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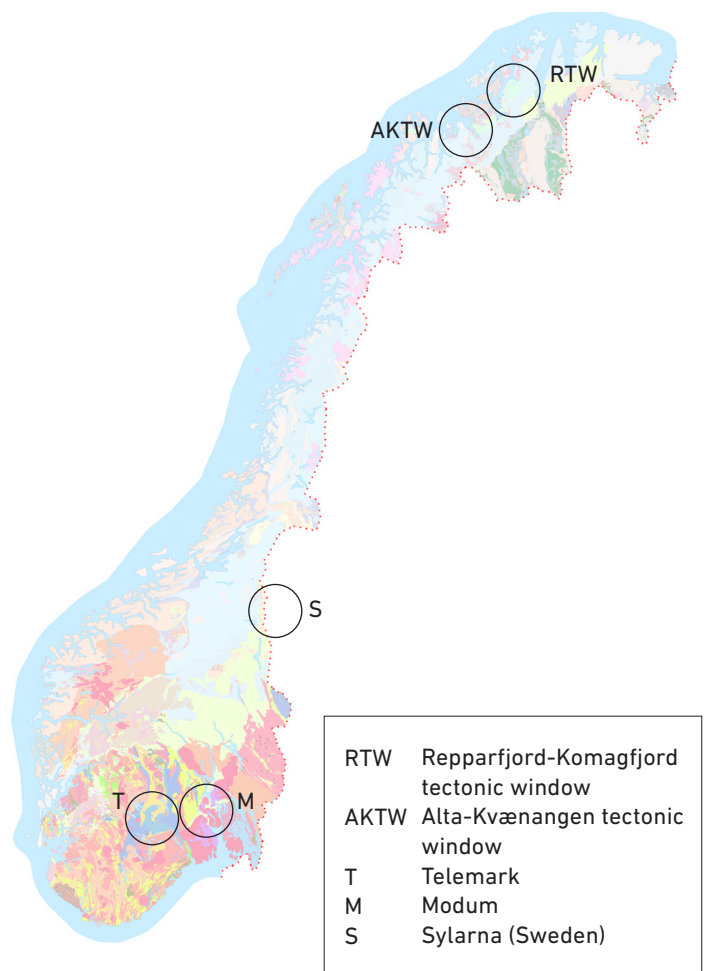
SEDIMENT-HOSTED CU-DEPOSITS

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There is a high potential for sediment-hosted, stratiform Cu-deposits (SSC) in Proterozoic sedimentary basins in Norway. Larger deposits occur in favourable basins. They are under-explored and undiscovered due to till coverage and weak responses in airborne geophysical surveys, although they give good response in induced polarization (IP) ground surveys. The copper mineralogy is favourable and commonly precious metals add credits.

Several sediment-hosted copper deposits occur in tectonic windows that form large basement culminations within the Scandinavian Caledonides in western Finnmark, North Norway. The most significant of these is the Nussir deposit in the Repparfjord tectonic window (RTW) with indicated and inferred resources of 64.3 Mt of copper ore with average grade of 1.17 % Cu and payable amounts of silver and gold (www.nussir.no, JORC estimates). Ulveryggen is another major deposit within RTW with total resources of 7.7 Mt of approximately 0.8 % Cu. About 3 Mt of ore with an average grade of 0.66 % Cu were mined in the period 1972–1979 from four open pits in this deposit.

The Nussir and Ulveryggen Cu-deposits are emplaced in sedimentary rocks deposited within a rapidly subsiding basin, possibly a fault-controlled half-graben in a continental arc/back-arc setting. The Nussir deposit is hosted by 3-5 m thick beds of doloarenite and (argillitic) dolostone, that crop out over a strike length of 9 km. The Ulveryggen deposit is situated in coarse-grained quartzitic to feldspathic sandstone and conglomerate, and consists of several saucer-shaped ore bodies that are up to 130 m wide and at least 250 m deep, over a strike length of c. 2 km.



Bornite, chalcocite and chalcopyrite (\pm neodigenite) dominate the ore mineral assemblage of both deposits. The ore minerals occur finely disseminated, along foliation planes and in veins, and exhibit textural features indicative both of syn-diagenetic and epigenetic precipitation and localized structural reworking.

Minor, but widespread copper occurrences and mineralisations are found in metasedimentary rocks also in other tectonic windows in western Finnmark. Minor exploitations of these mineralisations, such as the Raipas deposit in Alta-Kvænangen tectonic window were carried out in the late 19th century. All of these sediment-hosted Cu-deposits are characterized by a bornite+chalcopyrite+chalcocite (\pm neodigenite) ore mineral paragenesis and a noticeable lack of pyrite. They are commonly enriched in Ag and locally have elevated Au, PGE and Co contents. Current exploration has shown that these are much more widespread than previously assumed.

There is also a potential for sediment-hosted Cu-deposits in Mesoproterozoic belts in Southern Norway. Several minor copper deposits are known in the Telemark supracrustal belt. The ore paragenesis spans from native Cu and Ag in quartzite, bornite-chalcocite-chalcopyrite in metadolerite/quartz schist to chalcopyrite in quartz veins in metasandstone/quartz schist and metabasalt.

In the Modum area cobalt was mined for over 120 years over a length of 2 km in the Skuterud deposit. About 1 Mt of ore with 0.1-0.2 % Co was produced, but significant content of copper as well as local enrichment of gold also occur. The Cu-Co mineralisation is found disseminated in 100-200 m wide zones in quartzite and various mica schists which are often graphitic and can be followed for 12 km along strike. The ore minerals include cobaltite, glaucodote, safflorite, skutterudite and chalcopyrite. Recent reconnaissance drilling shows up to 1.3 % Cu over 8.3m. The deposit is not a typical SSC deposit, and various other genetic models have been proposed.

By correlation with Cu-deposits in the Sylarna area in Sweden, close to the border with Norway, a potential for SSC in the Norwegian Caledonides may also exist.



Bornite along bedding and axial plane cleavage in dolomite, Alta



West pit at Ulveryggen



Open pit in the abandoned Skuterud Cu-Co deposit

MORE INFORMATION?



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