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Pasi Eilu

FINGOLD: BRIEF DESCRIPTIONS OF ALL DRILLING-INDICATED GOLD OCCURRENCES IN FINLAND – THE 2007 DATA

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This report comprises brief summary descriptions of all the gold occurrences that presently are in the FINGOLD data base. This is an update of the information in the FINGOLD which is a public-domain geoscience data base containing all drilling-indicated gold occurrences in Finland, all described in a uniform format. The data base is aimed to be used in both mineral exploration and academic research. The data base is in ACCESS® format and all its contents are also available through the Internet pages of Geological Survey of Finland. Since its first release in March 1999, the volume of information in FINGOLD is roughly tripled. There now are data on more than 200 occurrences. For any occurrence, there may be information in up to 187 data fields in the data base. In addition, more than 1,200 images, 60 tables on mineral and whole-rock analytical data, and 360 primary reports and other complete publications have been linked to the data base.

Key words: (GeoRef Thesaurus, AGI): economic geology, gold ores, data bases, FINGOLD, greenstone belts, schist belts, Precambrian, Proterozoic, Paleoproterozoic, Archean, Finland

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Tämän raportin pääsisällön muodostavat FINGOLD-tietokannassa olevien kultaesiintymien tiivistelmäkuvaukset. Raportti on lyhyt tekstimuotoinen päivitys tietokannan sisällöstä. FINGOLD on englanninkielinen geologian alan tietokanta, joka sisältää yhtenäisessä muodossa kaiken julkisen tiedon kaikista kairauksin osoitetuista kultaesiintymistä Suomessa; sen on tarkoitus olla sekä kultamalmien etsintää että tutkimusta tukeva, mahdollisimman kattava metatietokanta. Tietokantana FINGOLD on saatavilla ACCESS® -muodossa, ja sen koko sisältö on esitetty myös GTK:n englanninkielisillä Internetsivuilla. Tietokannan koko on nyt noin kolminkertainen verrattuna maaliskuuhun 1999, jolloin se julkaistiin ensimmäisen kerran. FINGOLD:issa on nyt yli 200 kultaesiintymää, ja kustakin kohteesta voi olla tietoa 187 eri tietokannan kentässä. Lisäksi kantaan on linkitetty yli 1200 kuvaa, yli 60 kemiallista kokokivi- ja mineraalianalyysitaulukkoa, sekä yli 360 alkuperäistä tutkimusraporttia ja muuta julkaisua.

Julkaisu on englanninkielinen.

Asiasanat: (Fingeo-sanasto, GTK): taloudellinen geologia, kultamalmit, tietokannat, FINGOLD, vihreäkivivyöhykkeet, liuskevyöhykkeet, prekambri, proterotsooinen, paleoproterotsooinen, arkeeinen, Suomi

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INTRODUCTION

Collection of data for the FINGOLD data base started 10 years ago, in mid-1997, and the data base was first released in March 1999 (Eilu 1999). Originally, the FINGOLD was created by a joint project between the Department of Geology, University of Turku (UTU), and the Geological Survey of Finland (GTK). The project was partially funded by the Finnish Ministry of Trade and Industry. Since 2001, the data base has entirely been taken care of by GTK.

The purpose to set up the FINGOLD was to provide in a compact and uniform style, for the first time, all public information on all drilling-indicated gold deposits and occurrences in Finland (Eilu 1999). The style of presentation of the data, and the ways to publicise it, were proven successful and resulted in very positive feedback from both the mining and exploration industry and from the academia. Since 1999, FINGOLD has been updated tens of times every year, with new data coming from the previously known occurrences and from reports of new discoveries. All the updates have been immediately available for the public both in the Internet and in the ACCESS-format data base. In addition, a review of metallogeny of gold in Finland, essentially based on the information collected into the FINGOLD, was released in 2003 (Eilu et al. 2003), and an updated review on gold mineralisation styles in northern Finland was published more recently (Ojala 2007). Also, significant new research data on key deposits have been published since 1999, for example, by Hölttä and Karhu (2001), Vanhanen (2001), Holma et al. (2003), and Niiranen et al. (2007).

Despite the easy availability of the updates to the FINGOLD, the metallogenic reviews and other publications, it was seen important to produce this report summarising the present information in the data base. The reasons behind the decision include:

1. Many data users still find it difficult to formally refer to the Internet pages of the FINGOLD. This is especially complicated when referring to data sources in papers in certain scientific journals and has, for example, resulted in to referring to Eilu (1999) even when the actual data referred to is more recent. In such cases, one can now refer to this update report.
2. There has often been queries of summarising various aspects of data in the FINGOLD. For each occurrence, this was recently done in an uniform style, and then realised that such brief deposit summaries could nicely form the core of an update report of what there now is in the data base and from which a reader can draw ones' own review of gold in Finland.
3. With addition of new discoveries, new data fields and new primary data sources, the size of the data base has more than tripled since 1999. This reflects the intensity of the recent exploration in gold in Finland: there has never been so many exploration companies active in the country.
4. The 200th occurrence was included into the FINGOLD in March 2007. Passing such a milestone was thought to be the right time to release this summary report. The number of occurrences in the data base is 50 % higher than at its first release in 1999. Table 1 reflects the change from 1999 to 2007.

Despite the vast amount of data added into the data base since 1999, the purpose of the data base and the criteria for any piece of information or an occurrence to be included into the FINGOLD have not been changed. The data base forms an integral part of the geological data bases available to the public from the GTK and is aimed to be particularly useful for mining and exploration companies and geoscientists. To be included into the FINGOLD, gold must be the sole or

Table 1. *Selected key figures of the FINGOLD data base, comparison between March 1999 (first publication) and March 2007.*

	1999	2007
No. of occurrences	131	200*
No. of data fields available for an occurrence	85	187
No. of primary sources of data	380	795
No. of references with an Internet link to the full primary report**	0	355
No. of hyperlinked images	126	1200
No. hyperlinked ore composition tables	0	51
Pre-mining resource, total Finland, *in situ* tonnes of gold	105	300

** In this report, there is a description on more than 200 occurrences, as the report was accomplished in late 2007.*

***A full report, in pdf or other format, available through the Internet, linked to deposit description in the FINGOLD*

the most significant commodity in an occurrence, and there must be at least one drill hole with a grade of 1 g/t Au over 1 m or 0.5 g/t Au over 5 m. To extend the metallogenic coverage to areas with very few gold-dominated occurrences, exceptions to the rule above were done for certain localities, especially the iron oxide-copper-gold deposits of the Kolari area, NW Finland, and for Co-rich deposits in Kuusamo schist belt. For any information to be included, the data must be public, although not necessarily formally publicised.

Below, all occurrences now (October 2007; Fig 1. and App.) in the FINGOLD are briefly described. The order of the presentation is according to geological district, first the Archaean, then the Palaeoproterozoic (Karelian and Svecofennian) belts. The belts are in a geographic order within each main section: the Archaean and Karelian belts from south to north and the Svecofennian from north to south. Within each greenstone or schist belt, the occurrences are in alphabetic order. Table 2 presents how these belts and other geological areas mentioned in the FINGOLD are located in the recently defined metallogenic belts (Saltikoff et al. 2002, 2006) and which domains they form parts of in the geological regions of Finland as defined by Nironen et al. (2002) and Vaasjoki et al. (2005).

*Table 2. Greenstone and schist belts and other geological districts in FINGOLD vs. metallogenic belts in the Metallogenic map of Finland (Saltikoff et al. 2006) and geological regions of Finland as defined by Nironen et al. **(2002) and Vaasjoki et al. (2005).***

Belt or area in FINGOLD	*Metallogenic zone by Saltikoff et al. (2002, 2006)*	*Geological region by Nironen et al. (2002), Vaasjoki et al. (2005)*
Ilomantsi greenstone belt	Hattu	Ilomantsi belt
Kuhmo greenstone belt	Moukkori−Lokkiluoto	Kuhmo belt
Suomussalmi greenstone belt	Moukkori−Lokkiluoto	Kuhmo belt
Oijärvi greenstone belt	Oijärvi	Pudasjärvi complex
Savukoski greenstones	None	Eastern Lapland complex
Enontekiö greenstones	None	Enontekiö area
Peräpohja schist belt	Tervola	Peräpohja belt
Kuusamo schist belt	Kuusamo Au	Kuusamo belt
Central Lapland greenstone belt	Kittilä	Central Lapland area
Kolari region	Rautuvaara + SW corner of Kittilä	SE margin of Enontekiö area + SW part of Central Lapland area
Kiiminki schist belt	None	Kiiminki belt
Raahe–Haapajärvi area	Laivakangas	Savo belt
Southern Ostrobothnia	Seinäjoki	Pohjanmaa belt
Central Finland granitoid complex	None	Central Finland granitoid complex
Southern Savo	Rantasalmi	Saimaa area
Tampere schist belt	Haveri-Orivesi	Tampere belt
Vammala migmatite zone	Pirkkala-Valkeakoski	Pirkanmaa belt
Häme volcanic belt	none	Häme belt
Uusimaa belt	Orijärvi	Uusimaa belt

ARCHAEAN GREENSTONE BELTS

In the Archaean domain of Finland, orogenic gold has been recognized in all greenstone belts. The largest number and the best known examples are from the Ilomantsi greenstone belt in eastern Finland. The existence of gold deposits at Ilomantsi and in the Kuhmo and Suomussalmi greenstone belts has been known since the 1980s (e.g., Nurmi & Sorjonen-Ward 1993, Luukkonen 1993), whereas the first signs of gold mineralisation in the Oijärvi greenstone belt, in the westernmost part of the Finnish Archaean, were only discovered in 1996 (Tolppi 1999).

Nearly all occurrences in the Finnish Archaean are typical for the orogenic gold category (*sensu* Groves 1993): structurally controlled, gold-only, low-sulphur deposits hosted by the locally most competent lithological units, enriched in As, Au, Bi, CO_2, K, S, Te, and W, and characterised by carbonatisation, sericitisation and biotitisation. Mineralisation most probably took place during the D3 to D4 stages of the Archaean orogenesis at ca. 2.70−2.65 Ga (Luukkonen 2001).

Kylmäkangas, in the Oijärvi greenstone belt, forms an exception to the common style: it is a Ag-Au-Cu-Pb-Zn occurrence hosted by intensely silicified felsic metavolcanic rocks unrelated to quartz veining (Juopperi et al. 2001). The style of alteration, host rock type, siting of gold, and the metal association suggest that Kylmäkangas might be metamorphosed epithermal, not an orogenic, occurrence. Also the Ruossakero occurrence, at Enontekiö, northwesternmost Finland, may form an exception to the common style, as it seems to be enriched in both gold and copper, but very little is known about it because the exploration efforts in the area have, so far, been concentrated on nickel.

Ilomantsi greenstone belt

ELINSUO is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted by a felsic porphyry and located in the NE-trending Korvilansuo shear zone. Native gold is disseminated in the host rock and quartz±tourmaline veins, and is intergrown with tellurides and pyrite.

ISO-KIVIJÄRVI is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted by sericite schist in the N-S trending Rosvohotu shear zone, north of the small Hosko deposit.

KELOKORPI is an Archaean orogenic gold occurrence with no resource estimate available. It comprises a set of subvertical lodes defined by sulphide-gold disseminations and auriferous quartz±tourmaline veinlets in intermediate volcanogenic metasedimentary rock and in tonalite. The occurrence is in the Kelokorpi shear zone. Native gold is disseminated in the host rock associated with pyrrhotite and pyrite, and in the quartz veins associated with molybdenite, tourmaline, arsenopyrite, tellurides and pyrrhotite.

KIVISUO is an Archaean orogenic gold occurrence with no resource estimate available. It comprises subvertical lodes formed by disseminations and auriferous tourmaline-quartz veins in intermediate volcanogenic metasedimentary rock, close to the NE-trending Korvilansuo shear zone. Native gold is disseminated in the host rock and quartz veins with tellurides, arsenopyrite and pyrrhotite in silicate matrix.

KORPILAMPI is an Archaean orogenic gold deposit with no resource estimate available. It is hosted by intermediate volcanogenic metasedimentary rock, and comprises a set of gently-dipping lenses located at the contact with pegmatite dykes in a minor ductile shear zone in the Pampalo shear zone system. Native gold, disseminated in the host rock, is intergrown with bismuth, galena and bismuthinite, locally as inclusions in garnet.

KORVILANSUO is an Archaean orogenic gold occurrence with no resource estimate available. It comprises subvertical lodes formed by disseminations and auriferous tourmaline-quartz veins in intermediate volcanogenic metasedimentary rock, close to the NE-trending Korvilansuo shear zone. Native gold is disseminated in the host rock and quartz veins as inclusions in biotite, pyrrhotite, pyrite and arsenopyrite, free between silicate grains, and intergrown with bismuth, tellurides and rutile.

KUITTILA has an *in situ* resource estimate of 700 kg gold. There is no JORC-compliant resource calculation is available (cf. Australasian Joint Ore Reserves Committee 2004). It is an Archaean orogenic gold deposit of one subvertical lode comprising a set of laminated quartz±tourmaline±carbonate veins and sulphides and gold disseminations in a tonalite, close to the NE-trending Kelokorpi shear zone. The auriferous veins postdate sets of molybdenite-bearing and barren quartz veins. Chiefly native gold occurs as inclusions and intergrowths with pyrite in association with tellurides.

KUIVISTO has an *in situ* resource estimate of 400 kg gold (unclear if this is a JORC-compliant resource). It is an Archaean orogenic gold deposit comprising two lodes defined by feldspar- and tour-

maline-bearing quartz vein networks in intermediate metatuffite, close to the NNW-trending Pampalo shear zone.

MUURINSUO has an *in situ* resource estimate of 1330 kg gold (a JORC-compliant resource). It is an Archaean orogenic gold deposit comprising a set of subvertical disseminated lodes in intermediate volcanogenic metasedimentary rock, close to the NE-trending Korvilansuo shear zone. Chiefly native gold, disseminated in the host rock, intergrown with pyrrhotite, pyrite, arsenopyrite, gersdorffite and tellurides.

PALOSUO is a Archaean gold occurrence with no resource estimate available, to the SSE of the Rämepuro deposit. It is hosted by intermediate tuffite, immediately to the east of the N-trending Tsurkkila shear zone. Native gold is disseminated in the host rock. There is no information on siting of gold.

PAMPALO is a partially mined deposit now (October 2007) under feasibility study by Endomines Oy. The current *in situ* resource estimate is 6300 kg gold. Pampalo is an Archaean orogenic gold deposit comprising three NE-plunging ore lenses in an intermediate pyroclastic unit bounded by sedimentary rocks and a komatiitic unit, all intruded by felsic porphyries. All rocks have been metamorphosed to the greenschist-amphibolite transition or to lower-amphibolite facies. The ore lenses are in highly sheared, boudinaged zones rich in biotite within the host unit. The deposit is strongly rock-hosted, despite the anomalously high strain in the ore zone, and is sited regionally near the triple point junction of three granitoid bodies. Gold is predominantly (90%) in its native form.

PAMPALO NW is an Archaean orogenic gold occurrence with no resource estimate available. It comprises quartz veins in apparently subsidiary shear zones of the Pampalo shear zone, northwest from the Pampalo gold deposit and test mine. Gold is in quartz veins and their immediate wallrocks.

RÄMEPURO has an *in situ* resource estimate of 1250 kg gold (no JORC-compliant resource calculation is available). It is an Archaean orogenic gold deposit comprising one subvertical, quartz- and tourmaline-rich lode in a tonalitic porphyry dyke, close to the N-S trending Tsurkkila shear zone. Chiefly free native gold.

SIVAKKO is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted by felsic to intermediate porphyries in subsidiary shear zones of the Pampalo shear zone, northwest from the Pampalo gold deposit and test mine.

VALKEASUO (HOSKO) has an *in situ* resource estimate of 2750 kg gold (a JORC-compliant resource). It is an Archaean orogenic gold deposit comprising a set of pipe-like subvertical lenses in a mineralised domain at least 1.5 km long. The deposit is hosted by intermediate volcanogenic metasedimentary rock and located close to the N-S trending Rosvohotu shear zone. Native free gold is associated with quartz, tourmaline and K feldspar.

VIINIVAARA is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted by intermediate volcanogenic metasedimentary rock, and is located close to the NE-trending Korvilansuo and N-trending Tsurkkila shear zones. Native gold is disseminated in the host rock.

Kuhmo greenstone belt

AITTORANTA is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted by mafic volcanic rocks, defined by tourmaline-quartz veins and altered host rock, and located in the eastern margin of the main, N-trending shear zone ("Kuhmo shear zone") of the greenstone belt.

HETTEILÄ, in the central part of the Kuhmo greenstone belt, is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted by BIF and amphibolite near a NNW-trending shear zone.

JOUSIJÄRVI is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted by intermediate metatuffite in the eastern margin of the main, N-trending Kuhmo shear zone of the greenstone belt.

KARVOSENVAARA, in the southern part of the Kuhmo greenstone belt, is an Archaean orogenic gold occurrence with no resource estimate available. It comprises auriferous quartz and quartz-carbonate veins in mafic volcanic rock. The controlling structure may be a NW-trending subsidiary zone of the main Kuhmo shear zone of the greenstone belt.

LOKKILUOTO is an Archaean orogenic gold occurrence in an islet in a lake, with no resource estimate available. It is formed by a single lode in mafic metatuffite close to the main, NW-trending, shear zone of the greenstone belt. Native gold occurs as inclusions and in margins of arsenopyrite and chalcopyrite grains.

LOUHINIEMI is an Archaean orogenic gold occurrence with no resource estimate available. It comprises several narrow lodes in mylonitic, N-trending, late-D3 or D4 structures near the main, N-trending Kuhmo shear zone of the greenstone belt. The occurrence is hosted by mafic volcanic rocks.

MUJESUO is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted

by mafic or ultramafic volcanic rocks, defined by quartz veins and altered host rock, and controlled by the main N-trending Kuhmo shear zone of the greenstone belt.

NAURISPURO is an Archaean orogenic gold occurrence with no resource estimate available. It comprises a set of N-trending subvertical lodes which may be subsidiary to the main shear zone of the Kuhmo greenstone belt. The occurrence is hosted by a major Mg-tholeiitic unit of the greenstone belt.

PALOVAARA is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted by banded iron formation, and comprises quartz veins and altered host rock. The location of the occurrence seems to be defined by an intersection of NW-trending D3 or D4 fault crossing the main, N-trending Kuhmo shear zone of the greenstone belt.

PIILOLA, in the central part of the Kuhmo greenstone belt, is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted by mica schist within the main, N-S trending, shear zone of the greenstone belt.

PUTAALA, in the southern part of the Kuhmo greenstone belt, is an Archaean orogenic gold occurrence with no resource estimate available. It is characterised by auriferous quartz veins in chlorite schist (mafic or ultramafic volcanic rock). The controlling structure is the main shear zone of the greenstone belt or a NW-trending branch of the main shear.

RONINLAMPI, in the southern part of the Kuhmo greenstone belt, is an Archaean orogenic gold occurrence with no resource estimate available. It comprises auriferous quartz and quartz-carbonate veins in mafic volcanic rock. The controlling structure may be a NW-trending branch of the main shear zone of the greenstone belt.

SEPPONEN is an Archaean orogenic gold occurrence with no resource estimate available. It is in a small greenstone fragment (amphibolite) surrounded by high-grade granite-gneiss terrain southeast of the Kuhmo greenstone belt proper. The occurrence is controlled by a local, NW-trending, dextral shear zone. Native gold is associated with arsenopyrite.

TAMMASUO is an Archaean orogenic gold occurrence with no resource estimate available. It comprises a set of NNE-trending lodes defining a mineralised zone >2 km long, and is hosted by mafic volcanic rocks. The occurrence is controlled by the N- or NNE-trending Tammasuo shear zone which may be subsidiary to the main shear zone of the Kuhmo greenstone belt. Native gold associated with arsenopyrite.

TIMOLA is an Archaean orogenic gold occurrence with no resource estimate available. It comprises several narrow lodes in mylonitic, NNW-trending, late-D3 or D4 structures near the main, N-trending shear zone of the greenstone belt. The occurrence is hosted by komatiites. Gold occurs in quartz-carbonate veins and their immediate wallrock.

Suomussalmi greenstone belt

KUIKKAPURO has an *in situ* resource estimate of 800 kg gold, with an average grade of 14.6 g/t Au (unclear if the resource calculation is JORC-compliant). It is an Archaean orogenic gold deposit in tholeiitic metabasalt in a second-order, D3 to D4, NNW-trending, lithology-parallel, ductile shear zone. Alteration mineral assemblages (biotite-calcite) indicate mineralisation under amphibolite-facies conditions. Coarse, free native gold occurs in quartz veins and their immediate, intensely biotitised host rock.

MOUKKORI is a small deposit with gold grades >10 g/t, and with an *in situ* resource estimate of 220 kg gold (unclear if the resource calculation is JORC-compliant). It is an Archaean orogenic gold deposit comprising, at least, three or four parallel, narrow lodes in mafic metavolcanic rock in a second-order D3 fault zone. It comprises chiefly native free gold disseminated in the host rock and in quartz veins. Visible gold is common.

PAHKALAMPI has an *in situ* resource estimate of 2100 kg gold (a JORC-compliant resource). It is an Archaean orogenic gold deposit comprising several subparallel, narrow lodes in mafic metavolcanic rock in a second-order D3 fault zone. The resource estimate only covers one of the lodes. Native gold is intergrown with, and as inclusions in, tellurides, pyrite, pyrrhotite, quartz, albite and K feldspar. There is fine-grained (<5 um) gold in host rock, whereas there is coarse gold in quartz veins.

PAHKOSUO has an *in situ* resource estimate of 150 kg gold (unclear if the resource calculation is JORC-compliant). It is an Archaean orogenic gold deposit in tholeiitic metabasalt, and comprises several narrow lodes in a second-order, D3 to D4, N-trending, brittle-ductile shear zone close to the contact between greenstones and TTG terrain. Native is gold associated with scheelite in quartz veins.

SEIPELÄ, in the northeastern part of the Suomussalmi greenstone belt, is an Archaean orogenic gold occurrence with no resource estimate available. It is hosted by tholeiitic metabasalt and comprises auriferous quartz veins and altered host rock. The occurrence is controlled by shear zones parallel to the greenstone belt-granitoid contact.

SYRJÄLÄ has an *in situ* resource estimate of 160 kg gold (no JORC-compliant resource calculation is available). It is an Archaean orogenic gold deposit comprising three parallel, narrow lodes in intermediate volcaniclastic rock in a NW-trending, ductile shear zone in an overturned anticline. Alteration mineral assemblages indicate mineralisation under amphibolite-facies conditions. Most of the gold is probably in native form.

Oijärvi greenstone belt

KARAHKALEHTO is an Archaean orogenic gold occurrence with no resource estimate available. It comprises quartz-calcite vein arrays in the Karahka shear zone in the central part of the greenstone belt, and is hosted by mafic volcanic rocks. Free native gold is associated with sulphides and quartz-carbonate gangue.

KOMPSA is an Archaean orogenic gold occurrence with no resource estimate available. It comprises several subparallel lodes defined by quartz-carbonate veins and altered host rock in the Karahka shear zone in the central part of the greenstone belt. It is hosted by a felsic dyke and mica schist. Free native gold occurs in quartz-carbonate veins and sericitised host rocks.

KUPSUSSELKÄ, in the southern portion of the Oijärvi greenstone belt, is an Archaean orogenic gold occurrence with no resource estimate available. It is in a 500 m wide shear zone along the eastern boundary of the greenstone belt, and is hosted by tonalite and mafic volcanic rocks.

KYLMÄKANGAS is an Archaean gold-silver-base metal occurrence with no resource estimate available. It comprises a few subparallel lodes defined by intensely silicified, dacitic to rhyolitic quartz-feldspar porphyry. Local quartz veins are barren. The style of alteration, host rock type, siting of gold, and the metal association suggest a high-sulphidation epithermal occurrence metamorphosed under upper-greenschist facies conditions. Very fine-grained native gold in quartz is associated with electrum and hessite.

Savukoski greenstones

AUERMAVAARA is an Archaean gold occurrence with no resource estimate available. It comprises a lode in garnet-pyroxene rocks (silicate-facies iron formation?). Mineral assemblages and enriched and depleted elements suggest syngenetic (epithermal?) mineralisation has been metamorphosed under prograde lower granulite- and retrograde greenschist-facies conditions. No information on structural control or siting of gold is available.

PATONENÄKKEENSELKÄ is an Archaean orogenic gold occurrence with no resource estimate available. It comprises quartz-tourmaline veins in komatiite and quartz-carbonate veins in felsic gneisses. Free native gold is sited in the quartz veins.

ROVAUKONSELKÄ is an Archaean orogenic gold occurrence with no resource estimate available. It comprises a lode in garnet-cordierite gneiss. Mineral assemblages suggest mineralisation has formed under amphibolite-facies conditions. No information on structural control or siting of gold is available.

Enontekiö greenstones

RUOSSAKERO, in northwesternmost Finland, is an Archaean orogenic(?) copper-gold occurrence with no resource estimate available. In the sequence, there is also a komatiite-hosted nickel deposit of 5.44 Mt @ 0.53 % Ni (no JORC-compliant resource is available for the Ni deposit). The Ruossakero Cu-Au occurrence comprises two lodes in a shear zone at the contact between komatiites, mica schist and granodiorite.

PALAEOPROTEROZOIC GREENSTONE AND SCHIST BELTS OF THE KARELIAN DOMAIN

At present, 78 drilling-indicated gold occurrences have been discovered in the Palaeoproterozoic greenstone belts (orogenic belts) of northern Finland. Genetic deposit types detected in the region include, at least, the orogenic, iron oxide-copper-gold (IOCG) and palaeoplacer types. The orogenic type can be further divided into the gold-only and the atypical-metal-association subtypes. The genetic type(s) for the Kuusamo deposits (Vanhanen 2001) and the Pahtavaara deposit (Korkiakoski 1992) in the Central

Lapland greenstone belt are not clear: for more detail see the Pahtavaara description and the introduction for the Kuusamo schist belt, below.

Most of the features of gold occurrences in northern Finland are similar to those detected in Palaeoproterozoic greenstone belts globally. In all epigenetic occurrences in northern Finland, structure is the regionally the most significant control for mineralisation. Locally, the two most significant controls are structure and rock type. Fluid compositions suggest variable, mixed, origins for volatiles and metals with no obvious indications of a local source. The orogenic gold-only type is characterised by carbonatisation with sericitisation or biotitisation, PT conditions at 300–450°C and 1–3 kbar, pyrite, pyrrhotite and arsenopyrite being the main ore minerals, consistent enrichment of Ag, Au, As, CO_2, K, Rb, S, Sb, and Te, and a low-salinity fluid with hydrothermal quartz showing $\delta^{18}O$ at +11 – +13 ‰ and carbonate $\delta^{13}C$ at -8 – -1 ‰ (Hölttä & Karhu 2001, Eilu et al. 2007). Orogenic gold occurrences with atypical metal association are similar to the gold-only type, except having significant chalcopyrite ± cobaltite, gersdorffite and/or uraninite contents, enrichment in Cu and, in some cases, in Co, LREE, Ni and/or U, and intense albitisation predating the gold-related alteration (e.g., Grönholm 1999, Vanhanen 2001, Holma et al. 2003, Eilu et al. 2007). The iron oxide-copper-gold (IOCG) occurrences are characterised by regional albitisation ± scapolitisation, multi-stage local alteration, formation T at 400–600°C, main ore minerals of magnetite, pyrite, pyrrhotite, chalcopyrite ± cobaltite, consistent enrichment in Ag, Au, Bi, Cu, Fe, S, and Te, and an aqueous high-salinity mineralising fluid with variable Eh, and $\delta^{18}O$ at +9.6 – +17.5 ‰ (Liipo & Laajoki 1991, Niiranen et al. 2007). The palaeoplacers are Au-only, sedimentary facies-controlled, occurrences in molasse-like sediments of the uppermost stratigraphic formation of the Central Lapland greenstone belt (Härkönen 1984, 1986).

Timing of gold mineralisation in northern Finland is not well-constrained. Most of the orogenic gold mineralisation took apparently place during the continental collision epoch of the evolution of the Fennoscandian shield, at 1.85–1.79 Ga, although some orogenic mineralisation may be related to the earlier compressional stage, the microcontinent accretion, at 1.91–1.87 Ga (Mänttäri 1995, Lahtinen et al. 2005). For the IOCG type of mineralisation, both of the extensional epochs of the Palaeoproterozoic orogenic evolution seem to be possible: the occurrences could have been formed during the continental extension at 1.88–1.85 Ga, or orogenic collapse and stabilisation at 1.80–1.77 Ga, or both. For the IOCG deposits in the Kolari area, the ca. 1.80 Ga timing appears to be the most probable (Niiranen et al. 2007). The probable time frame for the palaeoplacer mineralisation covers the 1.88–1.85 Ga epoch and the early parts (pre-D3?) of the 1.85–1.79 Ga epoch.

Peräpohja schist belt

KIVIMAA is an orogenic copper-gold deposit with an *in situ* pre-mining resource estimate of 106 kg gold and 1160 t copper (no JORC-compliant resource calculation is available). In 1969, 18,600 t of ore was mined by Outokumpu Oy, but only 37 kg gold and 223 t Cu was recovered. Kivimaa comprises a 1–6 m wide, >350 m long quartz vein and enveloping alteration halo in a E-W trending dip-slip fault in a dolerite. Gold occurs as inclusions in arsenopyrite and, possibly, as free gold. All gold appears to be in the quartz vein.

LAURILA, in the SW corner of the Peräpohja belt, is a gold occurrence with no resource estimate available. It possibly is an orogenic mineralisation with an anomalous metal association, and comprises a set or sets of quartz-ankerite veins in mafic volcanic rocks and quartzite. Free gold occurs apparently only in the quartz-ankerite veins.

PETÄJÄVAARA is an orogenic copper-gold occurrence with no resource estimate available. It comprises a set of quartz veins in a sheared, SW-trending, contact zone between dolerite and quartzite, and is chiefly hosted by the dolerite. Gold occurs only in the quartz veins.

SIVAKKAJOKI, in the Palaeoproterozoic Peräpohja schist belt, close to the Kivimaa deposit, is an orogenic gold occurrence with no resource estimate available. It comprises a set of carbonate-quartz veins and enveloping alteration halo in an E-W trending fault in dolerite. Apparently, gold is present only in the quartz veins.

VÄHÄJOKI possibly is an iron oxide-copper-gold deposit. It includes 14 magnetite ore bodies with a resource estimate totalling at 10.5 Mt, and with a variable copper, cobalt and gold content. The best gold lodes are 0.1 Mt, 0.23 Mt and 1.0 Mt in size and contain 0.5 g/t Au, 0.03–0.5 % Co, and 0.05–1 % Cu (no JORC-compliant resource calculation is available). In addition, there are at least 15 magnetite bodies which are not included into the resource estimate. The magnetite bodies form a N-S trending array possibly indicating the trend for a controlling structure (shear or fault zone). Host rocks are Fe-metasomatic products of altered mafic volcanic rocks and dolomitic

marbles. Mineral assemblages suggest mineralisation under 465°C, 2–4 kbar conditions. No intrusive rocks have been detected in the vicinity of Vähäjoki. Native gold is mostly as inclusions in cobaltite, but is locally also associated with arsenopyrite.

VINSA is an orogenic copper-gold occurrence with no resource estimate available. It comprises a 0.5–2 m wide, >250 m long quartz vein and enveloping alteration halo in a dolerite. Native gold is associated with chalcopyrite, pyrite and pyrrhotite.

Kuusamo schist belt

Models of orogenic gold with atypical metal association, iron oxide-copper-gold, and syngenetic style have been suggested for the gold-only and gold-cobalt-copper ± uranium occurrences at Kuusamo (e.g., Pankka 1992, Pankka & Vanhanen 1992, Vanhanen 2001, D.I. Groves, pers. comm. 2006). The timing seems to fit with the orogenic style of mineralization. Alteration, metal association and the mineralising fluid(s) fit best with the IOCG hypothesis. Mineralising fluid(s), metal association, and the rift−self and host rock settings are consistent with the syngenetic (metamorphosed) hypothesis. Structural control and gold fineness fit with all of the genetic styles proposed.

The supracrustal sequence is in an intracratonic failed rift setting. The general sequence of alteration at Kuusamo is reported as follows (Pankka 1992, Pankka & Vanhanen 1992, Vanhanen 2001): Albitisation is the most extensive alteration type and is, apparently, premetamorphic. Albitisation is followed by a sequence of syn- to late-metamorphic(?) alteration stages. First of them is the Mg-Fe metasomatism which is closely related to gold mineralisation and indicated by formation of chlorite, tremolite-actinolite, magnetite, chloritoid, talc and Fe sulphides. The next stage is K±S metasomatism indicated by biotite and sericite ± pyrite and additional(?) Au mineralisation and ductile deformation. This is followed by a stage of carbonation, silicification, further Au-mineralisation (or remobilisation) and brittle deformation.

APAJALAHTI has an *in situ* resource estimate of 1000 kg gold and is also enriched in copper (no JORC-compliant resource calculation is available). It is hosted by anthophyllite-garnet-quartz ± albite, cordierite rock in sericite quartzite, and is controlled by a NE-trending fault. Native gold is associated with silicates, magnetite, ilmenite and rutile.

HANGASLAMPI has an *in situ* resource estimate as of 1060 kg gold, 180 t cobalt, and is also enriched in Ag, Cu, REE, Mo and U. It is hosted by sericite schist. Hangaslampi comprises, at least, two lodes controlled by NW-trending faults crossing the NE-trending Käylä–Konttiaho anticline. Native gold occurs as inclusions in pyrite, and also as free gold associated with sulphides and silicates.

HANGASPURO is a gold-copper-cobalt-molybdenum occurrence with no resource estimate available. It is hosted by albitised and carbonatised metasedimentary rocks. It is controlled by WNW-trending faults which cross the NE-trending Käylä–Konttiaho anticline. Gold is chiefly in the altered host rocks, with less in the quartz-carbonate veins.

HANHILAMPI (Kuusamon Hanhilampi) is a gold occurrence with no resource estimate available. It includes a set of 1–3 m wide quartz veins in sericite quartzite. It is located at the intersection of WNW-trending faults and the NE end of the Käylä–Konttiaho anticline. Siting of gold and the possible enrichment of Co, Cu ± U are not known.

HONKILEHTO is a gold-copper-cobalt occurrence with no resource estimate available. It is hosted by albitised sericite quartzite, and is in the Hyväniemi–Maaninkavaara anticline. Both free gold and gold bound in sulphides are present.

ISOAHO 1 is an uranium-enriched gold occurrence with no resource estimate available. It is hosted by sericite quartzite and is controlled by WNW-trending faults which cross the NE-trending Käylä–Konttiaho anticline.

ISOAHO 2 is an uranium-enriched gold occurrence with no resource estimate available. The occurrence is hosted by sericite quartzite and is controlled by WNW-trending faults which cross the NE-trending Käylä–Konttiaho anticline.

ISO-REHVI has an *in situ* resource estimate of 160 kg gold (no JORC-compliant resource calculation is available), and contains, in 1 m drill intercepts, up to 0.1 % cobalt and 0.3 % copper. It is hosted by quartz-carbonate veins and chlorite-amphibole-albite-carbonate rocks produced by alteration from metasedimentary rocks. The deposit is in the NE-trending Käylä–Konttiaho anticline. Native gold occurs as inclusions and in fractures of silicates and carbonates.

JUOMASUO is the largest known gold deposit in the Palaeoproterozoic Kuusamo schist belt. It has been test mined, is under feasibility study by Polar Mining Oy, and presently (October 2007) has an *in situ* JORC-compliant(?) resource estimated as 3360 kg gold and 1550 t cobalt. The deposit is also enriched in Ag, Cu, Mo, Ni, REE and U. It is mainly hosted by albitised, biotitised and sulphidised sericite quartzite. Juomasuo comprises one major and a number of smaller lodes controlled by a NW-trending fault

crossing an axial culmination in the NE-trending Käylä–Konttiaho anticline. Native gold is chiefly associated with Bi and Te minerals as inclusions in pyrite, cobaltite and uraninite, between silicates, and in tiny Au-Bi-Te rich veinlets oriented parallel to foliation and enveloped by silicates.

KANTOLAHTI is a gold-copper-cobalt occurrence with no resource estimate available. It is hosted by chloritised and carbonatised metavolcanic rocks. It comprises four parallel lodes in the central bend of the Hyväniemi–Maaninkavaara anticline, near the location where the trend of the anticline changes from NE to NW.

KONTTIAHO is a gold-copper-cobalt-uranium occurrence, also enriched in LREE and Mo, with no resource estimate available. It comprises a set of pipe-like, multiply brecciated lodes in metasiltstone-evaporate(?) sequence first albitised, then Mg-Fe metasomatised, during mineralisation. The mineralised domain is in a NNE-trending shear zone which may follow the strike of the Hyväniemi–Maaninkavaara anticline. At a local scale, the hydrothermal pipes appers to be in fold hinges, in small antiforms. Native gold is in silicate grain boundaries, as inclusions in pyrite and uraninite, and associated with tellurides.

KOUVERVAARA has an *in situ* resource estimate of 1.58 Mt of ore containing 630 kg gold, 3160 t copper, and 1580 t cobalt (unclear if this is a JORC-compliant resource). It is hosted by actinolite-garnet-biotite rock in sericite quartzite, and is controlled by two parallel NNW-trending faults. Four gold lodes are reported to overprint the 900 m long, 200 m wide, Co-enriched domain and to be potential for open-pit mining. Native gold, is located between silicate, magnetite and Bi-mineral grains, or as inclusions in garnet, biotite, quartz, chalcopyrite, and pyrrhotite; gold also occurs as intergrowths with bismuth and Bi sulphides.

LAVASUO is a gold-copper-cobalt occurrence with no resource estimate available. It is hosted by albitised and carbonatised metasedimentary rocks. It is in the NW-trending part of the Hyväniemi–Maaninkavaara anticline.

LEMMONLAMPI has an *in situ* resource estimate from 1960's as of 15 kg gold, 360 t copper and 270 t cobalt (no JORC-compliant resource calculation is available). It is hosted by metadolerite, mica schist and quartzite, and is controlled by a NE-trending fault.

LIKALAMPI is a gold-copper occurrence with no resource estimate available. It is hosted by albitised and carbonatised metasedimentary rocks. It appears to be a single-lode occurrence at the northwestern end of the Hyväniemi–Maaninkavaara anticline.

MEURASTUKSENAHO has an *in situ* resource estimate of 600 kg gold, 1000 t copper and 1300 t cobalt (no JORC-compliant resource calculation is available). It is enriched in Mo and REE, and is hosted by sericite quartzite. The deposit comprises one(?) lode within the NE-trending Käylä–Konttiaho anticline. Native gold is chiefly related to the most Co-rich parts of the deposit. Gold occurs as inclusions in pyrrhotite, chalcopyrite and pyrite and along sulphide-calcite grain boundaries.

MURRONMAA is a gold-copper-cobalt occurrence with no resource estimate available. It is hosted by albitised metasedimentary rock, and is in the Hyväniemi–Maaninkavaara anticline.

OLLINSUO is a gold-copper-cobalt occurrence with no resource estimate available. It is hosted by sericite schist, and is at the intersection of a NW-trending fault and the Hyväniemi–Maaninkavaara anticline. It is formed by a NE-trending mineralised zone characterised by calcite, quartz and quartz-calcite veins. Native gold is associated with silicates.

POHJASLAMPI is a gold-copper-uranium occurrence with no resource estimate available. It is hosted by albitised and carbonatised intermediate volcanogenic metasedimentary rocks. It is located at the intersection of NW-trending faults and the NE-trending Käylä–Konttiaho anticline.

POHJASVAARA has an *in situ* resource estimate as of 300 kg gold, 250 t copper, and 80 t cobalt (unclear if this is a JORC-compliant resource). Pohjasvaara is hosted by sericite schist and comprises two lodes controlled by WNW-trending faults crossing the NE-trending Käylä–Konttiaho anticline. Mainly free native gold is chiefly associated with silicates, although some gold is associated with sulphides.

SAKARINKAIVULAMMINSUO (JUOMASUO II) is a gold-copper-cobalt occurrence with no resource estimate available. It is hosted by sericite quartzite, and comprises four lodes and is controlled by WNW-trending faults which cross the NE-trending Käylä–Konttiaho anticline.

SARKANNIEMI is an uraniferous gold occurrence with no resource estimate available. It is hosted by albitised metasedimentary rocks, and is in a N-trending shear zone in the axial plane of the Hyväniemi–Maaninkavaara anticline.

SÄYNÄJÄVAARA has an *in situ* resource estimate of 400 kg gold and 240 t cobalt (no JORC-compliant resource calculation is available). It is hosted by sericite schist. Säynäjävaara comprises two lodes in, or close to, intersection of a NW-trending fault and the Hyväniemi–Maaninkavaara Anticline. Native gold is chiefly associated with silicates.

SIVAKKAHARJU has an *in situ* resource estimate of 320 kg gold (11 g/t Au), 34 t copper and 8 t cobalt (unclear if this is a JORC-compliant resource), and is also enriched in Mo and U. It is hosted by sericite- and albite-rich schist of sedimentary origin. The deposit

comprises two lodes at the intersection of two faults within the N-trending Hyväniemi–Maaninkavaara anticline. Native gold is mainly free and associated with silicates, but also occurs with uraninite, and, locally, as inclusions in molybdenite and pyrite, and as intergrowths with tellurides.

Central Lapland greenstone belt

Sodankylä region

HIRVASSELKÄ, in the Lapland granulite complex, has no resource estimate available. It is Palaeoproterozoic, hosted by intermediate metavolcanic rock, and comprises a set of quartz-haematite-barite veins. The high-oxidation mineral assemblage and late timing suggest either a post-orogenic granitoid-related (non-skarn) or IOCG style of mineralisation. Most or all gold is in the veins.

HOOKANA is a Palaeoproterozoic orogenic, copper-enriched, gold occurrence with no resource estimate available. The occurrence is hosted by albitised dolerite.

KAARESSELKÄ has an *in situ* resource estimate of 1500 kg gold (unclear if this is a JORC-compliant resource). It is a Palaeoproterozoic orogenic gold deposit, also enriched in copper (<0.1–3.0 % Cu), and comprises several ore bodies in intermediate tuffite and metasedimentary rocks. The ore bodies are in a NW trending, 200–1000 m wide, 4 km long domain within the WNW-trending Kaaresselkä shear zone; locally, the lodes appear to be controlled by lithological contacts. Gold occurs both in quartz carbonate veins and in altered host rocks. It is predominantly free native gold, commonly associated with carbonates; minor gold occurs in the lattice of pyrite and chalcopyrite.

KAARESTUNTURI is a Palaeoproterozoic palaeoplacer gold occurrence with no resource estimate available. It is hosted by Kumpu Group conglomerate. Major ore minerals associated with gold include magnetite and haematite. Free palaeo-detrital gold occurs in the matrix of the conglomerate.

KOPPELOKANGAS is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by albitised metasedimentary rocks.

MÄKÄRÄROVA (SIIKALEHTO), in the Archaean Pomokaira basement complex area, has an *in situ* resource estimate of 170 kg gold (no JORC-compliant resource calculation is available). It's timing has not been defined, but relationships to deformation suggest that the mineralisation more probably is Palaeoproterozoic than Archaean. Structural control, style of alteration, ore mineral (abundant haematite) and gangue assemblages, and relative timing suggest either post-orogenic granitoid-related (non-skarn) or IOCG style of mineralisation. The deposit comprises mineralised veins hosted by Archaean granitoid gneiss; the veins are controlled by tensional fractures in a NW-trending major shear zone. Most of the gold is in pyritiferous haematite-carbonate-quartz pyrite veins, apparently in, or associated with, pyrite.

PAHKAVAARA, close to the southeastern margin of the Central Lapland greenstone belt, is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by graphitic mica gneiss, and comprises a set of banded lodes defined by quartz veins and altered host rock. Alteration mineral assemblages indicate mineralisation under amphibolite-facies conditions.

PAHTAVAARA is an active gold mine (in production 1996–2000, 2003–), with a total *in situ* size estimate of 15 t gold (production + resource, February 2006). It is sited in an altered komatiitic sequence at the eastern part of the Central Lapland greenstone belt. It comprises a swarm of subparallel lodes; nearly all gold is free native. It has many of the alteration characteristics of amphibolite-facies orogenic gold deposits and an obvious structural control, but has an anomalous barite-gold association and a very high fineness (>99.5 % Au) of gold. The geometry of high-grade quartz-barite lenses and amphibole rock bodies relative to biotite-rich alteration zones is also anomalous, as is the $\delta^{13}C$ of alteration carbonate minerals. Pahtavaara is best interpreted as a metamorphosed seafloor alteration system with ore lenses as either carbonate- and barite-bearing cherts or quartz-carbonate-barite veins. The gold may have been introduced later, but its grain size, textural position (nearly all is free, native, and occurs with silicates, not sulphides) and high fineness point to a pre-peak metamorphic timing which is highly anomalous for orogenic gold.

PALOKIIMASELKÄ, in the northeastern corner of the Central Lapland greenstone belt, has no resource estimate available. It is Palaeoproterozoic, hosted by hornblende gneiss, and either of post-orogenic granitoid-related (non-skarn) or IOCG style. The occurrence comprises a set of late quartz-haematite-albite-magnetite veins, and is a few hundred metres from a post-orogenic granite intrusion. Most of the gold is in the quartz veins.

RUOSSELKÄ (SAKIATIEVA), close to the northeastern margin of the Central Lapland greenstone

belt, is a Palaeoproterozoic orogenic gold deposit with no resource estimate available. It comprises a number of W-, WNW-, NNW- and NE-trending, 1–20 m wide lodes hosted by graphitic sedimentary rocks, mafic tuff and komatiite, and is defined by altered host rocks and quartz-carbonate-sulphide veins and breccias. The orientation of the lodes is defined by conjugate sets of minor shear and fault zones. Free native gold occurs with gangue and sulphides in veins and altered host rocks.

Kittilä region

AAKENUSVAARA, close to the closed Saattopora mine, is a Palaeoproterozoic orogenic gold deposit, also enriched in copper, with no resource estimate available. It is hosted by albitised metasedimentary rocks in the E-W trending Sirkka shear zone.

AHVENJÄRVI (ISOMAA) is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It comprises subparallel lodes defined by quartz-tourmaline vein networks in altered quartzite. The occurrence is 3 km from the WNW-trending Sirkka shear zone.

HAKOKODANMAA is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is 2 km to the north of the Suurikuusikko deposit, in a similar setting to the lodes at Suurikuusikko, within the subvertical, compressional, Suurikuusikko shear zone. Gold associated with arsenopyrite and pyrite.

HARRILOMMOL, next to the Saattopora mine, is a Palaeoproterozoic orogenic gold deposit, also enriched in copper, with no resource estimate available. It comprises one lode hosted by albitised intermediate tuffite and phyllite immediately to the south of the E-W trending Sirkka shear zone (SSZ). The local control probably is by a subsidiary shear zone of the SSZ, and the host is apparently is the same lithological unit which hosts the Saattopora B lode.

HIRVILAVANMAA has an *in situ* resource estimate of 320 kg gold (unclear if this is a JORC-compliant resource). It is a Palaeoproterozoic orogenic gold deposit, and comprises a quartz-carbonate vein network in metakomatiite. The occurrence is on the eastern flank of the locally NW-trending Sirkka shear zone, close to the contact zone between ultramafic rocks and graphitic phyllite. Native gold is associated with pyrite and tellurides.

KELLOLAKI is a Palaeoproterozoic orogenic gold occurrence, locally enriched in silver, with no resource estimate available. It is >1.5 km long, hosted by mafic tuff or tuffite and located in the N-trending Hanhimaa shear zone (HSZ) which is parallel, and apparently similar, to the Suurikuusikko shear zone 15 km to the east of the HSZ.

KIEKERÖNMAA is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is in albitised and carbonatised quartzite in or close to the WNW-trending Sirkka shear zone.

KITTILÄN HANHILAMPI (JOLHIKKO) is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It comprises sets of ankerite-quartz veins in intensely altered dolerite. The occurrence is in an E-W trending shear or fault zone.

KITTILÄN PALOVAARA (JERUSALEMINJÄNKÄ) is a Palaeoproterozoic orogenic gold occurrence, weakly enriched in copper, with no resource estimate available. It comprises several subparallel lodes formed by quartz±carbonate veins and intensely altered intermediate tuffite. The occurrence is controlled by a set of minor shear zones within the locally NW-trending section of the Sirkka shear zone.

KUOTKO has an *in situ* resource estimate of 2400 kg gold (probably a JORC-compliant resource). It is a Palaeoproterozoic orogenic gold deposit, and comprises several ore bodies in mafic metavolcanic rocks. The ore bodies are in the NE-trending the Kuotko shear zone, at least one at the intersection between the Kuotko and the Suurikuusikko shear zone. Chiefly (80%) free native gold is associated with iron sulphides and arsenopyrite, in both quartz-carbonate veins and in altered host rock.

KUTUVUOMA is a small open-pit mine that produced 70 kg gold in 1998–2000, and presently (May 2007) has an *in situ* resource of about 430 kg gold (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic orogenic gold deposit, locally enriched in Cu and Ni, hosted by pre-gold albitised komatiite and phyllite. The deposit comprises two subparallel shallow lodes defined by quartz-carbonate veins and intense alteration in a hinge zone of SW plunging fold. It is in the contact zone between komatiite and phyllite in an E-W or ENE-trending shear zone apparently branching from the Sirkka shear zone. Native gold is associated with pyrrhotite and pyrite.

LAMMASVUOMA is a Palaeoproterozoic orogenic gold occurrence, enriched in copper, with no resource estimate available. It comprises quartz-carbonate veins in totally albitised metasedimentary rocks. The occurrence is close to the contact zone between komatiites and metasedimentary rocks, close to a WSW-trending fault which is a branch of the Sirkka shear zone.

LOUKINEN (LEVIJÄRVI-LOUKINEN) has an *in situ* resource for one of its lodes at 57 kg gold and 513 t nickel (no JORC-compliant resource calculation is available). The deposit comprises four major lodes and is also enriched in copper and silver. It is Palaeoproterozoic in age, possibly an orogenic gold

deposit with an anomalous metal association, and is hosted by pre-gold albitised komatiite and phyllite. The style of alteration (proximal sericitisation and carbonatisation), close relationship to late stages of deformation, and structural control support the hypothesis for this deposit belonging to the class of orogenic gold mineralisation, despite the atypical metal association. The deposit lodes are defined by quartz-carbonate vein networks and intense alteration, and are at intersections between the E-W trending Sirkka shear zone and N-trending faults, at minor bends of the Sirkka shear zone. The most favoured sites for mineralisation are contact zones between the graphitic phyllite and komatiite units. Chiefly free gold, as fracture fill and inclusions, occurs with chalcopyrite and pyrrhotite, in sulpharsenides.

MANTOVAARA is a Palaeoproterozoic orogenic gold deposit with a local (pre-gold?) enrichment of base metals, and with no resource estimate available. It is hosted by mafic tuff or tuffite and located at a faulted contact between two major lithological groups of the greenstone belt, possibly in a NE-trending fault and shear zone branching to the NE from the Sirkka shear zone.

MUSTAJÄRVI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is characterised by carbonate- and tourmaline-rich quartz veins in albitised schists. The occurrence is controlled by a NE-trending shear zone possibly branching from the WNW-trending Sirkka shear zone. Native gold is present in quartz veins and their alteration haloes.

MUUSANLAMMIT is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available, significantly enriched in copper. It comprises quartz-carbonate veins and intensely altered phyllite and intermediate tuffite. The occurrence is in, or next to, the intersection between the locally E-W trending Sirkka shear zone and a NE-trending fault.

NAAKENAVAARA is a Palaeoproterozoic orogenic copper-gold deposit with no resource estimate available. It consists of several lodes comprising altered host rocks and abundant albite-carbonate-quartz veins within a zone >1 km long. The occurrence is hosted by pre-mineralisation albitised graphitic phyllite, is close to a komatiite unit, and is located a few kilometres from the Sirkka shear zone.

OUTAPÄÄ is a Palaeoproterozoic palaeoplacer gold occurrence with no resource estimate available. It is hosted by a Kumpu Group fanglomerate deposited in a fluvial fan. Major ore minerals associated with gold include magnetite and haematite. Free palaeo-detrital gold occurs in the matrix of the fanglomerate.

PAHA, in the Central Lapland greenstone belt, is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is comprises a single N-S trending lode in the Suurikuusikko shear zone. It is about 4 km to the north of the Suurikuusikko deposit, and its style of mineralisation appears very similar to that of the latter. Gold occurs associated with arsenopyrite and pyrite.

PÄIVÄNENÄ (KETTUKUUSIKKO, LÄLLEÄVUOMA) is a Palaeoproterozoic orogenic gold deposit, locally enriched in copper, with no resource estimate available. It comprises several lodes hosted by komatiite, located close to a contact between komatiite and phyllite units, and is structurally controlled by intersections of N- to NNW-trending faults and the NW-trending Sirkka shear zone. Native free gold is associated with pyrite and vein quartz.

PALOLAKI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by intermediate and felsic tuffites, and apparently controlled by NE- and NW-trending faults

PIKKU-MUSTAVAARA is a Palaeoproterozoic orogenic gold occurrence, enriched also in copper, with no resource estimate available. It comprises quartz-carbonate veins forming a set of small lodes in albitised graphitic phyllite. The occurrence is in a WSW-trending fault which converges with the Sirkka shear zone 1–2 km from Pikku-Mustavaara.

RIIKONKOSKI is a Palaeoproterozoic orogenic- or VMS-style copper-gold deposit with nearly 10 Mt @ 0.4–0.6 % copper and 0.1−12 g/t gold (no JORC-compliant resource is available). Five ore bodies have been detected; these comprise albitised and carbonated phyllite and tuffite and abundant albite-carbonate-quartz veins within an area 1.4 km long, 0.6 km wide, in an antiform. The mineralisation is in the locally most porous and brittle rock units. All gold so far detected is related to arsenopyrite.

ROVASELKÄ is a Palaeoproterozoic orogenic(?) gold occurrence, enriched also in copper, with no resource estimate available. It comprises quartz-carbonate vein sets in sulphide-rich metasedimentary rock, in the contact zone between mafic metavolcanic rocks and synorogenic (ca. 1.88 Ga) granitoid. The occurrence is close to a NW-trending shear zone.

RUOPPAPALO is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It comprises thin quartz-carbonate vein sets, and altered intermediate dykes and granodiorite, in the contact zone between the Ruoppapalo synorogenic granitoid intrusion and its country rocks. The occurrence is close to the northeast continuation of the Suurikuusikko (Kiistala) shear zone. Free native gold is associated with carbonate gangue.

SAATTOPORA was mined between 1988 and 1995 when 6279 kg gold and 5177 t copper was produced from the deposit. There is no information about the

remaining resource. It is a Palaeoproterozoic orogenic gold deposit with an anomalous metal association (Au-Cu). It is hosted by albitised intermediate tuffite and phyllite, which obviously formed the locally most competent rock units during mineralisation. The three main lodes are E-W trending and comprise swarms of N-S trending quartz-carbonate veins formed under brittle deformation. The deposit is in the major, locally E-W trending, Sirkka shear zone. Mainly free native gold occurs in quartz-carbonate veins and in their immediate wallrock, chiefly associated with quartz, carbonates and sulphides.

SIRKKA KAIVOS is a test mine that produced 3 kg gold in 1956, but has a suggested *in situ* resource of about 200 kg Au, 250 t Co, 950 t Cu and 800 t Ni (no JORC-compliant resource calculation is available). It is Palaeoproterozoic in age, possibly an orogenic gold deposit with an anomalous metal association, and is hosted by pre-gold albitised mafic lavas, tuffs and tuffites, and metasedimentary rocks. The style of alteration (proximal sericitisation and carbonatisation), close relationship to late stages of deformation, and the O- and C-isotope values from carbonate support the hypothesis that this deposit belongs to the class of orogenic gold mineralisation, despite the unusual metal association. The deposit comprises six lodes defined by quartz-carbonate veins and intense alteration, and is within the E-W trending, 200–300 m wide Sirkka shear zone. There is dominantly native gold which chiefly occurs as inclusions in gersdorffite and arsenopyrite.

SIRKKA W is a Palaeoproterozoic orogenic gold occurrence, enriched also in copper, with no resource estimate available. It comprises quartz-carbonate vein sets in intensely altered intermediate tuffite. The occurrence is within the E-W trending, 200–300 m wide Sirkka shear zone and may form a western continuation to the Sirkka Kaivos deposit.

SORETIALEHTO has an *in situ* resource estimate of 40 kg gold (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic orogenic gold deposit, and comprises a quartz-carbonate vein network in metakomatiite. The occurrence is at the intersection of the locally NW-trending Sirkka shear zone, and a NE-trending fault, in the contact zone between ultramafic rocks and graphitic phyllite. Native gold occurs as inclusions and fractures in pyrite and as free grains associated with vein quartz.

SORETIAVUOMA N is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It comprises quartz-carbonate-albite veins in metakomatiite. The occurrence is at the intersection of the locally NW-trending Sirkka shear zone and a NE-trending fault, close to the contact zone between ultramafic rocks and graphitic phyllite. Native gold is chiefly in fractures and as inclusions in pyrite.

SUKSETON is a Palaeoproterozoic orogenic gold occurrence, enriched also in copper, with no resource estimate available. It comprises quartz-carbonate veins in felsic or intermediate metapyroclastic rock. The occurrence apparently is in a minor shear zone a few kilometres from the larger, NW-trending Kuotko shear zone. Mostly free-milling gold associated with arsenopyrite or gangue.

Suurikuusikko is the largest gold deposit in northern Europe. It has a current in situ resource of 132 t gold. Agnico-Eagle started to build a mine at the site in 2006, and production is planned to start in 2008. Suurikuusikko is a Palaeoproterozoic orogenic gold deposit hosted by albitised, mafic to intermediate, volcanic rock, graphitic tuffite, and chert. It comprises a number of subvertical ore bodies in a 4-km long section of the subvertical, compressional, Suurikuusikko shear zone. This NNE-trending shear zone, which has a dextral component, is known to be gold-enriched for its entire length of >20 km, and more drilling may show ore bodies further away from the presently known lodes at Suurikuusikko. The gold is refractory: 71 % of gold in the lattice of, and as tiny inclusions in, arsenopyrite and 22 % in pyrite, in both thin veins and altered host rock.

TUONGANKUUSIKKO is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available, significantly enriched in copper, nickel and cobalt. It comprises three gold lodes defined by quartz-carbonate veins and intensely altered phyllite. These lodes are in a wider domain in base metals-enriched phyllite. The occurrence is at the intersection between the locally WNW-trending Sirkka shear zone and a NE-trending shear zone.

Kolari region (IOCG-style mineralisation)

All gold occurrences in the Kolari area are spatially, and possibly also genetically, related to the N- to NNE-trending Pajala shear zone (a.k.a. Kolari shear system). They all best fit into the iron oxide-copper-gold class of mineralisation style; although in *sensu lato*, they also fit into skarn deposit category due to their gangue assemblages.

ÄKÄSAIVO, in the western margin of the Central Lapland greenstone belt (CLGB), is a Palaeoproterozoic gold-copper-iron occurrence with no resource estimate available. The IOCG style of mineralisation is suggested by it's metal association, ore mineral association, the skarn-like alteration assemblage diopside-tremolite-carbonate, and structural control. Äkäsaivo is in the contact zone between a 1.86 Ga monzonitic intrusion and the supracrustal CLGB rocks. Visible gold is associated with magnetite in ironstone.

HANNUKAINEN, in the western margin of the

CLGB, is a deposit mined in 1978–1992 when 1.96 Mt iron, 40,000 t copper and 4300 kg gold were produced. The present (September 2007), NI43-101 compliant, *in situ* resource estimate is 15 t Au, 300,000 t Cu and 60 Mt Fe. It is a Palaeoproterozoic iron oxide-copper-gold deposit including five main ore bodies all variably enriched in Au, Ca, Cu, K, Mg, Na, Fe, and S. The ore is hosted by massive to banded diopside-hornblende- and magnetite rocks in a bend in the Pajala shear zone, in the contact zone between a 1.86 Ga monzonitic intrusion and the supracrustal CLGB rocks. Sulphides and gold postdate diopside, hornblende and magnetite, and the age dating at site suggests epigenetic Au-Cu mineralisation postdating the monzonite by about 40 million years. Native gold is closely associated with chalcopyrite, magnetite and gangue: inclusions in pyrite with chalcopyrite, in cracks of magnetite and pyrite, or as inclusions in chalcopyrite.

KUERVITIKKO, in the western margin of the CLGB, has an *in situ* resource of 1200 kg gold, 3600 t copper and 0.48 Mt iron, or 440 kg gold, 2730 t copper and 0.28 Mt iron (the latter may be a JORC-compliant resource). It is a Palaeoproterozoic iron oxide-copper-gold deposit including two Au-Cu and two Fe-Cu-Au ore bodies. Kuervitikko is hosted by diopside-hornblende- and magnetite-rich rocks in a bend in the Pajala shear zone, in the contact zone between a 1.86 Ga monzonitic intrusion and the supracrustal CLGB rocks. Sulphides and gold postdate diopside, hornblende and magnetite, and the age dating at Hannukainen, a few kilometres to the south of Kuervitikko, suggest epigenetic Au-Cu mineralisation postdating the monzonite by about. 40 Million years. Native gold, all or most of it, closely associated with chalcopyrite is present, but may also occur in fractures of magnetite and silicate grains.

LAUTTASELKÄ, in the western CLGB, is a small deposit with an *in situ* resource estimate of 300 kg gold and 1400 t copper, and also is enriched in iron, cobalt, nickel and uranium (this may be a JORC-compliant resource). The IOCG style of mineralisation is suggested by metal association, ore mineral association characterised by magnetite and copper-rich sulphides, the skarn-like alteration assemblage hornblende-dolomite, and structural control. The deposit comprises three individual lodes and separate chalcocite veining, all in a fault separating two major supracrustal formations of the greenstone belt.

RAUTUOJA, in the western margin of the CLGB, is a small deposit with an *in situ* resource estimate of 650 kg gold, 3600 t copper, and 0.7 Mt iron (no JORC-compliant resource is available). It is a Palaeoproterozoic iron oxide-copper-gold deposit hosted by a diopside-hornblende-magnetite-altered gabbro within the Pajala shear zone, in the contact zone between a 1.86 Ga monzonitic intrusion and the supracrustal CLGB rocks.

RAUTUVAARA, in the western margin of the CLGB, is a deposit mined in 1974–1988 when 5.4 Mt iron and 23,000 t copper were produced. The present *in situ* resource estimate is about 1 t Au, 26,000 t Cu, 36,500 t Mn, and 2.3 Mt Fe (no JORC-compliant resource is available). It is a Palaeoproterozoic iron oxide-copper-gold deposit including three main ore body groups (Mine, SW and Cu) all variably enriched in Ca, Cu, K, Mg, Mn, Na, Fe, and S. The ore is hosted by massive to banded diopside-hornblende, albite-antophyllite and magnetite rocks in the Pajala shear zone, in the contact zone between a 1.86 Ga monzonitic intrusion and the supracrustal CLGB rocks. Sulphides and gold postdate diopside, hornblende and magnetite, and the age dating at Hannukainen suggest epigenetic Au-Cu mineralisation postdating the monzonite by about 40 million years. Gold is associated with chalcopyrite.

PALAEOPROTEROZOIC SCHIST BELTS OF SVECOFENNIAN DOMAIN

The Svecofennian domain contains the most variable styles of gold mineralisation in Finland. At least orogenic, granitoid-related non-skarn, porphyry, epithermal and VMS-styles of mineralisation have been suggested.

Orogenic gold mineralisation has been detected in all schist belts and it is the dominant style in nearly all areas, whereas the other genetic types show much more restricted presence. Most of the orogenic gold deposits are typical gold-only occurrences. Several occurrences in Southern Ostrobothnia differ from all the others with a prominent Sb content, and some occurrences in the Raahe–Haapajärvi and Southern Savo areas have high Cu concentrations (Gaál & Isohanni 1979, Isohanni 1984, Nurmi et al. 1991, Kontoniemi 1998).

High Ag, Co, Cu or Zn contents have resulted in suggestions for orogenic gold mineralisation locally overprinting pre-metamorphic, VMS, SEDEX, porphyry or epithermal base metal mineralisation (Eilu et al. 2003, Karvinen 2003). However, classifying for example, Kopsa into porphyry Au-Cu, and Haveri into the gold-rich VMS category, without any significant epigenetic mineralisation stage, has perhaps

gained most support (Gaál & Isohanni 1979, Mäkelä 1980, Eilu et al. 2004).

Granitoid-related non-skarn Au-Cu and porphyry Au-Cu occurrences seem to be restricted to the Raahe–Haapajärvi area and the Central Finland granitoid complex (Aho 1975, Gaál & Isohanni 1979, Isohanni 1984). There, the deposits are, at least spatially, related to I-type calc-alkaline granitoid intrusions. Epithermal and gold-rich VMS deposits have been detected in the Raahe–Haapajärvi area, and Tampere, Häme and Uusimaa belts. Especially in the Uusimaa belt, the epithermal- and VMS-style occurrences seem to be closely related, and with the few data there exists, it is difficult to say into which genetic class an occurrence would go (Grönholm et al. 2005). Also there are occurrences, like Satulinmäki in the westernmost part of the Häme belt, where there are features indicating to orogenic, and other features suggesting metamorphosed epithermal style of mineralisation (Ojala 2003, Kärkkäinen et al. 2006, Saalmann 2007). Only for the Kutemajärvi (Orivesi) and Iilijärvi deposits, practically all reported features (Mäkelä 1989, Luukkonen 1994, Poutiainen & Grönholm 1996, Kojonen et al. 1999) indicate metamorphosed epithermal gold mineralisation without any significant later introduction of gold.

There are very few radiometric age data for gold mineralisation in the Svecofennian domain, and the timing must be constrained from indirect indications. The syngenetic (VMS and epithermal) gold occurrences probably were formed during the early accretional, volcanic-arc stages of the Svecofennian orogeny, at ca. 1.92−1.89 Ga. Orogenic and intrusion-related occurrences may have had formed during the main collisional and compressional stages of the region, at 1.90–1.87 Ga or 1.85–1.79 Ga, or during both times (Mänttäri 1995, Kontoniemi 1998, Lahtinen et al. 2005).

Kiiminki schist belt

HONKANEN, in the Kiiminki schist belt, is a Palaeoproterozoic orogenic(?) gold occurrence with no resource estimate available. It comprises one lode defined by quartz veins in mica schist and mafic volcanic rock. The gold mineralisation overprints a syngenetic Cu(±Zn±Pb) mineralisation. There is no information on structural control or siting of gold.

KUMPUSELKÄ, in the Kiiminki schist belt, is a Palaeoproterozoic occurrence with no resource estimate available. It comprises one lode defined by quartz vein breccia and altered host rock in axial planes of D3 folds, and is hosted by metagreywacke. An orogenic gold mineralisation overprint on a weak syngenetic Ag-Cu-Pb-Zn mineralisation is suggested. Native gold occurs in quartz veins, breccia-matrix quartz and immediate wallrock.

MIETUNOJA, in the Kiiminki schist belt, is a Palaeoproterozoic orogenic(?) gold occurrence with no resource estimate available. It comprises one lode defined by quartz veins in phyllite. The gold mineralisation overprints syngenetic Cu(±Zn±Pb) mineralisation. There is no information on structural control or siting of gold.

Raahe–Haapajärvi area

AHVEROINEN is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It comprises a set of gold-rich quartz veins in quartz diorite and is located between two of the main NW-trending shear zones of the Raahe–Ladoga suture zone.

ALA is a Palaeoproterozoic orogenic gold occurrence, locally enriched in copper, with no resource estimate available. It is hosted by a felsic porphyry, and comprises two lodes with minor quartz veins in the country rocks of the synorogenic, 1.89–1.88 Ga, Rautio batholith. One of the NW-trending main shear zones of the Raahe–Ladoga suture is 1–2 km to the east of the occurrence. Native gold occurs as inclusions and(?) in cracks of arsenopyrite.

ÄNGESLAMPI has an *in situ* resource estimate of 830 kg gold (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic orogenic gold deposit hosted by plagioclase porphyry. The deposit is close to the NW-trending Ruhaperä shear zone which is one of the main structures of the Raahe–Ladoga suture zone.

ÄNGESNEVA (KIIMALA 1) has an *in situ* resource estimate of 1900 kg gold (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic orogenic gold deposit, comprises a single lode of quartz vein stockwork and massive sulphide breccia, and is hosted by plagioclase porphyry. The deposit is close to the NW-trending Ruhaperä shear zone which is one of the main structures of the Raahe–Ladoga suture zone. Dominantly free gold is associated with Bi and Te minerals.

ANSAKANGAS is a gold-zinc ± lead occurrence with no resource estimate available. It is characterised by K feldspar-cordierite-sillimanite-quartz alteration, hosted by a mafic dyke and felsic porphyries. It is

within a 5 km long sulphidised domain dominated by VMS or submarine epithermal base-metal mineralisation. Element associations implies enrichment in Ag, Au, Cu, K, Mg, Pb, S, Si, and Zn. These features suggest that Ansakangas represents a metamorphosed gold-rich VMS or submarine epithermal occurrence.

ANTIKANPERÄ has no resource estimate available. It is a Palaeoproterozoic orogenic or granitoid-related (non-skarn) gold occurrence comprising quartz-tourmaline and arsenopyrite veins and tourmaline breccia in mica gneiss and tonalite. The deposit is close to one of the main NW-trending shear zones of the Raahe–Ladoga suture zone. Native gold occurs as inclusions in gangue and arsenopyrite with Bi-Sb-Te minerals.

ANTINOJA is a Palaeoproterozoic orogenic(?) gold-copper-silver occurrence with no resource estimate available. It comprises a set of gold-rich quartz veins in mafic metabasalt and is located between two of the main NW-trending shear zones of the Raahe–Ladoga suture zone. Native gold is present in quartz veins, chiefly as inclusions in arsenopyrite and silicates.

HIETAJÄRVI is a Palaeoproterozoic orogenic(?) gold occurrence with no resource estimate available. It is enriched in copper, characterised by auriferous quartz veins, hosted by plagioclase-hornblende porphyry and possibly controlled by a N-S trending shear zone.

HIRSIKANGAS, in the western Raahe-Haapajärvi area, is a Palaeoproterozoic orogenic gold occurrence with an *in situ* resource estimate of 3700 kg gold (no JORC-compliant resource is available). It is hosted by a felsic schist, and comprises a set of subvertical lodes along a minor NW-trending shear zone within the Raahe-Ladoga Suture. Ag-rich gold as inclusions and in cracks of silicate gangue, associated with Bi and Te minerals.

HUHTA is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by a plagioclase porphyries, and defined by auriferous shear bands and quartz veins mostly located in contact zones between subvolcanic rock units which are part of the country rock association of the synorogenic, 1.89–1.88 Ga, Rautio Batholith. 10–25 % Ag in the gold grains which occur associated with arsenopyrite and silicate gangue.

JOUHINEVA has an *in situ* resource estimate of 400 kg gold, 3600 t copper, and 800 t cobalt (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic orogenic or a porphyry deposit, or a porphyry Cu deposit overprinted by orogenic gold mineralisation. It consists of a set of subparallel lodes in meta-andesite. Native gold chiefly as inclusions in cobaltite, mostly in tourmaline- and arsenopyrite-bearing quartz veins

KANGASKYLÄ is a Palaeoproterozoic orogenic(?) copper-gold occurrence with no resource estimate available. It comprises a set of gold-rich zones within a broad zone of low-grade Cu mineralisation in mafic metabasalt in a N-S or NW-trending shear zone.

KÄPYKORPI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by tonalite, and is located between two major NW-trending shear zones of the Raahe–Ladoga suture zone.

KIIMALA (KIIMALA 2) is a Palaeoproterozoic orogenic(?) gold occurrence with no resource estimate available. It is enriched in silver (Au/Ag <1), copper and zinc, which makes it exceptional for an orogenic gold mineralised system, but quite similar to several other occurrences within a few kilometres from Kiimala. It comprises a set of stockwork quartz veins and massive sulphide breccia which are in a set of minor, *en echelon* shear zones. The occurrence is hosted by a hypabyssal gabbro and is close to the NW-trending Ruhaperä shear zone which is one of the main structures of the Raahe–Ladoga suture zone. Native, dominantly free gold is apparently associated with pyrrhotite.

KOKKOHARJU is a Palaeoproterozoic gold-copper-silver-zinc occurrence with no resource estimate available. It is possibly an orogenic gold occurrence overprinting a syngenetic Ag-Cu-Pb-Zn occurrence in intermediate to felsic metavolcanic rocks. Two lodes are located around an intersection of two fault zones, possibly in a fold hinge.

KOPSA has an *in situ* resource estimate of 14 t gold, 45,000 t copper, and 100 t silver (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic deposit with an obvious affinity to porphyry copper-gold style. The deposit comprises quartz-vein stockworks and disseminations in a calc-alkaline tonalite stock. The stock is at the intersection of two regional faults. There are mostly free grains of native gold in quartz veins and veinlets.

KURULA is a Palaeoproterozoic orogenic or a granitoid-related (non-skarn) gold-cobalt occurrence with no resource estimate available. It comprises a subvertical lode of auriferous quartz-tourmaline vein networks in an intermediate metavolcanic rock. Native gold occurs as inclusions in arsenopyrite-löllingite-cobaltite-saffrolite grains.

LAIVAKANGAS is a deposit now (October 2007) under feasibility study and test mining by Nordic Mines Ab. The current *in situ* (JORC-compliant?) resource estimate is 20 t of gold at an average grade of 2.4 g/t Au. It is a Palaeoproterozoic orogenic gold deposit comprising at least 18 individual lodes containing sets of auriferous, arsenopyrite-rich quartz

veins. The main host rock is quartz diorite. All rocks have been metamorphosed to lower- or mid-amphibolite facies. Alteration is characterised by formation of a diopside-biotite-hornblende-plagioclase-K feldspar-quartz assemblage. The deposit is between two major NW-trending shear zones of the Raahe–Ladoga suture. Native gold is present as inclusions in arsenopyrite, löllingite, quartz and other silicate gangue.

LOUETJÄRVI-KUKKO is a Palaeoproterozoic orogenic(?) gold occurrence with no resource estimate available. It is in the axial plane of a late fold, and is hosted by intermediate metatuffite. Native gold is associated with arsenopyrite in quartz veins and host rock.

OLTAVA has an *in situ* resource estimate of 22 kg gold for one lode with a grade of 30 g/t Au. For the rest of the deposit (several lodes), there is no resource estimate available. It is a Palaeoproterozoic orogenic or granitoid-related (non-skarn) gold deposit, comprises a number of lodes with variable grades, and is characterised by arsenopyrite-bearing tourmaline-quartz veins in mica gneiss and quartz diorite. The deposit is located between two major NW-trending shear zones of the Raahe–Ladoga suture zone. Native gold occurs as inclusions in arsenopyrite and löllingite and free gold with quartz. No arsenic in the lode with the resource estimate, where gold occurs as free in gangue.

PIRTTINEVA is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by a plagioclase porphyry, and characterised by NE-trending auriferous quartz veins and mylonitic shear zones. The occurrence is <500 m from the NW-trending Ruhaperä shear zone which is one of the main structures of the Raahe–Ladoga suture zone.

PÖHLÖLÄ is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is characterised by mineralised quartz veins in a tonalite intrusion. The occurrence is close to the NW-trending Ruhaperä shear zone which is one of the main structures of the Raahe–Ladoga suture zone. Free native gold is in quartz veins.

SARJANKYLÄ is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is characterised by mineralised quartz veins and thin shear bands forming two parallel lodes in plagioclase porphyry and diorite. The occurrence is 3 km from the NW-trending Ruhaperä shear zone which is one of the main structures of the Raahe–Ladoga suture zone. Native gold occurs as inclusions and in fractures of arsenopyrite and löllingite and in silicates.

SIPILÄ is a Palaeoproterozoic orogenic(?) gold-copper-cobalt occurrence with no resource estimate available. It is hosted by mafic metabasalt. Invisible (submicroscopic) gold is located in arsenopyrite disseminations and sulphide-rich veins.

TEERINEVA is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by a hypabyssal gabbro or plagioclase porphyry, and characterised by NE-trending auriferous quartz veins and shear zones. The occurrence is close to the NW-trending Ruhaperä shear zone which is one of the main structures of the Raahe–Ladoga suture zone. Native gold is present as inclusions in and in fractures of arsenopyrite, löllingite and silicates.

TIITOLA is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by a hypabyssal gabbro, and characterised by sets of NNE-trending shear bands and a few metres-wide shear zones. The deposit is close to the NW-trending Ruhaperä shear zone which is one of the main structures of the Raahe–Ladoga suture zone. Native gold is dominantly associated with arsenopyrite and a bismuth mineral.

VESIPERÄ has an *in situ* resource estimate of 730 kg gold (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic orogenic gold deposit, is characterised by mineralised quartz veins and thin shear bands, and comprises several subparallel lodes in a plagioclase porphyry. The deposit is close to the NW-trending Ruhaperä shear zone which is one of the main structures of the Raahe–Ladoga suture zone. Gold occurs, with native bismuth and electrum, as inclusions in arsenopyrite and as free grains, inclusions and in fractures of silicates.

Southern Ostrobothnia

HAASIAKANGAS is a Palaeoproterozoic orogenic(?) gold occurrence with no resource estimate available. It is located at the western contact of the Central Finland granitoid complex.

KALLIOSALO has an *in situ* resource estimate of 300 kg gold and 3300 t antimony (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic orogenic gold-antimony deposit comprising auriferous quartz vein arrays in plagioclase porphyry. The deposit is controlled by a discordant shear zone and is close to a regional NW-trending shear zone. Most of the gold is in aurostibite, and native antimony is the main Sb carrier. Significant native gold occurs as inclusions in löllingite-arsenopyrite.

KOPPELOMÄKI is a Palaeoproterozoic orogenic antimony-gold occurrence with no resource estimate available. It is hosted by plagioclase porphyry, and is in a fold hinge, close to a WSW-trending fault.

MARTTALANNIEMI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is formed by a set of tourmaline-quartz veins in felsic plagioclase porphyry. The occurrence is close to a major NW-trending shear zone. Native gold occurs both in tourmaline-quartz veins and in the enveloping, altered host rock.

SUDENKYLÄ (HAUDANKYLÄ) is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by mica gneiss, and located between two major NW-trending shear zones.

SUOLASALMENNEVA is a Palaeoproterozoic orogenic(?) gold occurrence with no resource estimate available. It is hosted by supracrustal rocks near the western contact of the Central Finland granitoid complex.

TERVASMÄKI is a Palaeoproterozoic, orogenic, antimony-rich, gold occurrence with no resource estimate available. It is hosted by plagioclase porphyry and mica schist. The occurrence is within a regional NW-trending shear zone, locally controlled by minor shears within the main shear zone.

TIMANTTIMAA has an *in situ* resource estimate of 500 kg gold (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic orogenic gold deposit comprising an auriferous quartz vein network in felsic plagioclase porphyry and tonalite. The deposit is close to a NE-trending shear zone. There is chiefly free gold in quartz veins.

TULISILMÄ is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by plagioclase porphyry, formed by a NE-trending set of mineralised lenses comprising quartz-tourmaline veins in altered host rock. The occurrence is located between two major NW-trending shear zones. Native gold is present in quartz veins.

YLIJOKI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is formed by a set of quartz veins in mica gneiss. The deposit is close to a major NW-trending shear zone.

Central Finland granitoid complex

MÄKRÄ, within the Central Finland granitoid complex area (CFGC), is a Palaeoproterozoic orogenic(?) gold occurrence with no resource estimate available. It is formed by a set of arsenopyrite-rich quartz veins hosted by intermediate metavolcanic rock or by tonalite. Native gold apparently only occurs in quartz veins and is closely associated with arsenopyrite.

PIRUNKOUKKU, in the northern part of the CFGC, is a gold-base metal occurrence with no resource estimate available. It possibly is a granitoid-related (non-skarn) occurrence or orogenic gold mineralisation overprinting granitoid-related copper mineralisation. The sulphidic quartz veins are hosted by quartz-feldspar porphyry in a E-W trending shear zone branching from one of the main NW-trending shear zones of the Raahe–Ladoga suture. Native gold and Bi-Sb-Te minerals occur together as inclusions and in cracks in sulphides (chiefly arsenopyrite and chalcopyrite) and silicates.

RITOVUORI, within the northern margin of the CFGC, is a Palaeoproterozoic orogenic or a granitoid-related (non-skarn) gold occurrence with no resource estimate available. It is formed by a set of arsenopyrite-rich tourmaline-quartz veins hosted by mafic to intermediate metavolcanic rocks. Native gold is mostly associated with arsenopyrite.

VATSA has an *in situ* resource estimate of 1700 kg gold (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic orogenic(?) gold deposit hosted by a gabbro and controlled by a shear zone at the contact between gabbro and pegmatitic granite.

Southern Savo

HAKOJÄRVI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by felsic to intermediate, volcanogenic metasedimentary rocks. The deposit is close to the transcurrent, NW-trending Kolkonjärvi shear zone.

OSIKONMÄKI is a deposit presently (May 2007) under feasibility study and test mining by Belvedere Resources Ltd. The current *in situ* JORC-compliant resource estimate is 4400 kg of gold at the average grade of 1.9 g/t Au. It is a Palaeoproterozoic orogenic gold deposit comprising several complex ore bodies in a tonalite (intrusion dated to 1887±5 Ma). The ore bodies comprise both auriferous quartz veins and mineralised host rock, and form at least a 3-km long mineralised domain in the E-W trending, south-dipping Osikonmäki shear zone. The mineralisation is related to peak deformation, but appears to have been metamorphosed at upper-amphibolite facies conditions. Chiefly native gold occurs with Bi-Se-Te minerals, as inclusions and at grain boundaries within and between arsenopyrite, quartz and plagioclase.

PIRILÄ has an *in situ* resource estimate of 2000

kg gold and 10 t silver (JORC-compliant resource calculation for the gold resource). It is a Palaeoproterozoic orogenic(?) single-lode gold deposit which is enriched in silver and base metals. It comprises auriferous arsenopyrite-quartz veins and intensely altered host rock in a major fold hinge in intermediate metavolcanic rock. The deposit is close to the transcurrent, NW-trending Kolkonjärvi shear zone. Gold and electrum are chiefly at the contact between arsenopyrite and löllingite; also submicroscopic gold in löllingite, and gold and electrum as inclusions in arsenopyrite and löllingite.

PIRILÄ II has an *in situ* resource estimate of 80 kg gold (no JORC-compliant resource calculation is available). It is a Palaeoproterozoic orogenic single-lode gold deposit comprising auriferous quartz ± arsenopyrite veins in intermediate metavolcanic rock. The deposit is close to the transcurrent, NW-trending Kolkonjärvi shear zone. Native gold is present.

Tampere schist belt

ISOVESI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It has an irregular shape, is controlled by a NW-trending shear zone, and is hosted by an intermediate volcanogenic metasedimentary rock. Native gold is associated with silicates and arsenopyrite, both in fractures and as inclusions, and commonly occurring with native bismuth.

HAVERI is a deposit presently (October 2007) under feasibility study by Lappland Goldminers Ab. It was mined in 1942–1962 when it produced 4.2 t gold and 6000 t copper from 1.5 Mt of ore. There is no JORC-compliant resource calculation available for Haveri, but a suggestion of an *in situ* resource of 6–7 Mt @ 3.5 g/t Au and 0.5 % Cu. Haveri is a Palaeoproterozoic deposit in a back-arc setting, in pillowed, mafic metabasalt. It probably represents roots of a submarine Cu-Au VMS system partially remobilised by deformation. There are five ore body groups in an area of 0.7 x 1.4 km. All rocks have been metamorphosed to lower-amphibolite facies. Native gold occurs mainly along grain boundaries of Co and As minerals and as very fine-grained inclusions in cobaltite and larger (up 1–2 cm) grains with silicates. Gold is in two settings: 1) in siliceous zones of a few metres wide where Cu content is low (<0.02%), and 2) with sulphides which form irregular masses, stringers and groups of semi-massive to massive lenses with Cu >0.2 %.

JÄRVENPÄÄ is a Palaeoproterozoic metamorphosed epithermal gold occurrence with no resource estimate available. At least locally, it contains 1–3 % zinc and copper, and 10–25 g/t silver. The occurrence comprises 1–4 m wide mineralised zones within an intensely sericitised intermediate metavolcanic rock, close to the contact between a supracrustal sequence and a granodiorite intrusion. Most of the gold is in electrum which is associated with sulphide spots and Pb-Sb mineral clusters.

KIVIKESKU is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It comprises sets of 1–5 m wide lodes and is hosted by metagreywacke. There is free native gold, and 1-micron gold inclusions in arsenopyrite.

KUTEMAJÄRVI (ORIVESI MINE) is an active mine (in production 1994–2003, 2007–) operated by Polar Mining Oy. In 1994–2003, it produced 13 t gold from 1.4 Mt of ore. The current resource estimate is about 10 t gold (a JORC-compliant resource). It is a Palaeoproterozoic epithermal high-sulphidation deposit hosted by intermediate metavolcanic rock metamorphosed to lower-amphibolite facies, possibly with an orogenic overprint on it. It comprises at least eight vertical pipes, of which the Pipe V and Sarvisuo are the largest. Proximal alteration (including the ore bodies) is characterised by intense leaching of major elements, intense silicification, and pyrophyllite formation to a variable degree. Locally, phosphates and F minerals (eg. topaz, lazulite) occur in the alteration assemblage. Chiefly native free gold is associated with quartz, but native gold also occurs as inclusions in quartz, pyrite and arsenopyrite, and in symplectites with tellurides; in addition, gold tellurides are present.

LAVAJÄRVI (PÄSSÄRINVUORI & LEPOMÄKI) is a Palaeoproterozoic gold occurrence, locally enriched in base metals, with no resource estimate available. It possibly is a purely granitoid-related (non-skarn) occurrence or a case where orogenic gold mineralisation overprints granitoid-related base-metal mineralisation. It is characterised by quartz and tourmaline veins. It comprises two major lodes, Pässärinvuori and Lepomäki, occurring along the sheared, E- to ENE-trending, contact zone between a synorogenic granodiorite batholith and felsic to intermediate volcanic rocks, and is hosted by all these rock types. The tourmalinised, potentially auriferous domain is kilometres long. Gold is associated with arsenopyrite, both in the veins and host rocks.

METSÄKYLÄ is a Palaeoproterozoic orogenic gold occurrence, locally enriched in copper, with no resource estimate available. It comprises four or five subparallel, NE-trending lodes defined by quartz-, carbonate and quartz-tourmaline veins, within a NE-

trending shear zone close to the contact zone between a synorogenic granodiorite batholith and the hosting plagioclase porphyry. Free native gold, with grain size up to 5 mm, is present.

TAMMIJÄRVI, in the easternmost part of the Tampere Schist Belt, is an orogenic or a granitoid-related (non-skarn) copper-tungsten-gold occurrence with no resource estimate available. Six subvertical lodes are known, occurring along a 6 km long part of the hosting D1 shear zone in metagreywacke. Most or all gold is in quartz veins, chiefly in electrum which is associated with bismuth; some gold is in tellurides.

Vammala migmatite zone

ANIA is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by mica gneiss, and is located in the contact zone between tonalite and metagreywacke.

ERKKILÄ is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It comprises NW-trending(?) sets of narrow auriferous quartz veins in mica gneiss.

HOPEAVUORI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It has an undefined shape, comprises sets of gold- and arsenopyrite-rich quartz veins in small shear zones, and is hosted by intermediate metavolcanic rock and granodiorite. Highest Au values occur where the local shear zones are near the contact between the metavolcanic rock and granodiorite.

JOKISIVU is a deposit presently (October 2007) under feasibility study and test mining by Polar Mining Oy. The current *in situ* resource estimate is 10 t of gold at an average grade of 6.8 g/t Au (a JORC-compliant resource). It is a Palaeoproterozoic orogenic gold deposit comprising two major ore bodies in a diorite. The ore bodies comprise several auriferous quartz vein arrays surrounded by altered host rock. The deposit is controlled by a conjugate set of brittle-ductile shear zones between two major NW-trending shear zones in upper-amphibolite facies rocks. Free gold is chiefly in quartz veins, locally related to arsenopyrite, commonly with the minor tellurides; 90 % of gold is native and free milling.

KAAPELINKULMA is a Palaeoproterozoic orogenic gold deposit presently (October 2007) under feasibility study by Polar Mining Oy. The current *in situ* resource estimate is 1000 kg of gold at an average grade of 8.15 g/t Au (unclear if this is a JORC-compliant resource). The deposit comprises a set of subparallel lodes in a tight array in a sheared quartz dioritic unit inside a tonalitic intrusion surrounded by mica gneiss. Free gold is largely in quartz veins.

KAITAJÄRVI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by mica gneiss, characterised by auriferous quartz veins, and is controlled by minor WSW-trending shear zones branching from a larger NW-trending shear zone.

KALLIOJÄRVI, close to the northern margin of the Vammala Migmatite Zone, is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by mica gneiss, and comprises a set of subparallel, E-W trending mineralised zones along strike of minor shear zones in a gently west-plunging synform. Native gold is possibly associated with arsenopyrite.

PAISKALLIO, in the western part of the Vammala Migmatite Zone, is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It comprises a set of quartz veins in altered uralite porphyrite (mafic lava?) in a subvertical shear zone in the contact zone between porphyrite and intermediate metavolcanic rocks. Visible gold occurs in quartz veins.

RITAKALLIO is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by gabbro, and is defined by sets of auriferous, NW-trending shear zones. Most of the gold is native in quartz veins.

SILMUSSUO, in the western part of the Vammala Migmatite Zone, is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by mica gneiss. Alteration mineral assemblages containing significant diopside suggests mineralisation under amphibolite-facies conditions. No information is available on the structural controls or siting of gold.

TIKKARINVUORI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It comprises sets of a few centimetre wide *en echelon* quartz veins in gneissic metagreywacke, and is controlled by a dextral D4 shear zone. Native, free gold, commonly visible to the naked eye, is developed chiefly at quartz vein margins.

VÄLIMÄKI is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It is hosted by mica gneiss, and comprises two quartz vein-rich lodes controlled by NE-trending shear zones.

VATANEN is a Palaeoproterozoic orogenic gold occurrence with no resource estimate available. It has an undefined shape, is comprises sets of Au- and As-rich quartz veins, and is hosted by tonalite. There is free native gold with quartz, and native gold as inclusions in arsenopyrite.

Häme volcanic belt

LIESJÄRVI, in the Palaeoproterozoic Häme Volcanic Belt (or Hämeenlinna schist belt), is an orogenic(?) copper-enriched gold occurrence with no resource estimate available. It is hosted by granodiorite and controlled by sets of minor shear zones close to the contact of the hosting intrusion.

PÄÄJÄRVI is an orogenic(?) copper-gold occurrence with no resource estimate available. It is hosted by mica schist and located near the regional Pappilanlahti shear zone.

RIUKKA is a gold-base metal occurrence with no resource estimate available. It is possibly a metamorphosed epithermal occurrence or orogenic mineralisation which has overprinted pre-metamorphic mineralisation. The NW-trending mineralised domain contains several potential lodes characterised by extensive biotitisation and quartz±tourmaline veins in uralite porphyry and tonalite. Riukka is possibly similar to the Satulinmäki occurrence.

SATULINMÄKI has an *in situ* resource estimate of 840 kg gold (a JORC-compliant resource). It is possibly an epithermal occurrence metamorphosed under amphibolite-facies conditions or orogenic mineralisation. The E-W trending mineralised domain contains several high-grade shoots characterised by quartz±tourmaline veins around a contact zone between felsic and intermediate metavolcanic rocks. Native gold occurs in quartz-tourmaline veins and is disseminated in the host rock, closely associated with arsenopyrite and Au-Bi and Au-Sb minerals.

Uusimaa belt

IILIJÄRVI, in the western part of the Uusimaa belt (UB, in SW Finland), is a gold-silver-base metal deposit that was test-mined in the 18th and 19th centuries. The present *in situ* resource estimate is 200 kg Au, 2 t Ag, 650 t Zn, 300 t Pb and 300 t Cu. However, this only includes the most intensely drilled ore bodies (no JORC-compliant resource is available), which only form a small part of the mineralised domain. Iilijärvi is hosted by felsic volcanic rocks altered and metamorphosed to quartz rock (main host to gold), and andalusite-cordierite-muscovite and cordierite-anthophyllite assemblages, which mostly occur as stratiform units. The alteration assemblages, metal association, Au/Ag ratio, and geological setting together suggest a pre-metamorphic timing and gold-rich VMS or submarine epithermal style for mineralisation. There is no exact data on the siting of gold.

KORVENALA, in the NW part of the UB, is a gold occurrence with no resource estimate available. A set of parallel lodes hosted by plagioclase porphyry are apparently controlled by minor NE-trending shear zones. The scarce geological information available means that genetic type of mineralisation and siting of gold are equivocal.

KULTANUMMI, in the NW part of the UB, is a gold occurrence with no resource estimate available. It is characterised by tourmaline-cordierite-sillimanite-quartz alteration and hosted by mica gneiss and plagioclase porphyry. Rocks have metamorphosed at upper-amphibolite facies conditions. The element association suggests enrichment in Au, S and Si, and depletion in Ca, K, Mg and Na. These features suggest that Kultanummi may be a metamorphosed epithermal occurrence, not an orogenic gold deposit.

MICKELSÄNGSBERGEN is a gold occurrence with no resource estimate available. It is hosted by felsic or intermediate metavolcanic rock, has no obvious structural control, is spatially associated with syngenetic Cu-Zn deposits related to felsic volcanism, and may hence well be an epithermal occurrence which has metamorphosed under lower-amphibolite facies conditions.

PYHÄLAMMI is a copper-gold occurrence with no resource estimate available. It is hosted by quartz rock (totally silicified volcanic rock), has no obvious structural control, is spatially closely associated with syngenetic Cu-Zn deposits related to felsic volcanism. Hence, it may be a high-sulphidation epithermal mineralisation which has metamorphosed under upper-amphibolite facies conditions.

STENMO, in the western part of the UB, is a gold occurrence with no resource estimate available. It is characterised by a conjugate set of auriferous quartz veins in sericitised, chloritised and biotitised mica schist associated with magnetite-garnet, garnet-antophyllite, and sillimanite gneisses of possibly felsic and intermediate volcanic origin. The element association implies enrichment in Au, Bi, K, S, and W. These features suggest that Stenmo is a metamorphosed epithermal or Au-VMS mineralisation, with sulphur, gold and silica remobilised during deformation. Native free gold occurs in quartz veins.

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Appendx. *All deposits and occurrences in FINGOLD, listed according to Geological domain and Metallogenic belt.*

ID[1]	Deposit name	Geological domain	Belt	Latitude	Longitude	Mining	Discovery year	No. of holes drilled	Drilled in metres
201	Ruossakero	Archaean	Enontekiö	68.6099	22.1423		1986	5	500
11	Elinsuo	Archaean	Ilomantsi	62.8204	31.1894		1989	3	396
174	Iso-Kivijärvi	Archaean	Ilomantsi	63.0865	31.1795		1993	4	453
13	Kelokorpi	Archaean	Ilomantsi	62.7632	31.2126		1987	1	150
8	Kivisuo	Archaean	Ilomantsi	62.8110	31.1890		1986	13	1,763
12	Korpilampi	Archaean	Ilomantsi	63.0243	31.2224		1988	13	1,100[2]
7	Korvilansuo	Archaean	Ilomantsi	62.7986	31.1729		1986	14	2,202
5	Kuittila	Archaean	Ilomantsi	62.7732	31.1993		1984	20	2,727
65	Kuivisto	Archaean	Ilomantsi	63.0344	31.1954		1993	94	6,000[2]
6	Muurinsuo	Archaean	Ilomantsi	62.8289	31.2310		1987	30	2,838
157	Palosuo	Archaean	Ilomantsi	62.8955	31.2751		1993	5	142
1	Pampalo	Archaean	Ilomantsi	62.9871	31.2652	Test mine	1990	>380[2]	>25,000[2]
143	Pampalo NW	Archaean	Ilomantsi	62.9944	31.2537		1995	>10*	>2,000[2]
4	Rämepuro	Archaean	Ilomantsi	62.8974	31.2653		1984	29	4,043
173	Sivakko	Archaean	Ilomantsi	63.0170	31.2270		1993	24	1,961
10	Valkeasuo	Archaean	Ilomantsi	63.0803	31.1683		1992	59	3,580
9	Viinivaara	Archaean	Ilomantsi	62.7199	31.1912		1986	5	666
135	Aittoranta	Archaean	Kuhmo	64.3964	29.0679		1992	5	?
212	Hetteilä	Archaean	Kuhmo	64.3511	29.1481		2002	10	1,274
16	Jousijärvi	Archaean	Kuhmo	64.3717	29.0797		1994	9	382
189	Karvosenvaara	Archaean	Kuhmo	64.0837	29.3018		2001	6	478
14	Lokkiluoto	Archaean	Kuhmo	64.1375	29.2546		?	10	>400[2]
159	Louhiniemi	Archaean	Kuhmo	64.3338	29.1031		1998	7	507
134	Mujesuo	Archaean	Kuhmo	64.3695	29.0646		1994	17	997
168	Naurispuro	Archaean	Kuhmo	64.4254	29.0368		1997	5	356
137	Palovaara	Archaean	Kuhmo	64.4727	29.0736		1987	19	1,528
197	Piilola	Archaean	Kuhmo	64.3526	29.0859		2003	30	2,427
196	Putaala	Archaean	Kuhmo	64.1898	29.1777		2003	>15[2]	>1,500[2]
190	Roninlampi	Archaean	Kuhmo	64.0838	29.3161		2001	7	495
63	Sepponen	Archaean	Kuhmo	63.8556	29.7700		1992	Channel sampling only	
167	Tammasuo	Archaean	Kuhmo	64.6140	29.1586		1994	5[2]	500[2]
160	Timola	Archaean	Kuhmo	64.4305	29.0605		1995	21	1,498
153	Karahkalehto	Archaean	Oijärvi	65.7170	25.9724		1996	15	3,304
154	Kompsa	Archaean	Oijärvi	65.7361	26.0131		1998	27	2,167
209	Kupsusselkä	Archaean	Oijärvi	65.3708	25.9838		2002	10	2,090
155	Kylmäkangas	Archaean	Oijärvi	65.7264	25.9110		1999	40	>6,000[2]
106	Mäkärärova	Archaean	Pomokaira Basement Complex	68.1935	26.8608		1949	20	1,843
148	Auermavaara	Archaean	Savukoski	67.5016	29.5163		1985	6	615
119	Patonenäkkeen-selkä	Archaean	Savukoski	67.3249	28.3758		1998	37	3,002
147	Rovaukonselkä	Archaean	Savukoski	67.7788	28.7206		1985	4	667
141	Kuikkapuro	Archaean	Suomussalmi	65.1517	29.0553		1997	52	4,359
17	Moukkori	Archaean	Suomussalmi	65.2904	29.5861		1990	17	1,746
60	Pahkalampi	Archaean	Suomussalmi	65.2669	29.5533		1996	42	3,250
142	Pahkosuo	Archaean	Suomussalmi	65.3334	29.3397		1995	48	>5,000[2]
161	Seipelä	Archaean	Suomussalmi	65.2599	29.3511		1998	21	1,240

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136	Syrjälä	Archaean	Suomussalmi	65.1408	29.0482		1995	41	3,133
202	Aakenusvaara	Lapland	CLGB[3]	67.7838	24.5074		?	42	?
132	Ahvenjärvi	Lapland	CLGB	67.6172	25.2566		1984	11	516
207	Hakokodanmaa	Lapland	CLGB	67.9481	25.4018		2006	10	1,811
191	Hannukainen	Lapland	CLGB (K)[4]	67.5546	23.9793	Open pit	1974	>200[2]	?
145	Harrilommol	Lapland	CLGB	67.7876	24.4222		1997	16	?
116	Hirvilavanmaa	Lapland	CLGB	67.7480	25.1808		1986	49	>3,000[2]
105	Hookana	Lapland	CLGB	67.5840	26.4515		1986	1	25
103	Kaaresselkä	Lapland	CLGB	67.5195	26.2086		1987	>200[2]	>11,600[2]
108	Kaarestunturi	Lapland	CLGB	67.5587	26.2357		1981	5	421
185	Kellolaki	Lapland	CLGB	68.0051	25.0958		2003	>15[2]	>2,000[2]
203	Kiekerömaa	Lapland	CLGB	67.5336	25.6738		1996	?	?
126	Kittilän Hanhil-ampi	Lapland	CLGB	67.6987	24.6755		1989	3	222
125	Kittilän Palovaara	Lapland	CLGB	67.6917	25.2759		1987	23	>1,000[2]
109	Koppelokangas	Lapland	CLGB	67.6117	26.0787		1989	>5	>600[2]
130	Kuervitikko	Lapland	CLGB (K)	67.5909	23.9675		1979	32	2,417
113	Kuotko	Lapland	CLGB	68.0332	25.4109		1986	>160	>16,500[2]
133	Kutuvuoma	Lapland	CLGB	67.5911	25.7263	Test mine	1993	?	4000[2]
117	Lammasvuoma	Lapland	CLGB	67.5984	25.3410		1989	17	?
146	Lauttaselkä	Lapland	CLGB (K)	67.5754	24.3010		1982	11	2,000[2]
131	Loukinen	Lapland	CLGB	67.8131	24.9682		1994	>80[2]	>3,000[2]
170	Mantovaara	Lapland	CLGB	67.8496	25.0173		1995	9	891
204	Mustajärvi	Lapland	CLGB	67.6090	25.3009		1991	12	702
128	Muusanlammit	Lapland	CLGB	67.7791	24.5878		?	29	?
165	Naakenavaara	Lapland	CLGB	67.6968	25.1346		1995	33	5,193
129	Outapää	Lapland	CLGB	67.7063	25.5248		1978	6	862
211	Paha	Lapland	CLGB	67.9847	25.4247		2007	?	?
139	Pahkavaara	Lapland	CLGB	66.7210	28.4309		1997	13	1,397
102	Pahtavaara	Lapland	CLGB	67.6303	26.4146	Open pit, under-ground	1985	>300[2]	?
107	Palokiimaselkä	Lapland	CLGB	68.1073	27.2361		1952	?	?
169	Palolaki	Lapland	CLGB	67.7894	25.7660		1999	4	653
118	Pikku-Mustavaara	Lapland	CLGB	67.6132	25.4422		1982	3	381
144	Päivänenä	Lapland	CLGB	67.7689	25.1511		1977	>100[2]	10,000[2]
205	Rautuoja	Lapland	CLGB (K)	67.4905	23.8788		?	?	?
192	Rautuvaara	Lapland	CLGB (K)	67.4905	23.9022	Open pit, under-ground	1957	>200[2]	?
198	Riikonkoski	Lapland	CLGB	67.7446	24.9723		1966	110	22,162
123	Rovaselkä	Lapland	CLGB	68.1673	25.2799		1984	5	368
124	Ruoppapalo	Lapland	CLGB	68.0437	25.5512		1996	5	301
166	Ruosselkä	Lapland	CLGB	67.9442	27.1593		2000	27	2,100
111	Saattopora	Lapland	CLGB	67.7915	24.4080	Open pit, under-ground	1985	?	59,400
121	Sirkka kaivos	Lapland	CLGB	67.8143	24.7322	Test mine	1939	>190[2]	>10,000[2]
122	Sirkka W	Lapland	CLGB	67.8122	24.7191		1977	5	450
114	Soretialehto	Lapland	CLGB	67.7472	25.1713		1989	27	1,185

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115	Soretiavuoma N	Lapland	CLGB	67.7634	25.1674		1984	36	2,077
120	Sukseton	Lapland	CLGB	68.0839	25.3564		1981	24	3,381
112	Suurikuusikko	Lapland	CLGB	67.9015	25.3910	Open pit	1986	?	>170,000
127	Tuongankuusikko	Lapland	CLGB	67.6070	25.5592		1990	12	1,741
158	Äkäsaivo	Lapland	CLGB (K)	67.6994	24.1468		1990	8	418
79	Apajalahti	Lapland	Kuusamo	66.1290	28.7596		?	?	?
93	Hangaslampi	Lapland	Kuusamo	66.2808	29.2036		1988	>60[2]	?
96	Hangaspuro	Lapland	Kuusamo	66.2906	29.1877		1989	6	906
84	Honkilehto	Lapland	Kuusamo	66.1809	28.9982		1992	13	1,437
100	Isoaho 1	Lapland	Kuusamo	66.2683	29.2151		1975	5	?
101	Isoaho 2	Lapland	Kuusamo	66.2700	29.2039		1991	?	?
88	Iso-Rehvi	Lapland	Kuusamo	66.2129	29.0913		1988	12	>1,000[2]
94	Juomasuo	Lapland	Kuusamo	66.2888	29.1995	Test mine	1985	>80[2]	>16,000[2]
99	Kantolahti	Lapland	Kuusamo	66.2384	29.0092		1983	28	1,737
85	Konttiaho	Lapland	Kuusamo	66.1813	29.0603		1985	12	1,101
78	Kouvervaara	Lapland	Kuusamo	66.1312	28.8186		1982	49	3,124
90	Kuusamon Hanhilampi	Lapland	Kuusamo	66.2690	29.1906		1990	1	105
97	Lavasuo	Lapland	Kuusamo	66.3602	28.9280		1985	4	516
80	Lemmonlampi	Lapland	Kuusamo	66.1437	28.8069		?	?	?
98	Likalampi	Lapland	Kuusamo	66.4228	28.6991		1983	2	245
87	Meurastuksenaho	Lapland	Kuusamo	66.1985	29.0796		1984	12	2,163
83	Murronmaa	Lapland	Kuusamo	66.1585	28.9924		1987	11	1,190
81	Ollinsuo	Lapland	Kuusamo	66.1309	28.9005		1984	>10[2]	3,000[2]
91	Pohjaslampi	Lapland	Kuusamo	66.2709	29.2061		1975	11	?
92	Pohjasvaara	Lapland	Kuusamo	66.2781	29.2170		1985	19	2,022
95	Sakarinkaivu-lamminsuo	Lapland	Kuusamo	66.2924	29.2054		1989	8	741
89	Sarkanniemi	Lapland	Kuusamo	66.2600	29.0173		1988	4	303
86	Sivakkaharju	Lapland	Kuusamo	66.1911	29.0422		1986	16	2,202
82	Säynäjävaara	Lapland	Kuusamo	66.1621	28.8748		1983	20	1,500[2]
110	Hirvasselkä	Lapland	Lapland granulite complex	68.3435	27.2604		?	2	63
72	Kivimaa	Lapland	Peräpohja	66.2159	24.8178	Open pit, underground	1965	25	2,434
210	Laurila	Lapland	Peräpohja	65.8010	24.5490		1836	12	500[2]
74	Petäjävaara	Lapland	Peräpohja	66.2808	25.3990		1992	10	500[2]
73	Sivakkajoki	Lapland	Peräpohja	66.2124	24.8066		1991	14	500[2]
71	Vinsa	Lapland	Peräpohja	66.3571	25.0525		1966	20	500[2]
75	Vähäjoki	Lapland	Peräpohja	66.1115	25.2791		1943	52	9,392
44	Mäkrä	Svecofennian	CFGC[5]	63.0933	26.1851		1982	9	>500
194	Pirunkoukku	Svecofennian	CFGC	63.3183	25.8693		2000	40	3,777
70	Ritovuori	Svecofennian	CFGC	63.3516	25.5763		1958	10	500[2]
104	Vatsa	Svecofennian	CFGC	61.9062	25.8270		1992	30	?
69	Liesjärvi	Svecofennian	Häme	60.9224	23.7902		1988	47	2,283
67	Pääjärvi	Svecofennian	Häme	61.0442	25.0331		1978	15	1,181
193	Riukka	Svecofennian	Häme	60.7296	23.5221		2000	40	3,350
48	Satulinmäki	Svecofennian	Häme	60.7464	23.4613		1980	59	4,727
187	Honkanen	Svecofennian	Kiiminki	65.1796	25.6283		1997	9	906

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156	Kumpuselkä	Svecofennian	Kiiminki	65.1825	25.6452		1997	6	355
188	Mietunoja	Svecofennian	Kiiminki	65.2163	25.3485		1997	5	636
38	Ahveroinen	Svecofennian	RHA[6]	63.6639	24.7910		1887	6	630
199	Ala	Svecofennian	RHA	64.1035	24.1912		2000	34	3,232
186	Ansakangas	Svecofennian	RHA	64.4024	25.4043		2002	1	514
25	Antikanperä	Svecofennian	RHA	64.1954	24.9667		1988	7	531
35	Antinoja	Svecofennian	RHA	63.8898	24.2070		1981	34	2,300[2]
77	Hietajärvi	Svecofennian	RHA	64.0691	24.0516		1965	10	?
208	Hirsikangas	Svecofennian	RHA	64.0484	23.8049		2004	32	4,092
175	Huhta	Svecofennian	RHA	64.0473	24.2727		?	41	4,675
33	Jouhineva	Svecofennian	RHA	64.0644	24.2319		1979	43	5,392
37	Kangaskylä	Svecofennian	RHA	63.6769	24.7635		1887	77	8,000[2]
76	Kiimala 2	Svecofennian	RHA	64.1279	24.9535		1985	11	1,217
176	Kokkoharju	Svecofennian	RHA	63.8652	24.2607		1995	32	3,489
36	Kopsa	Svecofennian	RHA	63.7709	25.2339		1939	320	>10,000[2]
31	Kurula	Svecofennian	RHA	64.0953	24.5500		1970	8	340
23	Käpykorpi	Svecofennian	RHA	64.5192	24.5985		1982	5	489
21	Laivakangas	Svecofennian	RHA	64.5407	24.5839	Test mine	1982	>150[2]	27,000[2]
34	Louetjärvi	Svecofennian	RHA	63.8984	24.2830		1985	2	53
24	Oltava	Svecofennian	RHA	64.4408	24.6681		1951	55	4,064
172	Pirttineva	Svecofennian	RHA	64.0265	25.2033		1940	13	2,000
29	Pöhlölä	Svecofennian	RHA	64.0916	24.9856		1984	16	243
30	Sarjankylä	Svecofennian	RHA	64.0358	25.1034		1985	Only minidrilling in outcrops	
32	Sipilä	Svecofennian	RHA	64.0829	24.2013		1986	4	213
171	Teerineva	Svecofennian	RHA	64.0585	25.0039		1939	1	115
150	Tiitola	Svecofennian	RHA	64.1059	24.9502		1994	11	387
27	Vesiperä	Svecofennian	RHA	64.1037	24.9715		1984	35	5,191
28	Ängeslampi	Svecofennian	RHA	64.1136	24.9402		1986	20	2,671
26	Ängesneva	Svecofennian	RHA	64.1219	24.9420		1987	58	6,200[2]
39	Haasiakangas	Svecofennian	S Ostrobothnia	63.1249	24.0777		1987	?	?
56	Kalliosalo	Svecofennian	S Ostrobothnia	62.7303	22.9483		1977	>50[2]	8,000[2]
183	Koppelomäki	Svecofennian	S Ostrobothnia	62.7526	22.7190		?	8	700
42	Marttalanniemi	Svecofennian	S Ostrobothnia	62.7197	23.0093		1987	17	360
57	Sudenkylä	Svecofennian	S Ostrobothnia	62.6534	22.7697		1986	?	?
40	Suolasalmenneva	Svecofennian	S Ostrobothnia	63.1250	24.1738		1981	Only minidrilling(?)	
64	Tervasmäki	Svecofennian	S Ostrobothnia	62.7404	22.9245		1977	10	?
41	Timanttimaa	Svecofennian	S Ostrobothnia	62.5628	23.2771		1986	9	910
61	Tulisilmä	Svecofennian	S Ostrobothnia	62.7084	22.9022		1989	19	658
43	Ylijoki	Svecofennian	S Ostrobothnia	62.6308	23.0600		1987	11	420
62	Hakojärvi	Svecofennian	Southern Savo	61.9998	28.0636		1984	4	503
45	Osikonmäki	Svecofennian	Southern Savo	62.0488	28.2163		1986	145	18,150
47	Pirilä	Svecofennian	Southern Savo	62.0309	28.0549		1983	49	7,761
46	Pirilä II	Svecofennian	Southern Savo	62.0404	28.0436		1984	11	1,605
51	Haveri	Svecofennian	Tampere	61.7137	23.2441	Open pit, under-ground	1737	296	38,677
50	Isovesi	Svecofennian	Tampere	61.6885	22.6930		1967	14	852
4	Järvenpää	Svecofennian	Tampere	61.6405	23.5307		1937	11	1,600
59	Kivikesku	Svecofennian	Tampere	61.5294	23.5100		1990	14	?

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55	Kutemajärvi	Svecofennian	Tampere	61.6529	24.1570	Open pit, under-ground	1982	>100[2]	30,000[2]
178	Lavajärvi	Svecofennian	Tampere	61.6414	23.4783		1940	17	1,547
177	Metsäkylä	Svecofennian	Tampere	61.5635	23.4628		2000	12	1,113
68	Tammijärvi	Svecofennian	Tampere	61.8175	25.8053		1978	25	?
200	Iilijärvi	Svecofennian	Uusimaa	60.2353	23.5212	Test mine	1757	66	10,657
164	Korvenala	Svecofennian	Uusimaa	60.4945	22.8096		1997	10	840
184	Kultanummi	Svecofennian	Uusimaa	60.4686	22.9296		2001	31	2,144
151	Mickelsängs-bergen	Svecofennian	Uusimaa	60.1032	22.8157		1986	?	?
152	Pyhälammi	Svecofennian	Uusimaa	60.2857	23.6298		1984	?	?
195	Stenmo	Svecofennian	Uusimaa	60.1278	22.7122		1999	4	129
181	Ania	Svecofennian	Vammala	61.4100	23.5402		2000	7	399
182	Erkkilä	Svecofennian	Vammala	61.3974	23.5440		2000	12	625
58	Hopeavuori	Svecofennian	Vammala	61.1189	23.9585		1991	31	2,096
49	Jokisivu	Svecofennian	Vammala	61.1174	22.6202	Test mine	1985	>120[2]	10,000[2]
53	Kaapelinkulma	Svecofennian	Vammala	61.2305	24.1238		1986	35	2,861
180	Kaitajärvi	Svecofennian	Vammala	61.4108	23.6971		2001	7	700
162	Kalliojärvi	Svecofennian	Vammala	61.3242	23.6979		1994	46	2,463
163	Paiskallio	Svecofennian	Vammala	61.5398	22.7907		1997	12	767
206	Ritakallio	Svecofennian	Vammala	61.1101	22.7485		2002	15	1,097
149	Silmussuo	Svecofennian	Vammala	61.5168	22.3681		1955	?	?
140	Tikkarinvuori	Svecofennian	Vammala	61.4255	23.5377		?	25	1,500
52	Vatanen	Svecofennian	Vammala	61.4363	23.5973		1987	4	504
179	Välimäki	Svecofennian	Vammala	61.4670	22.2636		?	14	1,767

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