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Excursion guide: Sala silver mine

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Cover photograph: The Christina shaft, Sala silver mine.
Photo: Jeanette Bergman Weihed

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Contents

One day excursion to the historic Sala Zn-Pb-Ag deposit

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Preliminary schedule

08.00	Departure from Hotel Radisson Blu, c. 1 hour drive.
09.00–11.30	Introduction at Sala mine site, visit field localities.
11.30–12.45	Lunch
12.45–15.00	Mine visit, underground localities.
15.00–16.00	Drill core exhibition with Alicanto Minerals Ltd – SAL22-26.
16.00-17.00	Drive back to Hotel Radisson Blu.

Disclaimer

This excursion guide to the Sala area is a modified and updated version of the one originally compiled for "SWE6 the historic Sala silver deposit" by Jansson (2013), which was a one day excursion organized in conjunction with the 12th biennial SGA meeting in Uppsala. Text segments from that guide are re-used with permission from the Geological Survey of Sweden.

Introduction

The Sala Zn-Pb-Ag mine is located 60 km west of Uppsala. It produced c. 450 metric tons of Ag and 35 000 tons of Pb from 5 Mt ore during continuous mining from the late 15th century until 1908. Zn was intermittently mined in the middle of the 20th century. Despite being a small deposit in a modern sense, it is historically one of Sweden's most important mines, mainly because of its endowment in silver and proximity to Stockholm. Hence, silver from Sala could serve as a financial back-bone for the Swedish monarchy during the 16th century, granting the Sala mine epithets such as "the kingdoms foremost jewel".

Today, the mine is open for tourists with regular guided tours, while the area remains a subject of both mining (Björka Mineral's Tistbrottet dolomite mine) and exploration (Alicanto Minerals Ltd's current drilling campaign in the area). The mine is unique in being one of the few mines in Sweden where 17th century workings can still be accessed underground. Additionally, the surroundings of the mine are rich with regards to key geological outcrops for understanding the palaeoenvironments during deposition of c. 1.89 Ga supracrustal rocks in this part of the Svecokarelian orogen. This excursion will provide a tour through Sala mine and its immediate surroundings. We also look at a drill core from the current drilling campaign of Alicanto Minerals Ltd directly west of the old silver mine.

Geology

The mined ore at Sala mine mainly comprised massive to semi-massive replacement bodies, veins, vein networks and breccia infill in dolomitic marble and magnesian skarn. The main ore minerals were Ag-rich galena and sphalerite, whereas skarn minerals were dominantly tremolite-actinolite, serpentine, diopside-ferroan diopside, talc, olivine, chlorite and phlogopite (Jansson 2007; Jansson et al. 2022a). The deposit is hosted by one of the most extensive marble units in Bergslagen, herein lithostratigraphically referred to as the Sala limestone (Fig. 1; Ripa et al. 2002; Jansson et al. 2022a). During the excursion, we'll visit a well-preserved part of the Sala limestone in outcrops and quarries directly west of the mine (Fig. 1), which reveal that the host originally comprised a shallow marine succession of calcitic, stromatolitic limestone, with interbeds of reworked, felsic volcaniclastic material (Ripa et al. 2002; Allen et al. 2003).

Stratigraphic relationships in the Sala area have until recently been poorly constrained. Earlier models have suggested that the Sala limestone unit overlie a several km thick, rhyolitic to dacitic volcanic succession which is exposed to the east, west and north (Fig. 1–2; e.g. Ripa et al. 2002; Stephens et al. 2009). However, recent geological mapping by Jansson et al. 2022a illustrate that the western volcanic succession is in fact the stratigraphic hangingwall of the Sala limestone, and that the stratigraphic footwall is not exposed due to intrusion by plutonic rocks (Sala granite) at depth and towards the east (Fig. 1). Along with the effects of the complex folding in the area, this precludes estimating the original thickness of the Sala limestone with

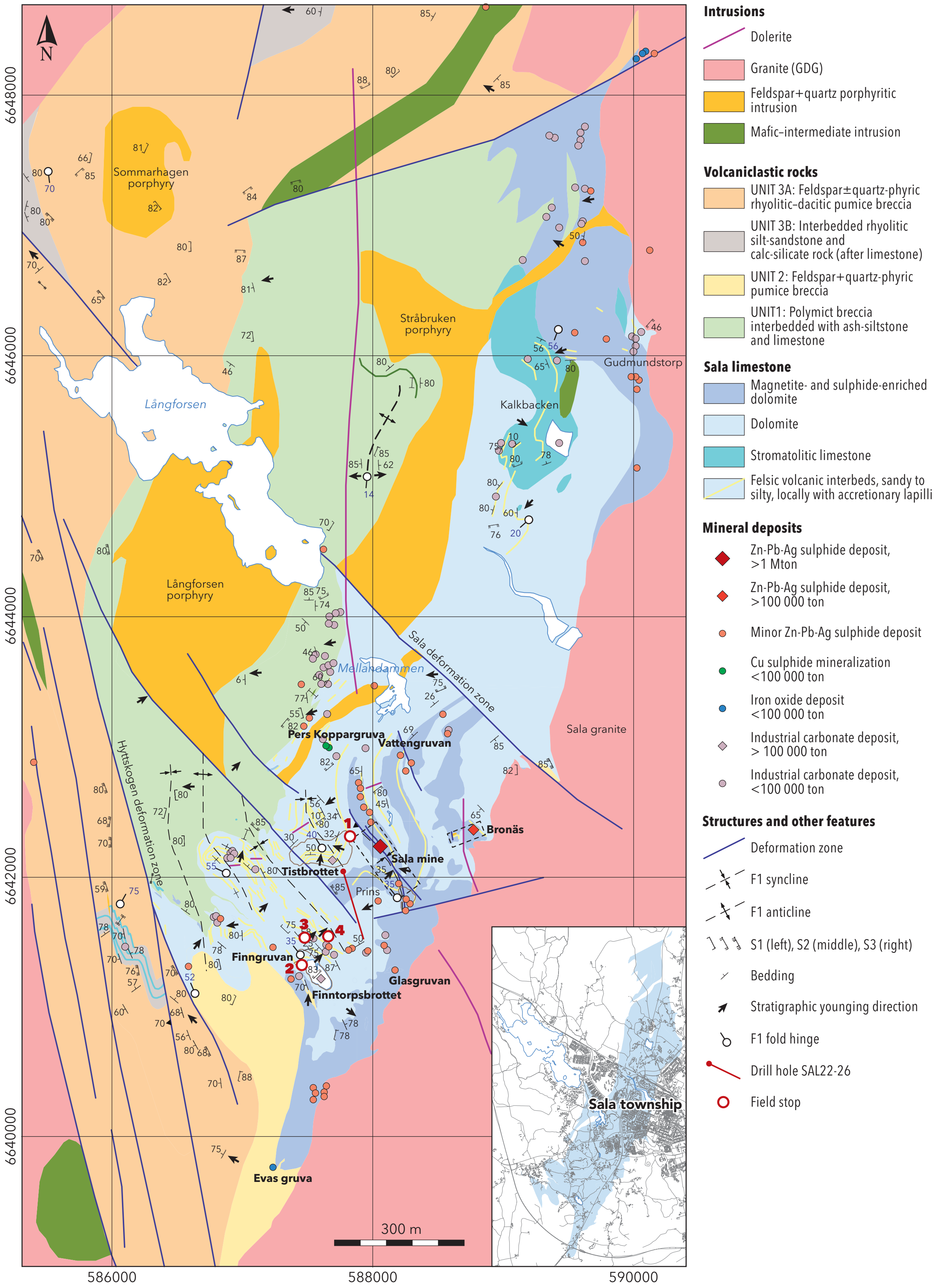


Figure 1. Regional geological map of the Sala area. Modified after Jansson et al (2022a), adapted from Tegengren (1924), Ripa et al. (2002), Allen et al. (2003) and Jansson (2007). Geology around the Sala mine is schematically projected to surface based on Jansson (2007).

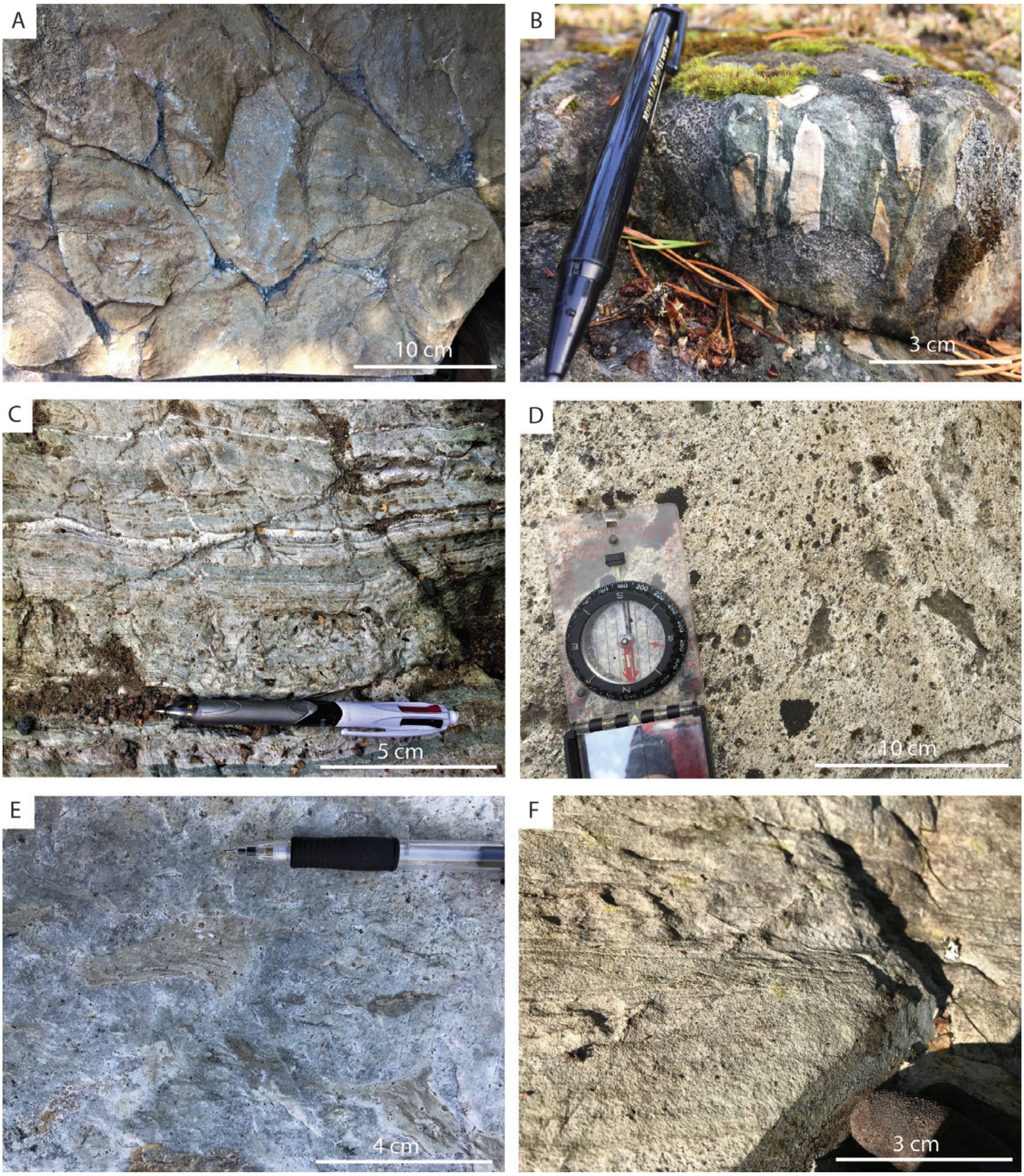


Figure 2. Selected volcanic and sedimentary facies in the Sala area. **A.** Dolomite marble with relict domal stromatolites. The dark interstitial material consist of chlorite. Sala limestone. Boulder from Finntorpsbrottet, E587552, N6641268. **B.** Matrix-supported monomict breccia facies from the stratigraphic hangingwall of the Sala limestone UNIT1. Angular, aphyric, white felsic clasts occur in a sandy matrix of quartz, feldspar, chlorite and calcic clinoamphibole. Viewed from the side. The sub-vertical alignment of these clasts reflect a pronounced stretching lineation adjacent to the Hyttskogen deformation zone. E586280, N6642246. **C.** Finely laminated silt-sandstone facies belonging to UNIT1. Green-tinted bands reflect elevated presence of metamorphic calc-silicates (calcic clinoamphibole, epidote, clinozoisite). E587572, N6643730. **D.** Weathered surface of feldspar+quartz-phyric rhyolitic pumice breccia belonging to UNIT2. Irregular-shaped, sericite-altered pumice fragments are preferentially weathered out in comparison to the more siliceous, feldspar+quartz phyric matrix. E587278, N6641229. **E.** Wispy, sericite-altered pumice fragments in pumice breccia facies belonging to UNIT 3A. E587109, N6646526. **F.** Cross-bedded rhyolitic sandstone belonging to UNIT 3B. E587859, N6649044.

precision, but it is estimated to have been at least 500 m thick.

Marble in the Sala limestone carry abundant interbeds of felsic, metavolcanic rock. One such interbed, interpreted as an accretionary lapilli-rich volcanic air-fall bed (field stop 2), was dated at 1894±2 Ma (Stephens et al. 2009). The Stråbruken porphyry (Fig. 1), a metamorposed, porphyritic, subvolcanic dacite intrusion in the Sala limestone, has been dated at 1892±2 Ma (Stephens et al. 2009). Metamorphosed granite and granodiorite, dated at 1891±6 Ma and 1890±3 Ma, respectively, border the supracrustal rocks towards the east (Stephens et al. 2009). Altogether, these ages suggest that deposition of the host succession followed by burial and granitoid emplacement occurred within the time range 1894±2 Ma to 1890±3 Ma.

Subsequent to their deposition, the supracrustal and plutonic rocks underwent polyphase ductile deformation and greenschist facies regional metamorphism at c. 1.87–1.86 Ga and 1.84–1.80 Ga during the Svecokarelian orogeny, leading to their currently complexly folded and recrystallized disposition. The semi-regional structure in Fig. 1 constitutes a fold interference pattern of F_1 folds which were refolded around open, east- to northeast-trending, moderately to steeply plunging F_2 fold axes (Ripa et al. 2002). The vergences and symmetries of folds suggest that the Sala limestone is located on the eastern limb of a doubly-plunging F_1 syncline with a hinge zone west of Tistbrottet. The western limb is seemingly truncated by the Hyttskogen deformation zone (Fig. 1). Numerous later shear zones and faults have added to the complexity of the structure (Fig. 1).

The Sala deposit is situated in the center of a northnorthwest-trending F_1 syncline, termed the 'Sala syncline' by Jansson (2007; Fig. 1). On a large scale, the Sala syncline is a minor parasite fold on the eastern limb of the main F_1 syncline. The F_1 fold axis plunges c. 35° towards northnorthwest in the mine, and is parallel to the plunge of the mined deposit (Fig. 3; Jansson 2007; 2017).Mining started in the southernmost, outcropping part of the deposit, whereas 17th to 20th century mining was conducted through shafts further north (Fig. 4).

The Sala syncline was cut by several southeast-dipping brittle to ductile shear zones, the largest being the Storgruveskölen shear zone (SSZ), which in the mine parallels the F_1 axial surface (Fig. 3). The SSZ is composed of schists of talc, serpentine, chlorite and carbonate and also formed carbonate breccias. Mineralization followed the SSZ and is discordant to stratigraphy, even though sulphide bodies locally appear to have formed along the contacts of the hydrothermally altered felsic interbeds near the SSZ (Fig. 3).

Field evidence indicate that the dolomitic composition of the marble host is due to alteration of originally calcitic, stromatolitic limestone. Dolomitization is semi-regional and not clearly spatially related to mineralization. Near the mined Zn-Pb-Ag deposits, the felsic volcaniclastic interbeds record intense alteration to schists of chlorite, phlogopite and sericite, and the dolomitic marble host is commonly brecciated and rich in veins, spots, pods and impregnations of skarn minerals, sulphides and magnetite (Jansson 2007; Jansson et al. 2022a). Furthermore, unlike the semi-regional dolomite marble, ore-proximal dolomite exhibits an enrichment in Fe and Mn compared with more distal regional dolomite (Jansson et al. 2022a, b).

Pre-20th century accounts mainly assumed that most silver occurred as a solid solution in galena and more rarely in visible silver minerals, as summarized by Sjögren (1900, 1910). Historically, massive galena ore from Sala held up to 1 weight-% Ag. Sjögren (1900) argued that it was unrealistic that such a high Ag grade could be explained by solid solution. The ore is also rich in Sb and Hg, and the Sala area is the type-locality of native antimony (Swab 1748), gudmundite (Johansson 1928) and geochronite (Svanberg 1841). It is one of the first places where mesoscopically visible, natural Ag-amalgams were identified (Zakrzewski & Burke 1987). Modern studies involving reflected light microscopy and electron micrope analysis have revealed that galena from Sala is very rich in inclusions of sulphosalts, antimonides, Ag-amalgams and rarely native silver (e.g. Kieft et al. 1987). Thus, most Ag was associated with Hg and Sb minerals, microscopically dispersed in galena or more rarely as mesoscopically visible, sulphur-poor assemblages.

An epigenetic origin has been proposed based on textural and structural observations (Sjögren 1910; Jansson 2007; 2017; Jansson et al. 2022a). The observations that 1) micas in hydrothermally

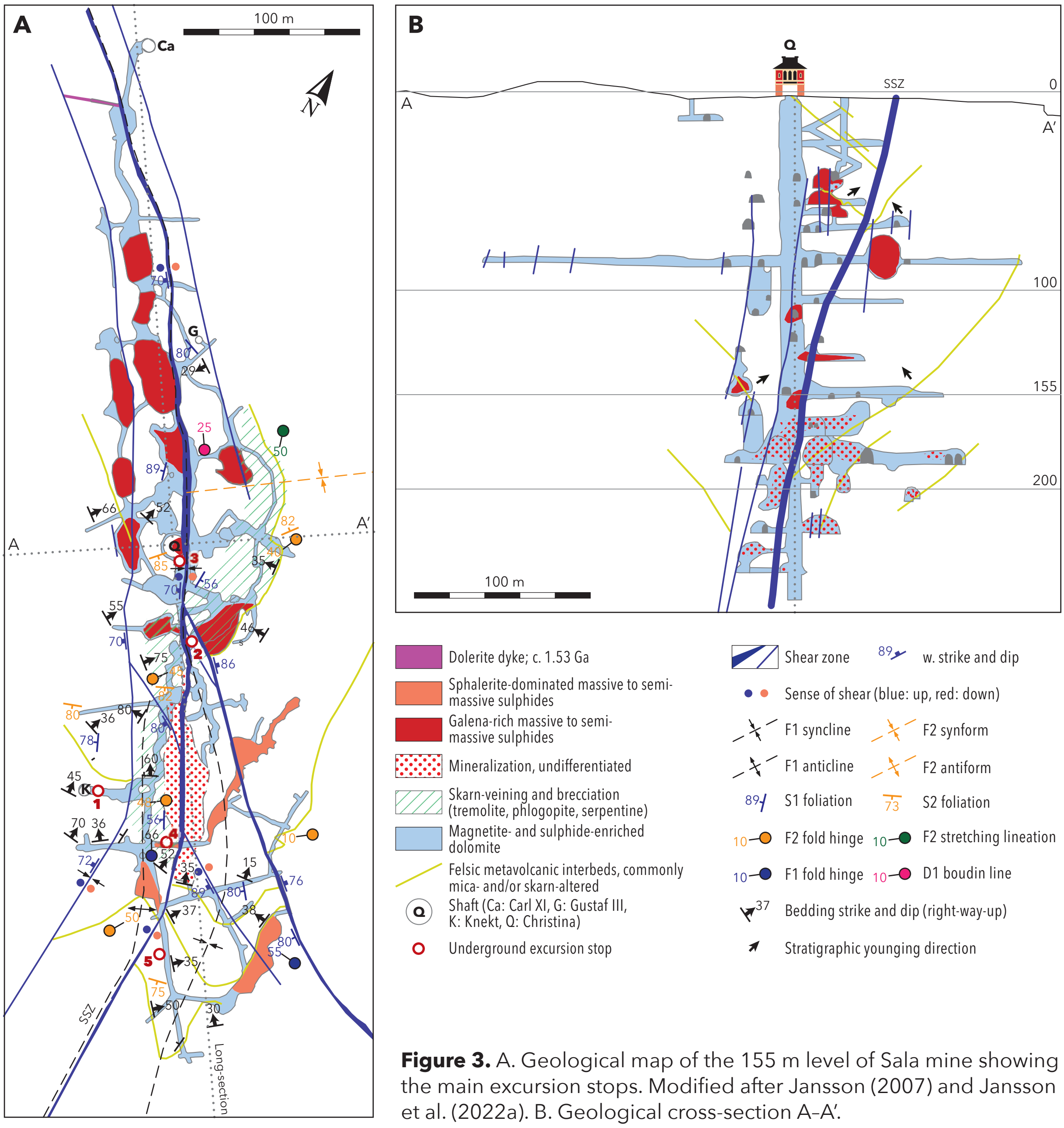


Figure 3. A. Geological map of the 155 m level of Sala mine showing the main excursion stops. Modified after Jansson (2007) and Jansson et al. (2022a). B. Geological cross-section A–A′.

altered metavolcanic beds record S_1, 2) L_2 stretching lineation is present in sphalerite ore (Fig. 6), 3) the plunge of ore lenses and F_1 fold axes are parallel at Sala mine and 4) stratabound alteration zones are folded by F_1 are easiest to reconcile with a pre-D_1 origin, e.g. in the time range 1.89–1.87 Ga. Furthermore, Jansson et al. (2022a) inferred a genetic relationship with nearby felsic subvolcanic and plutonic intrusions, all of which have been dated to c. 1.89 Ga. Importantly, the Sala granite sharply truncate intensely altered dolomite along its western contact without itself exhibiting evidence of strong alteration (besides e.g. minor saussuritiziation). Hence, Jansson et al. (2022a) interpreted granite emplacement to post-date the main stages of alteration, thus bracketing the timing of ore formation even further to c. 1.89 Ga. The close spatial relationship between mineralization, early brecciation and skarn-veining of the carbonate host along the strike of the SSZ (Fig. 3) makes it plausible that the zone functioned as the principal conduit for hydrothermal fluids, and that it underwent reactivation during subsequent compressional deformation phases.

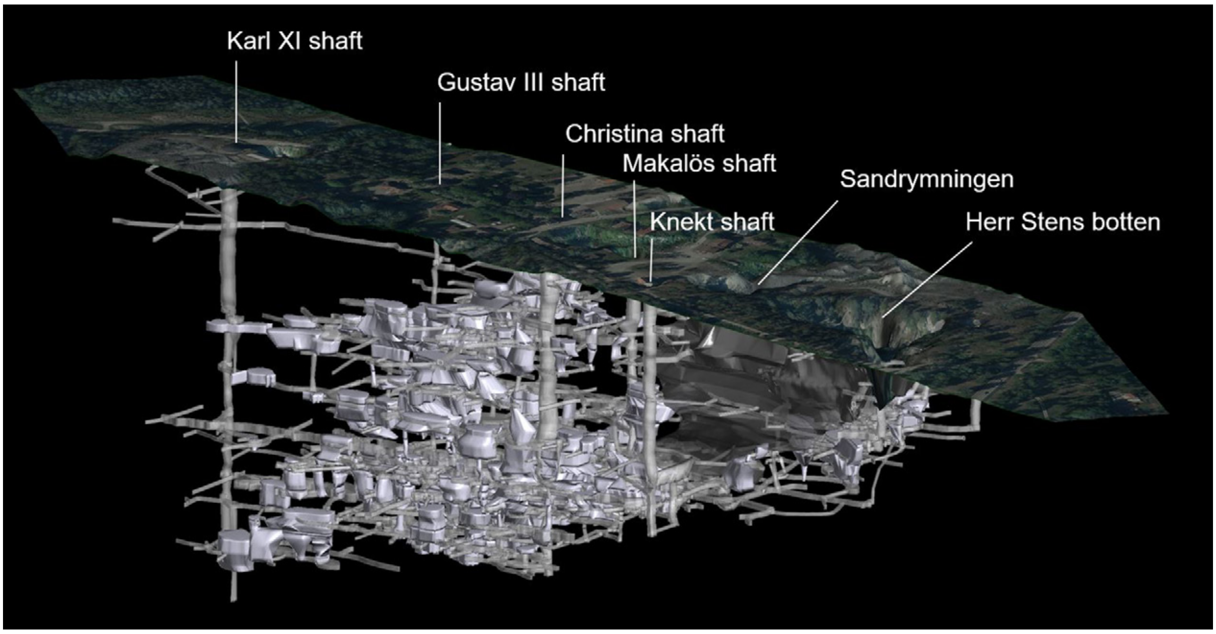


Figure 4. 3D model of the Sala mine, viewed towards northwest. The deepest shaft (Karl XI shaft) to the left in the figure is 318.6 m deep. Mining started in the area of Herr Stens Botten and progressed northwards and to deeper levels.

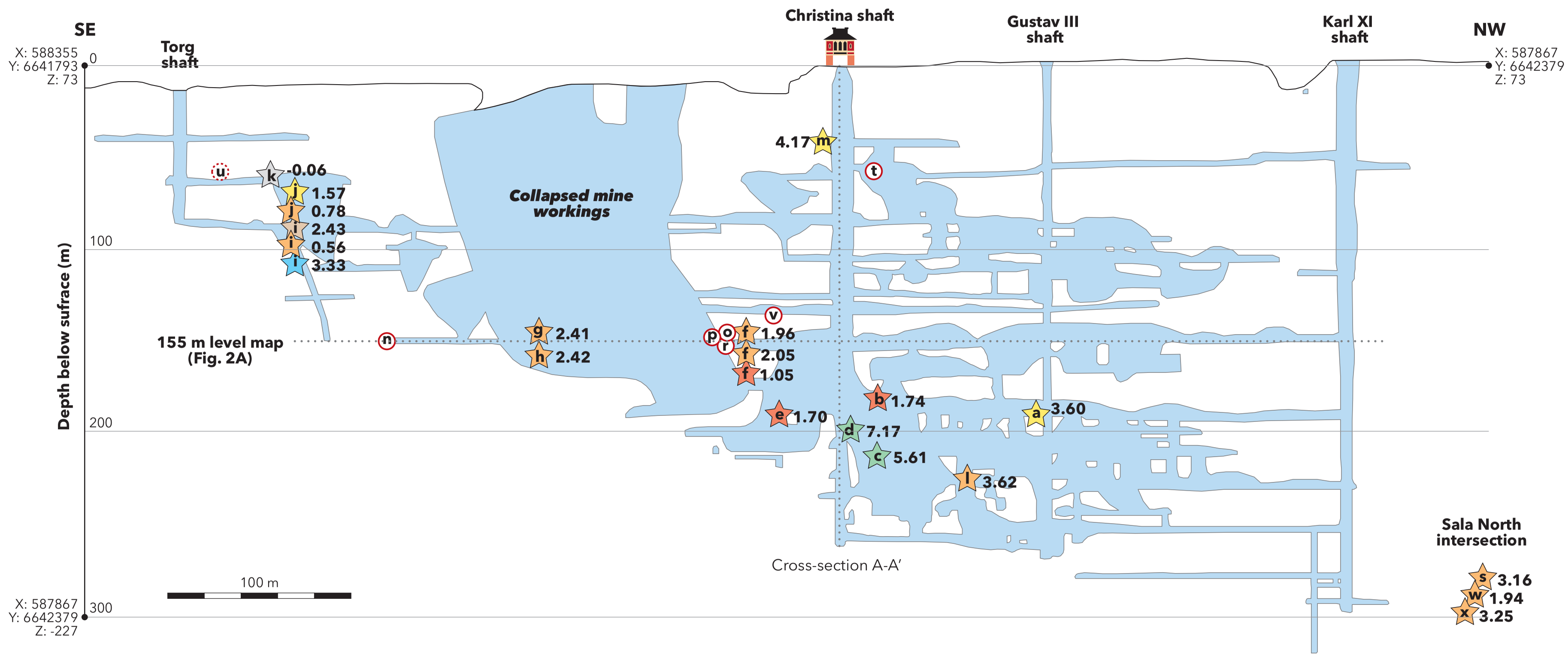
Utilizing an integration between geological mapping with lithogeochemical, mineralogical, and stable isotope data (C, O, S), Jansson et al. (2022) showed that complexly zoned garnet and clinopyroxene skarns in the Sala area must have formed prior to mineralization. This is consistent with historic observations of sulphides, such as galena, brecciating and replacing prograde skarn minerals and barite (Fig. 6B–D; e.g. Sjögren 1910; Jansson 2007).

The sphalerite-galena-dominated mineralization which constituted the ore is associated with more hydrous alteration associations of calcite, chlorite, phlogopite, serpentine, talc and tremolite-actinolite, chlorite. Jansson et al. (2022) inferred a metasomatic origin for the skarns and the mineralization, involving a transition from early barren high-T metasomatism to later hydrolytic alteration in coincident with mineralization. This is among other things suggested by trends defined by negative shifts $\delta^{18}O_{V\text{-}SMOW}$ and $\delta^{13}C_{V\text{-}PDB}$ in dolomite and calcite, which suggest fluid infiltration at 300–500 °C. A primordial sulphur source is suggested by an average $\delta^{34}S_{V\text{-}CDT}$ of 1.6 ± 1.9‰ in sulphides (Fig. 5).

Field excursion stops

The area west of Sala mine offers a possibility to study relatively well-preserved sections of the host succession. The descriptions to the field localities are largely summarized after Allen et al. (2003).

Field stop 1: Bedding and structure in dolomite sequence at Tistbrottet (N6642205, E587591). Tistbrottet is an active dolomite mine situated c. 200 m west of the Sala mine (Fig. 1). The old quarry part of the mine offers a view of almost rhythmic alternation of tabular, white, massive, dolomitic marble beds and thinner (0.5–1 m), very fine-grained (silty to sandy), pale-brown, meta-volcanic beds. Whole rock geochemical analysis of the meta-volcanic beds indicates juvenile rhyolitic compositions. Allen et al. (1996; 2003) interpreted them to have formed by mainly post-eruptive re-deposition of volcanic ash via a combination of turbiditic and suspension processes in a calm, sub-wave base environment. The marble protolith was interpreted as a stromatolitic limestone. The beds strike east to northeast and dip and young to the north (Fig. 1). The main foliation (S_2) also strikes east to northeast and has an associated strong,



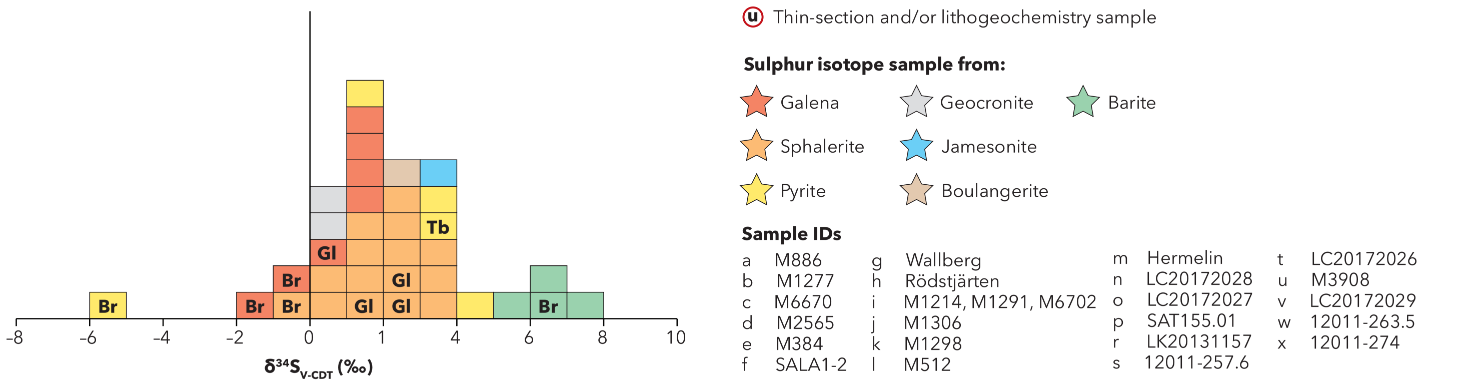


Figure 5. Simplified south-east–northwest long-section of Sala mine, summarizing available sulphur isotope data from the deposit.

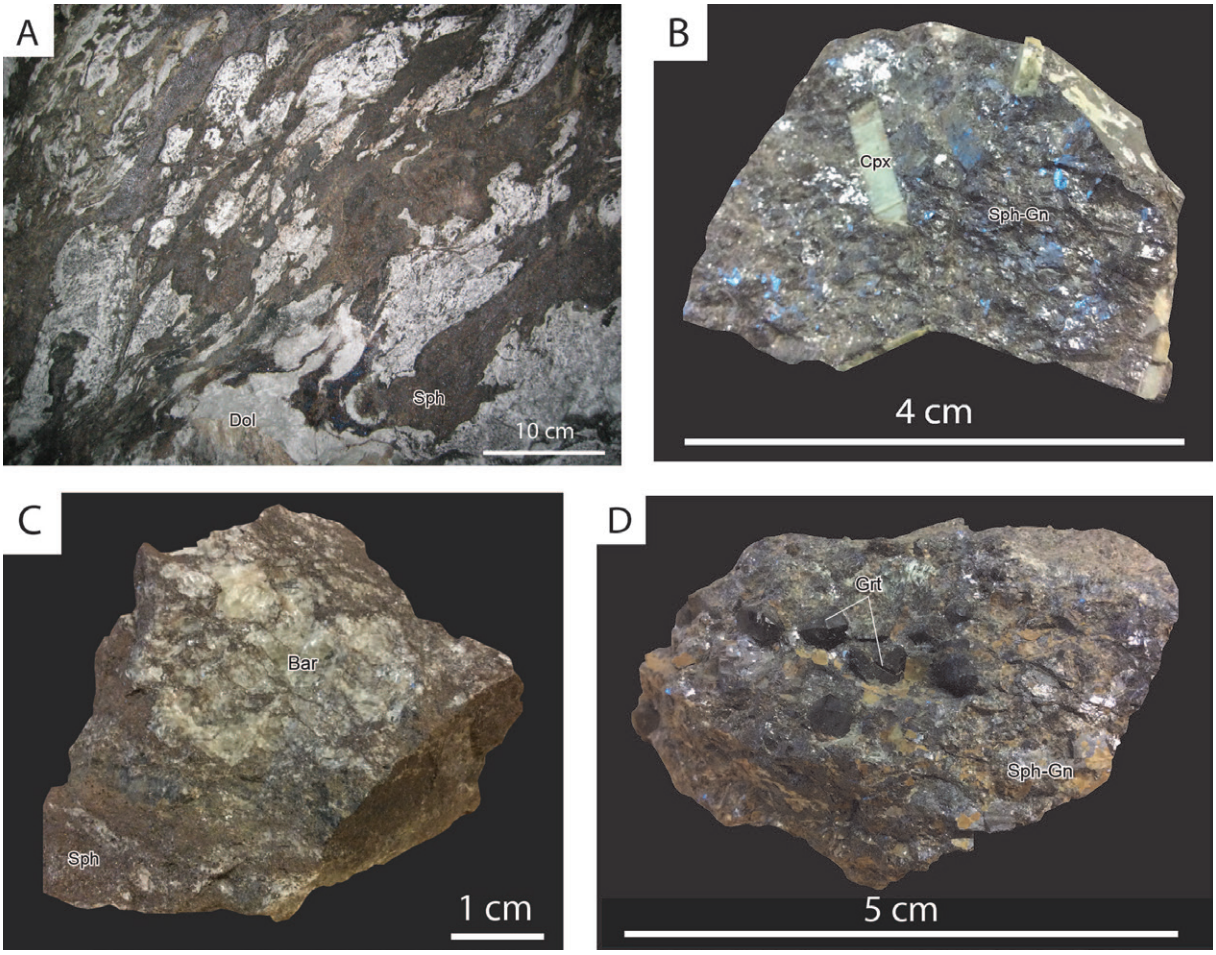


Figure 6. Selected mineralization styles at Sala mine. **A**: Ductile-deformed sphalerite vein network overprinting dolomite marble. **B:** Massive sphalerite+galena mineralization with subhedral crystals of ferroan diopside. **C:** Sphalerite mineralization with corroded and veined clasts of massive barite. **D:** Massive sphalerite+galena mineralization with euhedral black crystals of grossular-andradite.

steep stretching lineation. At the western end of the quarry, deformation and recrystallization associated with a folded, mylonitic D_1 shear zone have completely obliterated primary structures and textures.

Field stop 2: Stromatolites in the Finntorpet quarry (N6641345, E587562). Finntorpsbrottet is an abandoned dolomite quarry southwest of the Sala mine, where a slightly more grey dolomite variety than at Tistbrottet was mined from 1957 until 1974 (Fig. 1). The quarry and the area just north of it offer a chance to study the structure and texture of the marble and metavolcanic beds in more detail. The area is dominated by thick, tabular dolomite beds, mainly striking northwest to northnorthwest and dipping northeast or southwest, and metavolcanic interbeds. The northeastern side of the quarry, and outcrops in the forest more than 200 m to the north of it, contain well-preserved primary sedimentary textures and structures, including stromatolites in the marble and accretionary lapilli in the metavolcanic beds. Stratigraphic younging indicators, to be outlined in more detail below, indicate consistent northeastward younging in this area, except in the vicinity of a series of small northnorthwest-plunging F_1 folds. A moderate northnortheast- to northeast-striking S_2 cleavage is the main foliation in the area, and it contains a strong stretching lineation plunging 30 to 50 degrees southwest. The S_2 foliation crenulated a weak, earlier mica foliation, which is sub-parallel to bedding. Small F_2 folds plunge moderately to the northeast.

Stromatolites occur as original microbial mats, domal bioherms, columnar domal, conophyton and domal morphologies, of which the latter is most common. They range from linked to non-linked. Individual stromatolites have diameters up to 65 cm and synoptic relief up to 50 cm. Internal layering is locally observed, consisting of first order, 1 mm-thick laminae defined by traces of Mg-rich chlorite and tremolite. These laminae are interpreted as metamorphosed, fine-grained volcaniclastic material which draped the stromatolites during their growth.

Field stop 3: Rhyolitic sandstone to siltstone interbed in dolomite (N6641561, E587519). Many metavolcanic interbeds in the Sala area have bulbous and undulating bases with a relief of up to 1 m, yet flat tops. At this locality, it is seen that this geometry results from that the volcaniclastic material draped stromatolitic micro-topography during deposition. Regionally, this feature allows determination of stratigraphic younging direction, even where stromatolitic textures are not preserved.

The metavolcanic bed here comprises a 1 to 2 m-thick, white-weathering, stratified rhyolitic sandstone with partially reworked accretionary lapilli. The lower part of the bed is coarse-grained and rich in volcanic quartz and feldspar crystals. This facies was been interpreted to reflect shallow water or subaerial tractional sedimentation by Allen et al. (1996). This particular bed has abundant, close-packed to scattered, intact to broken, c. 1 cm-size accretionary lapilli. The basal part is massive, whereas low-amplitude cross-stratification may be observed close to the centre. The upper part of the bed comprises rhyolitic ash-siltstone. The upper part of the draped dolomitic marble bed consists of coalesced domal stromatolites, whereas the lowermost part of the overlying bed constitutes planar microbial mats. The metavolcanic bed is rimmed by c. 10 cm thick zones of massive, coarse-grained tremolite, interpreted as regional metamorphic reactions skarns.

Allen et al. (2003) suggested that stromatolite growth commenced in a sub-wave base environment, but that, eventually, growth to above wave base led to interruption in carbonate accumulation, and dumping of felsic volcaniclastic material unto the stromatolites by ash-fall eruptions and wave action. The above wave-base environment was thus inhospital to stromatolite growth. The continuous recolonization by cyanobacteria above each interbeds in the several 100 m thick marble formation is, however, evidence for continuous basin subsidence, whereby a new cycle of formation and smothering of stromatolites could begin upon subsidence to below wave base. The presence of partially reworked accretionary lapilli in the metavolcanic bed here suggests synchronicity between phreatomagmatic volcanism and deposition of storm wave- reworked volcaniclastic material. Possibly, beds like these constitute air fall deposits reworked by eruption-generated tsunamis (Allen et al. 2003).

Field stop 4: Rhyolitic sandstone interbed with reworked accretionary lapilli (N6641601, E587626). This outcrop shows a 2 to 3 m thick, white-weathering, stratified rhyolitic sandstone to siltstone interbed in the marble. The middle part of the bed contains a 30–50 thick interval cross bedded accretionary lapilli. The accretionary lapilli in this bed are more broken than at the previous stop, and the sandy matrix between the larger lapilli fragments contains abundant shell-like fragments from the outer rinds of broken lapilli.

Underground excursion stops at the 155 m level

Underground, in the mine, we will study the effects of hydrothermal alteration and mineralization on rocks similar to those observed in the field. We will furthermore study the SSZ and its relationships to the mined ore bodies.

Underground stop 1: Folded, altered, metavolcanic interbed in the Knekt shaft. Access to the 155 m level is through the Knekt shaft, east of which several collapsed workings testify to a series of collapses in the late 16th to mid 17th century, which nearly meant an early end to the mining operations. The shaft is one of several which were sunk in the early 17th century to secure safe passage to the ores and solve drainage problems. The shaft was made entirely by fire setting, as explosives had not yet been introduced in Swedish mining.

A folded and boudinaged, brown metavolcanic interbed is observed in the shaft wall at the 155 m level (Fig. 3). It contains abundant chlorite, sericite, phlogopite and tremolite and is rimmed by a c. 10 cm wide zone of tremolite skarn. The adjacent marble contains abundant skarn of tremolite, serpentine, chlorite and lesser diopside, in addition to disseminated magnetite, pyrite and minor galena and sphalerite. This gives the rock a patchy to speckled greenish-grey color, in contrast to the field localities. These features are typical of the "magnetite- and sulphide-enriched dolomite marble" as defined by Jansson et al. (2022a,b). This marble variety is characterized by enrichment in Fe, Mn, S, Zn, Pb, Hg, Sb and As relative to regional dolomite marble. It forms both a host rock to Zn-Pb-Ag mineralization, and outline c. 200 m wide hydrothermal alteration halos to the deposits (Fig. 1). The alteration zones range from discordant to concordant and are seemingly anchored at the SSZ. No primary textures, such as those observed in the field, are visible here. Nevertheless, planar upper contacts and undulating lower contacts towards dolomitic marble mimic those of the field, suggesting that the metavolcanic interbed draped the stromatolitic micro-topography. The way up indicators suggest that we are on the western limb of the Sala syncline.

Underground stop 2: The SSZ near the Bergenstierna working. This locality presents a view of internal structure of the SSZ, which is here 1.5 to 2 m wide and dips c. 70° southwest (Sala mine 155 m level map). Asymmetric sheared objects and mesoscale S-C and S-C' fabrics indicate reverse sense of shear with uplift of the southwestern block. Sub-horizontal, serpentine-coated fractures along the shear zone boundaries suggest a late phase of dextral strike-slip movement (Jansson 2007). Most mineralization in the mine occurred adjacent to the SSZ, even though it rarely carried mineralization itself. In a gallery nearby, veins and impregnation of galena in skarn-mottled, dolomitic marble may be observed. This constitutes the peripheral part of the Bergenstierna galena-dominated ore body.

Underground stop 3: The Drottning Christina shaft, the flooding of the mine, the 1877 collapse. After the closure of the mine in 1908, groundwater was allowed to fill the mine up to approximately the 155 m level, where some un-mined sphalerite ore remained. The result was the formation of some artificial, subterranean lakes, such as the one by the Drottning Christina shaft. The irregular outline of the working around the lake is the result of a collapse in October 1877. The collapse occurred along the SSZ. Material from an area of c. 300 m^2 and a vertical extent of c. 25 m cascaded 40 m down to the lower workings. Fortunately, the collapse started at night and security measures were taken, resulting in no casualties (Engelbertsson 1987). Most collapses in the mine occurred in association with the mechanically weak, talc- and serpentine-lubricated rocks of the SSZ.

Underground stop 4: Sphalerite mineralization. The sphalerite ores occurred stratigraphically and structurally below the galena ores (Fig. 3), defining a distinct metal zonation. The ores generally contained about 12% Zn, 2% Pb and 150 to 200 ppm Ag. However, they historically yielded lower Ag recovery than the galena ores and, as they were poorer in Ag, they were generally neglected until the late 19th century, when Zn and ZnO became interesting commodities.

The ores comprised sphalerite vein networks and breccia infill in dolomitic marble (Fig. 6A). Associated gangue minerals included tremolite, serpentine, phlogopite, diopside, barite, calcite and dolomite. Associated ore minerals included galena, geocronite, boulangerite, tetrahedrite, silver amalgam and native silver. The style of alteration and mineralization here differs from those of stops 1 and 2 in that skarn minerals and mineralization are largely restricted to veins and pods, rather than occurring disseminated in the dolomite marble. Close inspection of the walls reveal that stromatolitic textures are still preserved. Sphalerite vein networks cross-cut stromatolitic banding, and individual laminae have locally been replaced by sphalerite.

Underground stop 5: Stromatolites near sphalerite mineralization. Stromatolites here occur in thin, columnar and domal morphologies, which are here accentuated by a few, c. 5 cm-thick, chlorite-altered interbeds with flat tops and jagged lower contacts. Here, chlorite is also observed as regularly distributed lenses in the interspace between individual stromatolites near the base of the marble beds. The lenses have flat tops and convex lower contacts and are interpreted to reflect intermittent sedimentation of thin ash-fall deposits, which accumulated in the interspaces between stromatolite domes, yet did not completely bury them. The stromatolites continuously overgrew the interspace material, giving rise to the currently observed geometry.

Drill core exhibition

Following the end of the continuous mining operation in 1908, an active exploration program ensued which targeted extensions to known deposits as well as satellite deposits in the vicinity of Sala mine. More than 650 drill holes have been made in the area by various companies during the last c. 120 years, and additional mineralized zones have been intersected. The 20th century exploration efforts culminated in the discovery of the Bronäs deposit (Fig. 1), which was mined from 1945 to 1962. Subsequent to the closure of Bronäs mine, no sulphide mining has taken place in the Sala area, yet exploration continues.

Since May 2021, Alicanto Minerals Ltd have been conducting a very active exploration program in the area directly west of the old silver mine. Among other things, the current exploration aim at providing a maiden resource estimate for the 'Prince lodes', just southwest of the Sala mine (Fig. 1). Exploration drilling in this area have shown that the minor mineralization known at surface make way to an extensive system of sulphide lenses at depth, interpreted as a sphalerite-dominated stratabound hydrothermal breccia complex which is situated in deeper strata compared with the host of the ore at the historic silver mine. The Prince mineralization is texturally and compositionally similar to that at Sala mine, and similarly, early hydrothermal breccia structures appear to have been important in forming high-grade mineralization via focusing of mineralizing fluids (cf. Jansson, 2017).

We will look at drill core SAL22-26 (Collar: N6641933, E587961), where Alicanto intersected high grade massive sulphide mineralisation in 2022. Assay results from the massive sulphide zone of sphalerite and galena with native silver returned with 4.7 m @ 24.4% Zn, 875 g/t Ag and 3.7% Pb from 249.4 m. In the core, massive sphalerite rimmed by dark fine-grained serpentine-chlorite can be seen, interpreted as primary replacement textures of the dolomite.

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