ARCTIC MINERALS

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# Excellent Copper and Silver Recoveries in Historical Metallurgical Testing at Hennes Bay

*High copper (over 90%) and silver (up to 85%) recoveries possible using standard processing technologies*

Arctic Minerals AB (publ) ("Arctic Minerals" or the "Company") is pleased to report the results of recently discovered historical metallurgical testwork and mineralogy investigations at its flagship Hennes Bay copper-silver project in Sweden ("Hennes Bay" or the "Project").

The historical metallurgical testwork programme was undertaken on drill core from the Dingelvik and Henneviken deposits at the Minpro testing facility (Stråssa, Sweden) in 1982–1983. The objectives of the testwork programme were to assess flotation amenability and to provide an indication of achievable copper–silver concentrate quality relative to typical smelter specifications.

## Highlights

- Dingelvik and Henneviken composite samples reported to have responded favourably to conventional sulphide flotation, producing copper concentrates of potentially saleable quality
- Copper recoveries of ~90% for Dingelvik and >90% for Henneviken samples achieved under the testwork conditions. Silver recoveries indicated at ~75% for Dingelvik and ≥85% for Henneviken
- Copper concentrate grades of ~30% for Dingelvik and ≥30% for Henneviken reported. Silver grades in concentrate were typically reported in the range 400–500g/t
- Improved copper and silver recoveries at Dingelvik were observed at finer grind sizes (down to P90 ~70 µm), suggesting potential sensitivity to liberation
- Multi-element assays reported for selected final concentrates indicate low to moderate levels of common penalty elements (e.g. As, Sb, Bi) and base metal impurities (e.g. Pb, Zn). Reported impurity levels would not be expected to preclude concentrate saleability under modern custom smelter terms; however, penalty schedules are smelter- and market-dependent
- Historic mineralogy investigations from Dingelvik show chalcopyrite dominant mineralogy with local abundant bornite and chalcocite. Silver occurs in tennantite. Recent petrographic analysis on drill core samples from the Baldersnäs prospect similarly highlighted chalcopyrite as the dominant copper mineral specie

**Managing Director and Chief Executive Officer Peter George commented:**

*"These are extremely encouraging historical met results. The Company plans to conduct a modern preliminary met testwork program on Dingelvik mineralisation using a larger and more representative sample set, including material from additional drillholes and other zones within the potential orebody.*

*Arctic Minerals' focus is to build on this very solid foundation and systematically demonstrate the full potential and value of Hennes Bay through drilling to rapidly grow the resource base, as well as targeted technical work programs and studies to advance the Project's development".*

# Technical Assessment of Historical Metallurgical Testwork Programme and Mineralogical Studies on Dingelvik and Henneviken Mineralisation

## Executive Summary

Preliminary metallurgical testwork was undertaken on drill core samples from the Dingelvik and Henneviken copper–silver deposits at the Minpro testing facility (Stråssa, Sweden) in 1982–1983. The objectives of the testwork programme were to evaluate the amenability of the materials to conventional sulphide flotation and to provide an indication of achievable concentrate quality relative to typical smelter requirements.

On the basis of the reported results, Dingelvik is interpreted to have the potential to produce a copper concentrate grading ~30% Cu with 400–500 g/t Ag at an estimated ~90% Cu recovery and ~75% Ag recovery. Henneviken is interpreted to have the potential to produce a copper concentrate grading ≥30% Cu with approximately 500 g/t Ag at an estimated >90% Cu recovery and ≥85% Ag recovery.

The available historical testwork was based on limited sample mass and spatial coverage. Accordingly, additional variability testwork is planned to assess representativity and to refine comminution and flotation parameters.

### *Key Findings*

- **Flotation response:** Dingelvik and Henneviken composite samples were reported to have responded favourably to conventional sulphide flotation, producing copper concentrates of potentially saleable quality.

- **Projected recoveries:** Reported outcomes indicate copper recovery of ~90% for Dingelvik and >90% for Henneviken under the testwork conditions. Silver recovery is indicated at ~75% for Dingelvik and ≥85% for Henneviken.

- **Concentrate quality:** Copper concentrate grades of ~30% (Dingelvik) and ≥30% (Henneviken) were reported. Silver grades in concentrate were typically reported in the range 400–500 g/t.

- **Comminution sensitivity:** Improved copper and silver recoveries for Dingelvik were observed at finer grind sizes (down to P90 ~70 µm), suggesting potential sensitivity to liberation.

- **Penalty elements and marketability (indicative):** Multi-element assays reported for selected final concentrates (Tables 4 and 5) indicate low to moderate levels of common penalty elements (e.g. As, Sb and Bi) and base metal impurities (e.g. Pb and Zn). The reported impurity levels would not be expected to preclude concentrate saleability under many modern custom smelter terms; however, penalty schedules are smelter- and market-dependent. Additional assays (often including Hg, F and Cl, and in some cases Se/Te) are typically required for a modern marketing assessment.

- **Limitations:** The reported testwork is based on small composite sample masses (15kg) and limited drillhole coverage. Accordingly, the resulted values should be considered preliminary and indicative only. Metallurgical variability and representativity are key uncertainties that will be addressed in future planned metallurgical testwork programmes.

## *Summary of Testwork Results*

A summary of the principal results reported for Dingelvik and Henneviken is provided below in Table 1.

***Table 1. Summary of Reported Feed Grades and Projected Concentrate Performance (Minpro testwork, 1982–83)***

| | Dingelvik | Henneviken |
|---|---|---|
| Feed grade analysed | 0.76% Cu, 16 g/t Ag | 1.30% Cu, 23 g/t Ag |
| Feed grade calculated* | 0.83% Cu, 16 g/t Ag | 1.40%, Cu, 23 g/t Ag |
| Copper recovery in full scale operation (projected based on results) | ~90% | ≥90% |
| Silver recovery in full scale operation (projected based on results) | ~75% | ≥85% |
| Copper grade in concentrate | ~30% | ≥30% |
| Silver grade in copper concentrate | 400-500 g/t | 400-500 g/t |

** Back calculated from individual product masses and assays for all final products following flotation.*

## *Concentrate Marketability and Indicative Smelter Penalty Elements*

The multi-element assays reported for the Dingelvik and Henneviken final concentrates (Tables 4 and 5) indicate low to moderate levels of common penalty elements (e.g., As, Sb, Bi) and base metal impurities (e.g., Pb, Zn). On an indicative basis and subject to confirmation by additional sampling and analysis, the reported impurity levels would not be expected to preclude concentrate saleability under many modern custom smelter terms; however, treatment and refining charges and penalty schedules are smelter- and market-dependent and may vary materially over time.

- **Dingelvik:** As <0.02%, Sb 0.024%, Bi 0.003%, Pb 0.38% and Zn 0.48% (Table 4)
- **Henneviken:** As 0.02%, Sb 0.006%, Bi 0.010%, Pb 0.06% and Zn 0.28% (Table 5)
- **Additional elements:** Modern concentrate marketing assessments commonly also require assays for elements not reported in the historical dataset (often including Hg, F and Cl, and in some cases Se/Te and other deleterious components), as applicable to target smelters.

## Metallurgical Testwork Programme - Technical Information

The Dingelvik and Henneviken composite samples used in the 1982-83 testwork programme were derived from drill core sourced from three diamond drill holes at Dingelvik and ten diamond drill holes at Henneviken (Figure 1).

Details of the individual drillhole intervals contributing to the Dingelvik and Henneviken testwork samples are summarised in Table 2 and Table 3 respectively.

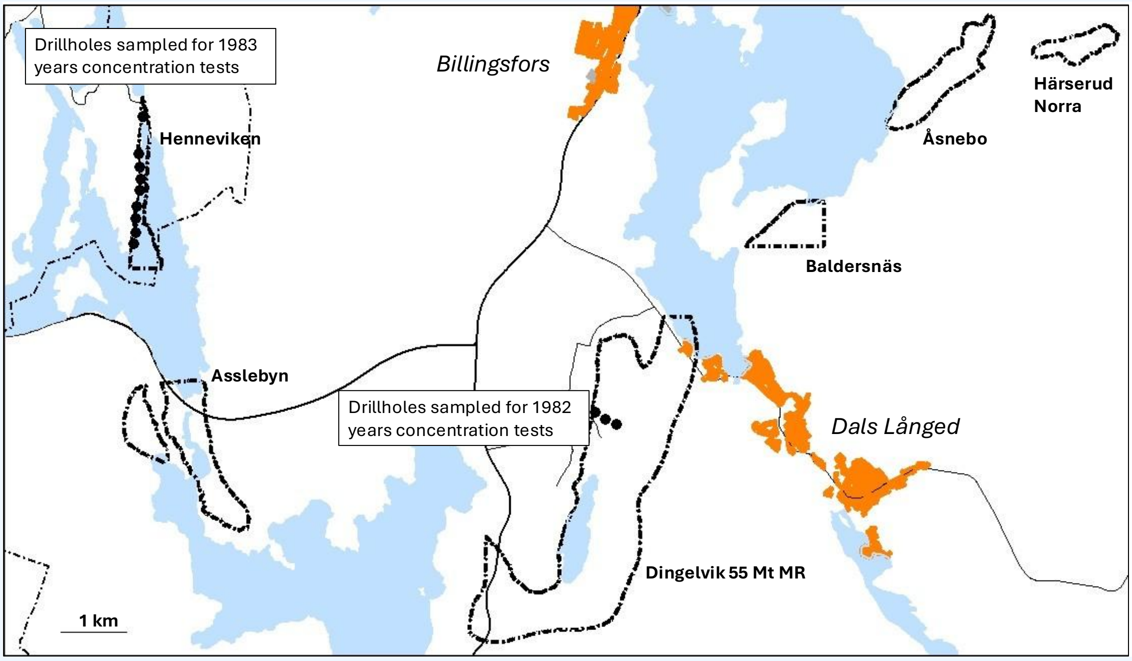


*Figure 1. Drillhole locations within the mineralised system for material used in the metallurgical testwork*

***Table 2. Drillhole Data for Dingelvik Samples used in the Testwork (as reported)***

| | DH | From | To | Weight (g) | Cu% | Ag g/t |
|---|---|---|---|---|---|---|
| **Dingelvik** | 82001 | 14.88 | 17.14 | 1,598 | 0.89 | 25 |
| **Dingelvik** | 82002 | 133.46 | 135.55 | 1,760 | 0.84 | 30 |
| **Dingelvik** | 82003 | 189.28 | 197.53 | 6,342 | 0.83 | 15 |
| | | | | | **0.84** | **19** |

*Bulk composite analysis pre-concentration test: 0.76% Cu, 16 g/t Ag*
*Mass balance back- calculated post concentration test: 0.83% Cu, 16 g/t Ag*

*Table 3. Drillhole Data for Henneviken Samples used in the Testwork (as reported)*

| | DH | From | To | Interval | Cu% | Ag g/t |
|---|---|---|---|---|---|---|
| **Henneviken** | 83001 | 69.23 | 72.50 | 3.27 | 1.52 | 31 |
| **Henneviken** | 83002 | 26.00 | 28.90 | 2.90 | 1.47 | 20 |
| **Henneviken** | 83003 | 20.59 | 21.60 | 1.01 | 1.35 | 40 |
| **Henneviken** | 83004 | 33.40 | 37.80 | 4.40 | 1.51 | 44 |
| **Henneviken** | 83005 | 22.15 | 25.00 | 2.85 | 1.32 | 19 |
| **Henneviken** | 83006 | 9.60 | 13.41 | 3.81 | 1.40 | 26 |
| **Henneviken** | 83007 | 13.25 | 15.42 | 2.17 | 1.25 | 25 |
| **Henneviken** | 83008 | 12.67 | 14.85 | 2.18 | 1.31 | 30 |
| **Henneviken** | 83010 | 37.37 | 41.50 | 4.13 | 1.05 | 15 |
| **Henneviken** | 83011 | 29.10 | 31.00 | 1.90 | 0.95 | 14 |
| | | | | | **1.30** | **26** |

*Bulk composite analysis pre-concentration test: 1.30% Cu, 23 g/t Ag*
*Mass balance back-calculated post concentration test: 1.40% Cu, 24 g/t Ag*

## Conventional Processing of Copper Sulphide Ores (Overview)

For copper sulphide ores, a conventional processing route typically comprises comminution (crushing and grinding) to achieve adequate mineral liberation, followed by flotation to separate valuable sulphide minerals from gangue.

Grinding energy input must be sufficient to achieve a particle size distribution that supports liberation and maximises flotation recovery. Excessive grinding should be avoided due to increased energy consumption and the potential for reduced metallurgical performance through the generation of ultrafine particles, which can be lost to tailings (e.g. by reduced collision probability and/or entrainment effects).

In flotation, surface-active reagents (collectors) and frothers are added to an aqueous slurry of ground ore. Air is introduced to generate bubbles to which hydrophobic mineral particles attach; the resulting mineralised froth is recovered as concentrate (Figure 2).

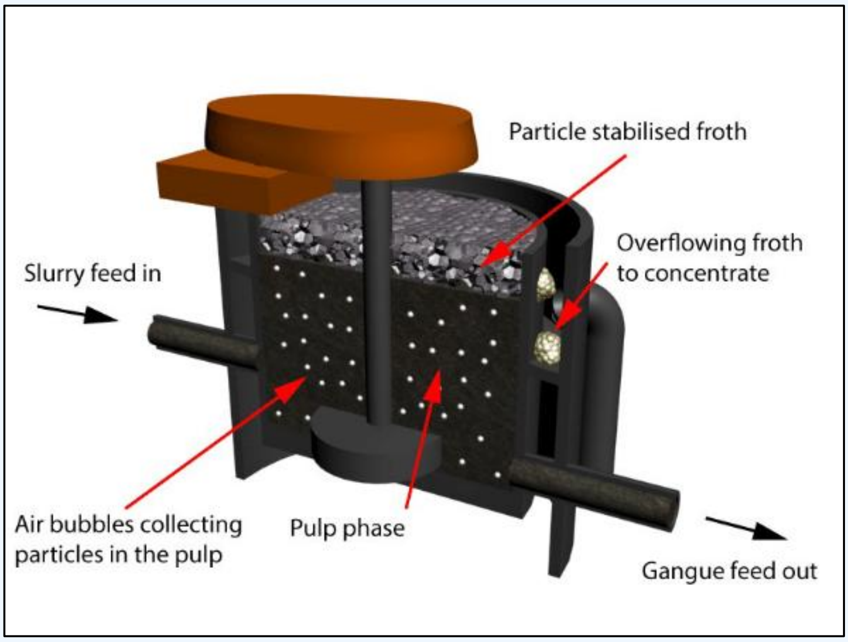


*Figure 2. Schematic of a Flotation Cell (source: public domain/industry schematic)*

In a typical circuit, feed slurry is treated in rougher flotation to maximise recovery, with subsequent scavenging as required to reduce losses to tailings. Rougher concentrate is then upgraded in one or more cleaning stages to achieve the target concentrate grade. Circuit performance is influenced by mineralogy, liberation characteristics, particle size distribution, reagent selection and dosage, pulp chemistry (including pH), water quality, and the presence of naturally floatable or deleterious minerals.

# Metallurgical Testwork

The objective of the testwork on Dingelvik and Henneviken material was to provide an indication of expected copper and silver recoveries under flotation processing and to characterise concentrate quality, including copper grade and the potential presence of penalty elements. The principal testwork results and observations for the Dingelvik and Henneviken samples are summarised below.

## Dingelvik

Three grinding durations were evaluated to achieve P90 values of 115 µm, 90 µm and 70 µm. Each grind product was subjected to rougher flotation; improved copper and silver recoveries were reported with decreasing grind size (Tests 1A–1C).

Collector screening was completed at P90 70µm using: (i) Potassium Amyl Xanthate ("PAX") only (Test 1C), (ii) Thionocarbamate ("Z200") + PAX (Test 2A), and (iii) Potassium Ethyl Xanthate ("PEX") (Test 2B). Pulp pH was adjusted to ~10 using lime ($Ca(OH)_2$) and methyl isobutyl carbinol ("MIBC") was used as frother. No material difference in copper recovery was reported between collector regimes; silver recovery was reported to be higher in the PAX-only test.

At P90 70 µm, three tests (3A–3C) comprised rougher flotation followed by concentrate cleaning. Collectors evaluated in the rougher stage included Z200, PAX and sodium butyl dithiophosphate ("LSB"). All collectors produced comparable outcomes; Z200 was reported to provide higher selectivity, faster kinetics and a marginal improvement in copper and silver performance.

The final concentrate from Test 3B was submitted for multi-element analysis (including potential penalty elements) and gold. Reported results are presented in Table 2.

*Table 4. Multi-element Assay Results for Dingelvik Final Concentrate (Test 3B; as reported)*

| Element | Result |
|---|---|
| Co | 0.01% |
| Sb | 0.024% |
| Bi | 0.003% |
| Zn | 0.48% |
| Pb | 0.38% |
| Cd | 0.001% |
| Au | <0.1 ppm |
| As | <0.02% |
| S | 32.0% |

On the basis of the reported laboratory results, Dingelvik is interpreted to have the potential to produce a copper concentrate grading ~30% Cu with 400–500 g/t Ag at an estimated 90% Cu recovery and ~75% Ag recovery in a continuous processing scenario.

## Henneviken

Three grinding durations were evaluated to achieve P90 values of 115 µm, 90 µm and 70 µm, followed by rougher flotation. Copper and silver were recovered in all tests, with the highest reported performance at P90 90 µm.

Two tests at P90 90 µm comprised rougher flotation followed by concentrate cleaning. In the first test, Z200 was added during grinding and, following removal of rougher concentrate for cleaning, a PAX + NaIPX blend was added to the scavenger portion of the rougher stage. In the second test, Z200 was not used and only a PAX + NaIPX blend was applied. No material difference in performance was reported between the two reagent schemes.

Maximum copper grade in the final concentrate after three cleaning stages appears to be around 38%. The main copper mineral in Henneviken is chalcopyrite ($CuFeS_2$), which has a maximum copper grade of ~35%. The ore also contains bornite ($Cu_5FeS_4$, maximum copper grade ~63%) and chalcocite ($Cu_2S$, maximum copper grade ~80%). Targeting a copper grade materially higher than ~30% is not recommended if it results in increased silver losses during cleaning.

A final concentrate from Test 2B was submitted for multi-element analysis (including potential penalty elements) and gold. Reported results are presented in Table 3.

*Table 5. Multi-element Assay Results for Henneviken Final Concentrate (Test 2B; as reported)*

| Element | Result |
|---|---|
| Co | 0.019% |
| Sb | 0.006% |
| Bi | 0.010% |
| Zn | 0.28% |
| Pb | 0.06% |
| Cd | 0.002% |
| Au | 0.6 ppm |
| As | 0.02% |
| S | 27.0% |

On the basis of the reported laboratory results, Henneviken is interpreted to have the potential to produce a copper concentrate grading ≥30% Cu with approximately 500 g/t Ag at an estimated >90% Cu recovery and ≥85% Ag recovery in a continuous processing scenario.

## Mineralogical Investigations of Dingelvik Mineralisation

A polished thin section study on six drill core and outcrop samples from Dingelvik was undertaken by the Swedish Geological Survey ("SGU") in 1981.

The key findings from the historical mineralogical study included:

- Chalcopyrite as the dominant copper mineral species ($CuFeS_2$ – 34.6% Cu)
- Bornite ($Cu_5FeS_4$ – 63.3% Cu), Chalcocite ($Cu_2S$ – 79.9% Cu) and Tennantite ($Cu_{12}As_4S_{13}$ – 51.6% Cu) occur, but are subordinate to Chalcopyrite in most samples
- Almost all copper mineral species occur as free grains in a calc-silicate ground mass
- Copper minerals are relatively fine grained, with 75-95% of copper minerals >20 µm in size
- Intergrowth between copper minerals is very rare
- Silver occurs as lattice intergrowth in Tennantite, with no primary silver minerals observed

A subsequent thin section study in 1983, undertaken on samples from drillholes 82303 and 82305 at Dingelvik, found Bornite intergrown with Chalcopyrite to dominant. In drillhole 82305 minor Chalcocite and Covelline (CuS) was also observed along with Sphalerite ((Zn,Fe)S) and Galena (PbS).

A recent petrographic analysis of three samples from drillhole 83804 at Baldersnäs completed in 2024 showed Chalcopyrite as the only copper mineral specie associated to muscovite-chlorite and quartz veinlets sub-parallel to an older foliation and mildly crenulated by a younger foliation. Fine-grained monazite (Rare Earth Element hosting mineral) also occurs in the matrix and in the muscovite-chlorite veinlets. The three samples through the mineralised horizon can be summarized as follows:

- Hanging wall shales: Pyrite > Chalcopyrite, Galena and Sphalerite > Arsenopyrite and Cobaltite
- Mineralised shales: Pyrite > Chalcopyrite, Sphalerite and Galena
- Mineralised sandstones: Chalcopyrite > Pyrite, Sphalerite and Galena > Rutile and Monazite

## Conclusions from Metallurgical Testwork Programme

Minpro laboratory programme was completed on a limited quantity of drill core from a small number of drillholes and is therefore considered preliminary and indicative only.

Reported results are interpreted to indicate that mineralisation from both Dingelvik and Henneviken may be amenable to conventional sulphide flotation, with high copper recoveries and moderate-to-high silver recoveries achieved under the testwork conditions

Based on the reported multi-element assays for selected final concentrates, impurity levels for common penalty elements (As, Sb and Bi) are interpreted to be low to moderate and, on an indicative basis, would not be expected to preclude concentrate saleability under many modern custom smelter terms, noting however, that the historical dataset does not include certain deleterious elements commonly required for marketing assessments (often including Hg, F and Cl, and in some cases Se/Te).

Dingelvik recoveries are reported to be slightly lower than Henneviken; however, the dataset is limited and these differences should be regarded as indicative only and may reflect sample selection, mineralogical variability and/or testwork conditions.

The causes of the reported recovery differences have not been established; liberation characteristics and mineral grain size are considered plausible contributing factors.

Dingelvik material is reported to have finer copper mineral grain size than Henneviken, and finer grinding may improve silver recovery.

## Next Steps / Planned Work

Arctic Minerals will now build on these extremely encouraging historical results by designing and implementing a modern preliminary metallurgical testwork program focussed on the existing Dingelvik resource base, and undertaking preliminary marketing studies.

Follow-up work will include:

- **Additional metallurgical testwork:** Further flotation testwork to be completed on Dingelvik mineralisation using a larger and more representative sample set, including material from additional drillholes and other zones within the potential orebody.
- **Mineralogy and liberation:** Integrate mineralogical characterisation (e.g. grain size, liberation, and mineral associations for Cu and Ag minerals) alongside metallurgical testing to support interpretation and flowsheet optimisation. To this end, the Dingelvik and Henneviken prospects have been selected for a three-year Centre of Advanced Mining and Metallurgy Critical Raw Materials ("CAMMCRM") research project. The objective of the research project is to investigate Critical Raw Metals ("CRM's") in Swedish copper mineral systems.
- **Smelter terms and concentrate marketing (indicative):** Compile indicative treatment, refining and penalty terms for relevant custom smelters and/or traders and update the list of potential penalty elements against current specifications. Confirm which elements are commercially critical for target markets and blending strategies.
- **Deleterious element suite and variability:** Undertake additional concentrate and feed assays for deleterious elements commonly considered in modern contracts (often including Hg, F and Cl, and in some cases Se/Te and others) using appropriate detection limits and QA/QC. Where possible, include variability sampling across lithologies/zones to assess potential ranges in penalty elements.

## Source Reports

- Minpro report 3080/1982-08-07, ”Anrikningsteknisk undersökning i laboratorieskala av koppar och silvermineraliseringen Dingelviken”. Available in Swedish only.
- Minpro report 3789/1983-12-27, ”Orienterande anrikningsförsök med prov från kopparmineralisering i Dalsland”. Available in Swedish only.
- SGU, BRAP 81902, 1981-12-02: ”Kornstorleksfördelningen hos kopparmineral från Dingelviken”. Available in Swedish only.
- Sveriges Geologiska AB, PRAP 83556, 1983-12-31: ”Geologiska Arbeten i Dalslandgruppen 1983 Delrapport II”. Available in Swedish only.
- Figula GeoServices AB, 2024-06-01: “Petrographic analysis of 3 thin sections”. Available in Swedish only.

## Scope and Reliance Statement

The technical information in this announcement is based on historical laboratory testwork reported by Minpro (1982–1983) and has not been independently verified. The results and interpretations presented herein are considered indicative only and are subject to uncertainty arising from limited sample mass, limited spatial coverage, and potential differences between laboratory and full-scale operating conditions.

## Competent Persons Statement

The information in this announcement that relates to historical Metallurgical Results is based on and fairly represents information researched and compiled by Ms Petra Brodin, a Competent Person who is a Qualified Metallurgist from the Lulea University of Technology. Ms Brodin is a consultant to Arctic Minerals and a holder of shares in the Company. Ms Brodin has sufficient experience which is relevant to the metallurgical properties and processing techniques under consideration, and to the activity which she has undertaken. Ms Brodin consents to the inclusion in the announcement of the matters based on her information in the form and context in which it appears.