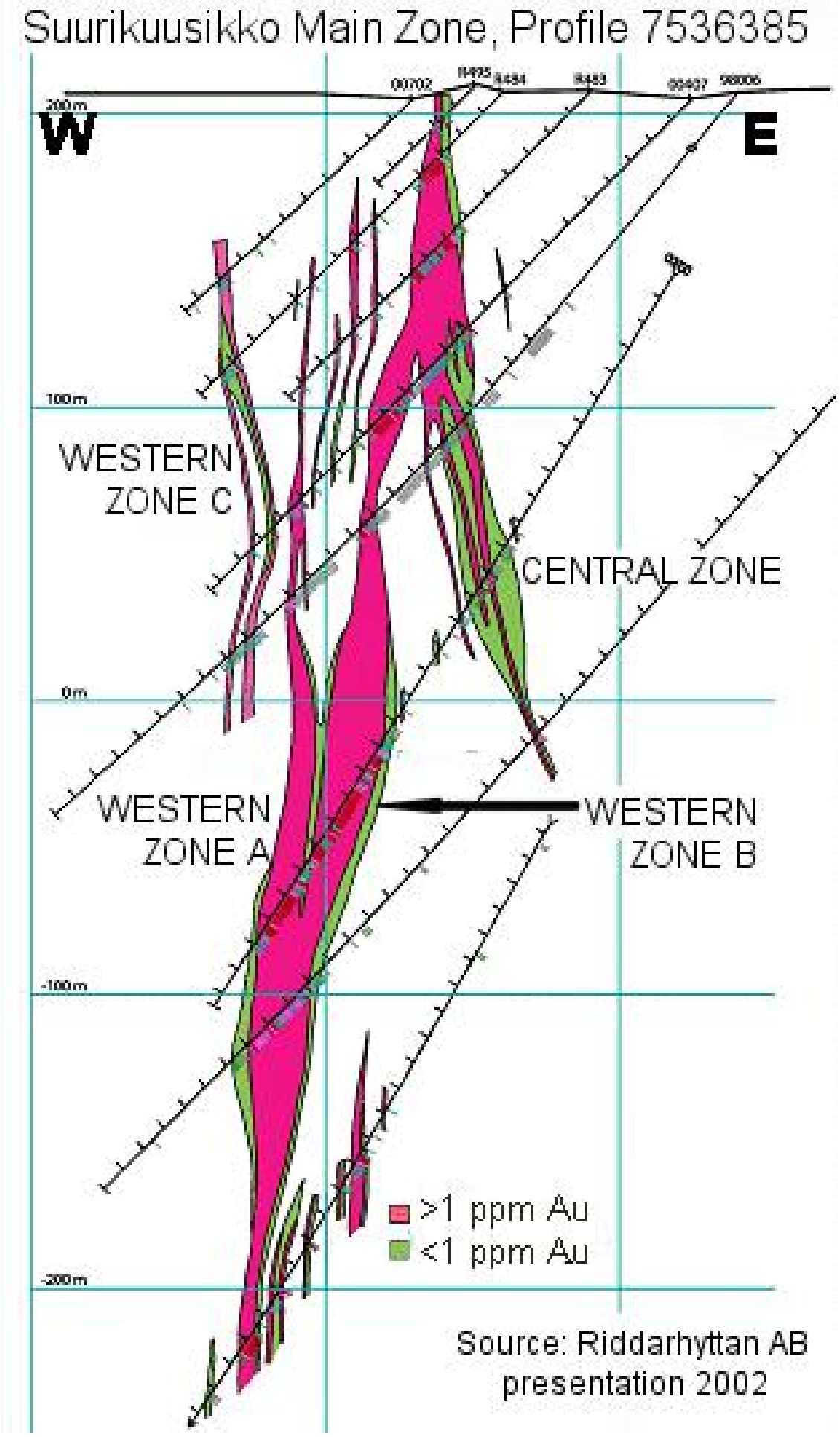
Gramm metres for gold along a long section of the Main Lode, Suurikuusikko.
Figure by Riddarhyttan Resources 2001.

A cross section of The Main zone with some gold contents:

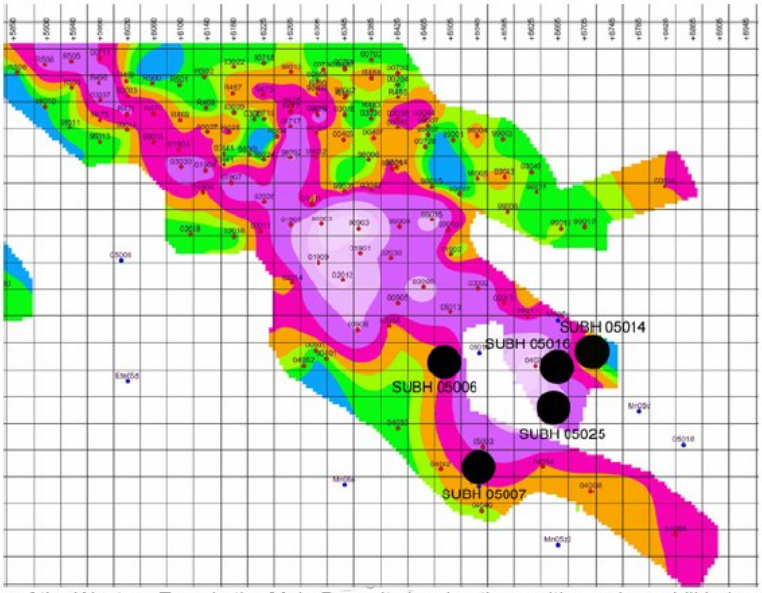


From (m)	To (m)	Gold Assay (g/t)
225	226	0.4
226	227	3.4
227	228	6.5
228	229	3.8
229	230	4.6
230	231	4.0
231	232	0.1
232	233	0.1
233	234	0.1
234	235	12.0
235	236	12.0
236	237	5.0
237	238	14.7
238	239	15.0
239	240	17.4
240	241	3.0
241	242	12.1
242	243	15.3
243	244	13.8
244	245	25.9
245	246	3.3
246	247	29.8
247	248	24.1
248	249	18.8
249	250	28.9
250	251	23.7
251	252.2	21.3
252.2	253.2	0.3

A cross section of the Main zone:


Suurikuusikko Main Zone, Profile 7536385
W
E
200 m
100 m
0 m
-100 m
-200 m
WESTERN ZONE C
CENTRAL ZONE
WESTERN ZONE A
WESTERN ZONE B
>1 ppm Au
<1 ppm Au
Source: Riddarhyttan AB presentation 2002

Longitudinal section of the western zone in the Main deposit:



Longitudinal section of the Western Zone in the Main Deposit showing the positions where drill holes SUBH 05006, SUBH 05007, SUBH 05014, SUBH 05016 and SUBH 05025 intersect the zone (big black circles).
Small blue circles represent ongoing or planned drill holes.

REFERENCES

1. AGNICO EAGLE REPORTS FOURTH QUARTER AND FULL YEAR 2015 RESULTS
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico049_2016_02_10_2015_results.pdf

2. Agnico Eagle 2014. Management's discussion and analysis for the year ended December 31, 2013.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico_Eagle_2013_MD&A.pdf

3. Agnico Eagle 2014. News release 12 February 2014.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico_Eagle_2014_02_12.pdf

4. Agnico Eagle 2015. Managements's discussion and analysis for the year ended December 31, 2014.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_AgnicoEagle_2014_MD&A.pdf

5. Agnico Eagle 2015. News release 11 February 2015.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico%20Eagle_Q4-2014.pdf

6. Agnico Eagle 2017. AGNICO EAGLE REPORTS FOURTH QUARTER AND FULL YEAR 2016 RESULTS.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_AEM-Q4-and-Full-Year-2016-Results.pdf

7. Agnico Eagle 2018. Agnico Eagle reports fourth quarter and full year 2017 results.
*http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico058_2018_02_14_fourth_quarter_*

8. Agnico Eagle 2019. Agnico Eagle publishes Q4 and full year 2018 results
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_2019_02_14_Agnico_Eagle_publishes_Q4

9. Agnico Eagle 2019. Media release 23 Oct 2019
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico68_2019_10_23.pdf

10. Agnico Eagle 2020. Agnico Eagle Mines Limited. Annual Report 2019. Measured and responsible growth.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_TSX_AEM_2019.pdf

11. Agnico Eagle 2020. Agnico Eagle reports third quarter 2019 results.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_2020_02_13%20Agnico%20Eagle%20Mine

12. Agnico Eagle 2020. Media release 28 Oct 2020
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico78_2020_10_28.pdf

13. Agnico Eagle 2020. Media release 29 July 2020.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico73_2020_07_29.pdf

14. Agnico Eagle 2021. Agnico Eagle Mines Limited. Annual Report 2020. Building trust. Creating value. Contributing to community well-being.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_AgnicoEagleAR2020_Full-EN.pdf

15. Agnico Eagle 2021. Media release 11 Feb 2021.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico79_2021_02_11.pdf

16. Agnico Eagle 2021. Media release 8 July 2021.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico81_2021_07_08.pdf

17. Agnico Eagle 2022. Agnico Eagle reports fourth quarter and full year 2021 results
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico86_2022_02_23.pdf

18. Agnico Eagle 2022. Media release 11 Sept 2022.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico89_2022_09_11.pdf

19. Agnico Eagle 2022. Media release 23 Feb 2022.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico86_2022_02_23.pdf

20. Agnico Eagle 2022. Media release 26 Oct 2022.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico90_2022_10_29.pdf

21. Agnico Eagle 2023. Agnico Eagle reports fourth quarter and full year 2022 results
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_AgnicoEagle_20230216.pdf

22. Agnico Eagle 2023. Media release 26 July 2023.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico93_2023_07_26.pdf

23. Agnico-Eagle Mines Limited 2004. Press release 22/04/2004.

24. Agnico-Eagle Mines Limited 2006. Press release 05/06/2006.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico_PressRelease_050606.pdf

25. Agnico-Eagle Mines Limited 2006. Press release 21/02/2006.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico_PressRelease_210206.pdf

26. Agnico-Eagle Mines Limited 2006. Press release 21/11/2006.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico_PressRelease_211106.pdf

27. Agnico-Eagle Mines Limited 2007. Press release 07/23/2007.

http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico_PressRelease_230707.pdf

28. Agnico-Eagle Mines Limited 2007. Press release 09/05/2007.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_AgnicoPressRelease_090507.pdf

29. Agnico-Eagle Mines Limited 2008. Press release 02/15/2008.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico_PressRelease_150208.pdf

30. Agnico-Eagle Mines Limited 2008. Press release 09/04/2008.

31. Agnico-Eagle Mines Limited 2009. Press release 03/04/2009.

32. Agnico-Eagle Mines press release 28 April 2011.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico_PressRelease_28042011.pdf

33. AgnicoEagle 2020. Media release 13 February 2020.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Agnico70_2020_02_13.pdf

34. Aho, P. 2009. Malmimineraloginen ja geokemiallinen vaihtelu kahdella Suurikuusikon kultakaivosalueen tutkimusprofiililla. MSc thesis. University of Oulu. 91 p. (in Finnish)

35. Chernet, T., Kojonen, K. & Pakkanen, L. 2000. Applied mineralogical study on the near-surface Suurikuusikko refractory gold ore, Kittilä, western Finnish Lapland (Phase I). Geological Survey of Finland, Report M 19/2743/2000/1/10. 22 p.
http://tupa.gtk.fi/raportti/arkisto/m19_2743_2000_1_10.pdf

36. Eilu, P. & Weihed, P. 2005. Fennoscandian Shield - Orogenic gold deposits. Ore Geology Reviews 27, 326-327.

37. Haga, I. 2007. Personal communication (talk in the FEM congress) 28 November 2007.

38. Härkönen, I. & Keinänen, V. 1989. Exploration of structurally controlled gold deposits in the Central Lapland greenstone belt. Current Research 1988, Geological Survey of Finland, Special Paper 10, 79-82.*http://tupa.gtk.fi/julkaisu/specialpaper/sp_010_pages_079_082.pdf*

39. Härkönen, I. 1992. Tutkimustyöselostus Kittilän kunnassa valtausalueella Suurikuusikko 1, kaiv.rek. n:o 4283/1 suoritetuista malmitutkimuksista. Geological Survey of Finland, Report M06/2743/-92/1/10. 5 p. (in Finnish)*http://tupa.gtk.fi/raportti/valtaus/m06_2743_92_1_10.pdf*

40. Härkönen, I. 1997. Tutkimustyöselostus Kittilän kunnassa valtausalueilla Suurikuusikko 2 ja Rouravaara 1-10 (kaivosrekisterinumerot 5965/1, 6160/1, 6288/1-6288/9) suoritetuista kultatutkimuksista vuosina 1987-1997. English summary: Gold exploration during 1987-1997 within the exploration claims Suurikuusikko 2 and Rouravaara 1-10 (Mine reg. nos. 5965/1, 6160/1, 6288/1-6288/9). Geological Survey of Finland, Report M 06/2743/97/1. 47 p.12.
http://tupa.gtk.fi/raportti/valtaus/m06_2743_97_1_10.pdf

41. Härkönen, I., Kojonen, K. and Johanson, B. (1999) The Proterozoic Suurikuusikko refractory gold deposit in Kittillä, Western Finnish Lapland. In: N.J. Cook and K. Sundblad (eds) Precambrian gold in

the Fennoscandian and Ukrainian Shields and related areas. Gold ¿99 Trondheim, Norway, 4-6 May 1999. Geol. Surv. Norway. Trondheim. 89-91.

42. Härkönen, I., Kojonen, K. and Johanson, B. 1999. The Early Proterozoic Suurikuusikko refractory gold deposit, Kittillä, Western Finnish Lapland. In: C.J. Stanley et al. (eds) Mineral Deposits: Processes to Processing. Proceedings of the Fifth Biennial SGA Meeting and 10. IAGOD Quadrennial Symposium, London, 22-25.9.1999. 159-162.

43. Hölttä, P. & Karhu, J. 2001. Oxygen and carbon isotope compositions of carbonates in the alteration zones of orogenic gold deposits in central Finninsh Lapland. Geological Survey of Finland Special Paper 31, 25-29.*http://tupa.gtk.fi/julkaisu/specialpaper/sp_031_pages_025_029.pdf*

44. Hölttä, P., Väisänen, M., Väänänen, J. & Manninen, T. 2007. Paleoproterozoic metamorphism and deformation in Central Lapland, Finland. Geological Survey of Finland, Special Paper 44, 7-56. *http://tupa.gtk.fi/julkaisu/specialpaper/sp_044_pages_007_056.pdf*

45. Kojonen, K. & Johanson, B. 1999. Determination of refractory gold distribution by microanalysis, diagnostic leaching and image analysis. Mineralogy and Petrology 67, 1-19.

46. Kojonen, K. & Johansson, B. 1998. Comparison of EPMA and SIMS Results of Trace Gold analyses of Suurikuusikko Deposits, Northern Finland. Geological Survey of Finland, Report M 41/2743/98/1. 11 p.*http://tupa.gtk.fi/raportti/arkisto/m41_2743_98_1.pdf*

47. Kojonen, K., Johanson, B., Pakkanen, L. & Juvonen, R. 1996. Selostus Suurikuusikon Au-malmiaiheen syanidiliotuskokeista sekä mineralogisista tutkimuksista. Alustava raportti. Geological Survey of Finland, Report M 41/2743/96/1a. 10 p. (in Finnish) *http://tupa.gtk.fi/raportti/arkisto/m41_2743_96_1a.pdf*

48. Kojonen, K., Johanson, B., Pakkanen, L. & Juvonen, R. 1997. Selostus Suurikuusikon Au-malmin mineralogisista tutkimuksista ja syanidi- sekä diagnostisista liotuskokeista. English summary: Mineralogic investigations and on cyanide- and diagnostic-leach tests on the Suurikuusikko gold mineralisation. Geological Survey of Finland, Report M 41/2743/96/1. 74 p. *http://tupa.gtk.fi/raportti/arkisto/m41_2743_96_1.pdf*

49. Kontas, E. & Niskavaara, H. 1997. Raportti Suurikuusikon malmitutkimushankkeen kemiallisista analyyseistä. English summary: Chemical analyses made for the Suurikuusikko exploration project. Geological Survey of Finland, Report M 41.2/2743/97/1. 13 p. *http://tupa.gtk.fi/raportti/arkisto/m41_2_2743_97_1.pdf*

50. Lehtonen, M., Airo, M.-L., Eilu, P., Hanski, E., Kortelainen, V., Lanne, E., Manninen, T., Rastas, P., Räsänen, J. & Virransalo, P. 1998. Kittilän vihreäkivialueen geologia: Lapin vulkaniittiprojektin raportti. Summary: The stratigraphy, petrology and geochemistry of the Kittilä greenstone area, northern Finland: a report of the Lapland Volcanite Project. Geological Survey of Finland, Report of Investigation 140. 144 p.*http://tupa.gtk.fi/julkaisu/tutkimusraportti/tr_140.pdf*

51. Leppiniemi, J., Kalpudas, R., Laukkanen, J. & Heiskanen, K. 1997. Suurkuusikon malmin rikastustutkimus. English summary: Beneficiation study of the Suurkuusikko ore. Geological Survey of Finland, Report M 41.1/2743/97/2. 22 p.*http://tupa.gtk.fi/raportti/arkisto/m41_1_2743_97_2.pdf*

52. Lindholm, T. 2005. Suurikuusikko gold project, Finland. FEM2005 Congress, Rovaniemi, 1-2. Dec 2005.

53. Lindholm, Thomas 2005. Personal communication, Rovaniemi, 01/12/2005.

54. Ministry of Industry and Trade 1997. International tender notice. Suurikuusikko gold deposit, Finland. Press release 10/11/1997.

55. Ministry of Industry and Trade 1998. Swedish Riddarhyttan Resources AB to start exploration at the Suurikuusikko gold deposit in Kittilä, northern Finland. Press release 19/04/1998.

56. Molnár, F., Middleton, A, Stein, H, O`Brien, H., Lahaye, Y., Huhma, H., Pakkanen, L. & Johanson, B. 2018. Repeated syn- and post-orogenic gold mineralization events between 1.92 and 1.76 Ga along the Kiistala Shear Zone in the Central Lapland Greenstone Belt, northern Finland. Ore Geol. Rev. 101, 936-959.

57. Nurmi, P. A., Lestinen, P. & Niskavaara, H. 1991. Geochemical characteristics of mesothermal gold deposits in the Fennoscandian Shield, and a comparison with selected Canadian and Australian deposits. Geological Survey of Finland, Bulletin 351. 101 p.
http://tupa.gtk.fi/julkaisu/bulletin/bt_351.pdf

58. Parkkinen, J. 1997. The Suurikuusikko Gold Deposit. Mineral Resource Estimate. Geological Survey of Finland, Report M 19/2743/97/1. 20 p.
http://tupa.gtk.fi/raportti/arkisto/m19_2743_97_1.pdf

59. Patison, N. 2007. Day 3, Stop 1 Suurikuusikko gold deposit. Geological Survey of Finland, Guide 54. 55-62.

60. Patison, N.L. & Oliver, N.H.S. 2001. Structural features associated with Palaeoproterozoic gold deposits in the Central Lapland Greenstone Belt, northern Finland. In: P.J. Williams (ed) 2001: A Hydrothermal Odyssey. May 17-19th, 2001, Townsville. Extended abstracts. EGRU and JCU. 162-163.

61. Patison, N.L. 2004. Personal communication 28/05/2004.

62. Patison, N.L. 2007. Structural controls on gold mineralisation in the Central Lapland Greenstone Belt. Geological Survey of Finland, Special Paper 44, 107-124.
http://tupa.gtk.fi/julkaisu/specialpaper/sp_044_pages_107_124.pdf

63. Patison, N.L., Salamis, G. & Kortelainen, V.J. 2007. The Suurikuusikko gold deposit: project development summary of northern Europe¿s largest gold resource. Geological Survey of Finland, Special Paper 44, 125-136.*http://tupa.gtk.fi/julkaisu/specialpaper/sp_044_pages_125_136.pdf*

64. Peltoniemi-Taivalkoski, A. ja Sarala, P, 2009. Maaperän geokemialliset ja stratigrafiset tutkimukset Suurikuusikossa, Kittilän kaivoksella. Geologian tutkimuskeskus, raportti P23.4/2009/25, 30 s, 10 liites. (in Finnish, English summary)
http://tupa.gtk.fi/raportti/arkisto/p23_4_2009_25.pdf

65. Riddarhyttan Resources AB 1998. Press release 21/04/1998. (in Swedish)

66. Riddarhyttan Resources AB 1998. Press release 28/09/1998. (in Swedish)

67. Riddarhyttan Resources AB 1999. Press release 12/04/1999. (in Swedish)

68. Riddarhyttan Resources AB 1999. Press release 15/03/1999. (in Swedish)

69. Riddarhyttan Resources AB 1999. Press release 17/12/1998. (in Swedish)

70. Riddarhyttan Resources AB 2002. Press release 07/03/2002.

71. Riddarhyttan Resources AB 2002. Press release 11/03/2002. (in Swedish)

72. Riddarhyttan Resources AB 2002. Press release 26/03/2002.

73. Riddarhyttan Resources AB 2003. Press release 05/11/2002.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Riddarhyttan_PressRelease051102.pdf

74. Riddarhyttan Resources AB 2003. Press release 11/08/2003.

75. Riddarhyttan Resources AB 2003. Press release 18/12/2002.

76. Riddarhyttan Resources AB 2003. Press release 20/02/2003.

77. Riddarhyttan Resources AB 2003. Press release 20/08/2003.

78. Riddarhyttan Resources AB 2003. Press release 24/03/2003.

79. Riddarhyttan Resources AB 2004. Press release 07/10/2004.

80. Riddarhyttan Resources AB 2004. Press release 21/04/2004.

81. Riddarhyttan Resources AB 2004. Press release 21/12/2004.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Riddarhyttan_PressRelease211204.pdf

82. Riddarhyttan Resources AB 2004. Press release 22/01/2004.

83. Riddarhyttan Resources AB 2004. Press release 27/10/2004.

84. Riddarhyttan Resources AB 2005. Annual report. Göteborg. 40 p.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/148801.pdf

85. Riddarhyttan Resources AB 2005. Press release 02/06/2005.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_riddarhyttan_PressRelease_020605.pdf

86. Riddarhyttan Resources AB 2005. Press release 03/03/2005.

87. Riddarhyttan Resources AB 2005. Press release 14/02/2005.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_riddarhyttan_PressRelease140205.pdf

88. Riddarhyttan Resources AB 2005. Press release 15/08/2005.

89. Riddarhyttan Resources AB 2005. Press release 16/02/2005.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Riddarhyttan_PressRelease_160205.pdf

90. Riddarhyttan Resources AB 2005. Press release 18/04/2005.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_riddarhyttan_PressRelease180405.pdf

91. Riddarhyttan Resources AB 2005. Press release 19/07/2005.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_riddarhyttan_PressRelease_190705.pdf

92. Riddarhyttan Resources AB 2005. Quaterly report January - March 2005. Press release 21/04/2005.*http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/148801.pdf*

93. Riddarhyttan Resources AB, 1999, Press release 24/08/1999. (in Swedish).

94. Riddarhyttan Resources AB, 2000, Press release 06/09/2000.

95. Riddarhyttan Resources AB, 2000, Press release 08/12/2000.

96. Riddarhyttan Resources AB, 2000, Press release 09/10/2000.

97. Riddarhyttan Resources AB, 2000, Press release 12/10/2000.

98. Riddarhyttan Resources AB, 2000, Press release 13/06/2000. (in Swedish)

99. Riddarhyttan Resources AB, 2000, Press release 19/12/2000.

100. Riddarhyttan Resources AB, 2001, Annual report. Göteborg. 43 p.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/102113.pdf

101. Riddarhyttan Resources AB, 2001, Press release 17/04/2001.

102. Riddarhyttan Resources AB, 2001, Press release 25/01/2001. (in Swedish)

103. Sayab, M., Molnár, F., Aerden, D., Kuva, J. & Välimaa, J. 2019. A succession of near-orthogonal horizontal tectonic shortenings in the Paleoproterozoic Central Lapland Greenstone belt of Fennoscandia: Constraints from the world-class Suurikuusikko gold deposit. Mineralium Deposita, https://doi.org/10.1007/s00126-019-00910-7

104. Tukes 2017. Tilastotietoja vuoriteollisuudesta 2016.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Tilastotietoja_vuoriteollisuudesta_2016.p

105. Tukes 2018. Tilastoja vuoriteollisuudesta 2017.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_VUORI2017.pdf

106. Tukes 2019. Tietoja vuoriteollisuudesta 2018.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Vuoriteollisuustilasto%202018.pdf

107. Tukes 2020. Tietoja vuoriteollisuudesta 2019.
http://tupa.gtk.fi/karttasovellus/mdae/references/514_Talvivaara/514_Vuoriteollisuustilasto%202019.pdf

108. Tukes 2021. Tilastotietoja vuoriteollisuudesta 2020.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Tilastotietoja%20vuoriteollisuudesta%202

109. Tukes 2022. Tietoja vuoriteollisuudesta 2021
http://tupa.gtk.fi/karttasovellus/mdae/references/12_Kevitsa/12_Tilastotietoja%20vuoriteollisuudesta%202021.pdf

110. Tukes 2023. Tilastotietoja vuoriteollisuudesta 2022.
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_Tilastotietoja%20vuoriteollisuudesta%202

111. Tukes: tilastoja vuoriteollisuudesta 2015
http://tupa.gtk.fi/karttasovellus/mdae/references/386_Suurikuusikko/386_VUORI2015.pdf

112. Valkama, J. 2006. Kultataskun löytyminen Kiistalassa johti Suurikuusikon kullan jäljille. Geological Survey of Finland, Report M19/2743/2006/1/10. 5 p. (in Finnish)
http://tupa.gtk.fi/raportti/arkisto/m19_2743_2006_1_10.pdf

113. Väisänen, M. 2002. Structural features in the Central Lapland greenstone belt, northern Finland. Geological Survey of Finland, Report K 21.42/2002/3. 20 p.
http://tupa.gtk.fi/raportti/arkisto/k21_42_2002_3.pdf

114. Wyche, N. L., Eilu, P., Koppström, K., Kortelainen, V. J., Niiranen, T. & Välimaa, J. 2015. The Suurikuusikko gold deposit (Kittilä Mine), northern Finland. In: Maier, W.D., Lahtinen, R. & O'Brien, H. (eds) Mineral deposits of Finland. Amsterdam: Elsevier, 411-433.
http://www.sciencedirect.com/science/article/pii/B9780124104389000169