

# Isoaho-2

**Alternative Names:** Rytisuo 2, Isoaho 2

**Occurrence type:** occurrence

Commodity	Rank	Total measure	Total production	Total resource	Importance
gold	1	NA	NA	NA	NA
cobalt	2	NA	NA	NA	NA

Easting EUREF: 598952,592

Northing EUREF: 7351748,898

Easting YKJ: 3599165

Northing YKJ: 7354824

**Discovery year:** 1991

**Discovered by:** Geological Survey of Finland

**Province:** Kuusamo-Kuolajärvi (Co, Au)

**District:** Kuusamo (Co, Au)

**Comments:** One of the Juomasuo satellite deposits. Found by GTK, as a follow-up of exploration at Juomasuo, detected by an IP survey and trenching

**References:** 3

## Mineral deposit type

**Group:** Metallogenic deposit

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

**Sub type 1:** Au-Co-Cu

**Comments:** The auriferous fluids were transported along deep, rift-tectonic faults up to the greenschist-metamorphic environment, concentrated on the antiform; the metals precipitated in structurally controlled sites close to impermeable dolerites and metavolcanic units or, rather, in the more competent sericite quartzite units between the more plastic mafic units or, rather, in the more competent sericite quartzite units between the more plastic mafic units.

**References:** 2, 4, 5, 6, 7, 8, 11

## Dimension

**Expression:** exposed

**Area (ha):** NA

**Form:** discordant

**Dip azim:** NA

**Shape:** NA

**Dip:** NA

**Length (m):** NA

**Plunge azim:** NA

**Width (m):** NA

**Plunge dip:** NA

**Thickness (m):** NA

**Orientation method:** NA

**Depth (m):** NA

**Dimension comments:** Dimesions not reported

## Holder history

**Current holder:** Latitude 66 Cobalt Oy

**Years:** 2020-2027

**Holding type:** Exploration permit

**Previous holders:**

Company	Years	Holding type	Comments
Latitude 66 Cobalt Oy	2019	Application for exploration permit	NA
Polar Mining Oy	2003	NA	NA
Outokumpu Oy	1992-2003	NA	NA

## EXPLORATION ACTIVITY

### Outokumpu Oy

Years	Activity type	Geologist	Exploration result	Ref
1992-1992	excavation	Jyrki Korteniemi	mineral occurrences	
	<i>MSc thesis</i>			
1992-1992	detailed geology	Jyrki Korteniemi	key geological features	
	<i>MSc thesis</i>			

### Geological Survey of Finland

Years	Activity type	Geologist	Exploration result	Ref
1988-1988	regional geochemistry	NA	geochemical anomaly	
	<i>Country-wide till-geochemical survey</i>			
1986-1991	detailed geophysics	Erkki Vanhanen	geophysical anomaly	2, 10
	<i>Ground IP, VLF-R, slingram, radiometric and magnetic survey. Response on IP and radiometric methods.</i>			
1986-1991	detailed geology	Erkki Vanhanen	key geological features	1, 2, 4, 5, 6, 7, 10
1986-1991	excavation	Erkki Vanhanen	mineral occurrences	1, 2, 4, 5, 6, 7, 10
1984-1984	regional geophysics	Erkki Vanhanen	key geological features	1, 2, 4, 5, 6, 7, 10
	<i>Low-altitude airborne magnetic, electromagnetic and radiometric survey</i>			

## GEOLOGY

**Host rock:** Sericite quartzite, Mafic volcanic rock, Mafic tuff

### Sericite quartzite (Host rock)

**Rock type:** Host rock

**Proportion:** major

**Grain size:** NA

**Color:** NA

**References:** 2, 4, 5, 6, 7, 9, 10, 11

#### Ore minerals:

Mineral	Proportion	Mineral texture
Gold	minor	
<i>Grain size of native gold is up to 1 mm.</i>		
Pyrite	major	
Pyrrhotite	major	

#### Other minerals:

Mineral	Proportion	Mineral texture
Actinolite	present	Alteration product
Albite	present	Alteration product
Biotite	present	Alteration product
Chlorite	present	Alteration product
Chloritoid	present	Alteration product
K-Feldspar	present	Alteration product
Magnetite	present	Alteration product
Quartz	present	Alteration product
Sericite	present	Alteration product
Talc	present	Alteration product
Tremolite	present	Alteration product

Alteration:	Distribution:	Degree:	Relation to mineralization:
silicification	NA	NA	Post
albitic alteration	Pervasive	Strong	Pre
<i>Comments: Locally intense albitization of clastic sediments and spilitisation of volcanic units when the 2.206 Ga mafic sills and dykes heated the evaporite-bearing sequence and put hot brines into circulation.</i>			
biotite alteration	Disseminated	NA	Syn
<i>Comments: Mg-Fe metasomatism which is closely related to gold mineralisation and indicated by formation of chlorite, tremolite-actinolite, magnetite, chloritoid, talc and Fe sulphides.</i>			
sulphidation	NA	NA	Syn
carbonate alteration	Disseminated	NA	Syn
sericitic alteration	Disseminated	NA	Syn
chloritic alteration	Disseminated	NA	Syn

#### Metamorphic description:

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

*Comments: Peak regional metamorphism at lower-amphibolite facies: staurolite porphyroblasts in Al-rich rocks, during D1?. This was followed by retrograde greenschist-facies metamorphism: sericitisation of staurolite, during D2?, related to NW-trending shear zones and gold mineralisation?; Quartz-albite-sericite-biotite ± chlorite, staurolite.*

### Geological age:

Geological era:	Max age - Minage (Ma):	Inferred age (Ma):	Age of mineralization:
Paleoproterozoic (2500-1600 Ma)	1800-2050		Y
<i>Comments: Mineralisation between 2.05-1.8 Ga</i>			
Paleoproterozoic (2500-1600 Ma)	1600-2500		N

## Mafic volcanic rock (Host rock)

**Rock type:** Host rock

**Proportion:** minor

**Grain size:** NA

**Color:** NA

**References:** 2, 4, 5, 6, 7, 9, 11

**Comments:** Dominated by mafic metavolcanic and intermediate metasedimentary rocks both subhorizontal in their present position and cross cut by minor dolerites.

### Metamorphic description:

Type:	Facies:	Degree:	Relation to mineralization:	Min P- Max P (kbar)	Min T- Max T (°C)
Regional	amphibolite metamorphic facies	medium metamorphic grade	Syn		
<i>Comments: Peak regional metamorphism at lower-amphibolite facies: staurolite porphyroblasts in Al-rich rocks, during D1?. This was followed by retrograde greenschist-facies metamorphism: sericitisation of staurolite, during D2?, related to NW-trending shear zones and gold mineralisation?</i>					

### Geological age:

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

## Mafic tuff (Host rock)

**Rock type:** Host rock

**Proportion:** minor

**Grain size:** NA

**Color:** NA

**References:** 1, 2, 4, 5, 6, 7, 9, 11

### Metamorphic description:

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

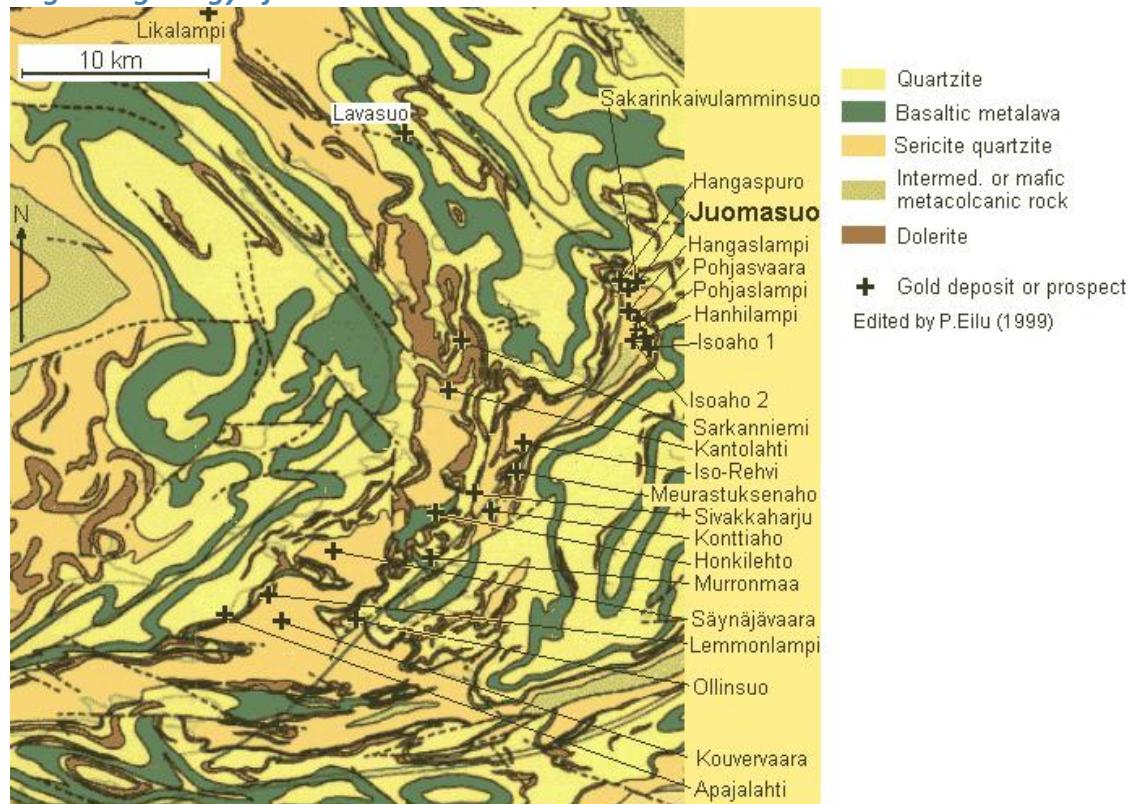
*Comments: Peak regional metamorphism at lower-amphibolite facies: staurolite porphyroblasts in Al-rich rocks, during D1?. This was followed by retrograde greenschist-facies metamorphism: sericitisation of staurolite, during D2?, related to NW-trending shear zones and gold mineralisation?*

### Geological age:

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

### Figures

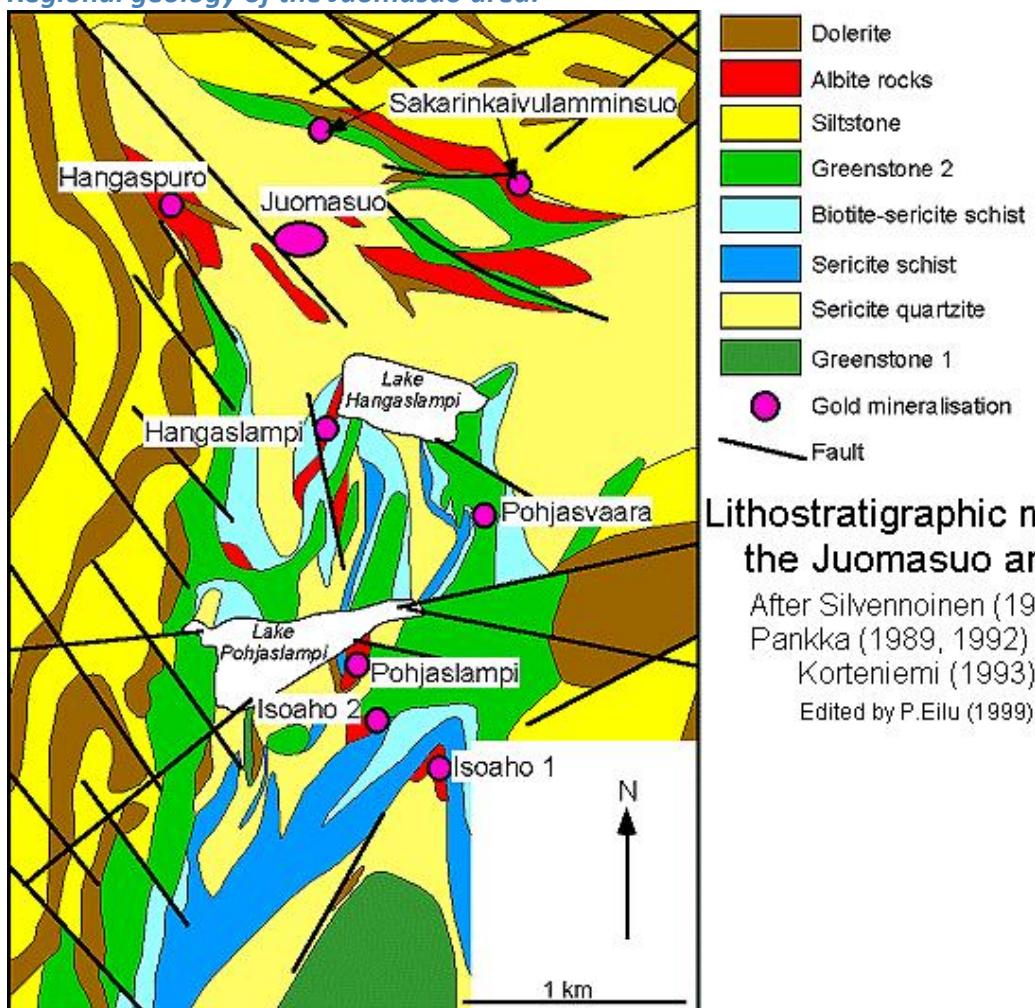
#### Regional geology of the Kuusamo area:



Quartzite  
Basaltic metavolva  
Sericite quartzite  
Intermed. or mafic metacolcanic rock  
Dolerite  
+ Gold deposit or prospect  
Edited by P.Eilu (1999)

Deposits and prospects in the Kuusamo Schist Belt. Geology from Silvennoinen (1992). Solid and dashed, curved lines indicate boundaries between lithological units, faults and shear zones

*Regional geology of the Juomasuo area:*

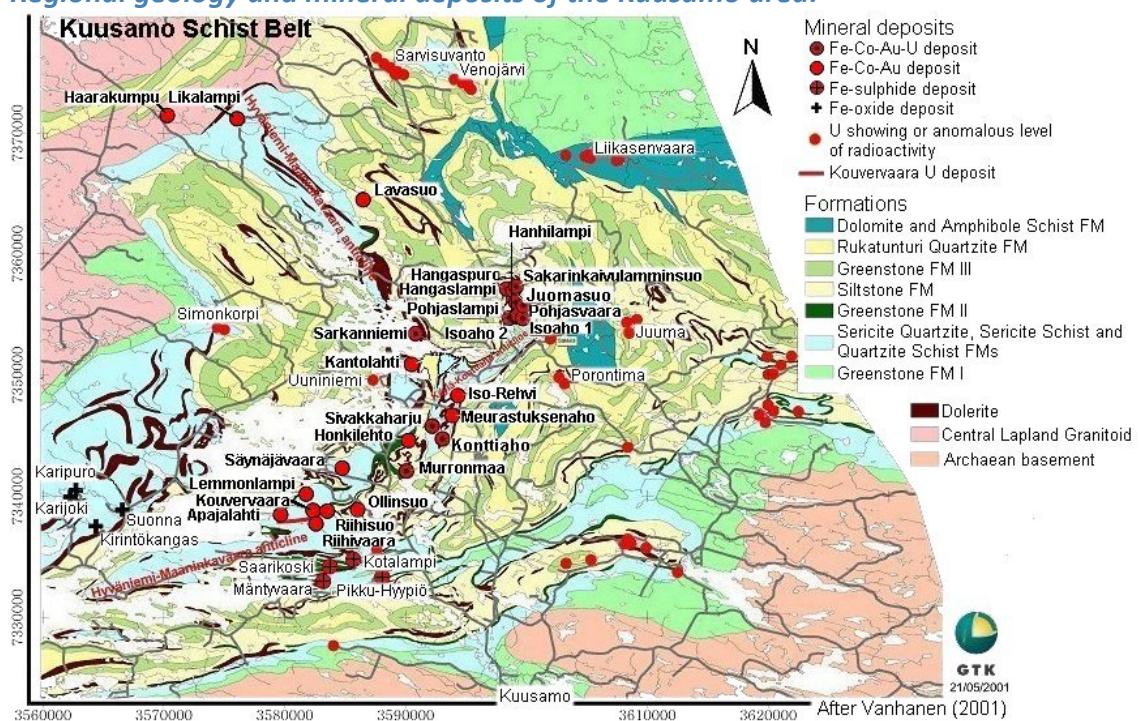


Lithostratigraphic map of the Juomasuo area.

After Silvennoinen (1972),  
Pankka (1989, 1992) and  
Korteniemi (1993).

Edited by P. Eilu (1999)

### Regional geology and mineral deposits of the Kuusamo area:



## REFERENCES

1. Arkimaa, H. 1997. The fingerprints of known gold occurrences in the Kuusamo schist belt as shown by airborne gamma-ray spectrometric data. Geological Survey of Finland. Special Paper 23, 25-28.  
[http://tupa GTK.fi/julkaisu/specialpaper/sp\\_023\\_pages\\_025\\_028.pdf](http://tupa GTK.fi/julkaisu/specialpaper/sp_023_pages_025_028.pdf)
2. Korteniemi, J. 1993. Kultaesiintymien ympäristön hydroterminen muuttuminen Käylän alueella Kuusamossa. Unpublished MSc thesis. Department of Geology, University of Turku. 90 p. (in Finnish)
3. Pankka, H. & Vanhanen, E. 2001. Personal communication 04/06/2001.
4. Pankka, H. 1992. Geology and mineralogy of Au-Co-U deposits in the Proterozoic Kuusamo volcanosedimentary belt, northeastern Finland. A dissertation. Geology. Michigan Technological University. 233 p.
5. Pankka, H. 1997. Epigenetic Au-Co-U deposits in an early Proterozoic continental rift of the northern Fennoscandian Shield: a new class of ore deposit? In: H. Papunen (ed.) Research and Exploration - Where Do They Meet? Proceedings of the Fourth Biennial SGA Meeting, Turku, Finland, 11-13 August 1997. 277-280.
6. Pankka, H. S. & Vanhanen, E. J. 1992. Early Proterozoic Au-Co-U mineralization in the Kuusamo district, northeastern Finland. Precambrian Research 58, 387-400.
7. Pankka, H., Puustinen, K. & Vanhanen, E. 1991. Kuusamon liuskealueen kulta-koboltti-uraaniesiintymät. Summary: Au-Co-U deposits in the Kuusamo volcano-sedimentary belt, Finland. Geological Survey of Finland, Report of Investigation 101. 53 p  
[http://tupa GTK.fi/julkaisu/tutkimusraportti/tr\\_101.pdf](http://tupa GTK.fi/julkaisu/tutkimusraportti/tr_101.pdf)
8. Sorjonen-Ward, P. 1992. Kultamalmien rakenngeologian. Geological Survey of Finland, Report M10.2/- 92/1. 45 p. (in Finnish)[http://tupa GTK.fi/raportti/arkisto/m10\\_2\\_92\\_1\\_sorjonen\\_ward.pdf](http://tupa GTK.fi/raportti/arkisto/m10_2_92_1_sorjonen_ward.pdf)
9. Vanhanen, E. 1991. Cobalt-, gold- and uranium-bearing mineralizations and their relation to deep fractures in the Kuusamo area. Geological Survey of Finland, Special Paper 13, 91-97.  
[http://tupa GTK.fi/julkaisu/specialpaper/sp\\_013\\_pages\\_091\\_097.pdf](http://tupa GTK.fi/julkaisu/specialpaper/sp_013_pages_091_097.pdf)
10. Vanhanen, E. 1992. Kuusamon Juomasuon kulta-kobolttiesiintymien lähiympäristön kultamalmitutkimukset vuosina 1986-1991. Geological Survey of Finland, Report M19/4613/- 92/1/10. 51 p. (in Finnish)[http://tupa GTK.fi/raportti/arkisto/m19\\_4613\\_92\\_1\\_10.pdf](http://tupa GTK.fi/raportti/arkisto/m19_4613_92_1_10.pdf)
11. Vanhanen, E. 2001. Geology, mineralogy and geochemistry of the Fe-Co-Au-(U) deposits in the Paleoproterozoic Kuusamo Schist Belt, northeastern Finland. Geological Survey of Finland, Bulletin 399. 229 p.[http://tupa GTK.fi/julkaisu/bulletin/bt\\_399.pdf](http://tupa GTK.fi/julkaisu/bulletin/bt_399.pdf)