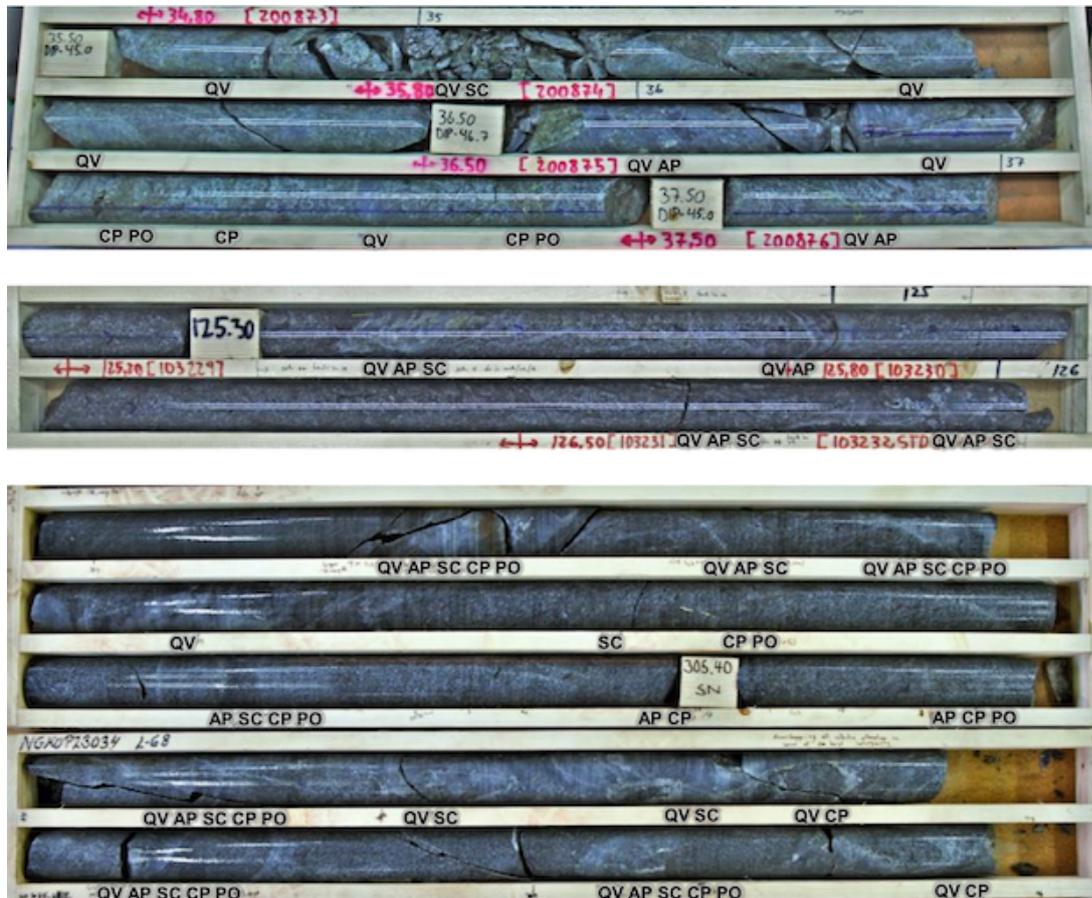


# Northgold, NG.ST

The best risk-reward in gold



**Simon Francis**

simonfrancis@oriorcap.com

+852 9389 5506

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Front cover: Photographs of drill core from deep drill hole NGKOP23034 (bottom) at Kopsa and drill core from holes NGKOP22022 (top) and NGKOP22014 (centre)

## Executive summary

Northgold AB, is exploring and developing gold mining assets in Finland, in the vast, highly prospective and relatively underexplored Middle Ostrobothnia Gold Belt. Northgold's most advanced asset is Kopsa, for which the company released a Mineral Resource Estimate in August 2023, and for which a preliminary economic assessment (PEA) was completed by a previous owner in 2013. Northgold also owns the Kiimala Trend and Hirsikangas projects both of which have NI 43-101 resources. In total, Northgold has resources of 783,700 oz gold-equivalent (AuEq). The company is listed on the Nasdaq First North Growth Market.

**Northgold looks compellingly cheap:** Despite the August 2023 announcement of a more than 0.5 Moz AuEq resource at Kopsa and subsequent assay results pointing to excellent resource upside potential, Northgold is trading at a market cap. of just US\$5.4m and an EV of US\$4.1m. Based on Northgold's total resources, **the company is trading at an EV/oz of just US\$5.2. This is an incredibly cheap valuation.** Despite strong prospects for resource growth across the asset portfolio, and the advantage of a historic granted mining licence, Northgold is trading at a 79% discount to the average of a sample of 25 Australian and Canadian listed gold explorers and early-stage developer peers that trades at US\$25/oz, and an 87% discount to the value of recent M&A transactions. Northgold's current valuation is also approximately one-twelfth of global gold discovery costs in the decade to 2019 as published by MinEx Consulting. **Valuing Northgold in line with peers would underpin a valuation of SEK17.15/share. This is almost 4x the current share price.**

This valuation does not factor in any potential resource upside from drilling conducted at Kopsa in 2023. Assay results from the first drill holes suggest strong potential for further resource growth. **Factoring in a 40% increase in resources at Kopsa would support a valuation of SEK22.00/share, 5x the current share price.** Northgold is expected to announce a resource update in 2Q24.

**Development scenario suggests further upside:** A conceptual development scenario is modelled based on Northgold mining 1.2Mtpa ore, using ore sorting to upgrade the ore, and a third party processor. The scenario demonstrates a post-tax NPV<sub>5</sub> of US\$91m. Valuing Kopsa at 0.4x EV/NPV (allowing for some recovery in market valuations) and the other projects at US\$25/oz suggests a valuation of SEK35.73/share. This is not a forecast. Rather the scenario aims to provide insight as to how valuations could potentially be enhanced as the project progresses. Ultimately, management's plan will be to develop sufficient resources to support Northgold having its own mill.

**Target rich environment:** The Fennoscandian Shield, which covers large parts of Finland, is geologically analogous to other shield areas including those in Canada and Australia. Yet it is relatively underexplored, reflecting both the glacial till covering and the historical lack of privately funded gold exploration. In fact, until the end of the 1970s, only a few gold deposits were known in the region. Many areas were only initially tested by the Geological Survey of Finland (GTK) in the 1980s, and many discoveries are yet to be drilled. **As a result, Finland offers frontier market geological potential, and with low political risk, and superb infrastructure.**

The region hosts varied styles of gold mineralisation including Precambrian porphyry gold-copper, orogenic and granitoid-related gold, metamorphosed epithermal gold, and gold bearing VMS mineralisation (Eilu 2015). **Northgold is focused on the Middle Ostrobothnia Gold Belt, an area that is particularly well-known for significant gold mineralisation.**

**There is huge potential upside at Kopsa:** Northgold's most advanced project, Kopsa, boasts an August 2023 Mineral Resource estimate of 424,000 oz Au and 25,770 tonnes Cu, representing a resource of 547,400 oz AuEq. Some 90% of the gold-equivalent resources are in the Measured and Indicated categories, representing a substantial de-risking of the resource. This has been achieved after just 18,500m of drilling, including 4,200m by Northgold. Management has identified a potential starter-pit of 53,500 oz AuEq at a grade of 1.65 g/t AuEq that could be mined at an ultra-low strip ratio of just 0.36:1.0.

**Upside potential to the main zone of mineralisation...** The main zone at Kopsa remains open to the south at depth. Northgold drilled nine holes in 2023 that were designed to test the mineralisation to the southeast and southwest. Assay results from the first three drill holes demonstrate that mineralisation continues south-southwest of the current resource. Drill hole NGKOP23034 was drilled along trend of the expected extension of the main mineralised core of the resource, more than 250m south-southwest of the current resource area. **NGKOP23034 intersected the main zone mineralisation over two wide intervals at depth, together spanning more than 72m.** The results extend the mineralised zone to a vertical depth of more than 250m, which is double that of the existing resource. **Assays for the remaining 6 holes at Kopsa are expected to be released this quarter.**

**...and at depth:** There is also potential for copper porphyry style mineralisation. Northgold completed an induced polarisation (IP) geophysical survey in 2022 that identified a resistivity anomaly beneath, northeast and south of the Kopsa deposit. This is hypothesized to be associated with a more copper-rich style of mineralisation that is analogous with copper-porphyry types of deposit such as at Boliden's Aitik mine in northern Sweden. Three intercepts from two drill holes aimed at testing the anomaly returned an average copper grade of 0.4% Cu, about 2.5x that of the 2023 Mineral Resource estimate.

**Additional geophysical surveys are planned to help define drill targets.**

Unusually for a company at this stage, Northgold holds a Mining Permit, issued under the former mining law, and which could potentially be used to mine up to 0.5Mtpa. This is conditional upon an Auxiliary Mining Permit for a road connection which could be awarded by year end. This would be viewed as a substantial de-risking of the project.

**Kiimala Trend is a 15km mineralised trend along regional fault structures.** Gold mineralisation has been discovered at multiple locations along the trend and there are numerous drill intercepts from historical work that require follow-up work. In this sense, Kiimala Trend epitomises the geological opportunity in Finland. Ängesneva, the most advanced prospect, boasts a current resource of 147,300 oz gold and remains open at depth and in parallel structures. GTK also intercepted gold mineralisation at Kiimala, some 700m to the north, and at Vesiperä, 2km to the southeast. Ultimately, Northgold will aim to 'connect the dots', developing a substantial resource.

**The Hirsikangas project** was acquired from Rupert Resources in February 2023. It boasts an NI 43-101 inferred resource of 89,000 oz. The Resource is constrained to an open-pit depth of 120m though mineralisation is known to continue to a depth of 300m. There is excellent potential for resource upside from deeper extensions of the main mineralisation and parallel or offset structures, as well as mineralisation along trend to the southeast. Drilling conducted by GTK at Hanni in 2013 to 2015 returned high-grade intercepts from shallow depths including 15.5m at 5.5 g/t Au from 35.4m downhole and 1m at 43.8 g/t Au from 39.7m, and Rupert Resources intersected mineralisation at Hanni SE in 2021.

**In short, Northgold has three highly prospective projects, all of which could yield significant resource growth with further exploration work.**

**Finland is a great jurisdiction:** In addition to being highly prospective for major discoveries, Finland is regarded as low-risk. It is an EU member, and has excellent infrastructure and a highly trained workforce. Several of the world's major mining companies operate there. Agnico Eagle operates the Kittila gold mine, which is Europe's largest gold producer. First Quantum operated the Pyhäsalmi zinc-copper mine until last year and still operates the plant. Anglo American owns Sakatti, a world-class Cu-Ni-PGM project.

**Significant and near-term share price catalysts:** There are a number of factors expected to propel the shares over the next few months including further assay results from the 2023 drilling at Kopsa and Kiimala Trend (4Q23), approval of an Auxiliary Mine Permit at Kopsa (expected 4Q23), further results from early-stage exploration activities across the asset portfolio, a resource update at Kopsa (2Q24) and a PEA (4Q24).

Judging Northgold's compellingly cheap valuation against its phenomenal prospects for resource development suggests the company represents one of the most compelling risk-reward ratios in all of junior mining globally. When the market realises the opportunity, it should underpin a substantial re-rating.

Simon Francis

November 2023

# Key financial data and management

**Figure 1: Shareholding structure**

Stock code		NG.ST
Share price, 7 November 2023	SEK/share	4.40
Shares on issue	Millions	13.439
Options and warrants	Millions	1.494
Fully diluted shares	Millions	14.933
Market capitalisation	SEK m	59.1
Market capitalisation	US\$ m	5.4
Net cash, 30 September 2023, estimated	SEK m	14.0
Enterprise value	SEK m	45.2
Enterprise value	US\$ m	4.1

**Source: Northgold**

## Key Management:

**Roberto Garcia Martinez, Chairman:** Roberto has over 25 years' experience in the international mining industry. He has been President and CEO of major gold mining groups in Africa (2006–2018) and is currently the CEO of Eurobattery Minerals AB. Roberto has experience in corporate strategy, marketing, mining, and exploration management. Roberto is a Doctor of Law and holds a bachelor's degree in economics and industrial psychology.

**Mitch Vanderydt, P.Eng, MBA, CEO:** Mitch has 15 years' experience in the metals and mining space, including 10 years focused on mining project development followed by 3 years as a mining analyst at an investment bank in Toronto. He holds a bachelors' degree in civil engineering from Western University in Canada, a P.Eng. License in Canada, and a mining-focused MBA from the Schulich School of Business at York University in Toronto. Mitch is based in Sweden.

**Timo Mäki, Deputy CEO:** Timo is an experienced geologist credited with the discovery of the Mullikkoräme Zn deposit in 1987 and the Pyhäsalmi underground Zn-Cu deposit in 1996. Timo is currently on the scientific advisory board of the K.H. Renlund Foundation. He is also a director of two Canadian publicly listed companies: Strategic Resources Inc (TSX:SR.V) and FireFox Gold Corp (TSX:FFOX.V).

**Mattias Modén, CFO:** Mattias has 25 years of experience within corporate taxation, company administration and auditing and has previously worked as CEO of a leading auditing firm and consulting company for the development of railway facilities. Mattias holds a degree in business administration from Örebro University.

**Henrik Löfberg, Director:** Henrik is a Tampere based academic, educator and entrepreneur serving as operations manager for Magnus Minerals Oy, Chairman for MagStar Mining Oy, Fennia Gold Oy, and board member for Lakeuden Malmi Oy, Suomen Akkumineraalit Oy, Magnus Minerals Oy, Pulju Malminetsintä, and Functional Fitness Academy Oy, and deputy board member for FlowBrainer Oy.

**Benny Mattson, Director:** Benny has a BSc. Department of Mineralogy and Petrology from Uppsala University and has over 40 years of experience in mineral exploration and geology. Benny is currently an advisor to Goldline Resources AB and has an extensive background as a leader of teams within exploration programs. He has focused a large part of his career in the productive Skellefteå district in Sweden, with Boliden.

**Petri Nousiainen, CEFA, M.Sc, M.Eng, Vice President of Investor Relations in Finland:** Petri helps spread the word of Northgold in Finland, after joining the Company in March 2022. He has more than 20 years of experience in the financial markets and commodities sectors, including as a Portfolio Manager in the energy industry. He is a Certified European Financial Analyst CEFA Charter holder, and also holds a Master of Science in Finance from the Hanken School of Economics and a Master of Engineering in Big Data Analytics from Arcada University of Applied Sciences. His passions include Investor Relations, Exploration of Gold, Board development and Big Data Analytics.

**Simo Piippo, PhD Candidate, Exploration Manager:** Simo oversees diamond drilling operations after joining Northgold AB in March 2022. He has 7 years of professional mining and geology experience, including 4 years of graduate academia at University of Turku where he began a PhD in structural geology in 2019, for which he is now in the final stages, and 2 years field mapping and logging drill core for other mining and exploration companies across Finland. Simo is based in Finland.

**Riikka Taipale, M.Sc., Senior Geologist:** Riikka assists Northgold with planning of early-stage exploration activities and overseeing operations of Northgold's Finnish subsidiaries, after joining Northgold in February 2023 through its acquisition of Northern Aspect Resources Oy from her former employer Rupert Resources Ltd. Riikka has more than 20 years geology experience in Finland, where she is based. Riikka holds a M.Sc. in Geology and Mineralogy from University of Turku.

**Figure 2: Northgold share price chart**



**Source: Nasdaq First North Growth Market, <https://www.nasdaqomxnordic.com>**

## Northgold looks compellingly cheap

- Trading at an EV/oz of resource of just US\$5.2, Northgold looks cheap in both absolute and relative terms
- Valuing Northgold in line with gold explorer and early-stage developer peers suggests a valuation of SEK17.15/share, nearly 4x the current share price
- Share price catalysts include assay results from the 2023 drilling, approval of a mining permit for Kopsa, increased resources, and further exploration success

### Current valuation of SEK17.15/share

A base case valuation is established that values Northgold in line with peers on the basis of EV per oz of resource. A sample of 25 Australian and Canadian listed gold explorers and early stage developers is trading at an EV of US\$25/oz gold or gold equivalent. **Valuing Northgold in line with peers, suggests a valuation of SEK17.15/share. This is nearly 4x the current share price.**

Incredibly, Northgold is trading at an EV/oz of resource of just US\$5.2. This represents a discount of 79% to the sample of peers. It also represents a discount of 87% to the average valuation of four recent transactions in the gold sector of US\$39/oz. Further, it is approximately one-twelfth of global average gold discovery costs. In 2019, MinEx Consulting Pty Ltd estimated that in the decade from 2009 to 2018, the average gold discovery cost was US\$62/oz. On that basis, **Northgold looks both absolutely and relatively cheap.**

**Notably, the resource does not include the drilling conducted so far in 2023.** Assays from the first three drill holes reported (NGKOP23034, NGKOP23032 and NGKOP23031) suggest there is potential to substantially increase the Kopsa resource. Factoring in a 40% increase in the Kopsa resource to 766,360 oz AuEq would support a valuation for Northgold of SEK22.00/share based on current peer valuations. This is 5x the current share price. Further drilling is planned for 2024.

### Conceptual development scenario valuation of SEK35.73/share

The two-year valuation is based on the conceptual development scenario, which is just one example of how share prices could develop as Kopsa is progressed. It does not capture the likelihood of further increases in resources which would enable an increased rate of mining or a longer mine life (or both) nor any potential operational benefits beyond the modelling herein. Nor does it capture any upside potential in the other projects.

**Figure 3: Valuation framework and potential outcomes**

Timeframe	Valuation SEK/share	Comments
Current	17.15	Northgold valued on current resources of 783,700 oz AuEq and in line with peers at US\$25/oz, and an fx rate of US\$:SEK of 11.0
2H25 2 years	35.73	Based on a development scenario post-tax NPV <sub>5</sub> of US\$91.2m, and Northgold trading at 0.4x NPV, which allows for some recovery from current trough market valuations Resources at Kiimala Trend and Hirsikangas valued at US\$25/oz (US\$5.9m) No growth in resources is assumed

**Source: Orior Capital estimates**

**Figure 4: Two year valuation based on conceptual Development Scenario**

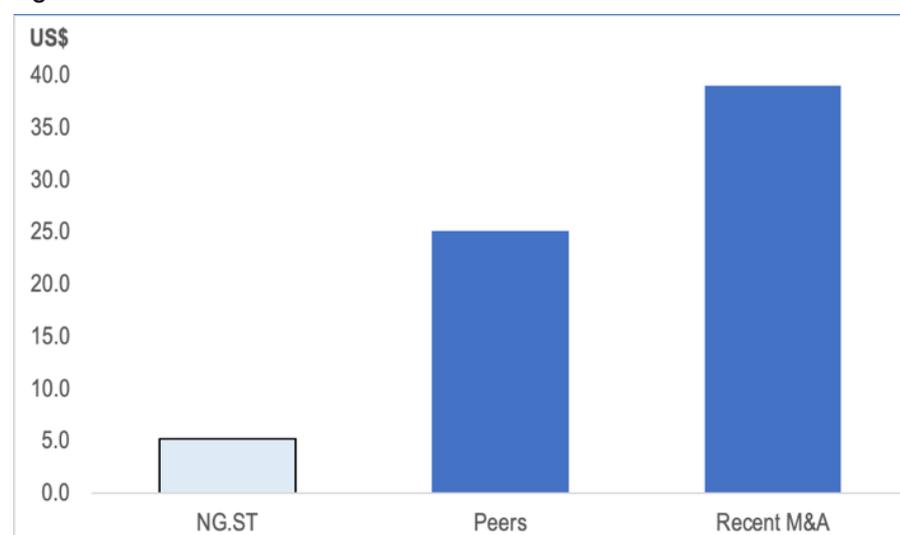
Asset	Valuation method	US\$ m
Kopsa	Development Scenario post-tax NPV <sub>5</sub> of US\$91.2m, 0.4x EV/NPV	36.5
Kiimala Trend	Compliant resources of 147,300 oz AuEq at US\$25/oz in line with peers	3.7
Hirsikangas	Compliant resources of 89,000 oz AuEq at US\$25/oz in line with peers	2.2
<b>Mining assets</b>		<b>42.4</b>
Net cash	SEK13.952m as at 30 September 2023, estimated	1.27
<b>Total assets</b>		<b>43.7</b>
Shares in issue (m)		13.44
Value per share	US\$	3.25
<b>Value per share</b>	<b>SEK</b>	<b>35.73</b>

Source: Orior Capital estimates

**Figure 5: Northgold current resources**

Project	AuEq resource, oz	Comments
Kopsa	547,400	Updated MRE released by Northgold in August 2023 comprising 424,000 oz Au and 25,770 tonnes Cu
Kiimala Trend	147,300	2011: NI 43-101 (and JORC 2004) resource published by Belvedere Resources at Ängesneva
Hirsikangas	89,000	2018: NI 43-101 compliant resource published by Rupert Resources
<b>Total</b>	<b>783,700</b>	

Source: Northgold

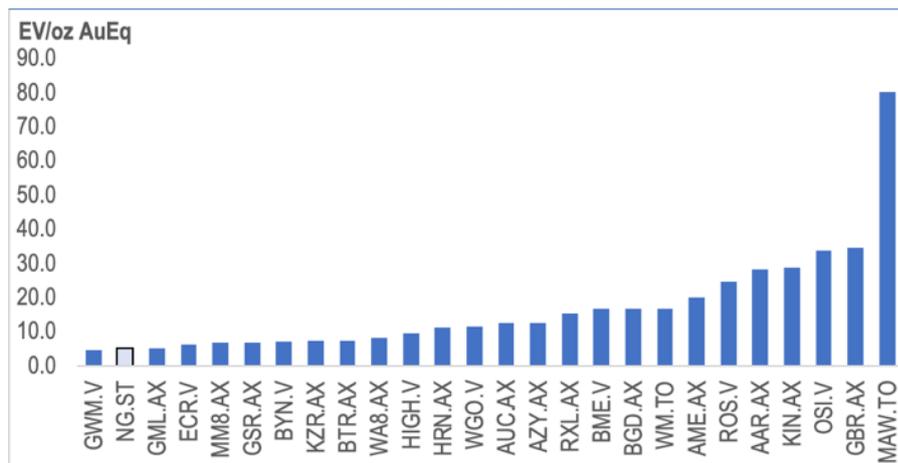
**Figure 6: Selected EV/oz of resource valuations**

Source: Company data, Orior Capital estimates

### Resource valuations

Australian and Canadian listed gold explorers and early-stage developers trade in a wide range of EV/oz of resource valuations. Many factors influence valuations including the stage of development, the type of ore body, for example whether it is oxide or sulphide, the depth of the deposit and whether it is likely to be mined from an open-pit or underground, the project location, and its accessibility to infrastructure, the perceived level of resource upside, the perceived execution risk as management moves towards production, where a company is listed, and a host of other factors.

A broad sample of 25 of these companies, made up of 15 companies listed in Australia and 10 that are listed in Canada, currently trades at an EV weighted average EV/oz of resource of US\$25/oz.

**Figure 7: Gold explorer and developer peer group valuations**

Source: Company data, Orior Capital estimates

### Deal based valuations

The gold sector is seeing a new wave of M&A brought on by high gold prices, high margins, increased capex costs over the past few years, long exploration and permitting times, and the potential for operational synergies. This M&A cycle arguably started with Barrick Gold's merger with Randgold in 2018. Newmont Mining acquired Goldcorp in 2019, and since then the sector has been a hive of activity, including at the junior end. A number of recent deals throw light on potential valuations for junior miners:

- Catalyst Metals announced a A\$66m bid for Vango Mining in January 2023. Vango had Mineral Resources of 1.0 Moz at a grade of 3.0 g/t Au implying a bid of US\$45/oz. The deal was completed in March 2023.
- Ramelius Resources paid an effective A\$33.1/oz (US\$22/oz) for Breaker Resources in March 2023. Breaker had Mineral Resources of 1.68 Moz at a grade of 1.6 g/t Au.
- Also in March, Beacon Minerals acquired the Lady Ida gold project and four exploration licences from subsidiaries of Ora Banda Mining, which viewed the assets as non-core. Lady Ida had resources of 318,000 oz at 2.0 g/t Au implying Beacon paid an estimated US\$27/oz.
- Chesser Resources said, May 2023, it had agreed to be purchased by Fortuna Silver. Fortuna's all share bid of 0.0248 Fortuna shares per Chesser share represented an implied value of A\$89m, a 95% premium to Chesser's last price before the bid and an 83% premium to Chesser's 30-day VWAP. Chesser had total Mineral Resources of 860,000 oz at a grade of 1.8 g/t Au valuing Fortuna's bid at A\$102/oz, or approximately US\$69/oz based on exchange rates at the time of Chesser's announcement.
- Northern Star acquired the Millrose project from Strickland Metals for A\$61m in June 2023. Mill had resources of 346,000 oz gold at a grade of 1.8 g/t Au implying a transaction value of US\$118/oz based on exchange rates at the time of the announcement.

Excluding the Northern Star deal, the gold resource weighted average price of these transactions was US\$39/oz.

## Share price catalysts

There are a number of factors expected to drive the share price over the next few months:

- Assays from the remaining six drill holes at Kopsa (some 1,300m of drilling) and the two holes at Kiimala Trend (one at Alakylä for 131.8m and one at Pääneva for 149.5m), are expected in 4Q23
- Approval of the Kopsa Auxiliary Mining Permit (4Q23) would put the existing mining licence (for 0.5Mtpa) into full legal force; it would be viewed as a major de-risking step for the project, and could potentially enable early cash flows
- A resource update is planned for 2Q24 once the full suite of assays is received for the 2023 drilling
- Management is planning a PEA for Kopsa by 4Q24
- Further developments at Kopsa, Kiimala Trend and Hirsikangas including the results of soil sampling, base of till sampling, and IP surveys (4Q23)

## Kopsa: a conceptual development scenario

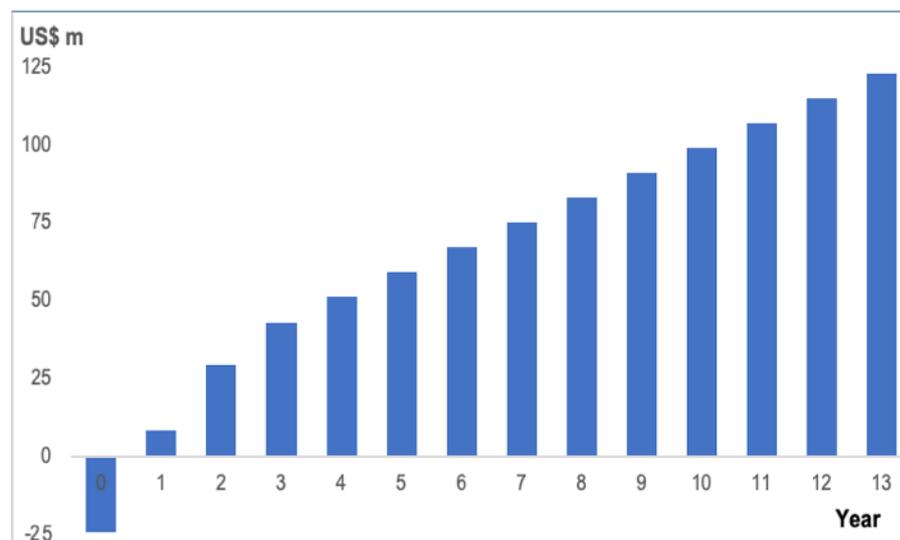
- A development scenario examines potential outcomes from a 1.2Mtpa operation based on existing resources, ore sorting, and third party processing
- The scenario highlights a profitable operation with a rapid pay-back, a post-tax NPV<sub>5</sub> of US\$91m and an IRR of 101%
- Further resource growth would likely improve the economics, perhaps ultimately supporting Northgold's construction or purchase of its own mill

A development scenario examines the economic potential of the current resource at Kopsa. The scenario assumes mining at a rate of 1.2Mtpa over 13 years, that the ore is upgraded using optical and x-ray analysis before being trucked to a third party mill, which is assumed to be the Pyhäsalmi mill owned by First Quantum. Assumptions are made about the 'upgradability' of the ore, and related recoveries. Costs and metallurgical recoveries are essentially in line with those in the 2013 PEA. **The development scenario is conceptual in nature. It is not a forecast.** Rather it aims to provide insight as to how valuations could potentially develop over time as Northgold continues to develop the project. Management aims to complete the PEA by late-2024.

The development scenario demonstrates:

- A post-tax NPV<sub>5</sub> of US\$91m from the start of operations, and an IRR of 101%
- A payback period of nine months; cash flow (before capex) of US\$33m in the first year of operations more than covers Northgold's assumed capex for the project
- Accumulative free cash flow (net of upfront and sustaining capital) of US\$123m attributable to Northgold over the project life time

**Figure 8: Development scenario accumulative free cash flow**



Source: Orior Capital estimates

**Figure 9: Kopsa conceptual development scenario model**

Year		0	1	2	3	4	5	6-13
<b>Material moved</b>								
Ore mined and processed	Mt		1.2	1.2	1.2	1.2	1.2	1.2
Waste mined	Mt		0.6	0.7	1.5	1.8	1.8	1.8
Total material moved	Mt		1.8	1.9	2.7	3.0	3.0	3.0
Strip ratio, ore : waste			0.48	0.60	1.26	1.50	1.50	1.50
<b>Ore grade</b>								
Gold	g/t		1.33	1.00	0.86	0.72	0.72	0.72
Copper	%		0.17	0.16	0.16	0.15	0.15	0.15
<b>Contained metal, ore</b>								
Gold	oz		51,441	38,581	33,184	27,787	27,787	27,787
Copper	tonnes		2,020	1,920	1,881	1,843	1,843	1,843
<b>Ore sorting</b>								
Concentration ratio, feed:sorted			2.0	2.0	2.0	2.0	2.0	2.0
Gold and copper recovery			90%	90%	90%	90%	90%	90%
Sorted ore to offsite mill	Mt		0.60	0.60	0.60	0.60	0.60	0.60
Gold grade in sorted ore	g/t		2.40	1.80	1.55	1.30	1.30	1.30
Copper grade in sorted ore	%		0.30	0.29	0.28	0.28	0.28	0.28
<b>Contained metal, sorted ore</b>								
Gold	oz		46,297	34,723	29,866	25,008	25,008	25,008
Copper	tonnes		1,818	1,728	1,693	1,659	1,659	1,659
<b>Metallurgical recoveries</b>								
Gold			85%	85%	85%	85%	85%	85%
Copper			80%	80%	80%	80%	80%	80%
<b>Production</b>								
Gold	oz		39,237	29,428	25,311	21,195	21,195	21,195
Copper	tonnes		1,454	1,382	1,355	1,327	1,327	1,327
<b>Metals prices</b>								
Gold	US\$/oz		1,800	1,800	1,800	1,800	1,800	1,800
Copper	US\$/t		8,000	8,000	8,000	8,000	8,000	8,000
<b>Payability to Northgold</b>								
Gold			65%	60%	60%	60%	60%	60%
Copper			50%	50%	50%	50%	50%	50%
<b>Northgold revenues</b>								
	US\$ m		61.4	44.4	39.0	33.6	33.6	33.6
Gold	US\$ m		54.2	37.5	32.3	27.0	27.0	27.0
Copper	US\$ m		7.3	6.9	6.8	6.6	6.6	6.6
<b>Operating costs</b>								
	US\$ m		21.3	17.9	22.2	23.7	23.7	23.7
Mining, crushing and sorting costs	US\$ m		13.7	10.3	14.6	16.2	16.2	16.2
Unit mining cost	US\$/t		5.39	5.39	5.39	5.39	5.39	5.39
Unit crushing and sorting cost	US\$/t		2.33	2.33	2.33	2.33	2.33	2.33
Transport costs	US\$ m		7.6	7.6	7.6	7.6	7.6	7.6
Unit transport costs	US\$/t/km		0.3	0.3	0.3	0.3	0.3	0.3
<b>EBITDA</b>								
	US\$ m		40.2	26.5	16.9	9.9	9.9	9.9
Depreciation	US\$ m		1.9	1.9	1.9	1.9	1.9	1.9
<b>EBIT</b>								
	US\$ m		38.3	24.6	15.0	8.1	8.1	8.1
Tax, at 20%			7.7	4.9	3.0	1.6	1.6	1.6
<b>Cash flow post-tax</b>								
	US\$ m		32.5	21.6	13.9	8.3	8.3	8.3
<b>Capex, sustaining capex</b>								
	US\$ m		24.2	0.30	0.30	0.30	0.30	0.30
<b>Free cash flow</b>								
	US\$ m		(24.2)	32.5	21.3	13.5	8.0	8.0
<b>NPV<sub>5</sub>, post-tax</b>								
	US\$ m		91.2					
<b>IRR</b>								
			101%					

Source: Orior Capital estimates

## Key assumptions

### Permitting

Northgold is not fully permitted for the volumes of mining and waste material modelled herein. The company's current Mining Permit, conditional upon an Auxiliary Mining Permit for a road connection, allows for mining (including waste) of up to 0.5Mtpa. Further, the currently permitted area would only accommodate waste material from the first 4-5 years of production. Clearly, Northgold will have some additional permitting requirements as the project progresses. This is normal for a project at this stage of development; it would be highly unusual for a PEA stage project to be fully permitted.

### Mining pits

In August 2023, Northgold announced an updated Kopsa Mineral Resource Estimate. Within the resource, Northgold identified a starter-pit with some 1Mt ore with an average grade of 1.4 g/t Au and 0.17% Cu for 45,200 oz Au and 1,700 tonnes Cu, representing 53,500 oz AuEq. The starter-pit has a very low projected strip ratio of 0.36:1.0. In the modelling herein, this is the material mined in 'Stage 1' of the project.

**Figure 10: Assumed mining pits and resources for development scenarios**

	Resource Mt	Grade g/t Au	Grade % Cu	Contained metal Au, oz	Contained metal Cu, t	Strip ratio	Optimal	AuEq oz
Stage 1: Starter-pit	1.00	1.40	0.17	45,011	1,700	0.36		53,131
Stage 2: Expanded starter-pit	2.00	1.00	0.16	64,301	3,200	0.60		79,587
Stage 3: Remaining resource	13.59	0.72	0.15	314,688	20,870	1.96	1.5	414,682
<b>Kopsa total</b>	<b>16.59</b>	<b>0.79</b>	<b>0.16</b>	<b>424,000</b>	<b>25,770</b>	<b>1.7</b>		<b>547,400</b>

Note: Gold equivalent figures based on US\$1,500/oz Au and US\$3.25/lb Cu as per 2023 Mineral Resource Estimate

Source: Orior Capital estimates

It seems likely, and drill results indicate, that this starter-pit could be expanded, albeit at a lower grade and a higher strip ratio. A conceptual 'Stage 2' pit is modelled that contains 2Mt at an average grade of 1.0 g/t Au and 0.16% Cu, and which could be mined at a strip ratio of 0.6:1.0, which is two-thirds higher than that of the identified starter pit.

Stage 3 comprises most of the remainder of the current resource. Note that the modelling is not based on the current pit-constrained resource. One part of the PEA process will be to complete pit optimisations that will examine more intricate bench designs. These are aimed at including more gold and copper in the mine plan, and to lower the strip ratio, typically by using steeper pits. Ultimately, it is not uncommon for the vast majority of the resource to be mineable. An optimised strip ratio of 1.5:1.0 is assumed, once the Stage 1 and 2 pits are depleted. This is about 23% lower than the calculated strip for the current overall pit.

### Mining

At a mining rate of 1.2Mtpa, all of the Stage 1 pit is assumed to be mined in Year 1. The Stage 2 pit is mined from Year 1 through Year 3. From the middle of Year 3, mining is from Stage 3, the remainder of the existing resource.

### Mine life

A mine life of 13 years is assumed during which time some 15.6Mt is mined, representing 94% of the current resource.

### Low grade ore stockpiling

It is common in mining for lower grade ores to be stockpiled and higher grade ores processed first to improve near-term cashflows. This was discussed in Belvedere Resources' 2013 PEA and Kopsa seems amenable to this. At this stage, there is insufficient information to model the potential for grade improvements in the early years and no consideration is given herein to the potential for the stockpiling of low grade ore. Northgold is expected to examine this as part of the PEA process.

### Ore sorting

Belvedere conducted two phase x-ray sorting tests, comprising an initial process, and a re-processing of the first stage reject on four different size fractions of -40+32 mm, -32+20 mm, -20+12 mm and -12+8 mm. Overall, x-ray ore sorting rejected 64% of the mass whilst retaining 86% of the gold. Across the different size fractions, the mass rejected varied from 63% to 72%. Gold grades of the sorted ore varied from 4.53 g/t Au to 9.49 g/t Au, representing increases of 2.25x to 4.75x the gold grade of the tested sample which was approximately 2.0 g/t.

The tested sample had a low copper grade of approximately 0.06% Cu, and the x-ray sorting demonstrated only a minor upgrading. Belvedere commented that this may suggest a different mineral association between the sulphide species, e.g. arsenopyrite (containing Au) and Cu, and/or may be a reflection of the slightly finer average particle size of the Cu minerals.

**Figure 11: Belvedere Resources' sorting test results, 2013 Kopsa PEA**

Size Fraction (mm)	Sorting Method	Sample	Fraction Wt (%)	Assay			
				Cu (%)	S (%)	Au (g/t)	Ag (g/t)
+40	Optical	Product	43.4	0.054	0.44	1.10	1.0
		Reject	56.6	0.052	0.46	1.12	1.4
-40+32	X-Ray	Product	37.2	0.070	0.95	4.53	2.9
		Reject	62.8	0.055	0.34	0.42	0.6
-32+20	X-Ray	Product	37.3	0.078	1.13	4.74	2.3
		Reject	62.7	0.052	0.32	0.59	0.4
-20+12	X-Ray	Product	33.5	0.095	1.49	7.92	4.8
		Reject	66.5	0.054	0.31	0.39	1.6
-12+8	X-Ray	Product	27.9	0.093	1.61	9.49	1.8
		Reject	72.1	0.059	0.34	0.97	0.6
-8			-	0.100	1.27	3.97	3.1
Total				0.067	0.55	1.79	1.5

Source: Belvedere Resources

The two main types of ore at Kopsa are Au-As-Cu-bearing quartz veins and Cu-Ag disseminated sulphides. Sulphides can be recovered from quartz veins using x-ray sorting, though disseminated ore is more challenging to recover. At Kopsa, the combination of different sorting techniques and some newer technologies have yet to be tested. Electromagnetic sorters can detect pyrrhotite and chalcopyrite and maybe useful for disseminated ore. Also, near-infrared (NIR) lasers can detect quartz veins (which are transparent to IR) or the IR properties of the ore such as biotitisation or sericitization (Salesses 2017). Northgold is expected to examine the potential of these techniques as part of the PEA.

In the development scenario, it is assumed that x-ray sorting results in 50% of the mass being rejected, with 90% of both the gold and copper being recovered.

### **Metals recoveries**

Metals recoveries are assumed to be as in the 2013 PEA, that is 84.75% for gold and 80% for copper. Northgold's metallurgical testing over the next year or so should determine whether these recoveries can be improved upon.

### **Payability**

Northgold is expected to deliver sorted ores to a third party processor. The payability is the portion of the contained metals delivered that Northgold will be paid for. It is assumed that Northgold gets 65% payability when the delivered grade is above 2.0 g/t, and 60% payability when the sorted ore grade is between 1.0 g/t Au and 2.0 g/t Au. This has the effect of apportioning approximately three-quarters of the project EBITDA to Northgold, and allows for the third party mill to achieve a slightly less than three year payback. These figures would be subject to negotiation between Northgold and third party mill owner.

### **Third party mill operator**

The assumption is that processing is done at the Pyhäsalmi mill, which is located about 45km from Kopsa, and owned by First Quantum. According to First Quantum, underground copper and zinc resources at Pyhäsalmi were depleted, and mining ended, in 2022. The operation is now expected to produce approximately 330,000 to 350,000 tonnes of pyrite pa from pyrite rich tailings.

While Northgold rented the core shack at Pyhäsalmi for last year's drill program and uses the facility to store drill core, **no formal discussions have taken place for Northgold's ore to be processed at Pyhäsalmi.** As such there is no guarantee that processing at Pyhäsalmi will be possible. That said, processing third party ores would presumably keep the mill running. This could have the advantage of deferring considerable closure costs. Completion of the PEA next year is likely to be the starting point for these discussions.

### **Metals prices**

Constant prices of US\$1,800/oz gold and US\$8,000/t copper are assumed. These prices are considered conservative. The model is highly sensitive to metals prices.

### **Operating costs**

Mining and processing costs are also taken from the 2013 PEA. While costs have generally increased over the past decade there may be operational efficiencies that counter this impact.

Mining costs are assumed to be US\$5.39/t, driven by the assumptions in the 2013 PEA. This may turn out to be conservative. In November 2022, Rupert Resources published a PEA for its Ikkari gold project, in northern Finland. Rupert Resources envisaged a 3.5Mtpa operation with 11 years of open-pit mining followed by 11 years of underground mining from the bottom of the open-pit. Rupert Resources estimated open-pit mining costs at US\$2.51/t, though that is for larger scale equipment.

Corporate tax costs are assumed to be 20%, the corporate tax rate in Finland.

### **Capital expenditure**

The development scenario is based on upfront capital expenditure being the same as that in the 2013 PEA, which was US\$48.3m, including a 25% contingency, for a 1.2Mtpa operation with ore sorting. It is assumed that capex will be split 50:50 with the mill operator. Sustaining capex is assumed to be 2.5% of initial capex pa, with half borne by the mill operator.

### Sensitivity

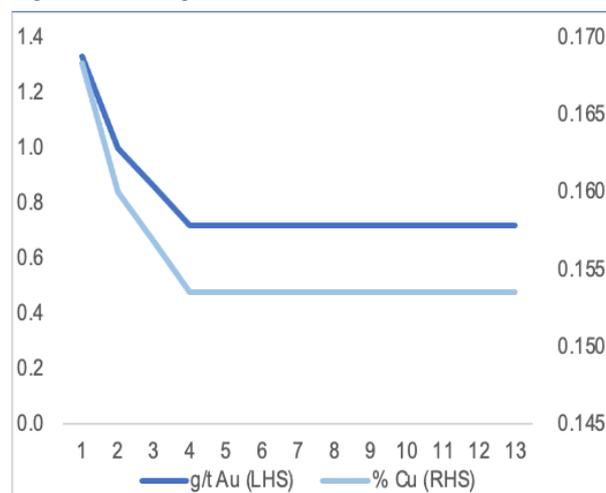
The development scenario is highly sensitive to changes in metals prices. A 25% increase in gold and copper prices to US\$2,250/oz Au and US\$10,000/t Cu would result in a 78% increase in the post-tax NPV<sub>5</sub> to US\$162.8m and an IRR of 154%. At current spot metals prices, the post-tax NPV<sub>5</sub> would increase by 22% to US\$111.7m with an IRR of 117%.

**Figure 12: Sensitivity analysis by scenario**

Metal price	Change from base case	-25%	0	+25%	+50%	Spot
Gold price	US\$/oz	1,350	1,800	2,250	2,700	1,950
Copper price	US\$/t	6,000	8,000	10,000	12,000	8,150
<b>Post-tax NPV<sub>5</sub></b>	<b>US\$ m</b>	<b>19.8</b>	<b>91.2</b>	<b>162.6</b>	<b>233.9</b>	<b>111.7</b>
Post-tax NPV <sub>5</sub>	Change from base case, %	-78	0	+78	+156	+22
Post-tax IRR	%	39	101	154	207	117

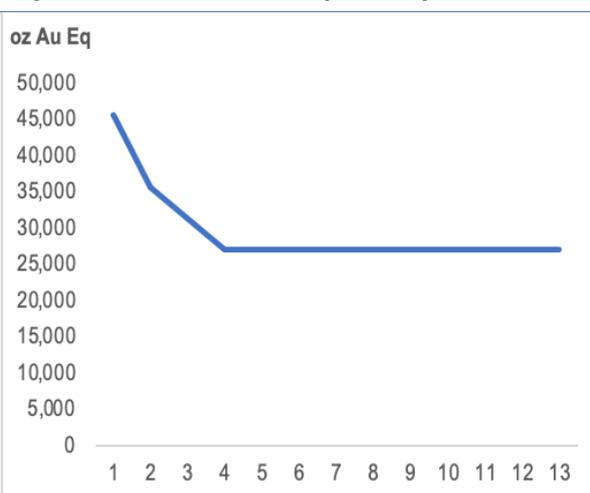
Source: Orior Capital estimates

**Figure 13: Ore grades**



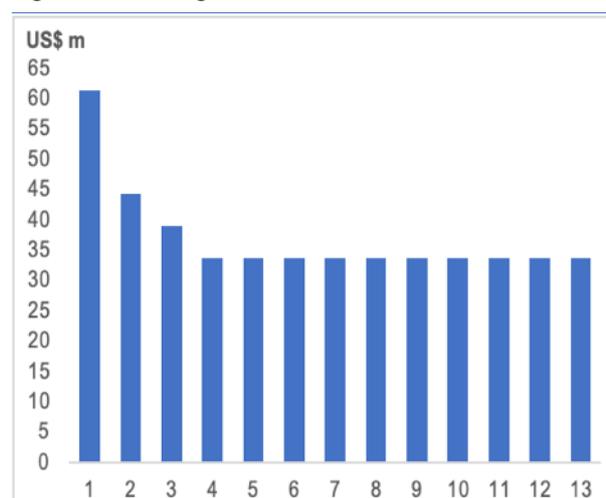
Source: Orior Capital estimates

**Figure 14: Production, AuEq, model prices**



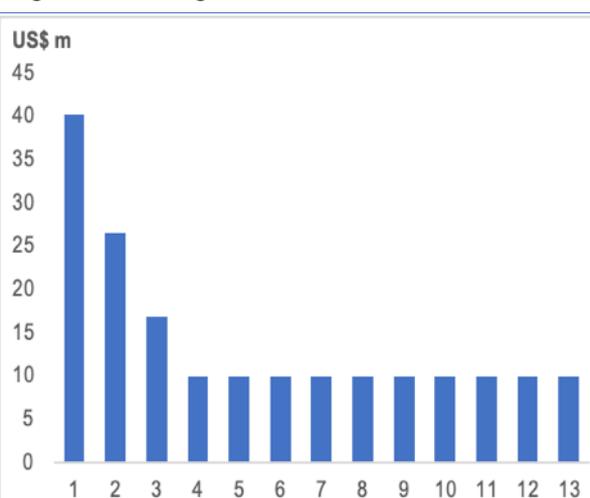
Source: Orior Capital estimates

**Figure 15: Northgold revenues**



Source: Orior Capital estimates

**Figure 16: Northgold EBITDA**



Source: Orior Capital estimates

## Kopsa: substantial resource upside potential

- Kopsa is Northgold's flagship asset with a Mineral Resource of 547,400 oz AuEq, achieved after just 18,500m of drilling
- The project boasts a conditional mining licence; award of the auxiliary mining permit, expected 4Q23, would be viewed as a major de-risking of the project
- Assay results from the first three drill holes of the 2023 drilling and IP survey results suggest there is potential to develop a substantial project at Kopsa

Kopsa is an advanced stage gold-copper exploration asset and Northgold's flagship project. It is located some 400km north of Helsinki, and about 8km by road northwest of the town of Haapajärvi, in central Finland. The project boasts a current resource of 547,400 oz AuEq and has substantial upside potential both to the main mineralisation and in more copper rich mineralisation at depth. The project has a conditional mining area licence, and an auxiliary mine area permit is pending approval. Previous owner Belvedere Resources completed a PEA in 2013, and substantial metallurgical testing has been completed. **Northgold released, November 2023, excellent results from three step-out drill holes, and is expected to release assays from the remaining 2023 drill holes this quarter. Management targets a PEA by 4Q24.**

### Significant resource

Northgold reported its maiden Mineral Resource Estimate for the Kopsa project in August 2023. The Resource is based on the 25 drill holes for 4,200m that Northgold completed in 2022, and 14,300m of historical drilling.

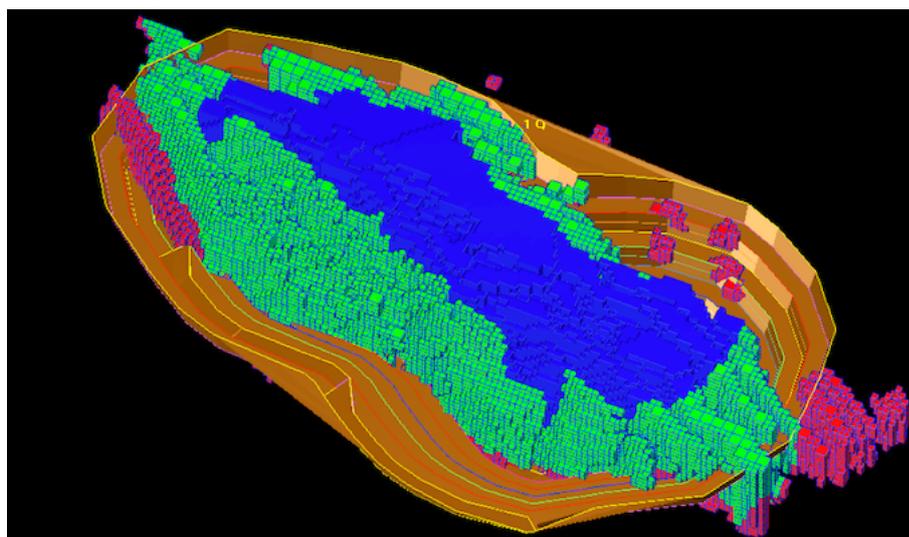
In 2012, Belvedere Resources released a Mineral Resource Estimate for Kopsa of 8.48 Mt at a grade of 1.23 g/t AuEq for 334,509 oz AuEq, that was prepared on similarly conservative assumptions and which represents a good comparison. **The Northgold 2023 Resource represents a substantial increase from these historical figures.** Northgold has increased the Measured and Indicated tonnage by 121% and the Measured and Indicated gold-equivalent resource by 79%. Overall, the resource tonnage has almost doubled with the gold-equivalent resource increasing by 64%. In the Northgold 2023 MRE, 90% of the gold-equivalent resources are in the Measured and Indicated categories, up from 82% previously. Overall, the work completed by Northgold to date has resulted in a substantial increase in, and a significant de-risking of, the Kopsa resource.

**Figure 17: Kopsa 2023 Mineral Resource Estimate**

Resource category	Tonnes Mt	Grade		AuEq g/t	Contained gold oz	Contained copper tonnes	Contained gold-equiv. AuEq oz
		Au g/t	Cu %				
Measured	6.06	0.91	0.16	1.15	178,100	9,720	224,600
Indicated	8.70	0.74	0.15	0.96	205,800	13,100	268,500
<b>M&amp;I</b>	<b>14.76</b>	<b>0.81</b>	<b>0.15</b>	<b>1.04</b>	<b>383,900</b>	<b>22,820</b>	<b>493,200</b>
Inferred	1.83	0.68	0.16	0.92	40,100	2,950	54,300
<b>Total</b>	<b>16.59</b>	<b>0.79</b>	<b>0.16</b>	<b>1.03</b>	<b>424,000</b>	<b>25,770</b>	<b>547,400</b>

Source: Northgold

**Figure 18: Block model for pit constrained portion of resource, with Measured (blue), Indicated (green) and Inferred (red)**



Source: Northgold

**Figure 19: 2023 and 2012 Kopsa Mineral Resource Estimates**

Resource parameters		Northgold	Belvedere Resources	Change
		2023	2012	
<b>Measured</b>				
Resource tonnes	Mt	6.06		
AuEq grade	g/t	1.15		
Contained gold-equiv.	oz AuEq	224,600		
<b>Indicated</b>				
Resource tonnes	Mt	8.70	6.68	
AuEq grade	g/t	0.96	1.28	
Contained gold-equiv.	oz AuEq	268,500	274,902	
<b>Measured and Indicated</b>				
Resource tonnes	Mt	14.76	6.68	121%
AuEq grade	g/t	1.04	1.28	
Contained gold-equiv.	oz AuEq	493,200	274,902	79%
<b>Inferred</b>				
Resource tonnes	Mt	1.83	1.80	
AuEq grade	g/t	0.92	1.03	
Contained gold-equiv.	oz AuEq	54,300	59,607	
<b>Total</b>				
Resource tonnes	Mt	16.59	8.48	96%
AuEq grade	g/t	1.03	1.23	
Contained gold-equiv.	oz AuEq	547,400	334,509	64%
<b>Assumptions</b>				
Gold price	US\$/oz	1,500	1,200	
Copper price	US\$/t	7,165	6,000	
Cut-off grade	g/t AuEq	0.3	0.4	

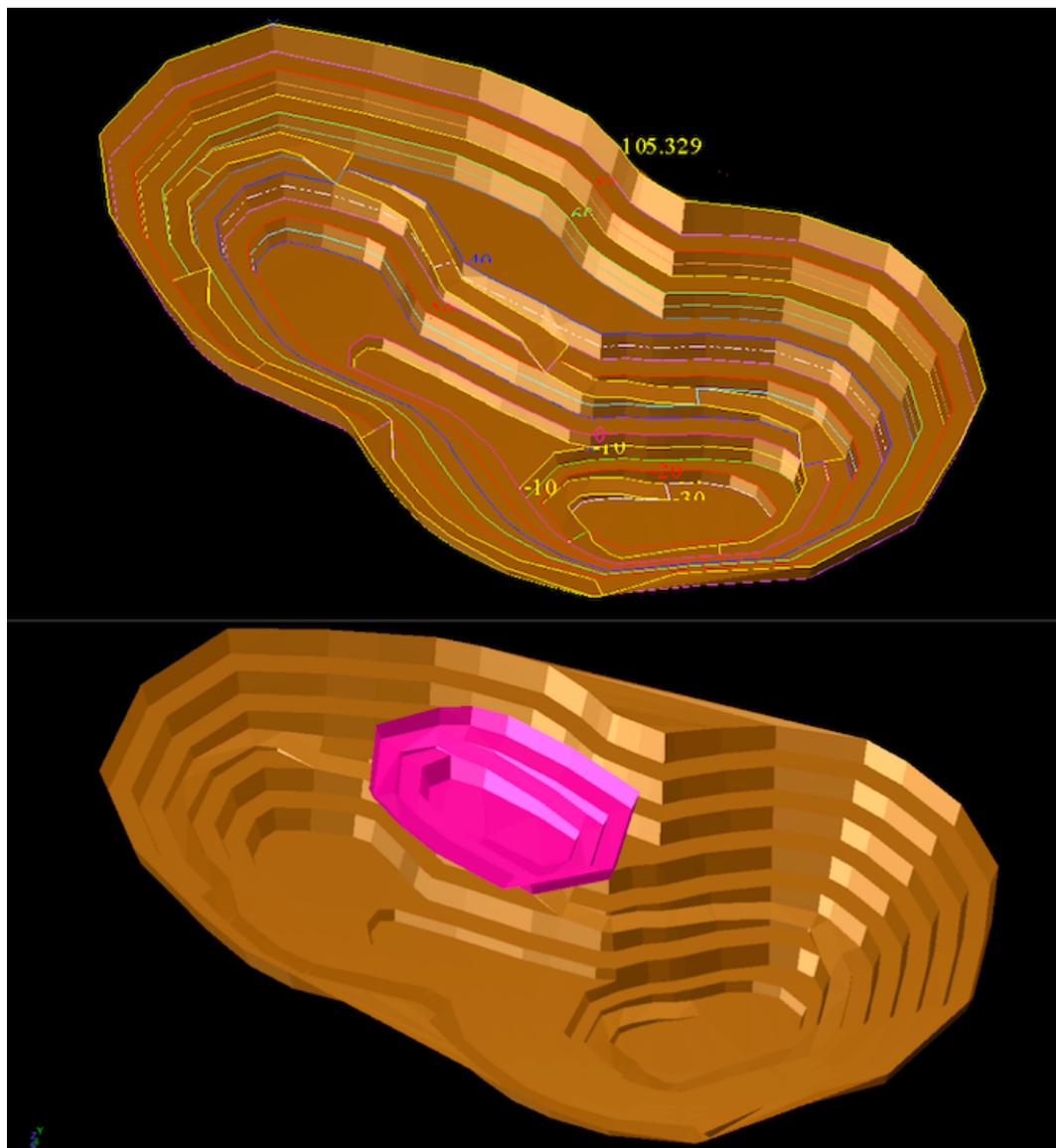
Source: Northgold, Belvedere Resources, Orior Capital Estimates

Belvedere Resources Kopsa Mineral Resource Estimate 2012  
<https://www.globenewswire.com/news-release/2012/10/29/1411311/0/en/Belvedere-Announces-Mineral-Resource-Estimate-for-Kopsa-Gold-Copper-Project-Finland.html>

### Starter-pit

Within the Mineral Resource Estimate management has identified a higher-grade starter-pit comprising 1Mt at 1.40 g/t Au and 0.17% Cu for 45,200 oz Au and 1,700 tonnes Cu. This represents 53,500 oz AuEq at a grade of 1.65 g/t AuEq. **Advantageously, this pit would have an ultra-low strip ratio of just 0.36.** Some 96% of the starter-pit material is in the Measured category.

Figure 20: Kopsa 2023 MRE's un-optimized open pit shell and starter-pit shell



Source: Northgold

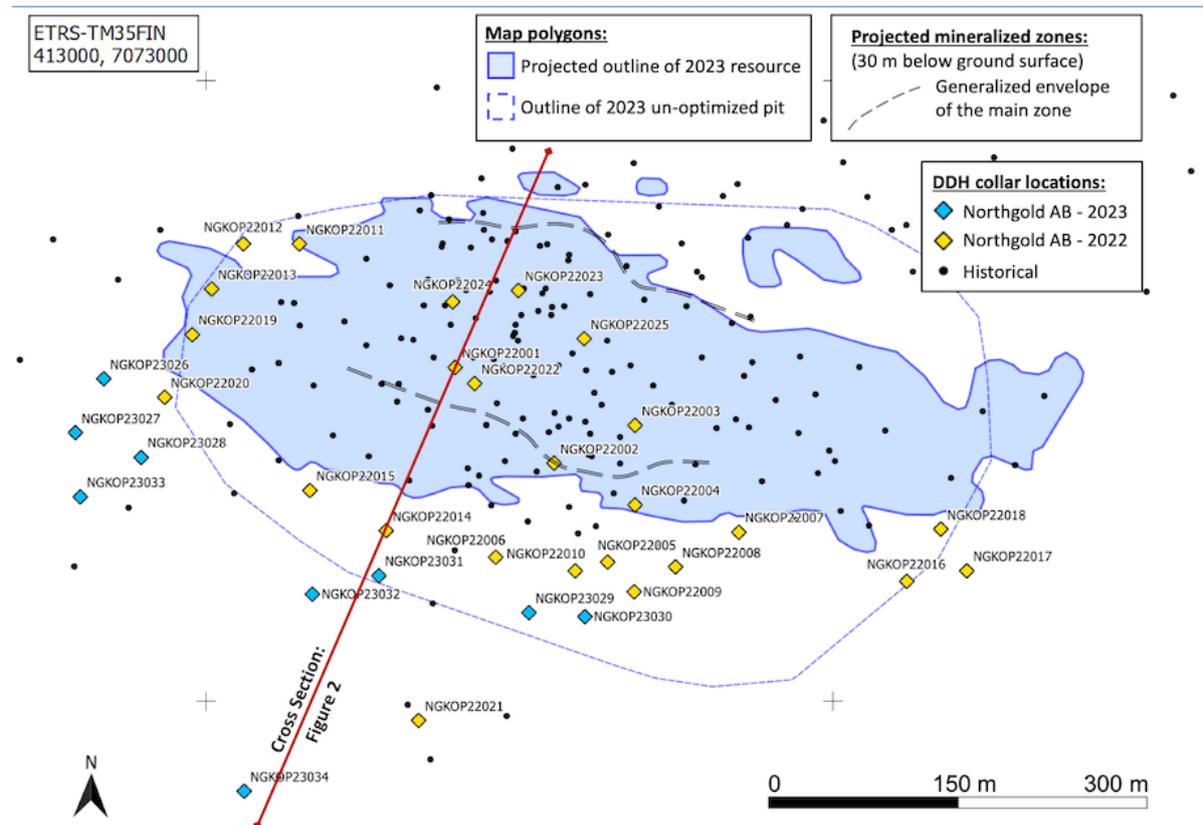
### Upside potential

There is substantial resource upside potential at Kopsa. The two areas of focus are potential extensions to the main zone of mineralisation, which remains open to the south at depth, and the potential for copper porphyry style mineralisation at depth. Little exploration has been conducted on the significant low-resistivity IP anomaly within the footwall, below and to the north of the main zone. Both areas are highly prospective for increases in resources.

## 2023 drilling; excellent results, further assays pending

In 2023, Northgold drilled a further nine holes, for a total of 1,993m that were designed to expand the resource to the southeast and southwest. So far, the company has reported excellent results for three important step-out drill holes (gold results on 20 September and copper results on 2 November). Assays for the remaining 6 holes at Kopsa are expected to be released this quarter.

**Figure 21: Drill hole locations, Kopsa 2023 MRE, and un-optimized pit outline**



Source: Northgold

### Drill hole NGKOP23034

Drill hole NGKOP23034 was drilled along trend of the expected extension of the main mineralised core of the resource, some 200m south-southwest of holes NGKOP23031 and NGKOP23032, and more than 250m south-southwest of the current resource area. The hole was designed to test the mineralised zone at new depths down to 275m vertical depth. (The current resource has a vertical depth of 125m). **NGKOP23034 intersected the main zone mineralisation over two wide intervals at depth, together spanning more than 72m. The results extend the mineralised zone to a vertical depth of more than 250m, double that of the existing resource.** Key intercepts include:

- 0.99 g/t AuEq (0.78 g/t Au and 0.14% Cu) over 105.7m from 208.2m (154.7m vertical depth) including:
  - 1.41 g/t AuEq (1.17 g/t Au and 0.16% Cu) over 34.2m from 208.2m (154.7m vertical depth) which includes 4.77 g/t AuEq (4.28 g/t Au and 0.33% Cu over 4.25m from 209.6m (155.8m)
- and
- 1.34 g/t AuEq (1.03 g/t Au and 0.21% Cu) over 37.75m from 276.15m (205.2m vertical depth) which includes 3.17 g/t AuEq (2.55 g/t Au and 0.42% Cu) over 7.95m from 299.65m (222.7m)

### Drill hole NGKOP23032

NGKOP23032 was drilled approximately 100m SSW of the 2023 resource outline. It intersected main zone mineralisation in two intervals that together span 60m along hole. Key results include:

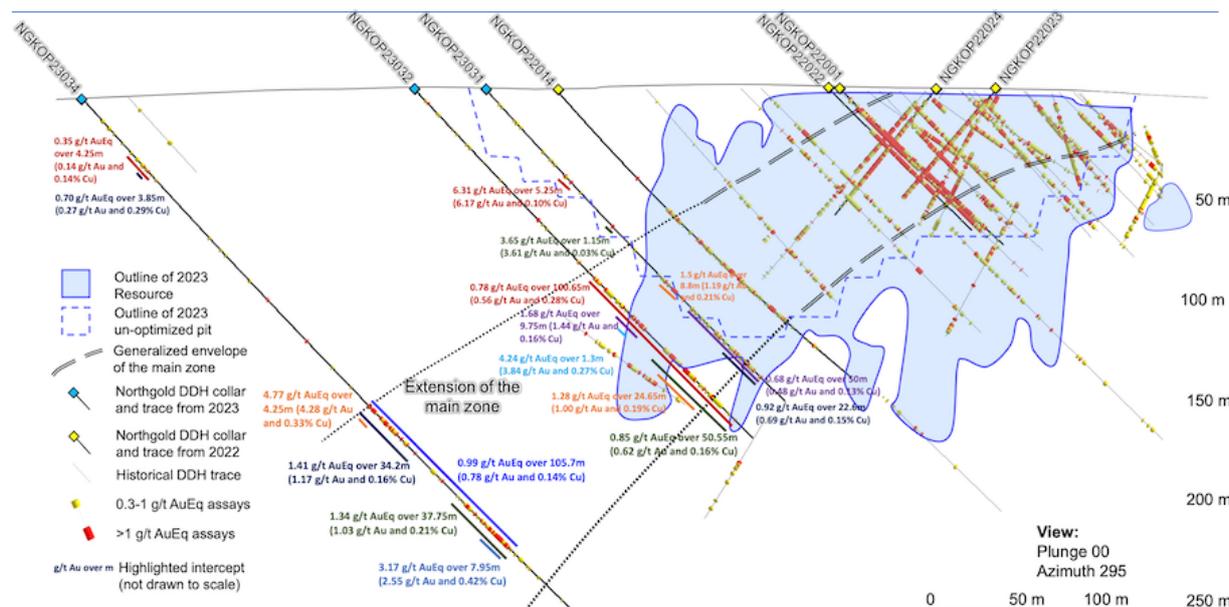
- 0.78 g/t AuEq (0.56 g/t Au and 0.14% Cu) over 100.65m from 129.25m (96.1m vertical depth) including:
  - 1.68 g/t AuEq (1.44 g/t Au and 0.16% Cu) over 9.75m from 156.25m (116.1m vertical depth) which includes 4.24 g/t AuEq (3.74 g/t Au and 0.27% Cu) over 1.3m from 159.7m (118.7m)
- and
- 0.85 g/t AuEq (0.62 g/t Au and 0.16% Cu) over 50.55m from 179.35m (133.3m vertical depth) which includes 1.28 g/t AuEq (1.00 g/t Au and 0.19% Cu) over 24.65m from 183.35m (136.3m)

### Drill hole NGKOP23031

NGKOP23031 was drilled approximately 75m SSW of the 2023 resource outline. It intersected main zone mineralisation in two intervals that together span 31m along hole. Key results include:

- 6.31 g/t AuEq (6.17 g/t Au and 0.10% Cu) over 5.25m from 57.15m (41.8m vertical depth) which includes 21.06 g/t AuEq (21 g/t Au and 0.04% Cu) over 0.85m from 57.15m (41.8m)
  - 3.65 g/t AuEq (3.61 g/t Au and 0.03% Cu) over 1.15m from 91.65m (67.0m vertical depth)
  - 1.50 g/t AuEq (1.19 g/t Au and 0.21% Cu) over 8.8m from 130.1m (95.1m vertical depth) which includes 3.17 g/t AuEq (2.6 g/t Au and 0.38% Cu) over 2.4m from 135.7m (99.2m)
- and
- 0.68 g/t AuEq (0.48 g/t Au and 0.13% Cu) over 50m from 148.6m (110.4m vertical depth) which includes 0.92 g/t AuEq (0.69 g/t Au and 0.15% Cu) over 22.6m from 176m (128.7m)

**Figure 22: Cross section (60m wide) looking W-NW showing assay results for NGKOP23031, NGKOP23032 and NGKOP23034 relative to the Kopsa 2023 MRE and previously reported drill results**



Source: Northgold

**Taken altogether, the results from these three drill holes suggest there is significant potential for resource expansion at depth.**

Management had previously noted that relatively intense quartz veining and/or silicic alteration with sulphide mineralisation is observed in drill hole NGKOP23034 over two intervals from 209m to 237m down hole (153m to 173m vertical depth) and from 276m to 311m down hole (202m to 228m vertical depth), and that this is particularly notable from 302m to 309m down hole. Visually, the core from these intervals appears consistent with previous results including:

- NGKOP22022: 7.2m grading 5.91 g/t Au and 0.29% Cu from 32.8m and
- NGKOP22024: 1.9m grading 5.27 g/t Au and 0.11% Cu from 125.2m

These visual observations are now confirmed by assay results.

Management also said that more moderately intense quartz veining and/or silicic alteration with sulphide mineralisation (suggesting more modest grades) was observed in drill hole NGKOP23034 to a depth of some 375m down hole (275m vertical depth) and in various other drill holes and at various depths. This includes in drill holes NGKOP23026, 23027, 23028, and 23033 which targeted shallow southwest extensions to the main mineralised zone and in NGKOP23029 and 23030 which targeted shallow southeast extensions to the main mineralised zone.

**Figure 23: Photographs of drill core from deep drill hole NGKOP23034 at Kopsa and drill core from holes NGKOP22022 and NGKOP22014**



Source: Northgold

### Potential for more copper-rich mineralisation at depth

In 2022, Northgold completed an induced polarisation (IP) geophysical survey that identified a resistivity anomaly beneath, northeast and south of the Kopsa deposit. This is hypothesized to be associated with a more copper-rich style of mineralisation that is analogous with copper-porphyry types of deposit such as at Boliden’s Aitik mine in northern Sweden, on the northern part of the Fennoscandian Shield. In 2022, Aitik had ore reserves of 1.13 billion tonnes grading 0.23% Cu and 0.16 g/t Au. The mine has been in production since 1962. At Kopsa, the higher gold grades nearer surface are believed to result from the overprinting of orogenic style gold mineralisation.

In May 2023, Northgold drilled two holes targeting the resistivity anomaly beneath the deposit (drill hole **NGKOP22010-deep**) and south of it (**NGKOP22021**). Three intercepts were reported with an average gold grade 0.92 g/t Au. The average copper grade was 0.4% Cu, 2.5x that of the 2023 MRE.

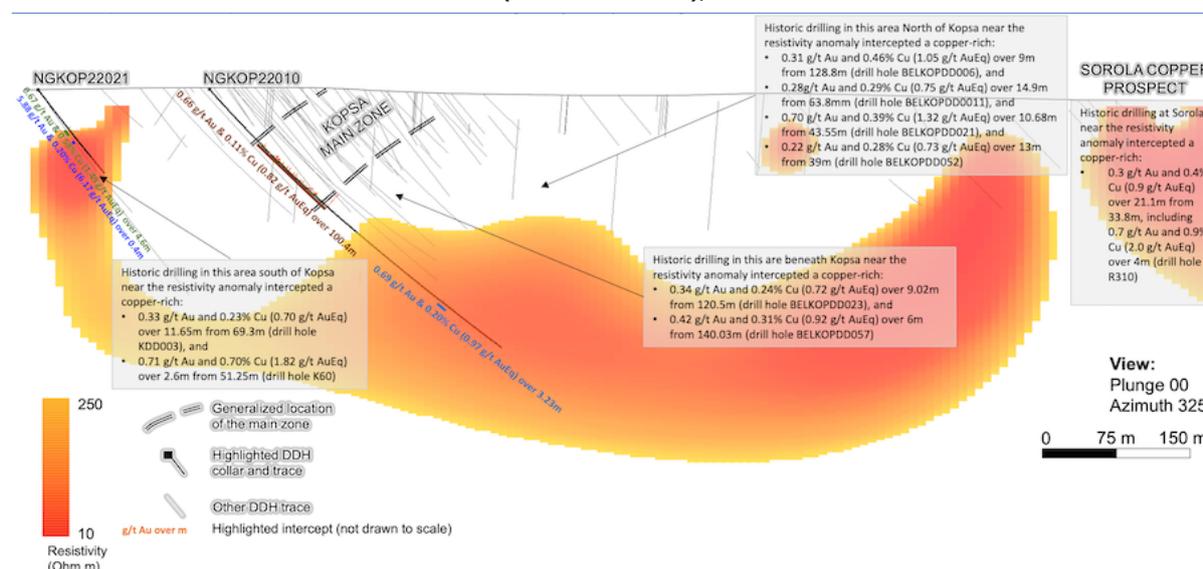
### Northgold is planning additional geophysical surveys this year to help define drill targets.

**Figure 24: Copper assays from two drill holes that targeted a resistivity anomaly**

Drill hole	From m	To m	Interval m	Gold grade g/t Au	Copper grade % Cu	Gold-equiv. grade g/t AuEq	Copper share of metal value
NGKOP22020-deep	332	335.65	3.65	0.69	0.2	0.97	29%
NGKOP22021	55.9	60.5	4.6	0.67	0.58	1.49	55%
NGKOP22021	70.5	70.9	0.4	5.88	0.20	6.17	5%
<b>Weighted average</b>			<b>2.9</b>	<b>0.92</b>	<b>0.4</b>	<b>1.48</b>	<b>42%</b>

Source: Northgold

**Figure 25: Cross section looking W-NW showing IP survey results and gold and copper assay results for drill holes NGKOP22021 and NGKOP22010 (150m wide slice), and select historic drill results**

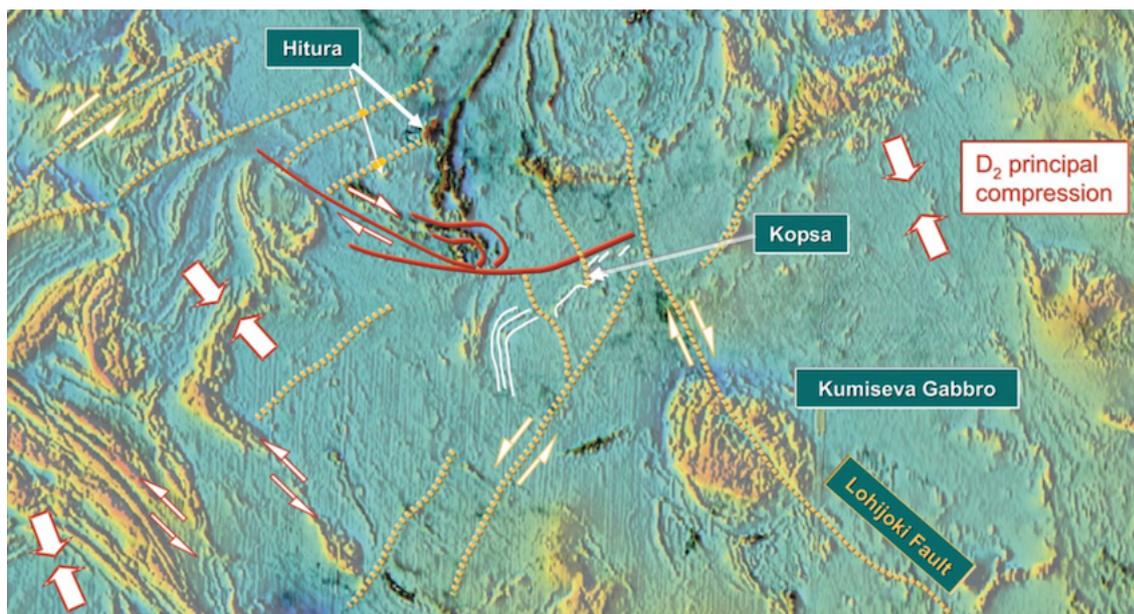


Source: Northgold

## Geology and mineralisation

Kopsa is located towards the southern corner of the Raahe-Haapavesi area, and about 30km SSE of the Kiimala Trend project. The deposit is hosted by the Proterozoic late orogenic Kopsa Tonalite, an intrusive body that is controlled by the intersection of NE and NW trending faults, and older volcano-sedimentary intrusions of greywackes, mica shists and intermediate pyroclastic rocks interpreted as turbidite sequences (Gaál and Isoanni, 1979, Pym et al. 2012). The whole sequence has been metamorphosed to upper-greenschist to amphibolite facies (Belvedere Resources, 2012).

**Figure 26: Structural setting of the Kopsa Tonalite.**



**Note:** Gradient enhanced regional magnetic data with grayscale real component (GTK Image Web Server). Yellow dotted lines are inferred NW-dextral faults that may correlate with the Lohijoki Fault. Note also the complementary sinistral offsets on NE trends. Several small ultramafic bodies, including past-producing Hitura are aligned along these trends. If this is a reflection of more mafic magmatism at depth, this implies both a potential thermal source and fault network for late orogenic fluids (from Sorjonen-Ward, 2004 and 2005).

**Source:** Northgold

Kopsa is the second largest gold resource within the highly prospective Middle Ostrobothnia Gold Belt after Laiva, which is situated approximately 100km to the north and which has more than 400,000 oz gold, as well as copper and silver. Mineralisation at Kopsa is associated with arsenopyrite-bearing quartz and sulphide veins, strings and blebs, which occur as a high density stockwork in the Main Zone of mineralisation. The ore body has so far been defined over a strike length of some 700m, and a down-dip extent of approximately 200m. It has a maximum thickness of about 50m. The body dips about 20° to the SSW. The major sulphides are arsenopyrite, chalcopyrite, and pyrrhotite. Gold occurs as free grains typically about 10µm in size.

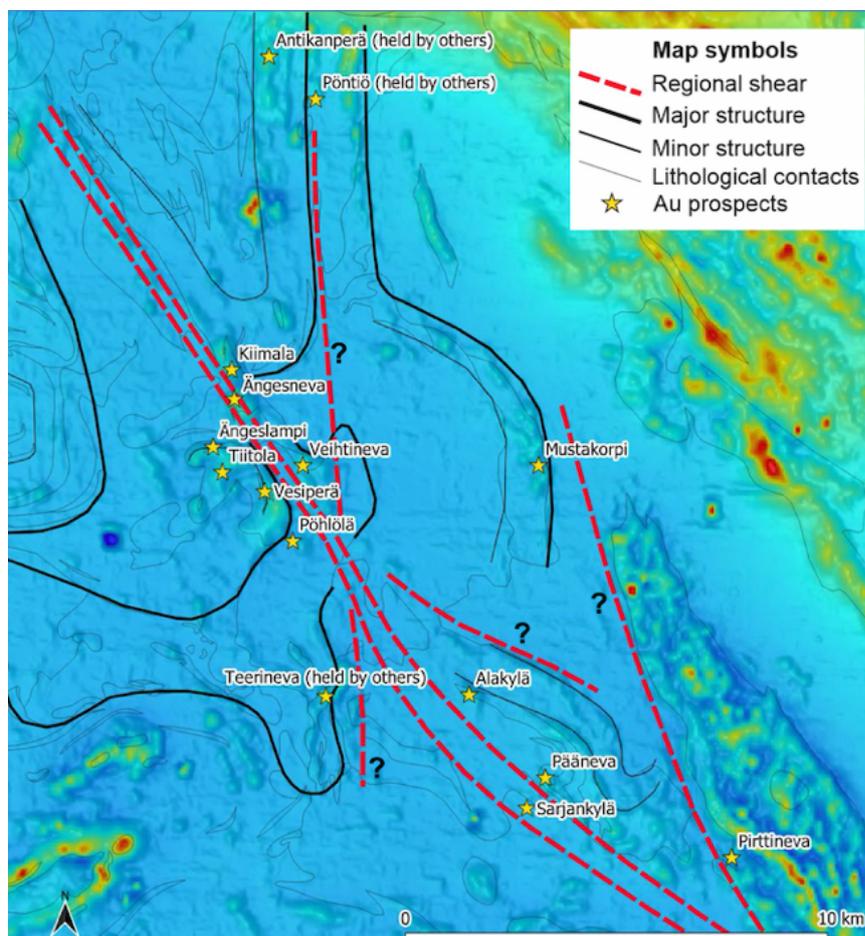
The mineralisation is exposed at surface and much of the mineralisation lies at or just below surface making the deposit amenable to an open-pit start with low strip-ratios.

## Kiimala Trend: district scale, underexplored

- Kiimala Trend is a 15km mineralised trend along regional fault structures that has returned multiple compelling intercepts but which remains underexplored
- Ängesneva, the most advanced prospect, boasts a current resource of 147,300 oz gold and remains open at depth and in parallel structures
- There are numerous mineralised prospects along the trend; ultimately, Northgold will hope to 'connect the dots' and develop a substantial project

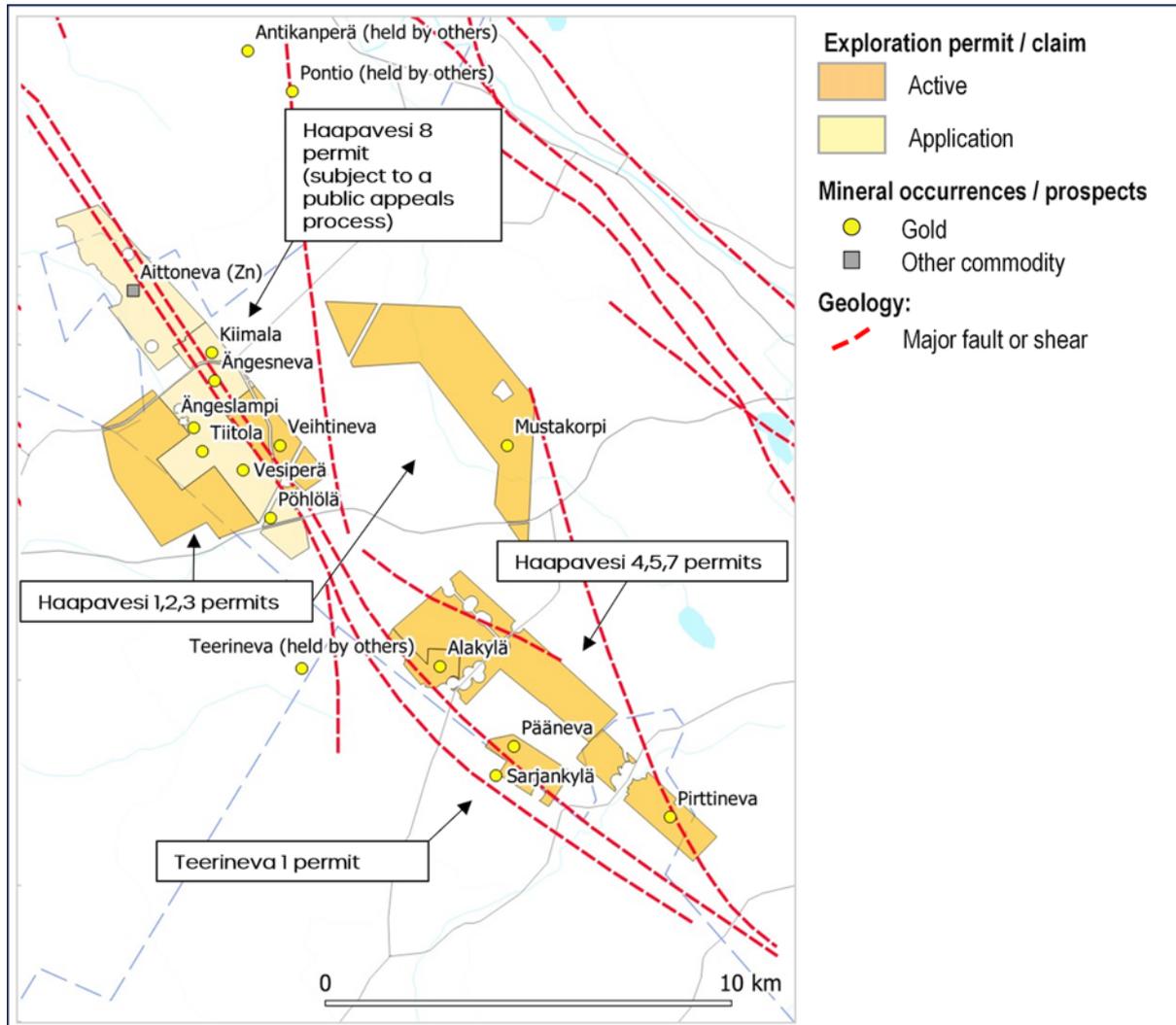
The Kiimala Trend is situated about 50km north of Kopsa, and about 65km from the Finnish coast in the Haapavesi community. The various properties are easily accessible by gravel roads from the sealed roads that connect the towns of Haapavesi with Ylivieska and Nivala. The project encompasses more than 15km of a mineralised trend. The area hosts a number of known gold deposits and prospects that occur intermittently along or offset from the regional fault structures. The largest known deposit at Ängesneva hosts a current resource of 147,300 oz Au. Further work is needed to better understand the mineralisation, yet historical drilling and the substantial strike length suggest excellent prospects to further develop the project.

**Figure 27: Preliminary interpretation of regional structures at Kiimala Trend, showing gold prospects, lithological contacts from the Finland Bedrock dataset, and low-altitude aeromagnetic mapping**



Source: Northgold

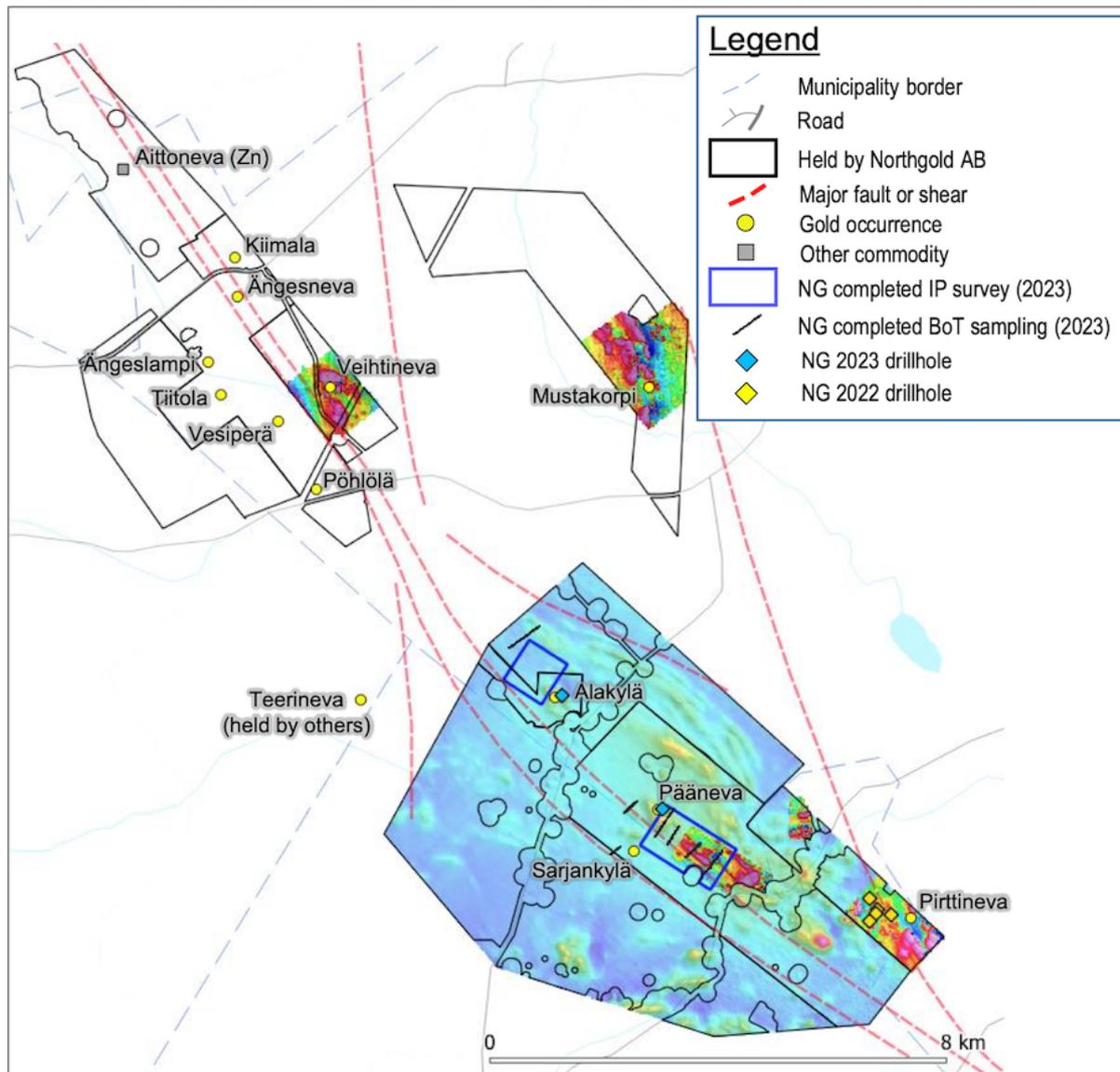
**Figure 28: Kiimala Trend current tenement map**



Source: Northgold

Northgold has commenced work at the southeastern end of the project area completing four drill holes at Pittineva in 2022. The company also drilled one hole at each of Alakylä and Pääneva in 2023, for which assays are pending, and has collected 191 base-of-till and top of rock samples at these locations.

**Figure 29: Kiimala Trend project area map showing exploration activities completed in 2023**



Source: Northgold

### Ängesneva

Ängesneva hosts an Indicated Resource of 147,300 oz at an average grade of 1.19 g/t gold. The resource estimate was released by Belvedere Resources in 2011 and calculated based on the guidelines of JORC 2004. The deposit was discovered by GTK in 1986 during a program of bottom-of-till sampling, excavations and bedrock sampling that was targeting geophysical and geochemical anomalies. Exploration and resource delineation work has been carried out by GTK, Endomines, and most recently Belvedere Resources.

**Figure 30: Mineral resource estimate at Ängesneva**

Category	Mt	Au (g/t)	Au (oz)
Indicated, and Total	3.85	1.19	147,300

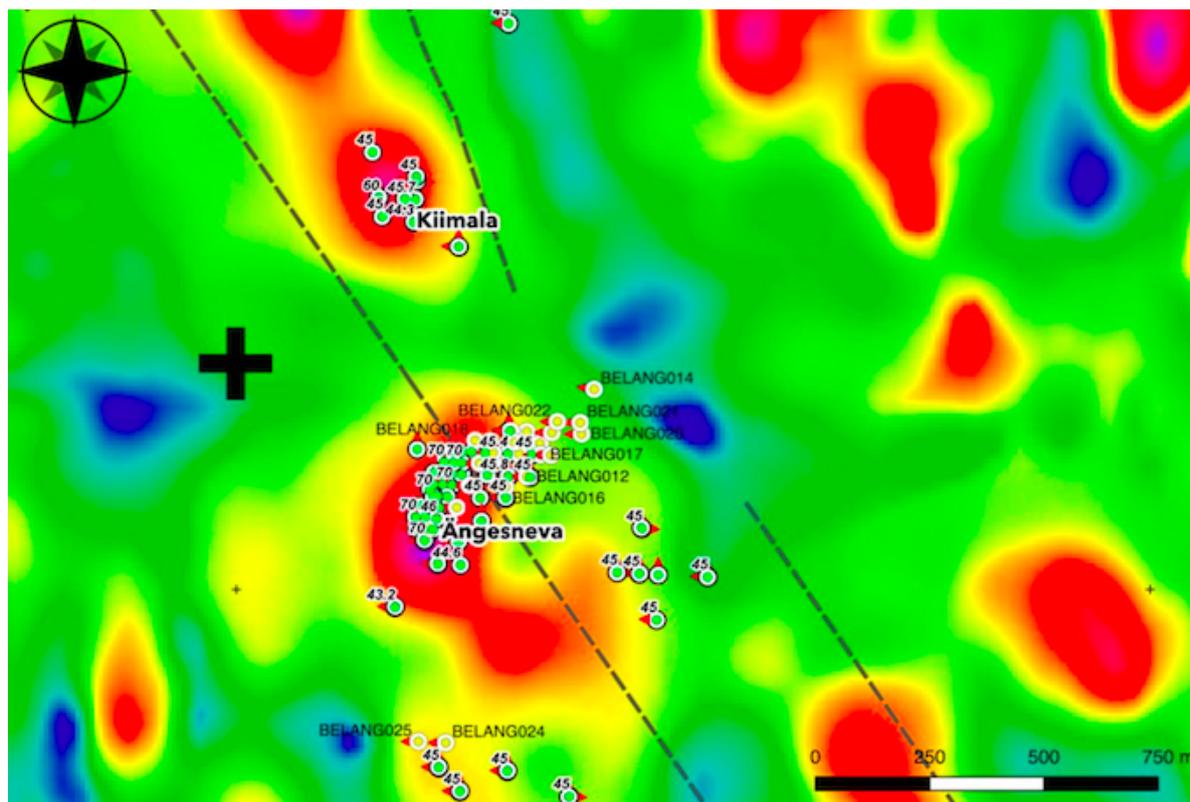
Source: Northgold

The deposit is a Paleoproterozoic orogenic gold deposit that comprises a set of near parallel SW-NE trending shear zones with quartz and sulphide bearing lodes and massive sulphide breccias. These

shears run between parallel NW-SE trending crustal scale (>100km) shear zones that form part of the Raahe-Ladoga suture zone.

The mineralised lenses plunge 40° to the northeast and dip steeply at 70-80° to the southeast. Mineralisation typically occurs as interconnected quartz veins and sulphides in the plagioclase porphyry, altered by hydrothermal solutions. Quartz-sericite alteration has been noted to be particularly strong in association with shear zones developed in the porphyry (Kojonen et al. 1991, Sipilä 1990, Västi 1991).

**Figure 31: Ängesneva and adjacent Kiimala gold deposit drilling collars shown on geocoded pole reduced magnetic total field map**



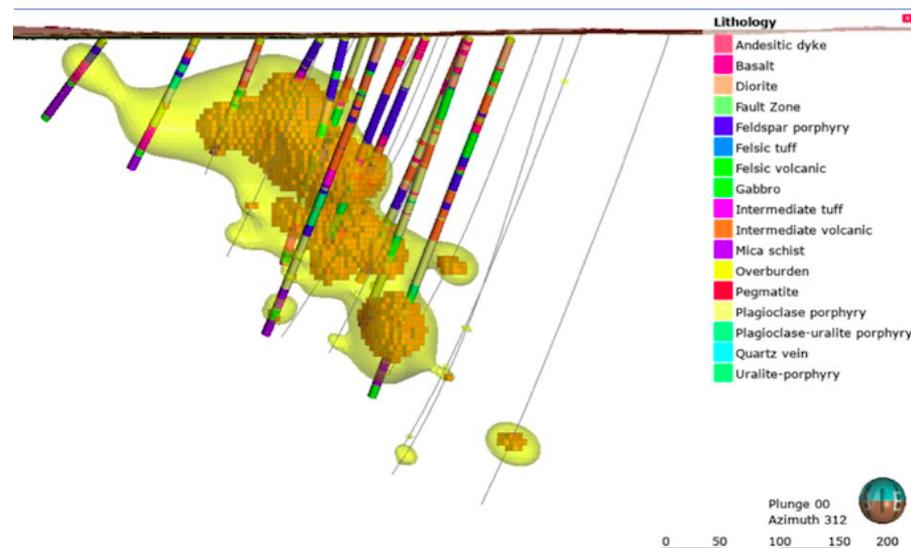
Source: Northgold

Historical drilling has returned both significant and high-grade intersections including:

- BELANG004: 122.4m at 1.52 g/t Au from 57m downhole depth
- BELANG009: 79.8m at 1.85 g/t Au from 127.82m
- BELANG008: 15.25m at 5.26 g/t Au and 0.3% Cu from 272.87m
- R386: 1.45m at 10 g/t Au from 52.85m
- R395: 7.35m at 5.45 g/t Au from 6.8m

So far, mineralisation has been defined over a strike length of some 370m, and down to a vertical depth of more than 250m at the northern end. The body has a true thickness of 50-60m.

**Figure 32: New block model (Northgold, 2020) for Ängesneva with 1 ppm Au cut-off and grade estimation shell of 0.52 ppm Au together with a simplified geological log are shown**



**Source: Northgold**

Ängesneva is open at depth and also in other parallel echelon structures. The intercept in drill hole BELANG008 suggests grades increase at depth where very little drilling has been completed. Further, the northern most drill hole, BELANG014 intersected 19.17m at 1.37 g/t Au from 405.45m downhole depth. This appears to identify a separate parallel mineralised structure and requires follow-up.

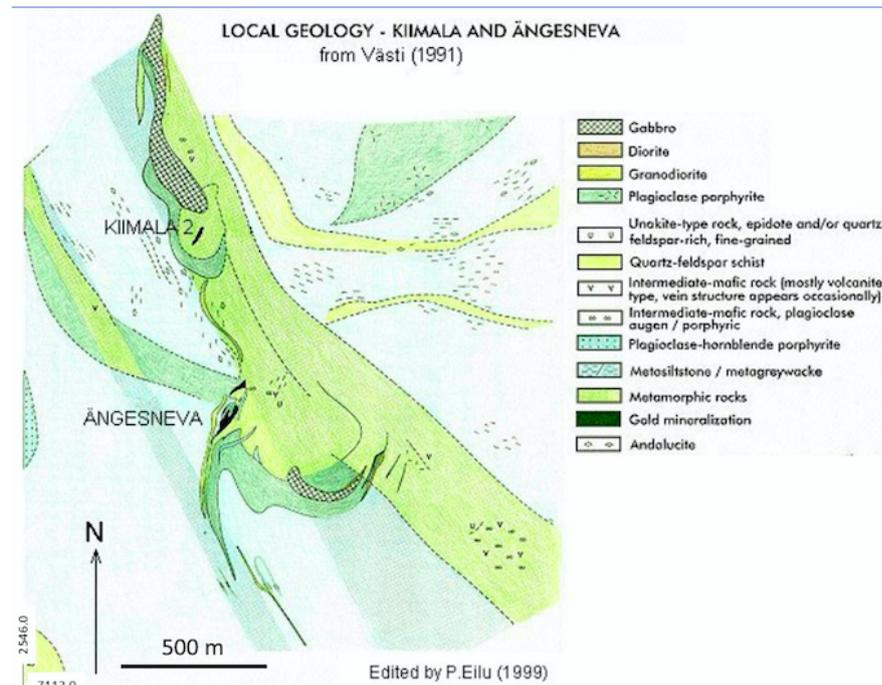
### **Kiimala**

The Kiimala prospect is situated some 700m north of Ängesneva. As with many of the gold occurrences in the region, it was discovered by GTK in the mid-1980s. GTK carried out bedrock mapping, till sampling and numerous ground geophysical surveys including gravity, magnetics, horizontal loop electromagnetics, and IP/resistivity between 1984 and 1991. Kiimala comprises stockwork veins and massive sulphide breccias in a set of parallel minor shear zones hosted in altered plagioclase porphyry.

In 1988-1989, GTK conducted an 11 drill hole program for 1,217m. Some 93 samples were assayed with 20 of them returning 1.0 g/t Au or better. The best intersections were:

- Drill hole 2433/-88/R390: 17.25m at 0.23 g/t Au, 0.29% Cu and 0.29% Zn, from 42.6m and
- Drill hole 2433/-89/R425: 1m at 9.0 g/t Au from 182.4m (Västi 1991)

**Figure 33: Local geology of the setting of Kiimala and Ängesneva Au deposits. After Eilu (1999), originally by Västi (1991)**



Source: Northgold

### Vesiperä

Vesiperä, discovered in 1984, is located some 2km SSW of Ängesneva. An amateur prospector discovered an arsenopyrite-rich outcrop sample that assayed 75 g/t gold, and follow-up work by Outokumpu led to a discovery of a major lode 250m SSE from the original finding.

Mineralisation consists of several sub-parallel lodes in the plagioclase porphyrite. Mineralisation occurs in quartz veins within shear zones that contain abundant arsenopyrite, and also in low sulphide shear bands that may still contain substantial gold. As with other deposits within the Middle Ostrobothnia Gold Belt, Vesiperä is interpreted to be a mesothermal orogenic deposit with strong structural controls.

Numerous ground geophysical surveys were undertaken in the area in 1985-1989. It is noted the Vesiperä mineralisation shows up well in IP chargeability surveys. The magnetic porphyrite body demonstrates an IP indication 400m long on the western margin and 600m long on the eastern margin. GTK took 900 bedrock samples along traverses 50m apart, sampling every 5-10m. The results of this helped define a 35 drill hole program for 2,198m carried out in 1986-1988. Key intercepts include:

Drill hole R307: 5m at 9.4 g/t Au

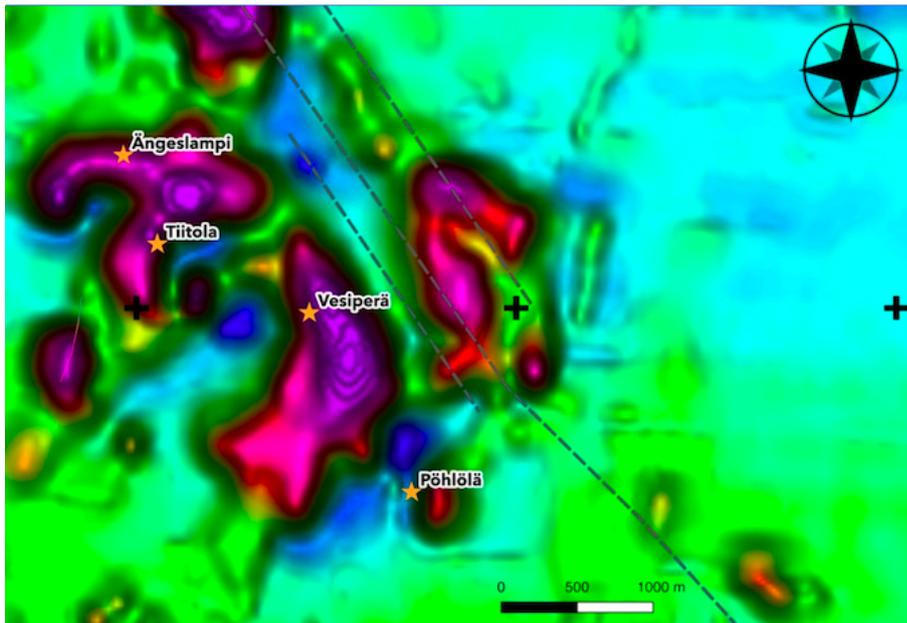
Drill hole R310: 4.5m at 2.2 g/t Au

Drill hole BELVES1: several mineralised zones grading >1 g/t Au over a total length of 83.7m

Following the drilling, a non-compliant Inferred Resource was estimated by Sipilä (1988) to be 0.29 Mt at 2.52 g/t for 23,500 oz. This was based on in-situ estimates with cut-off grades of 0.9 g/t Au above 50m and 1.2 g/t Au below 50m.

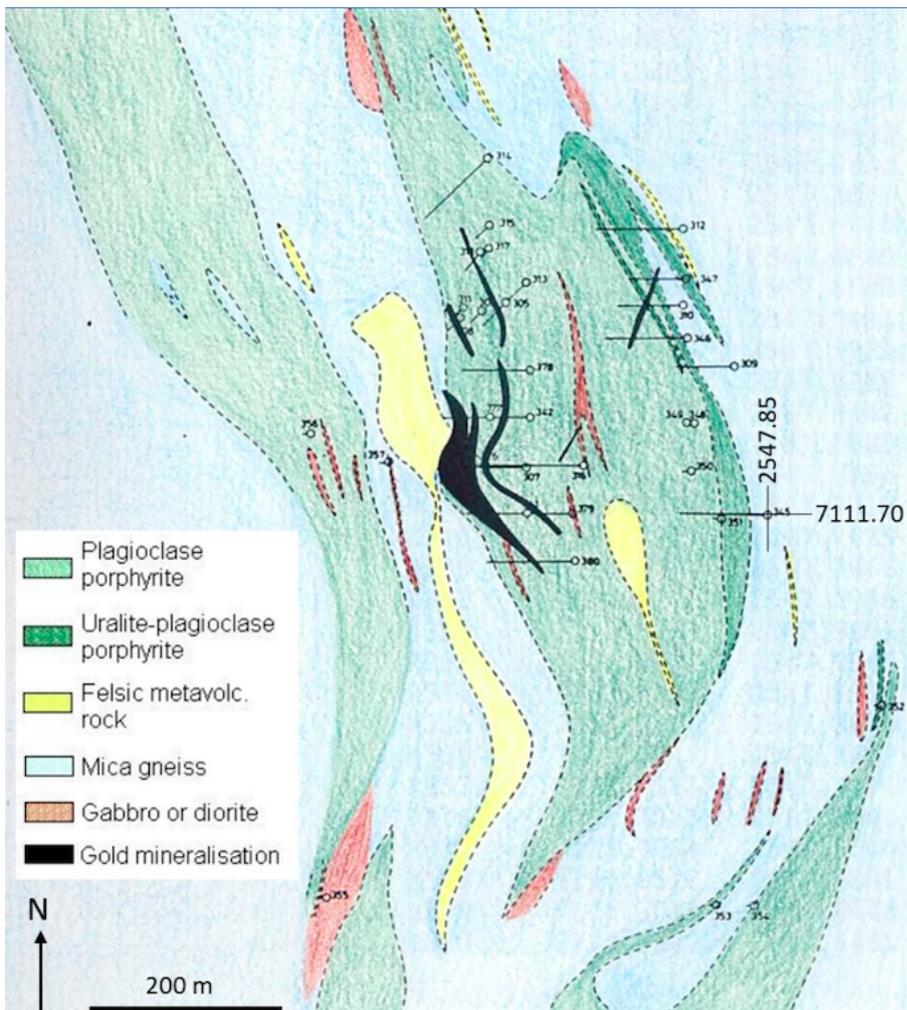
In addition, Eilu (1999) noted that a number of bedrock surface anomalies were not followed up.

**Figure 34: Vesiperä and nearby gold deposits shown on Geocoded pole reduced magnetic total field (purple = maximum)**



Source: Northgold

**Figure 35: Geological map of the Vesiperä area, showing drill holes by GTK**



Source: Northgold

**Figure 36: Drill hole traces and 0.5 g/t grade shells indicated for both the Ängesneva and Vesiperä prospects**



Source: Northgold

### Ängeslampi

Ängeslampi is located about 2km NW of Vesiperä, and about 1km SW of the NW-trending shear, parallel to the Ruhanperä shear zone. Mineralisation is hosted by an intrusive plagioclase porphyrite within metamorphosed sedimentary and volcanic rocks. Ängeslampi is also interpreted to be a mesothermal orogenic deposit with strong structural controls. Gold is associated with arsenopyrite-bearing quartz veins (Sipilä 1988). As with other areas along the Kiimala Trend, GTK conducted various ground surveys in 1986-1987. GTK also conducted a shallow 8 hole drill program totalling 468m. Best assay results were 1.0m at 13.5 g/t Au within an intersection of 3m at 5 g/t Au from 17m depth in hole R323.

### Tiitola

Tiitola lies between the Ängeslampi and Vesiperä prospects. It was discovered in 1994 by GTK undertaking bedrock sampling. Gold mineralisation is associated with coarse-grained gabbro and NNE-SSW trending shear and mylonite zones varying in width from millimetres to several metres. Mineralised zones vary from near-vertical to dipping 60-70° to the west. Arsenopyrite, pyrrhotite, pyrite, chalcopyrite and sphalerite are the most common minerals.

In 1994-1995, GTK conducted a shallow reconnaissance program comprising 11 drill holes for 386.5m that focused on a small area and with a maximum depth of 40m. Some 5 of the 50 samples assayed returned better than 1 g/t gold with best intersections of 1.25m at 4.58 g/t Au and 1.34m at 1.35 g/t Au.

### Pöhlölä

Mineralisation at Pöhlölä is also related to second order structures related to the NW-trending Ruhanperä Shear Zone. Gold mineralisation occurs in folded quartz veins that are between 0.5cm and 10cm thick. Outokumpu explored the area in 1984-1986 including conducting a small diamond drill program that comprised 16 shallow scout holes totalling 183.2m. In all, 134 samples were assayed for gold, of which 12 returned grades better than 1 g/t Au.

### Alakylä

Mineralisation at Alakylä comprises at least three sub-parallel lodes, each a few metres wide, in a NW-trending zone that dips steeply at 75-85° to the NE and hosted within sheared and tectonised plagioclase porphyrite. As, Bi, Sb, and Te are reported to be the geochemical pathfinders for gold in this prospect. Mineralisation is open along strike and at depth. GTK was able to follow the sheared

and sulphurised zones with ground magnetics, and this was followed by a small diamond drill program in 2005-2006 that comprised 6 holes for 526m. Drilling intersected three zones of mineralisation.

**Figure 37: Drill hole profile of the Alakylä deposit; gold abundances are indicated at yellow bars on the right-hand side of the drill core. From Lestinen and Mursu (2007)**



Source: Northgold

**Figure 38: Summary of significant historic drillhole intersections at Alakylä, with true thickness estimated to be 90-100% of the interval**

Drill hole	From (m)	To (m)	Interval (m)	Au g/t	As g/t	Cu %
R469	59.75	62.1	2.35	3.87	1,184	0.222
R477	70.8	71.8	1	2.66	1,850	0.326
R479	10.2	12.2	2	7.72	12	0.402

Source: Northgold

## Pääneva

Mineralisation is hosted in sheared and hydrothermally altered intermediate hypabyssal rocks where mineralised quartz veins trend between NW and NNE. The main sulphide mineral is pyrrhotite associated with less common arsenopyrite. Minor chalcopyrite, pyrite and scheelite are also present. Historic drill hole R476 return an intersect of 1m at 1.45 g/t Au and 206 ppm Cu.

## Pirtineva

GTK reported that distinct small geochemical till anomalies occur with Au associated with As, Bi, and Sb. Mineralised zones are reported to have a good response to induced polarisation. In 2022, Northgold followed up the results of an IP geophysical survey and historical outcrop samples that graded up to 12 g/t Au with a five drill hole program that ultimately returned only low concentrations of gold. The pyrrhotite mineralisation observed also occurs at Ängesneva. The results will be followed up with additional early-stage work.

## Emerging prospects

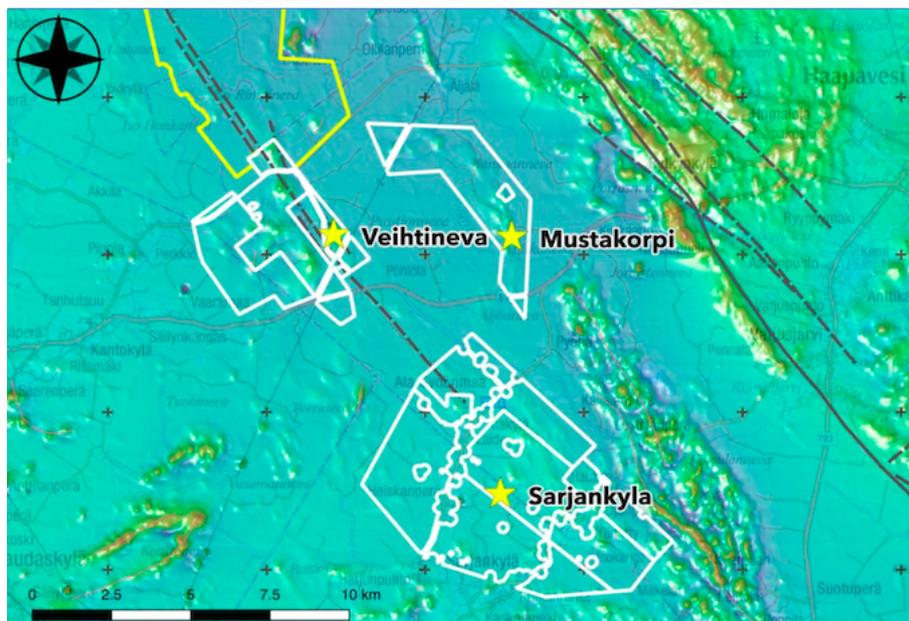
In addition, there are a number of identified prospects along the Kiimala that are yet to be drill tested.

**Sarjankylä** is located about 1km SW of the Pääneva prospect. Detailed mapping, geophysical and geochemical programs undertaken in 1999-2001 and in 2004 identified several distinct gold anomalies, and several high-grade grab samples were found.

At **Veihtineva**, located about 1km NE of the Vesiperä deposit, bottom-of-till samples have yielded significant gold concentrations that warrant follow-up work. Percussion drill till samples from test pits returned grades varying from 180 ppb to 2,800 ppb gold (versus background grades of 6 ppb).

**Mustakorpi** lies about 6.5km east of Vesiperä, and some 5km west of the Ruhanperä Shear Zone. Some highly anomalous samples have been recovered from the area, the location of which is adjacent to magnetic bodies that could potentially be similar porphyries to those elsewhere in the region. Again, the prospect is yet to be drill tested.

**Figure 39: Emerging prospects shown on the geocoded pole reduced magnetic total field map, illumination from the south-west at a 60-degree height angle (yellow = maximum)**



Source: Northgold

## Hirsikangas: open at depth and along trend

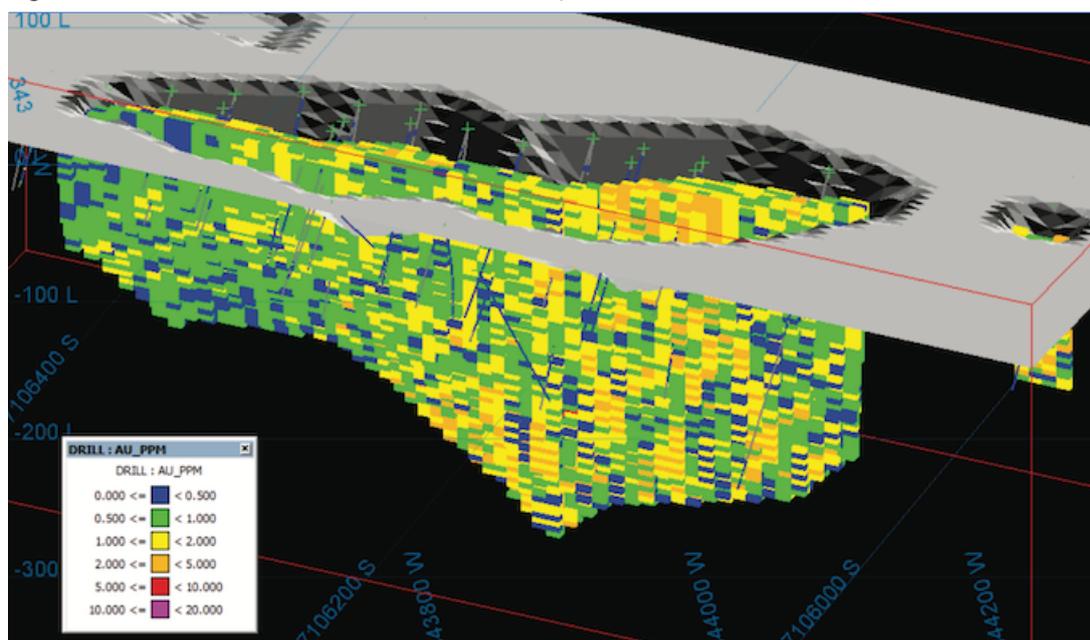
- Hirsikangas boasts a pit-constrained 2018 Inferred Resource of 89,000 oz Au that is confined within 800m of a mineralised 2.2km strike length
- The resource is open at depth, in parallel and offset structures, and also along trend to the southeast
- In 2013-2015, GTK drilling returned high-grade intercepts along trend at Hanni that require follow-up

The Hirsikangas gold project is located in the Middle Ostrobothnia Gold Belt, some 7km east northeast of the town of Himanka, near the west coast of Finland. Northgold acquired the project from Rupert Resources for some €1.1m in February 2023. Hirsikangas has an NI 43-101 Inferred Resource of 89,000 oz. There is excellent potential for resource upside from deeper extensions of the main mineralisation and parallel or offset structures, as well as mineralisation along trend to the southeast at Hanni in areas drilled by GTK in 2013 to 2015 and at Hanni SE, drilled by Rupert Resources in 2021. Northgold recently completed a soil sampling program at Hanni SE with results expected over the next several weeks.

### Current resource

In 2018, Rupert Resources reported an NI 43-101 compliant Inferred Resource of **2.27Mt at 1.2 g/t gold for 89,000 oz**, based on a cut-off grade of 0.5 g/t Au for the optimised pit-shell, a metallurgical recovery of 92%, and a gold price of US\$1,400/oz. According to the Technical Report **significant unreported mineralisation extends at depth beneath this pit**. The Resource is constrained by an open pit depth of 120m, though mineralisation is known to continue to a depth of 300m.

Figure 40: Isometric View of Block Model and \$1,400 Pit Shell



Source: Rupert Resources, Hirsikangas Technical Report, 2018

## Upside potential

Mineralisation at Hirsikangas is controlled by a NW-SE trending structure that continues for some 30km. So far, mineralisation has been intercepted over 2.2km of strike length and to 300m in depth. The main body of mineralisation occurs in, and the 2018 resource is constrained within, the eastern 800m of the known shear zone. There is less significant mineralisation at either end of the known strike, though drilling is also sparser. **There is potential resource upside at depth beneath the main mineralised area, in parallel and offset structures, and along strike to the southeast.**

### Rupert Resources drilling, 2018

In September 2018, Rupert Resources reported on a 10 drill hole program for 1,318m that targeted areas close to the historic resource estimate. This included one hole drilled beneath the main deposit, four holes drilled to extend a known parallel or offset structure, and five drill holes along strike to test a resistivity high to the east.

Drill holes HIR002 and HIR003 were located in the northwest of the project area. Drill hole HIR002 intersected 8m at 2.8 g/t Au from 48m downhole, including 0.5m at 28.9 g/t Au. The hole was designed to test a parallel or offset structure identified by Belvedere Resources in drill hole BELHIRSI030 which had intercepted 11m at 3.3 g/t gold from 48m downhole.

Drill hole HIR003, drilled on the same section, returned multiple short intersections, and 2.5m at 3.3 g/t Au from 93.5m downhole with this deepest intercept representing a potential 25m depth extension of the intersection in hole HIR002.

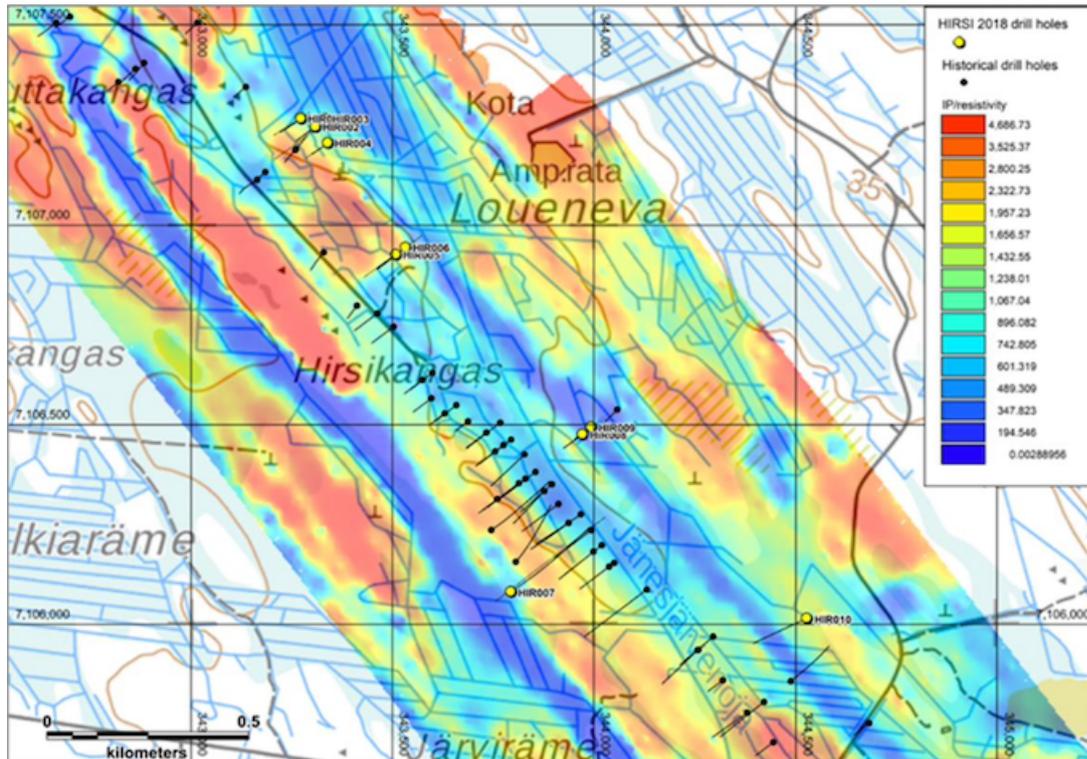
Drill hole HIR007 was drilled under the main zone of the deposit. Numerous mineralized zones were recorded including 7m at 1.1g/t Au from 258m downhole, and 10m grading 2.8 g/t Au from 274m that included 1.0m at 20.9 g/t Au.

Notably, these intersections were below previous drill holes R309 and R321 at a depth of approximately 250m below surface. Hole HIR007 also intersected 3.2m at 1.9 g/t Au from 341m downhole, thus identifying a further mineralised structure to the east.

Drill hole HIR010, drilled 250m east of the main shear zone at the south eastern extent of the deposit, intersected two new zones. According to Rupert Resources, the first was an intersection of 6m at 0.9 g/t Au from 118m downhole, and the second was an intersection of 18.0m at 0.9 g/t Au from 138m downhole at a vertical depth of 100m. These zones occur in mica schist adjacent to a graphite bearing breccia zone and remain open in all directions.

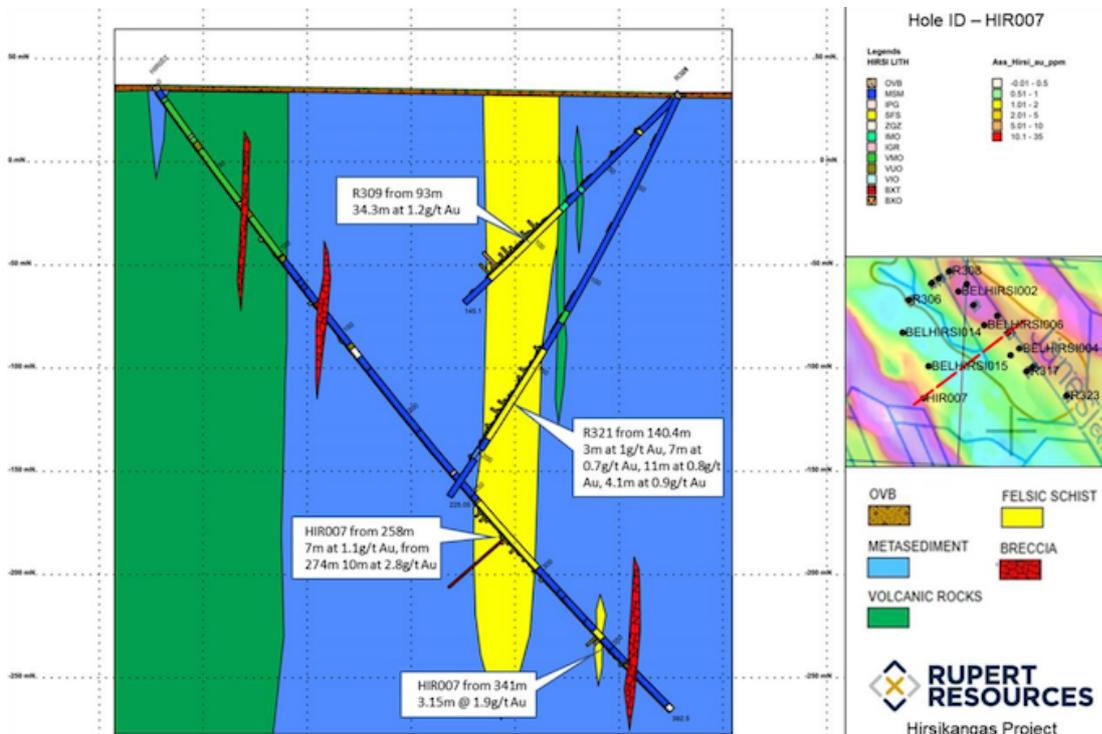
**Rupert Resources noted that future drill testing** of the deeper extensions of the main mineralisation identified in HIR007 and parallel or offset structures identified in HIR001 to HIR005 and HIR010 **presents good potential for upgrading the historic estimate.**

Figure 41: Collar locations of the Hirsikangas 2018 drilling campaign on ground IP Resistivity map



Source: Rupert Resources, September 2018

Figure 42: Extension of mineralisation at Hirsikangas



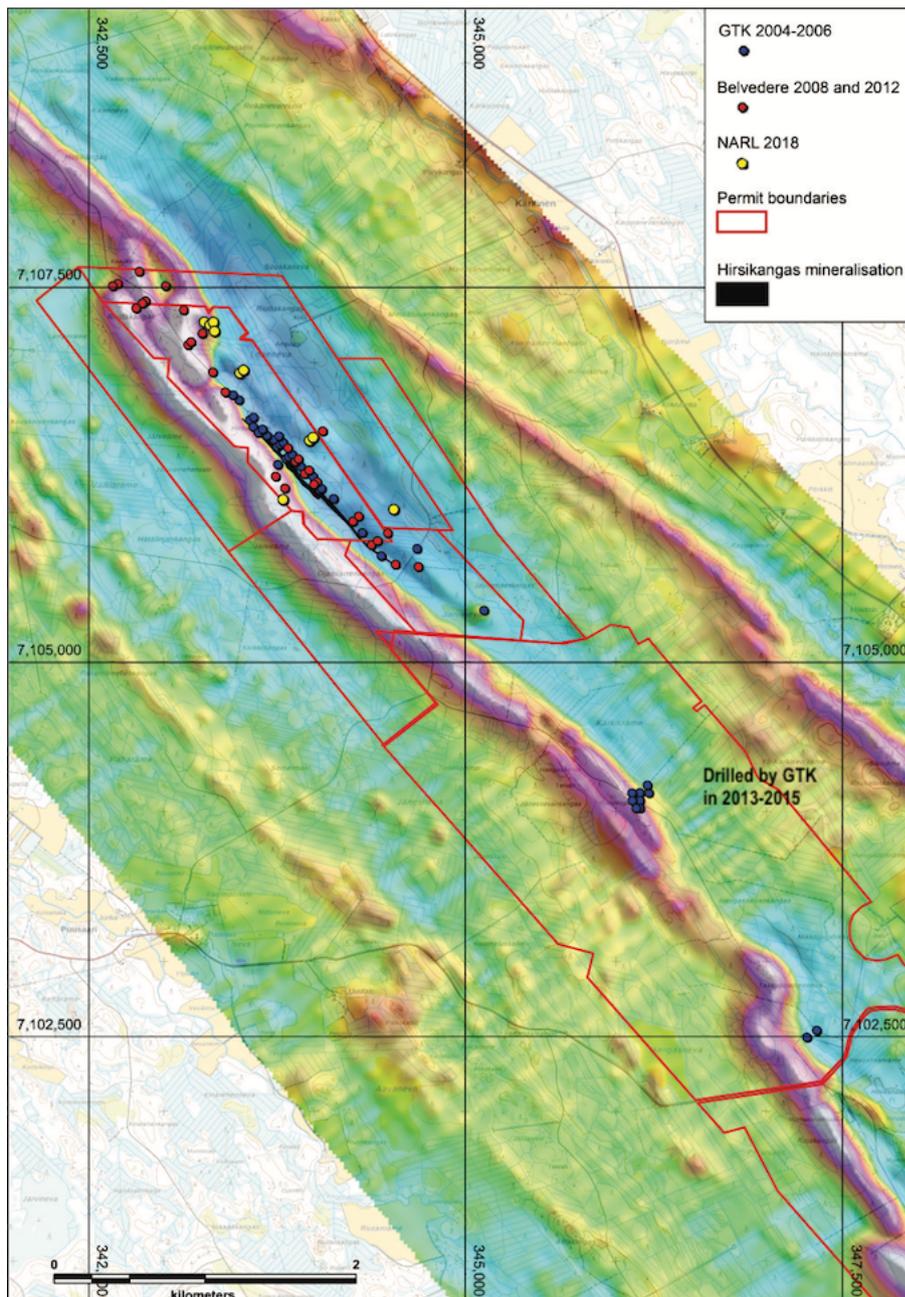
Source: Rupert Resources, September 2018

Rupert Resources drilling update, September 2018: <https://www.globenewswire.com/en/news-release/2018/09/11/1569105/0/en/Rupert-Resources-Provides-Update-on-Exploration-at-the-Hirsikangas-Project-Central-Finland-New-Drilling-Extends-Mineralisation-at-Depth-and-Identifies-Potential-Parallel-Structures.html>

The Rupert Resources drilling and 2018 Technical Report focused on the main area of mineralisation around Hirsikangas. It did not focus on known mineralisation southeast along trend at Hanni that was drilled by GTK in 2013-2015. GTK reported three compelling intercepts at Hanni including:

- Hole Q4212014R3: 5.5 g/t Au over 15.5m from 35.4m depth down hole
- Hole Q4212014R5: 43.8 g/t Au over 1m from 39.7m and
- Hole Q4212014R7: 2.65 g/t Au over 6.3m from 90.3m

**Figure 43: Historical drilling at Hirsikangas, annotated to show GTK drilling at Hanni in 2013-2015**



**Source: Rupert Resources 2018, Orior Capital**

In 2021, Rupert Resources drilled 7 holes at Hanni SE with HANNI006 returning several intercepts including 1m at 2.45 g/t Au from 62m. In 2023, Northgold completed a soil sampling program around these holes aimed at identifying further drill targets.

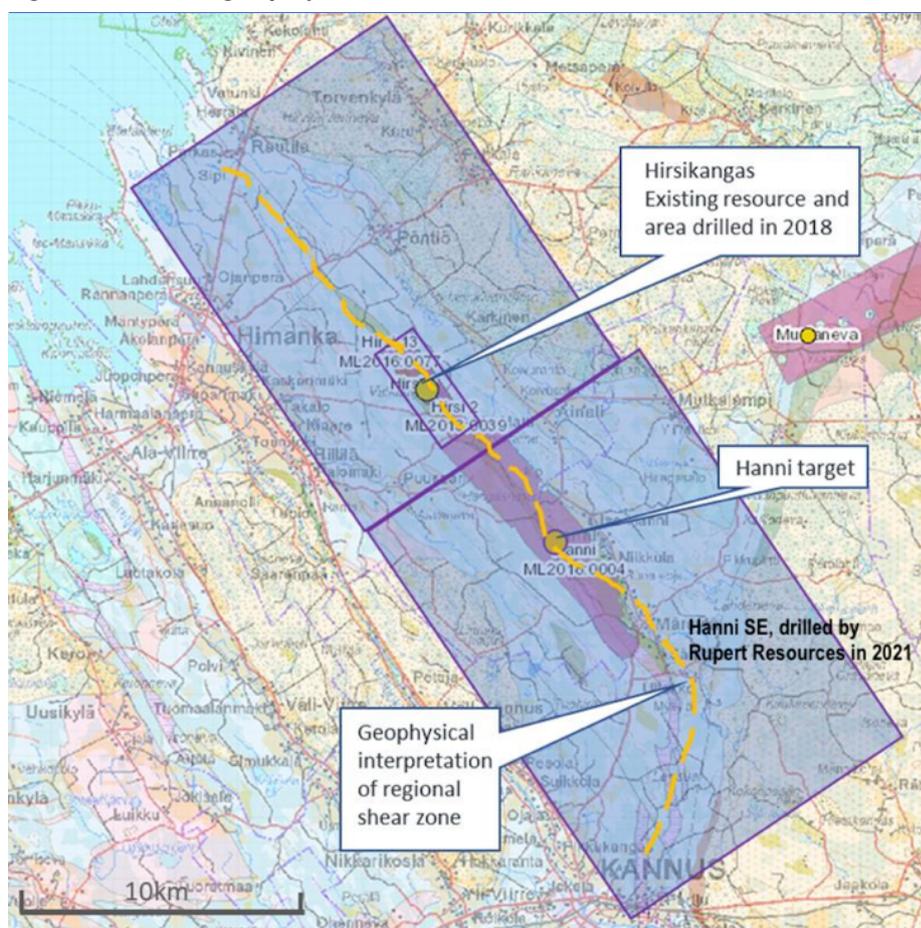
There seem to be a number ways forward for Northgold:

- A step-out drill program could test continuity and aim to incorporate existing outlying mineralisation
- Drilling could also target parallel and offset structures that have already been identified in historical reconnaissance drilling
- A regional program of soil and base-of-till sampling (which commenced this year) and interpretation of available geophysics may enable further targets to be developed in what is considered to be a fertile environment

## Geology and mineralisation

The project area is part of the Raahe-Ladoga zone (Korsman 1988, Ekdahl 1993). The bedrock in the area comprises mainly mica schist, mafic and ultramafic volcanic rocks, and felsic schist. Sheared and altered felsic rocks, probably of sedimentary origin, are the main host rocks of the gold mineralisation. In places, these rocks are intruded by late-stage granite porphyry dykes and pegmatites. The felsic schist host is massive, fine grained, quartz rock in which disseminated blebs of sulphides typically account of 1-2% of the rock. The primary structural control in the project area is a NW trending shear zone that dips steeply to the NE. As in other areas in Central Ostrobothnia, the presence of arsenopyrite blebs is a good indicator of the presence of gold.

**Figure 44: Hirsikangas project areas and licence areas**



Source: Rupert Resources, Orior Capital

## Appendix 1: Licences and tenements

In Finland, exploration areas can be applied for at the Mining Authority TUKES (Finnish Safety and Chemicals Agency). Eligible parties include companies registered in or persons living in the European Economic Area. An exploration permit allows the holder extensive exploration rights irrespective of the ownership of the land, and the right to apply for a mining permit. Exploration permits are valid for four years. They can be extended by up to three years at a time for a maximum exploration period of 15 years. Exploration fees start at €20/Ha/year for the first four years and rise to €50/Ha/year for the 11<sup>th</sup> to 15<sup>th</sup> years.

Reservations are often large areas of land that are applied for during early-stage exploration. Areas can be reserved by notifying the Mining Authority TUKES. Reservations are valid for two years and give the applicant the first option to apply for an exploration permit. During the reservation period, low-impact work such as geological mapping with light sampling, geophysical measuring, and light geochemical sampling can be undertaken, and more significant work depending on the landowners permission.

The Kopsa project is held by one Mining Concession, one Auxiliary Mining Permit application, two granted claims (the term under the old Mining Act), two exploration permit applications and one reservation.

The Mining Concession allows Northgold to mine up to 0.5Mtpa, including waste material, and allows for a 75m deep pit. The Concession is conditional upon the award of an Auxiliary Mine Permit for a road connection to allow for offsite processing. Northgold expects this permit to be awarded by the end of the year. Mining more than 0.5Mtpa would require an Environmental Impact Assessment.

The Kiimala Trend project is held under seven exploration permits, one exploration permit that is subject to a public appeals process, and one exploration permit application.

Hirsikangas is held under four exploration permits, five exploration permit applications and one reservation.

**Figure 45: Northgold licences and applications**

	Name, code	Date granted or renewed	Size Ha
<b>Kopsa, held by Fennia Gold Oy</b>			
Mining Concession (old law)	K7405	n.a.	118.2
Auxiliary Mining Permit application	KL2022:0005-01	19/12/2022	6.9
Exploration claims (old law)	Kopsankangas, 7405/1	07/05/2002	97.0
	Kopsankangas 2, 7686/1	02/02/2004	96.5
Exploration permit applications	Kopsa S, ML2022:0062	4/10/2022	1,293.9
	Pitkäjärvi, ML2022:0061	4/10/2022	2,046.9
Reservation	Kopsa E, VA2022:0079-01	19/12/2022	392.8
<b>Kiimala Trend, held by Lakeuden Malmi Oy</b>			
Exploration permits	Haapavesi 1 ML2019:0027	22/11/2021	657.7
	Haapavesi 2 ML2019:0028	22/11/2021	259.6
	Haapavesi 3 ML2019:0029	22/11/2021	1,050.8
	Haapavesi 4 ML2019:0030	27/09/2021	716.5
	Haapavesi 5 ML2019:0031	27/09/2021	301.0
	Haapavesi 7 ML2020:0016	27/09/2021	117.6
	Teerineva1 ML2020:0057	08/09/2022	174.6
Exploration permits in public appeals process	Haapavesi 8 ML2020:0017	Granted 22.11.2021, subject to public appeals process	769.3
Exploration permit application	Aittoneva, ML2020:0095-01	11/12/2022	529.9
<b>Hirsikangas, held by Northern Aspect Resources Oy, except Antinoja</b>			
Exploration permits	Hirsi 10, ML2017:0132-01	29/10/2020	88.2
	Hirsi 11, ML2017:0133-01	29/10/2020	57.7
	Hirsi 12, ML2017:0135-01	29/10/2020	88.2
	Kettuharju, ML2020:0046-01	23/03/2022	1,983.5
Exploration permit applications	Hanni, ML2018:0004-02	31/01/2018	1,350.6
	Hirsi 1, ML2012:0185-03	2012-10-08 <sup>2</sup>	100.3
	Hirsi 13, ML2016:0077-02	21/12/2016	98.7
	Hirsi 2, ML2013:0039-03	2013-06-27 <sup>2</sup>	52.1
	Viitajärv, ML2022:0068-01	19/10/2022	1,138.2
Exploration permit application	Antinoja, ML2022:0066-01 Held by Magnus Minerals <sup>1</sup>	14/10/2022	492.9
Reservation	Pudas, VA2022:0032	22/06/2022	23,324.6
<b>Total licence areas and applications excluding reservations</b>			<b>13,686.3</b>
Total licence areas and applications including reservations (except Pudas)			14,079.1

1. Exploration permit application for Antinoja is transferrable to Northgold AB from Magnus Minerals Oy according to a commercial agreement

2. There is only one active permit year remaining for Hirsi 1 and Hirsi 2 which are subject to an Exploration Permit renewal process, by obtaining landowner permission or by a new reservation and application process

**Source: Northgold**

## Appendix 2: The Middle Ostrobothnia Gold Belt

The Fennoscandian Shield is the largest exposed area of Precambrian rocks in Europe, covering large parts of Finland, north-westernmost Russia, Norway and Sweden. It is one of the oldest and most stable continental shields on earth and has an area greater than 1 million km<sup>2</sup>. The Shield comprises vast areas of Late Archean and Early Proterozoic terrains, and is geologically analogous to other shield areas including those in Canada and Australia.

The shield's bedrock is primarily Precambrian rocks that formed 4.0 Ga to 1.8 Ga, and which continue under sedimentary cover into the Baltic states of Estonia, Latvia and Lithuania, to the south. The shield is bordered to the west by the Caledonian Orogeny.

The oldest portions of the shield, which date back to the Archean Eon, 4.0 to 2.5 Ga, are known as 'cratons', which are large, stable blocks of continental crust relatively unchanged over long periods of time. This bedrock can be divided into three broad domains known as the Karelian, Svecofennian, and Kola-Karelian cratons, that are each significant parts of the Fennoscandian Shield, and which form a nucleus that is flanked on either side by Proterozoic mobile belts.

**Figure 46: Simplified geological map of the Fennoscandian Shield emphasising the most important gold deposits and precious metal rich base metal deposits of the Raahe-Ladoga Trend and its continuation on the Swedish side**



Source: Northgold

The Svecofennian domain to the southwest of the Karelian craton comprises juvenile Paleoproterozoic crust. The largest crustal growth in the Fennoscandian Shield occurred in the Paleoproterozoic age around 1.92 Ga to 1.80 Ga. This period involved the collision and convergence of tectonic plates, intense deformation, metamorphism, magmatism, and the formation of mountain ranges. This complex period of crustal evolution, called the Svecofennian Orogeny (Lehtinen et al. 2005) included multiple orogenic events. As a result, the Svecofennian domain hosts varied styles of gold mineralisation including Precambrian porphyry gold-copper, orogenic and granitoid-related gold, metamorphosed epithermal gold, and gold bearing VMS mineralisation (Eilu 2015).

The Middle Ostrobothnia Gold Belt is part of the Fennoscandian Shield. The belt is located within the Raahe-Haapajarvi gold province, an area known for significant gold mineralisation, and which is part of the Raahe-Ladoga Trend, a regional structure that extends across Finland into Russia. The trend represents a zone of tectonic activity and fluid circulation that gave rise to the deposition of gold and other minerals hosted in VMS and magmatic Ni-Cu sulphide deposits. The trend appears to have continuations into Sweden to the VMS Trend and the Skellefte Gold Line.

The Middle Ostrobothnia Gold Belt is characterised by significant gold mineralisation associated with quartz veins and altered host rocks being the product of hydrothermal processes related to the Svecofennian Orogeny.

The bedrock of the Middle Ostrobothnia Gold Belt consists of various rock types including metavolcanic rocks such as greenstone belts, metasedimentary rocks, and granitoid intrusions. The rocks are mainly metaturbidites (mica schists), and metamorphosed volcano-sedimentary units that have been intruded by mafic-intermediate porphyritic subvolcanic sills. The porphyritic rocks are closely associated with gold occurrences in the Middle Ostrobothnia Gold Belt. They typically contain magnetite and disseminated sulphides and give rise to both positive magnetic and induced polarization chargeability anomalies.

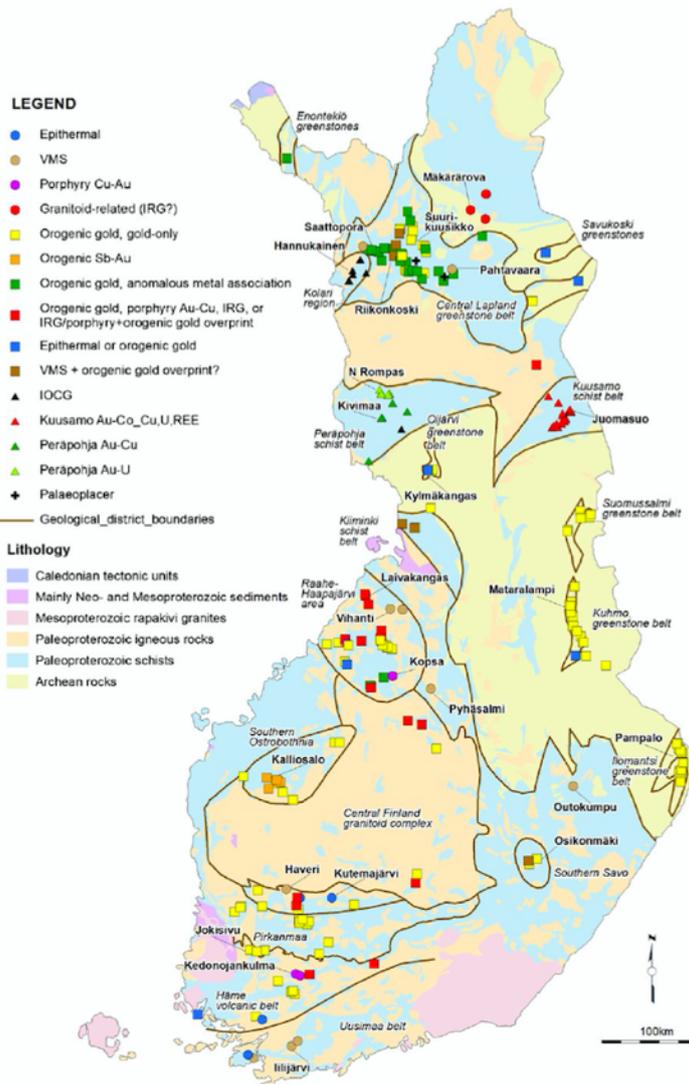
It is only relatively recently that the Fennoscandian Shield has been recognised to be so prospective for gold and other mineralisation. In fact, until the end of the 1970s, only a few gold deposits were known in the region. It was investment in exploration through the 1980s that led to the discovery of numerous gold deposits and the opening of a number of mines including Enäsen (in 1984) and Björkdal (1988) in Sweden; as well as Bidjovagge (1985) in Norway; and Saattopora (1988) in Finland.

In the Raahe-Haapajarvi gold province, the Raahe-Ladoga Trend separates into several local shear zones. One of these, the Ruhanperä Shear Zone, trends SE-NW, and runs just east of Northgold's Kiimala Trend properties, which are part of the larger Ruhanperä Shear Zone system. All known gold mineralisation occurs in a narrow band within about 10km of the shear zone.

The Kopsa project area is situated at the southern end of the Raahe-Haapavesi area, about 30km south-southeast of the Kiimala Trend project, and about 20km west of the Ruhanperä Shear Zone system which did not impose structural controls on Kopsa.

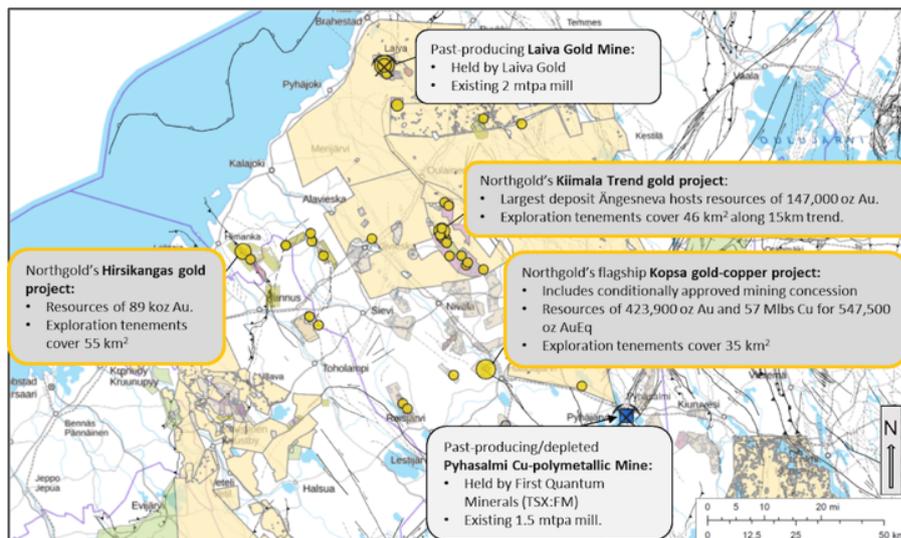
Geological Survey of Finland, Geochemical characteristics of mesothermal gold deposits in the Fennoscandian Shield, and a comparison with selected Canadian and Australian deposits, Pekka A. Nurmi, Pekka Lestinen and Heikki Niskavaara, 1991; [https://tupa.gtk.fi/julkaisu/bulletin/bt\\_373.pdf](https://tupa.gtk.fi/julkaisu/bulletin/bt_373.pdf)

**Figure 47: Notable gold camps in Finland; the Middle Ostrobothnia Gold Belt is located within the Raah-Haapajärvi area (from Eilu 2015)**



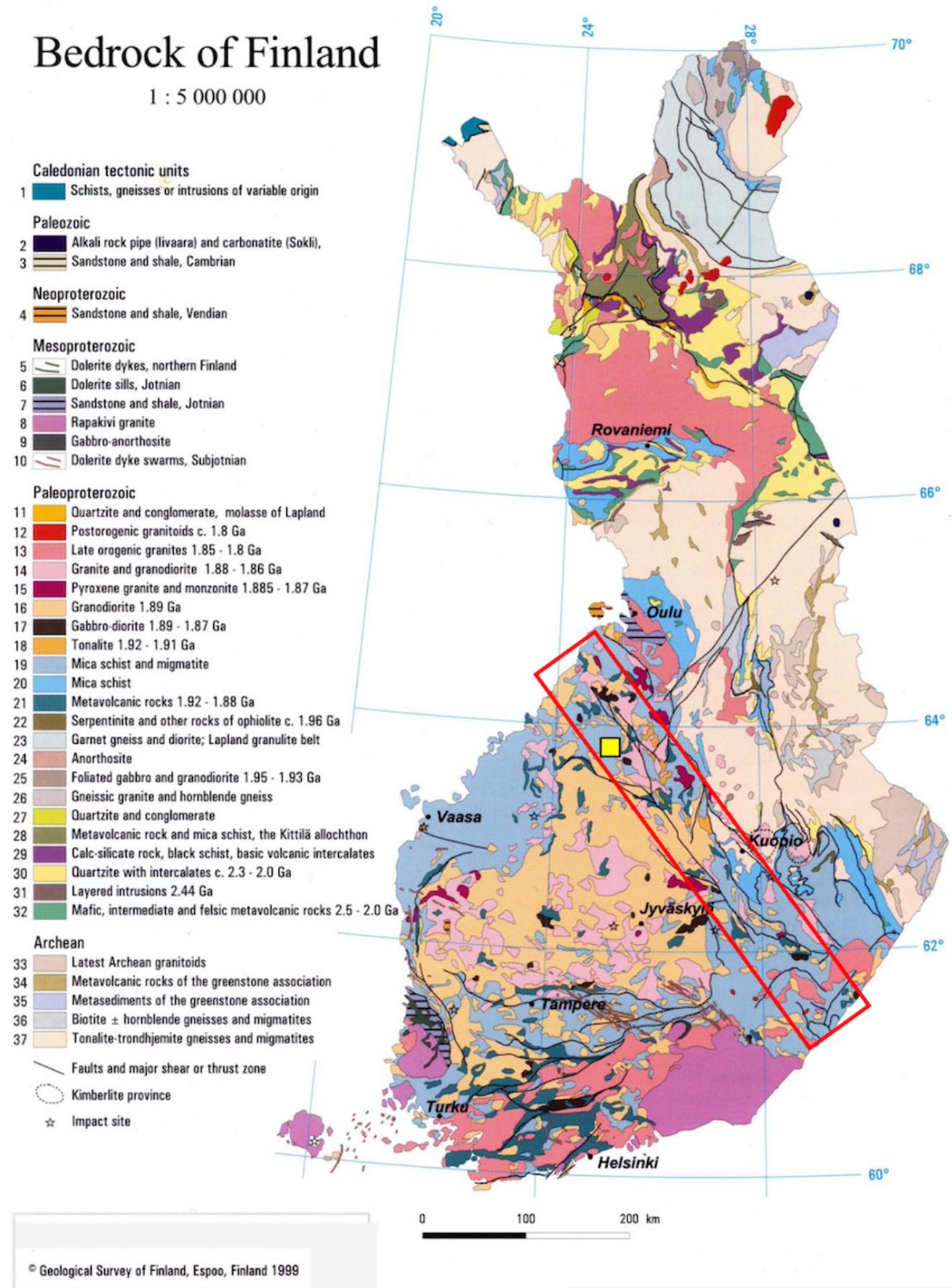
Source: Northgold

**Figure 48: Location map**



Source: Northgold, retrieved from GTK on 25.01.2023

Figure 49: Geological setting of the Kopsa Property (yellow square) on the bedrock map of Finland. The Raahe-Ladoga suture zone is marked by the red area



Source: Belvedere Resources, 2012

## Appendix 3: Companies mentioned

<b>Company</b>	<b>Code</b>
Northgold	NG.ST
Agnico Eagle	AEM
Anglo American	AAL.L
Barrick Gold	GOLD
Beacon Minerals	BCN.AX
Catalyst Metals	CYL.AX
Chesser Resources	CHZ.AX
First Quantum	FM.TO
Fortuna Silver	FSM
Newmont Corp.	NEM
Northern Star	NST.AX
Ora Banda Mining	OBM.AX
Ramelius Resources	RMS.AX
Rupert Resources	RUP.TO
Strickland Metals	STK.AX

**The author**

Simon Francis is a UK qualified chartered accountant with significant experience in the natural resources and minerals sector. Simon led research in the sector in various roles at major financial institutions including Macquarie, Samsung and HSBC, in a career spanning more than 20 years. He has been involved in approximately US\$4bn of capital raising, for a number of natural resources companies. Simon has been engaged in the financing of early stage companies using production agreements, and has privately funded exploration companies in various metals and jurisdictions. Simon seeks to deploy capital in undervalued mining and resources opportunities that have been missed by the market.