COMPETENT PERSON'S REPORT ON THE BØMLO AND BJERKREIM PROJECTS, NORWAY

Prepared for

Norge Mining

Report prepared by

srk exploration

SRK Exploration Services Ltd
ES7775
November 2018

Head Office
12 St Andrew's Crescent
Cardiff
CF10 3DD
United Kingdom

UK:	+44	(0) 2920 233 233
Russia:	+7	(0) 4955 454 413
Gabon:	+241	(0) 173 0501

ISO 9001 Registered Firm — Certificate No. GB2004603
International Accreditation Board — Registration No. 0044/1

Email: enquiries@srkexploration.com   Web: www.srkexploration.com

SRK ES Legal Entity:		SRK Exploration Services Ltd
SRK ES Registered Address		21 Gold Tops Newport NP20 4PG
SRK ES Office Address:		12 St Andrew's Crescent Cardiff CF10 3DD
Date:		14/11/2018
Project Number:		ES7775
SRK ES Project Manager:	Jon Russill	Principal Exploration Geologist
Client Legal Entity:		Norge Mining Plc.
Client Address:		764 Fulham Road London SW6 5SJ United Kingdom

Client Feedback

We merit all comments received from our clients, take pride in providing an excellent service and place value on our ability to correct error. Should you wish to comment on any aspect of the service that an individual staff member has provided, or else the company as a whole, please send an email to clientfeedback@srkexploration.com, or otherwise write in confidence to our Managing Director at the address above.

COMPETENT PERSON'S REPORT ON THE BØMLO AND BJERKREIM PROJECTS, NORWAY

EXECUTIVE SUMMARY

SRK Exploration Services Ltd ("SRK ES") is part of the global SRK Consulting Group (the "SRK Group"). SRK ES has been requested by Norge Mining Plc. ("NMP", hereinafter also referred to as the "Company" or the "Client") to prepare a Competent Person's Report ("CPR") on their mineral assets in Norway. These assets comprise mineral exploration licences over an area of known gold mineralisation near Lykling on the island of Bømlo and, separately, over parts of the Bjerkreim-Sokndal layered intrusion which is prospective for iron-titanium-vanadium-phosphate (Fe-Ti-V-P) mineralisation. These are known as the "Bømlo project" and the "Bjerkreim project" respectively. Both areas are in Southwest Norway and the licences are held in the name of Teøk A/S, a wholly-owned Norwegian subsidiary of NMP.

The purpose of the CPR is to summarise the geological and exploration status of the projects so that NMP can include them as assets of a company to be listed through an Initial Public Offering ("IPO") or an introduction on a public Stock Exchange. SRK ES has prepared the CPR following a review of data and reports and a visit to each project area in September 2018.

Bømlo and Bjerkreim are both early-stage projects that represent good exploration opportunities for the Company. The licences have been selected to include what are currently considered to be the principal zones of economic interest. At Bømlo, the project is covered by a single exploration licence that covers 9 km^2. Within this, there is a small (0.06 km^2) mining licence around the old Haugesund gold mine and owned by the Bømlo Gold Mining Company DA. The Bjerkreim project is covered by five exploration licences, each of which is 10 km^2 in area. One of the licences includes a 2 km^2 exploration licence that is owned by a third party, although SRK ES is informed that there is an agreement in place with NMP for exploration to proceed.

BØMLO

Bømlo is one of Norway's most important areas for orogenic gold with a long history of mining and research that goes back to the late 1800s. There are numerous showings of narrow vein gold mineralisation within a small area, many of which have been mined with some underground workings extending to 165 m depth. As is typical with this type of deposit, gold grades are very erratic and sometimes very high; coarse visible gold is common and grades of up to 183 g/t have been recorded in grab samples. Information for historical mining and gold production suggests that an average grade of processed material may have been about 7 g/t gold, although this may relate to ore that was sorted ("high-graded") before processing, meaning that in-situ grades were likely to be lower. On the other hand, it should be remembered that gold losses were likely during processing (if so, the feed grade may have been higher than the gold recovery suggests).

Most of the exposed quartz-gold veins have been mined out and it is unlikely that new mineralised showings will be found at surface. Despite this, in SRK ES' opinion there is potential to find new mineralisation both along strike or below former mine workings in areas that were beyond the reach of the old miners and where continuity of mineralisation could not be established with their rudimentary exploration approach. There may also be potential in the wider area where there are fewer showings, but the geological setting is similar.

SRK ES has provided recommendations and a preliminary budget for new exploration at Bømlo. This will require careful targeting that must include a thorough assessment of the area's structural geology; not only is this an important control on the formation and localisation of mineralisation, but it may have also been a factor that limited the extent of the historical mines. Diamond drilling will be required at a relatively early stage to identify structures that host veins and test for the continuity of known mineralisation into new areas and at depth. Large-scale sampling will also be important in obtaining a more quantitative indication of gold grades.

Overall, SRK ES considers that the Bømlo licence has potential for low-tonnage but high-grade narrow-vein gold mineralisation that lends itself to relatively small-scale, selective mining methods. The hosting geology at Bømlo should also be investigated further; ophiolitic rocks such as the layered gabbros in which the veins have formed can be of economic interest on account of their enrichment in ilmenite and magnetite, with the latter sometimes being a source of vanadium.

BJERKREIM

NMP's Bjerkreim licences cover what have been identified by previous workers as the main mineralised zones of the Bjerkreim-Sokndal Intrusion. The main commodities of interest are titanium in ilmenite, phosphate in apatite and vanadium in magnetite. This Late Proterozoic anorthositic layered intrusion is one of the largest of its kind in the world and covers an area of about 230 km^2. It has a trough-like geometry and is estimated to be 4-5 km thick in the core.

Three zones within the layered intrusion, which are covered by the exploration licences, have good potential to host high-tonnage deposits of phosphate, titanium and vanadium mineralisation. The locations of these zones are dictated by the intrusion's evolution history and are 20-100 m wide and extend laterally from 2.5 km to more than 10 km. In these zones, the economic minerals occur together and form 25-35% of the volume of the rock. Modal concentrates for these are typically about 8-10% for apatite, 11-15% for ilmenite and 7-11% for magnetite. The magnetite contains about 1.2% vanadium pentoxide, and ilmenite contains 1-2% magnesium oxide (the main deleterious element). Mineralisation extends beyond the three known zones, but the target minerals do not occur in combination or are at lower concentrations. It is also possible that 'waste' rock and minerals could be sold for use in construction.

Work by the NGU and others has attempted to estimate the grade and tonnage of the main mineralised zones. The outcome of this[1] is a combined tonnage of 552 Mt for the currently-known mineralised zones. Some significant assumptions have been applied to these estimates with respect to geological and grade continuity but, after review, SRK ES considers them to be a fair reflection of the potential order of magnitude of mineral resources that should be targeted by further exploration. Indeed, there are indications that mineralised zones could be larger than those delineated by the NGU. Furthermore, there are under-explored areas that share the same geology but have not yet been assessed and could host new deposits or continuations of known mineralisation.

The Bjerkreim project has the potential to produce three different commodities for which there are fairly strong markets, making it an attractive proposition and implying some resilience in times of changeable commodity prices. Further economic analysis is needed to understand whether phosphate, titanium or vanadium would be the main economic driver here, and whether

[1] They are not compliant with any international Mineral Resource reporting code and significant exploration is required to test this potential. It is uncertain whether exploration, once applied, will result in a Mineral Resource Estimate.

the grades and tonnage imply a sustainable operation; the recent sharp increase in vanadium price is encouraging and it is likely that the project economics are very different now compared to when they were assessed by NGU.

SRK ES has provided recommendations and a preliminary budget for new exploration at Bjerkreim, from further appraisal of current data and a new surface sampling programme through to diamond drilling to define Mineral Resources in one of the mineralised zones. Reconnaissance work is also required and recommended to assess further potential beyond the known mineralised zones in less explored parts of the licences. The project area is relatively populated with numerous landowners and a variety of land uses. It is critical that the Company takes the time to inform the host communities of their plans and accommodate their feedback. Fostering good relationships through good stakeholder engagement at all levels will be key to the success of exploration in this area as well as at Bømlo.

Table of Contents

List of Tables

List of Figures

COMPETENT PERSON'S REPORT ON THE BØMLO AND BJERKREIM PROJECTS, NORWAY

FILE REF: ES7775_Norge Minerals CPR_v1-0.docx

1 INTRODUCTION

1.1 BACKGROUND

SRK Exploration Services Ltd ("SRK ES") is part of the global SRK Consulting Group (the "SRK Group"). SRK ES has been requested by Norge Mining Plc. ("NMP", hereinafter also referred to as the "Company" or the "Client") to prepare a Competent Person's Report ("CPR") on their mineral assets in Norway. These assets comprise mineral exploration licences over an area of known gold mineralisation near Lykling on the island of Bømlo and, separately, over parts of the Bjerkreim-Sokndal layered intrusion which is prospective for iron-titanium-vanadium-phosphate (Fe-Ti-V-P) mineralisation. These are known as the "Bømlo project" and the "Bjerkreim project" respectively. Both areas are located in Southwest Norway (Figure 1-1) and the licences are held in the name of Teøk A/S, a wholly-owned Norwegian subsidiary of NMP.

The purpose of the CPR is to support the Company's intention to include the projects as assets of a company to be listed through an Initial Public Offering ("IPO") or an introduction on a public Stock Exchange.

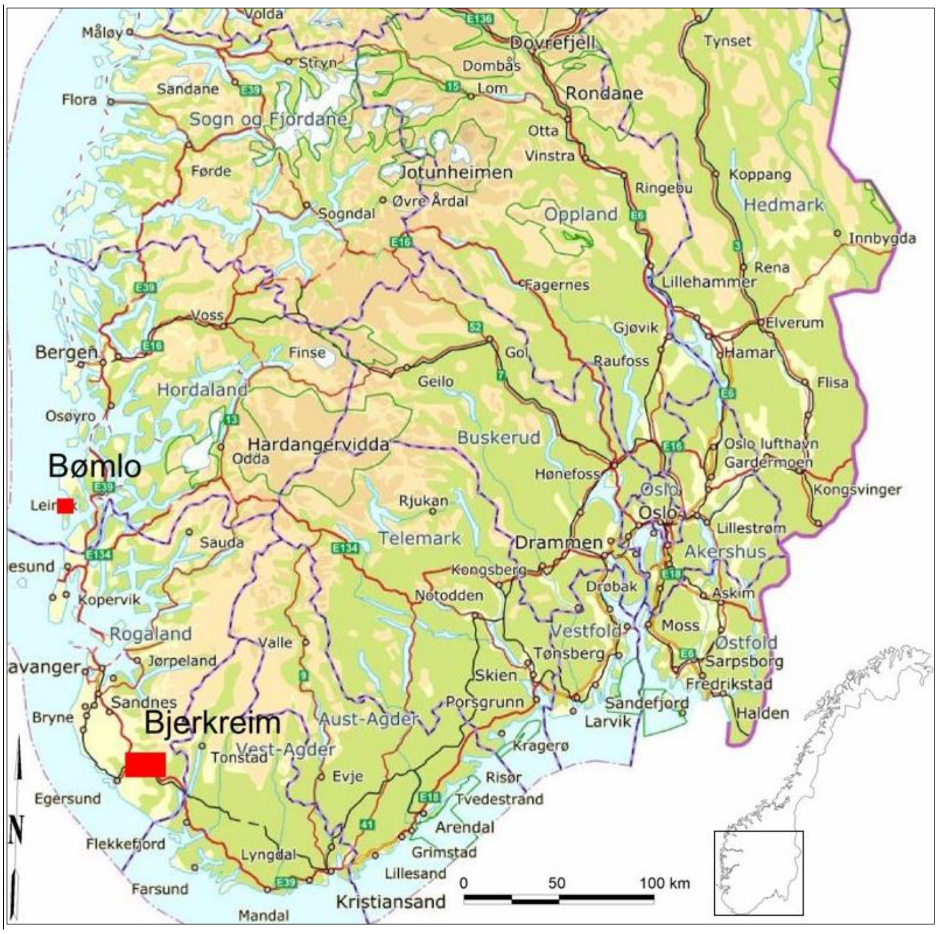


Figure 1-1 General location of the Bømlo and Bjerkreim project areas

1.2 TERMS OF REFERENCE

No formal terms of reference for this commission were issued by the Company, but these were established between SRK ES and NMP by email and telephone discussions and are presented in a in a proposal that was issued by SRK ES on 14 August 2018. It was agreed that SRK ES would review the technical status of each mineral asset and make recommendations for further exploration work and present its findings in a CPR.

1.2.1 Scope of Work

SRK ES proposed the following scope of work, which was agreed by the Company:

1. Compile and review geological and exploration data for both projects;
2. Undertake a site visit to both projects by a suitably-qualified Competent Person (“CP”); and

Produce one CPR to cover both projects, to include their current exploration status and recommendations for further work, in a format that can be used by the Company for their IPO on AIM.

1.3 WORK COMPLETED

SRK ES has completed the following work in order to meet the requirements of this commission:

- Obtained publicly available data for each project area, including mapping data for geology and mineral occurrences and technical reports or papers produced by companies, national geological survey, and academia;
- Reviewed the above in order to gain a full understanding of the mining and exploration history of the project areas and the current status of their mineral potential;
- Undertook a site visit to both project areas to view the geology and mineralisation first hand and to assess their exploration requirements. Bømlo was visited on 11 and 12 September, and Bjerkreim was visit on 13 and 14 September 2018; and

Produced a CPR to summarise the findings of the data review and site visit and to present SRK ES’ technical opinion of the projects and recommendations for further work.

1.4 REQUIREMENT, STRUCTURE AND COMPLIANCE

This CPR has been prepared in accordance with the AIM Rules for Companies and specifically the ‘‘AIM Note for Mining and Oil & Gas Companies - June 2009”. SRK ES accepts responsibility for the CPR and confirms that, to the best of its knowledge and belief, having taken all reasonable care to ensure that such is the case, the information contained in the CPR is in accordance with the facts and contains no omission likely to affect its import for the purpose of paragraphs 1.1 and 1.2 of Annex I and paragraph 1.1 and 1.2 of Annex III of the AIM Rules for Companies.

Where possible, the exploration results described herein have been reported in accordance with the Pan-European Standard for Reporting of Exploration Results, Mineral Resources and Reserves (the “PERC Reporting Standard”).

This CPR incudes technical sections covering Regional Geology and Mineralisation, Mineral Assets (including Geographical Setting, Geological Setting and Mineralisation, Exploration History and Results, Summary and Recommendations for each property), Exploration Programme and Concluding Remarks.

It has been prepared under the direction of the Competent Person ("CP") as defined by PERC and the Consent Form for the CP is presented in Appendix C. The CPR is issued by SRK ES, and accordingly SRK ES assumes responsibility for the CPR.

Unless indicated otherwise, all of the coordinates stated in this report are in Universal Transverse Mercator ("UTM") projection Zone 32 North ("32N") and the 1984 World Geodetic System ("WGS84") datum.

1.5 EFFECTIVE DATE AND BASE TECHNICAL INFORMATION DATE

The Effective Date of this CPR is deemed to be 17 October 2018. To the knowledge of SRK ES, and as informed by the Company, there has been no material change in respect of the Exploration Licences since the Base Information Date ("BID") which is also 17 October 2018. The exploration recommendations provided by SRK ES are dependent upon technical information as generated by the Company or found in the public domain as of the BID.

1.6 VERIFICATION, VALIDATION AND RELIANCE

This CPR is dependent upon technical, financial and legal input. In respect of the technical information as provided by the Company and taken in good faith by SRK ES, and other than where expressly stated, any figures provided have not been independently verified by means of re-calculation. SRK ES has, however, conducted a review and assessment of all material technical issues likely to influence the Exploration Assets, which included the following:

- An examination of historical data made available by the Company and found in the public domain in respect of the Exploration Assets;
- An inspection visit to the Bømlo project area that took place on 11-12 September 2018, and to the Bjerkreim project area that took place on 13-14 September 2018;
- Discussions with key project personnel and members of the Company's Board.

Where fundamental base data have been provided or obtained (geological information, assay information, exploration programmes) for the purposes of review, SRK ES has attempted to perform validation and verification procedures deemed appropriate in order to place an appropriate level of reliance on such information.

To the knowledge of SRK ES, as informed by the Company, there has been no material change in respect of the Exploration Assets since 17 October 2018.

1.6.1 Technical Reliance

SRK ES places reliance on the Company and its technical representatives that all technical information provided to SRK ES, as at the BID of 17 October 2018, is accurate. Information obtained in the public domain that pertains to historical records of mining and exploration, academic research or work by geological survey organisations has been taken in good faith. SRK ES cannot be held responsible for any loss or damage resulting from errors or misinterpretations in technical information produced by third parties and summarised in this CPR.

1.6.2 Financial Reliance

As of the BID SRK ES has not been provided with any information by the Company regarding the funds that it intends to make available for exploration following their successful IPO. An exploration budget has not been provided in this CPR.

1.6.3 Legal Reliance

In consideration of all legal aspects relating to the Exploration Licences, SRK ES has placed reliance on the representations by the Company that the following are correct as of 17 October 2018 and remain correct until the date of the documents submitted to AIM:

- That, save as disclosed in documents submitted to AIM, the Directors of the Company are not aware of any legal proceedings that may have any influence on the rights to explore for minerals;
- That the legal owners of all mineral and surface rights have been verified; and
- That, save as disclosed in documents submitted to AIM, no significant legal issue exists which would affect the likely viability of the exploration and production licences as reported herein.

The legal representatives of the Company are XXX in the United Kingdom, and XXX in Norway.

1.6.4 Reliance on Information

SRK ES believes that its opinion must be considered as a whole and that selecting portions of the analysis or factors considered by it, without considering all factors and analyses together, could create a misleading view of the process underlying the opinions presented in the CPR. The preparation of a CPR is a complex process and does not lend itself to partial analysis or summary.

SRK ES' opinion in respect of the mineral prospectivity of the licence areas and the exploration recommendations is effective as of 17 October 2018 and is based on information provided by the Company or sourced in the public domain throughout the course of SRK ES' investigations, which in turn reflect various technical-economic conditions prevailing at the date of this report. Further, SRK ES has no obligation or undertaking to advise any person of any change in circumstances which comes to its attention after the date of this CPR or to review, revise or update the CPR or opinion.

1.7 DECLARATION AND CONSENT

1.7.1 Declaration

SRK ES will receive a fee for the preparation of this report in accordance with normal professional consulting practice. This fee is not contingent on the outcome of the Admission and SRK ES will receive no other benefit for the preparation of this report.

Neither SRK ES, the Competent Persons, nor any Directors of SRK ES have at the date of this report, nor have had within the previous two years, any shareholding in the Company, the Exploration Assets or Advisors of the Company. Consequently, SRK ES, the Competent Persons and the Directors of SRK ES consider themselves to be independent of the Company.

In this CPR, SRK ES provides assurances to the Board of Directors of the Company that existing interpretations of technical data pertaining to the mineral prospectivity of the project areas as stated in documents provided to SRK ES by the Company and sourced by SRK ES from the public domain at the BID and, where appropriate, modified by SRK ES, are reasonable, given the information currently available.

This CPR includes technical information, which requires subsequent calculations to derive subtotals, totals and weighted averages. Such calculations may involve a degree of rounding and consequently introduce an error. Where such errors occur, SRK ES does not consider them to be material.

1.7.2 Consent

To be completed at the time of the Admission.

1.8 QUALIFICATIONS OF CONSULTANTS

The SRK Group, of which SRK ES is a subsidiary, comprises more than 1,400 staff, offering expertise in a wide range of geological disciplines. The SRK Group's independence is ensured by the fact that it holds no equity in any project. This permits the SRK Group to provide its clients with conflict-free and objective recommendations on crucial judgment issues. The SRK Group has a demonstrated track record in undertaking independent assessments of Exploration assets, resources and reserves, project evaluations and audits, CPR's, Mineral Experts Reports and independent feasibility evaluations to bankable standards on behalf of exploration and mining companies and financial institutions worldwide. The SRK Group has also worked with a large number of major international mining companies and their projects, providing mining industry consultancy service inputs. SRK ES also has specific experience in commissions of this nature.

This CPR has been prepared based on a technical review by a team of four consultants sourced from SRK ES (Table 1-1), and led by Mr Jon Russill, the Project Manager and a Principal Exploration Geologist with SRK ES.

The information in this report that is based on information compiled by Mr Jon Russill and Dr Jeroen van Gool and reviewed by Mr Bill Kellaway. Jon Russill is a Competent Person as defined by the PERC Reporting Standard.

Table 1-1 SRK ES Technical Team

Name	Qualification	Responsibility
Jon Russill	BSc, FGS	Project Manager and Exploration Review, Competent Person
Jeroen van Gool	MSc, PhD	Exploration Review
Thomas Stock	MSc, FGS	Exploration Review
Bill Kellaway	MCSM, MAusIMM	Peer Review

2 NORWEGIAN MINERAL LEGISLATION

The Norwegian Mineral Act of 2009 (translated to English in 2010) governs all mineral exploration and mining activities. The Act distinguishes between minerals owned by the State and minerals owned by the landowners. Any party wishing to explore for deposits of minerals owned by the landowner must enter into an agreement with the landowner. The minerals owned by the State, and which thereby are covered by an exploration or mining lease, are metals with a specific gravity of 5 g/cm^3 or more. This includes chromium, manganese, molybdenum, niobium, vanadium, iron, nickel, copper, zinc, silver, gold, cobalt, lead, platinum, tin, zinc, zirconium, tungsten, uranium, cadmium, thorium and ores of such metals. Titanium and arsenic and their ores as well as pyrrhotite and pyrite are also defined as minerals owned by the State.

It must be stated that any party may explore for mineral deposits on another party's land (including private landowners), although this work may not obstruct the exploration or mining activities and associated operations of other parties pursuant to the Norwegian Mineral Act. Only the holder of an Exploration Licence has the right to convert this to a Mining Licence should the outcomes of exploration support this.

The mineral licence holder has the right to undertake such works on the surface of the land as are necessary to establish the existence of mineral deposits, although activities that could cause damage may not be implemented without the consent of the landowner and the user of the land.

The Act states that Exploration Licences are initially granted for seven years. This can be renewed once for a further three years, after which the licensee must either give up the licence or apply for a Mining Licence, for which they have the sole right to do so.

Exploration Licences can be no more than 10,000,000 m^2 (10 km^2) and no less than 1,000,000 m^2 (1 km^2).

An applicant for an Exploration Licence must pay a fee of NOK 1,000 per lease area to have their application processed. This also covers the annual fee for the first year.

To retain an Exploration Licence, the annual fee to the Norwegian State for every 10,000 m^2 is:

- For the second and third calendar year: NOK 10
- For the fourth and fifth calendar year: NOK 30
- For the sixth and seventh calendar year NOK 50

After seven years, an extension lasting up to three years can be granted and, for a renewed Exploration Licence, the annual fee is NOK 50 for every 10,000 m^2.

2.1.1 Environmental Studies, Permitting and Social or Community Impact

The Company has not yet carried out any environmental studies on these licences and it is currently too early to do so.

In respect to permitting, mineral regulations in Norway dictate that the licensee must notify the Directorate of Mining, landowners and land users (if different to the owners) of the intention to conduct exploration work no less than three weeks before this work takes place. Landowner permission is not required to carry out exploration, so long as it does not cause substantial damage, the definition of which is decided on a case-by-case basis. Under these terms, it appears that surface sampling and drilling do not require permission, but activities such as larger excavations or bulk sampling do.

SRK ES strongly recommends that, although permission is not required for the exploration work that is recommended as the next phases for these projects, it is crucial that all stakeholders are kept informed of the Company's intentions, and that any concerns or objections are noted and acted on. Securing the support of local communities is vital for the long-term outlook of the projects.

3 BØMLO

3.1 PROPERTY DESCRIPTION AND LOCATION

3.1.1 Mineral Tenure

The Bømlo project is located on the western side of Bømlo island in Hordaland county, south-western Norway, about 70 km south of Bergen. The small village of Lykling is in the southern part of the licence area. The project area comprises one exploration licence for gold covering an area of 9 km^2, held by Teøk A/S and granted on 25th May 2016 (Figure 3-1). The licence number is 0073-1/2016.

Within the licence, there is a small mining licence (number 0005/1992-VB; shown in brown within the Teøk A/S licence in Figure 3-1) that covers an area of 0.06 km^2 around the old Haugesunds gold mine. This has been owned by the Bømlo Gold Mining Company DA since 1993 and it is understood that they operate this as a ‘hobby mine’, principally to find and sell specimens of gold-bearing quartz.

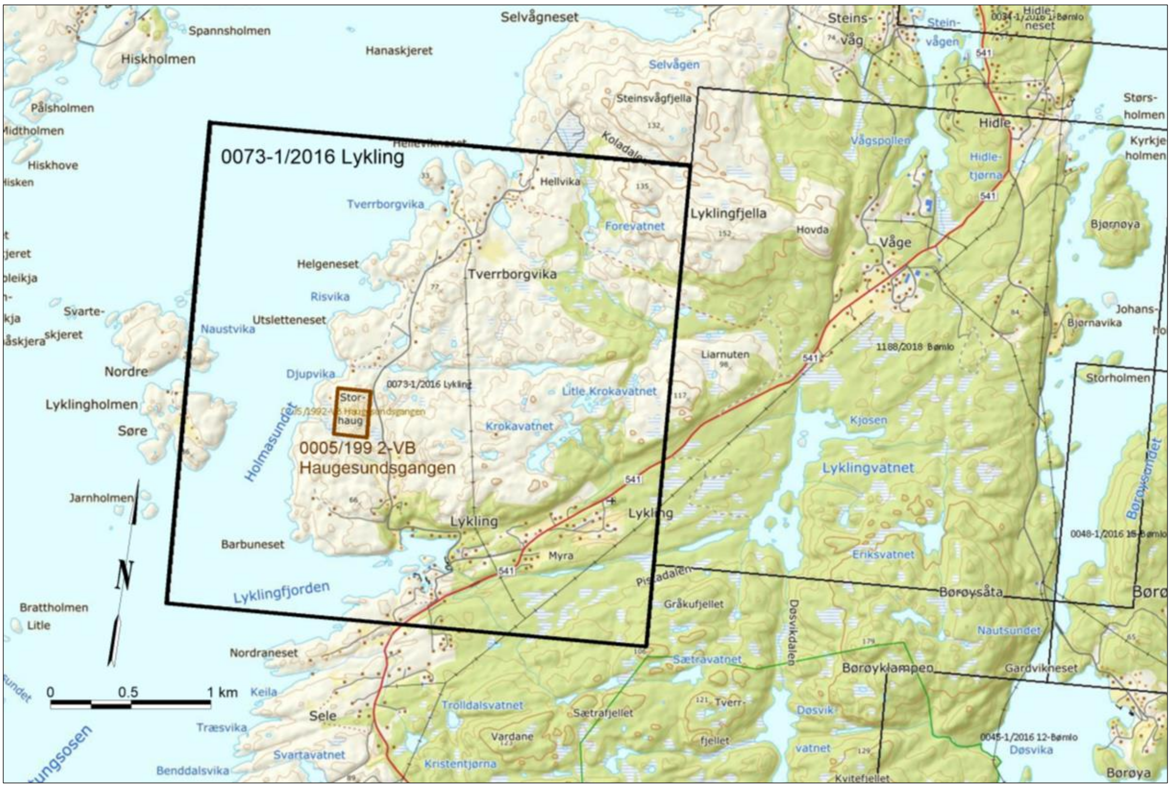


Figure 3-1 Teøk A/S exploration licence on the west coast of Bømlo

The adjoining exploration licence to the east is owned by Megastar Holding A/S and registered for gold and iron. See Figure 1-1 for location within Norway.

3.2 ACCESSIBILITY, CLIMATE, INFRASTRUCTURE AND PHYSIOGRAPHY

3.2.1 Accessibility

The property can be accessed all year by road, air or waterway. Bergen Airport, Fleslan, is about a three hour drive (113 km) from Lykling, and there is also a domestic airport at Haugesund which is about 1.5 hours away by road and has regular flights to Oslo. The Fv541 road is paved and of good quality and runs from north to south through the concession.

3.2.2 Infrastructure

The region has good infrastructure, with good quality roads linking Bømlo to the mainland via the Fv541 and the E49 roads which pass along an extensive tunnel and bridge system known as the Triangle Link. Many of the islands are also connected by ferry services.

Bergen Port is the largest seaport in Norway and the ninth-busiest cargo port in Europe. There are cruise ferry services to Hirtshals and Hanstholm in Denmark, Newcastle in England, Lerwick in Scotland, Tórshavn on the Faraoe Islands and Seyðisfjörður in Iceland. Bergen is the southern terminus of the Coastal Express, which operates daily services along the coast to Kirkeness. Passenger catamarans run from Bergen south to Haugesund and Stavanger and north to Sognefjorden and Nordfjord.

There is good availability of electricity and fresh water in the area.

3.2.3 Climate

The area has a temperate oceanic climate, with cool summers and relatively mild winters. Bergen is one of the warmest cities in Norway due to the influence of the Gulf Stream. The coastal location and mountainous terrain further inland means that the area has plentiful rainfall, with annual precipitation measuring 2,250 mm on average and 235 precipitation days. The lowest monthly average temperature is 3.6°C in January, and the highest monthly average temperature of 19.6°C is in July.

3.2.4 Physiography

The property has rugged, undulating terrain with abundant exposure of rock particularly along the coast. It is cut by numerous small, steep valleys and ravines, many of which feature lakes and ponds. There are some forested areas, especially at lower elevations, but steeper terrain is sparsely vegetated by low bushes and shrubs. Typical terrain in the central part of the licence area is shown in Figure 3-2 and Figure 3-3.

Figure 3-2 Typical terrain in the central part of the licence area (SRK ES, 2018)

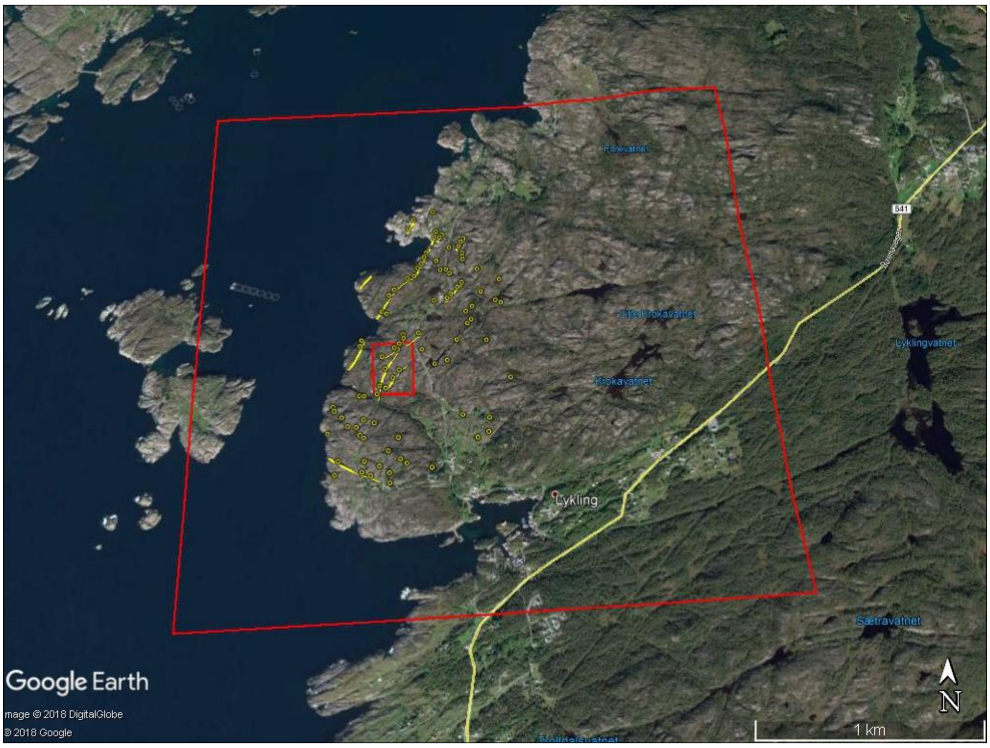


Figure 3-3 Oblique 3D view of the Bømlo exploration licence

Yellow circles show locations of former gold workings. Yellow lines shown know gold-quartz veins.

3.3 EXPLORATION AND MINING HISTORY

The areas to the east and south of Bergen have a long mining history of extraction of pyrite and lesser amounts of copper, zinc, nickel, iron and gold originating from a large number of small, mainly sulphide-associated occurrences. More than 200 individual mineral occurrences are known in the district.

Litlabø on the island of Stord was the largest operation and produced 9 Mt of pyrite until its closure in 1968. Another significant mine was at Vigsness on Karmøy which produced 1.4 Mt of lead-zinc ore. The largest known gold occurrence, however, is at Lykling on Bømlo where approximately 150 kg of gold were extracted. This is the area covered by the Company's exploration licence.

The following sections describe the exploration and mining history of the licence area and provides a summary of key pits, mines or shafts.

3.3.1 Gold Mining in the Lykling Area

The small village of Lykling, in the southern part of the licence area, is famous for its gold-rush in the late 19th Century where numerous small pits, trenches and underground excavations exploited gold-bearing quartz veins.

Gold was first discovered here in 1862 by an unknown miner who was prospecting for copper in a sulphide-bearing quartz vein. However, it was not until 1882 that production started, when the vein saw renewed interest by Hansen and Reitan, two telegraphists running a small copper mine on another quartz vein called Oscars-Gangen. During a period of 16 years (1882-1898), several companies conducted exploration in and around Lykling and several ore processing plants were built. The English-owned Oscar Gold Mining Co. Ltd. bought the rights to the Storhaugen Gruber mines on Bømlo in 1883 and were the largest-scale operators in the area, mining and processing until 1898. The plants were sold in 1910 after new attempts to find further mineralisation in the early 1900s were unsuccessful.

In total, about 157 kg of gold has been produced in the Lykling area from material with an average grade of about 2.5 g/t gold. The total exploited tonnage has been about 63,000 tonnes of mineralised quartz veins and wall rock (Christensen and Stendal 1995).

After 1910, no further large-scale operations were developed in the area. Today, numerous amateur geologists and mineral collectors are active in the area; one company, Bømlo Goldmining Company DA, owns a mining licence near the centre of NMP's exploration licence and sells specimens of quartz containing gold as well as tours to show the area's mining history.

The following section describes some of the more important historical excavations and occurrences in the area; Figure 3-5 shows a map of the main locations of interest. In addition to these larger workings, numerous small pits and trenches are found throughout the area, apparently targeting what would have been small discontinuous outcrops of vein material (Figure 3-4). It is not known whether gold was produced from these or if they were simply test excavations that were found to be barren.

Figure 3-4 Example of one of many small pits in the area and one of the few that has some vein material left in-situ. The pit is about 1 m^2 (SRK ES, 2018)

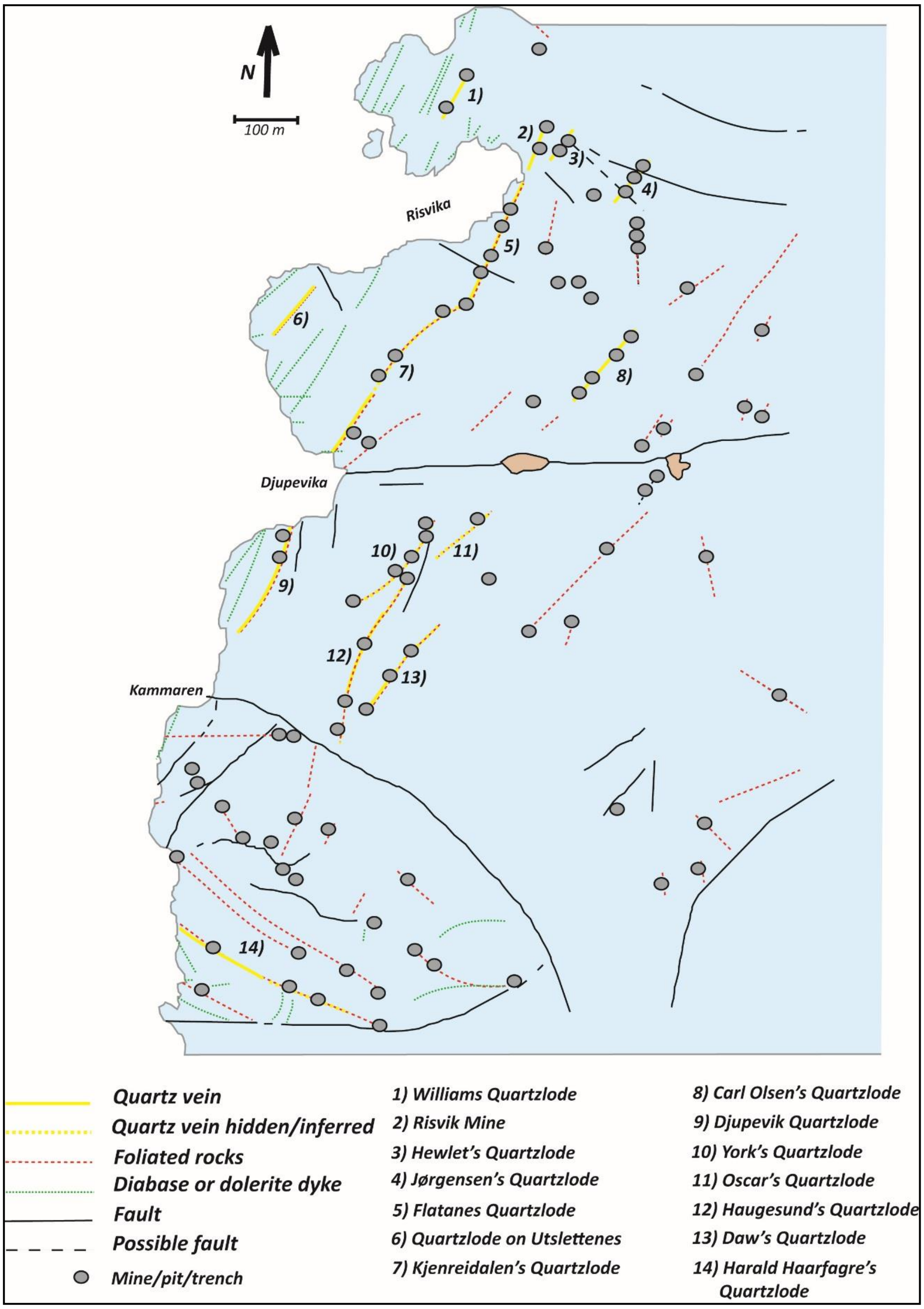


Figure 3-5 Map of the Lykling gold area showing locations of historical mining activities

Data and map material from Amaliksen (1980) and Berg (1986). The most important deposits are numbered. The area shown is in the north-western part of the Teøk AS licence area.

Oscar's Quartz Lode (Oscarsgangen)

This is described as a stockwork of quartz and carbonate veins with substantial amounts of pyrite. Chalcopyrite is also found along with lesser galena, sphalerite, tetradymite, tetrahedrite and silver. According to Reusch (1888) almost 15 kg gold was produced before June 1884. Reusch (1888) himself suggests that this number is probably exaggerated. Based on numbers from 1887 and 1888 the average gold grade was 6.4 g/t. The total amount of material mined during these years was 2,078 m^3 and 1,030 m^3 respectively producing a total of 12.7 kg gold. According to Carsten (1941) (cit. in Amaliksen (1980)) the mine is 165 m deep.

York's Quartz Vein (Yorks Gang)

This is adjacent to Oscar's Quartz Lode and strikes NE. The mineralisation occurs in schist intersected by irregular quartz veins. In 1888, 100 m^3 of this material was mined. The average gold grade was reportedly 3.5 g/t.

Haugesunds Quartz Lode (Haugesundsgangen)

This quartz vein (Figure 3-7) varies from 0.3 m to 1 m in width. The vein exploits a contact between a schist on its western side and dolerite to its east. It has been mined from surface over a distance of 200 m (Figure 3-6), while underground excavations extend to about 40 m depth. rom 1890-91, a total of 2,400 m^3 (c. 6,000 t) was mined. Some 733 t of this material was shipped to the washing plant and almost 7 kg gold was produced. The mineralisation is similar to that in Oscar' Quartz Load and includes pyrite, chalcopyrite and occasionally galena, sphalerite and tetradymite.

Figure 3-6 View southwards into Haugesundsgang from near the northern end of the workings (SRK ES, 2018)

Figure 3-7 Quartz vein (c. 60 cm wide, between the yellow lines) in the Haugesundsgang workings, possibly left as a pillar to support the hanging wall. View towards the southeast (SRK ES, 2018)

Daw's Quartz Lode (Daw's Gang)

This is situated just south of Oscar's Quartz Load. Two generations of quartz veins are hosted within schists that are bounded by dolerite to the east and gabbro to the west. Only minor pyrite is present in the quartz. In 1887, 1.25 kg gold was extracted from 154 t of auriferous rock and, in 1888, 11.61 kg was extracted from 1,299 t. The underground mine (Figure 3-8) had reached a depth of 125 m in 1888.

Figure 3-8 Entrance to Daw's Lode, looking northwards (SRK ES, 2018)

Djupevik Quartz Lode (Djupevik Kvartsgang)

Southeast of Djupeviken (Djupe Bay), the Djupevik quartz vein strikes NE following a zone of schist. According to the literature only copper was mined here from a small shaft blasted into the quartz vein, but Amaliksen (1980) analysed gold from this deposit using a microprobe, and NGU quartz samples from the same place graded up to 3.5 g/t gold.

Carl Olsen's Quartz Lode (Carl Olsen's Gang)

This quartz vein strikes northeast, is 1 m wide, exposed for about 10 m on surface and has been reportedly mined to a depth of 50 m. Gold was apparently not found until a depth of 6 m, below which the vein narrows for 15 m and becomes more auriferous before widening again. This eludes to the exploration potential at the project being at depth. In 1895, 135 t of quartz was mined, and 1.87 kg of gold was produced.

Flataneset Quartz Lode (Flatanesgangen)

The quartz vein strikes NNE and dips steeply to the east. It varies in width from 2 m to 5 m and is approximately 50 m long. The mineralisation resembles that found in the Oscar's and Haugesund mines, comprising pyrite, chalcopyrite, galena and some carbonate veining. There is no information in the literature about how much material was mined here, but it appears to be an area that shows a relatively large amount of historical activity judging by the amounts of waste rock in this area. Amaliksen (1980) quotes a source as saying that the mine is 35 m deep and that occasionally 'beautiful' samples of gold were found. Some quartz samples were analysed in 1930 but gold grades were poor (0.2 g/t).

Risvik Mine

This mine was previously known as Hodgkinson's Mine. The quartz vein is up to 2 m wide, strikes northeast and dips to the east. The host rock is trondhjemite (a variety of tonalite) and the mineralisation resembles that at Flataneset. The mine was reportedly 160 m deep. According to the “Norges Bergværksdrift” (1891) (cit. in Amaliksen 1980) the gold grade was 12-15 g/t from the surface to a depth of 25 m and decreased by half from 25 m to 100 m depth. From 1890-96, 12,000 t of material was mined of which 7,000 t was processed, producing 54 kg of gold in total. In 1909, a further 1,900 t were processed, producing 1.67 kg of gold.

Harald Haarfagre’s Quartz Lode (Harald Haarfagre’s Gang)

The 2 m wide milky quartz vein, which is exposed for 120 m in its western part, was test-mined in two places in 1895. The outcomes of this are unknown, but NGU analysed three quartz samples and recorded gold grades of 0.1 g/t, 1.2 g/t and 1.2 g/t. Wulff and Christensen (1991) reported grades up to 3.7 g/t gold found in fractured pyritic and silicified material. SRK ES assumes that these samples and those taken by NGU were rock chip or grab samples. Further east, the quartz vein merges into a schistose dyke with quartz lenses. The exposure of quartz at the western part of this area is quite striking, prominent above the ground surface and comprising very white, massive quartz (Figure 3-9). In SRK ES’ experience, this type of quartz vein is often poorly mineralised. Indeed, the mine workings have targeted material on its margins, possibly working an adjacent vein or highly silicified doleritic rock found at an oblique angle to the larger vein (Figure 3-10). Broken vein material lying near the lower mine entrances is richly mineralised with bands of pyrite and chalcopyrite, none of which is seen in the larger vein.

Figure 3-9 Massive quartz vein at Harald Haarfagre’s Gang. A mine entrance is seen to the right of the vein, marked by fence posts (SRK ES, 2018)

Figure 3-10 Paler grey silicified rocks leading towards the Harald Haarfagre's mine workings (fence posts), with the larger white quartz vein to the left (SRK ES, 2018)

3.4 GEOLOGICAL SETTING AND MINERALISATION

3.4.1 Regional Geology

The dominant geological features in the area surrounding Bømlo are the Hardangerfjord Shear Zone ("HSZ"), the Sunnhordland Fault and the Sunnhordland Batholith ("SB"). These features are shown on the regional geological map for the area in Figure 3-11.

The HSZ is a major crustal-scale structure that formed during Devonian extension shortly after the Caledonian Orogeny and may be part of an even larger zone of crustal deformation stretching across the North Sea into the Highland Boundary Fault in Scotland.

The SB occupies an area of approximately 1,000 km^2 on the west coast of Norway, south of Bergen. After its emplacement, all the rocks in this region experienced deformation and metamorphism during continental collision in the Caledonian Orogeny, and the SB was partly detached from the envelope along shear zones and emplaced to form the main part of the Tysnes Nappe.

The rocks into which the SB was emplaced can be grouped into four main units (Andersen and Jansen, 1987):

1. High-grade meta-sediments, including migmatitic micaschists and meta-arkoses, quartzites and marble;
2. Ophiolites and ensimatic island-arc lithologies;
3. Ensialic, bimodal volcanics and volcanogenic sediments of Ordovician age; and
4. Ordovician and presumed Ordovician meta-sediments including conglomerate, phyllite, meta-sandstone and limestone.

The palaeotectonic setting of the area is complex and not very well constrained. On Bømlo and Stord, there are both immature arc-supra-subduction zone ophiolite complexes and younger overlying mature-arc volcanic-sedimentary sequences and their plutonic counterparts of

Ordovician age. Early Silurian sedimentary sequences were deposited after rifting of the mature arc, as evidenced by felsic volcaniclastic rocks and pelagic sediments to the east (Sandstad, 2012).

The area on northern side of the Hardangerfjord (along which the HSZ runs; Figure 3-11), extending from the islands of Stord and Bømlo in the southwest for 100 km to the east towards the inner part of the fjord, is often referred to as the Hardanger Copper-Zinc area on account of its large number of mineral occurrences.

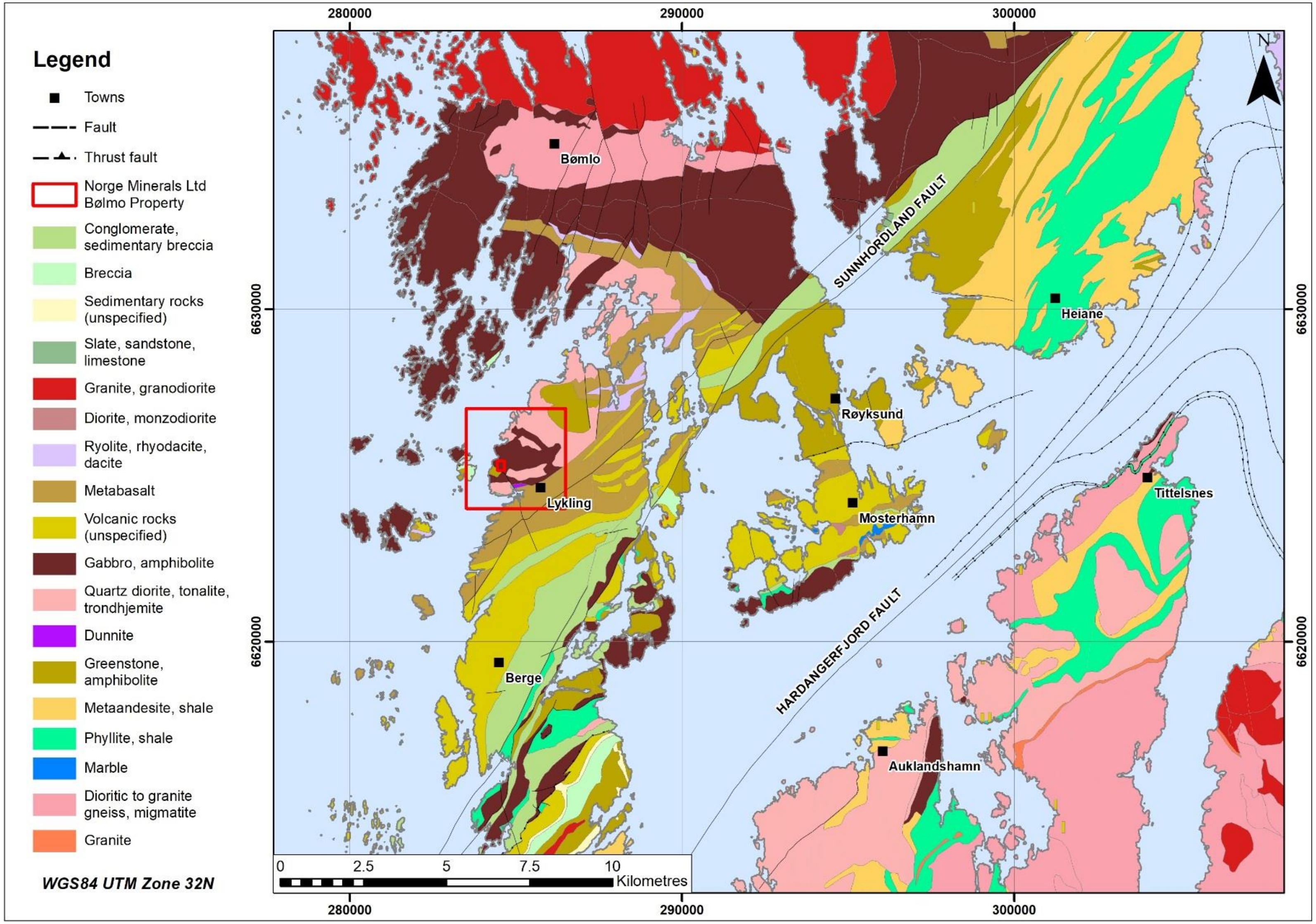


Figure 3-11 Regional geology of the area around Bømlo

Mapping data from NGU 1:250,000 map series and compiled by SRK ES (2018)

3.4.2 Local Geology

The island of Bømlo represents a geological section through a Caledonian convergent plate margin. It is underlain by Caledonian rocks ranging in age from Cambrian to Silurian and belonging to the upper allochthon of Norway's Caledonian nappe pile (Figure 3-14 and Figure 3-12). Bømlo's geology can be subdivided into five units: the Lykling Ophiolite, the Geitung Unit, the Siggjo Complex, the Vikafjord Group and the Langevåg Group (Brekke et al., 1984).

- The **Lykling Ophiolite** crops out in the area north of Lykling. This rock unit represents an almost complete pseudo-stratigraphy consisting of some serpentinite mega-lenses, layered and isotropic gabbros, a sheeted dyke complex and pillow lavas. The ophiolite is the oldest rock sequence on Bømlo and was developed prior to 535 ± 46 Ma (Furnes et al. 1986). The ophiolite has been intruded by voluminous plagio-granites which are geochemically similar to the quartz-keratophyres of the overlying Geitung Unit (Brekke et al 1984);
- The **Geitung Unit** is a mixed extrusive/sedimentary rock unit unconformably overlying the Lykling Ophiolite. The unit comprises 'greenstones' (generally mafic rocks, often deformed and of basaltic composition, but can include amphibolites), quartz-keratophyres and volcaniclastic breccias interbedded with thin, laterally persistent chert-like horizons and minor conglomerates and sandstones;
- The **Siggjo Complex** unconformably overlies the Lykling Ophiolite and Geitung Unit. The complex consists of largely sub-aerial volcanics with minor intercalations of sedimentary rocks. A reverse fault runs along strike within the complex from Siggjo to the west coast and juxtaposes lower levels to the north against higher levels to the south; and
- The **Vikafjord Group** which rests unconformably on the Lykling Ophiolite and the Siggjo Complex. It consists, from bottom to top, of:
  - A polymictic alluvial debris flow deposit of the Roaldsfjord Conglomerate;
  - Fossiliferous limestone of the Bergesvatn Formation;
  - Conglomerates and coarse sandstones of the Sagvatn Formation; and
  - A thick pile of sub-aerial mafic lavas of the Eriksvatn Formation.
- Rocks of the **Langevåg Group** crop out in a syncline on southernmost Bømlo and represent the progressive deepening of a marine basin. The group comprises subaerial tuff-breccias, lavas, chert, volcaniclastic debris flows, basic lavas, turbidites and pillowed greenstones.

The licence area itself is largely underlain by rocks of the Lykling Ophiolite (Figure 3-12) and dominated by layered gabbros. The layering in these alternates between leucocratic (light) and melanocratic (dark) and the latter is often strongly enriched in magnetite. Licence-scale folding is apparent in the gabbros, with layering varying from a northerly strike in the northern part to easterly in the central part. Small-scale faulting can also be observed (Figure 3-13).

Immediately south of the Haugesunds mine, a large and curved shear cuts through the licence area from the western coast to Lykling. The sense of movement on this shear has not been established but, on its southern side, there is a general change in lineament direction from north-easterly south-easterly. Where exposed at the coast, this shear forms a contact between gabbros to its north and pillowed basalts to its south (Figure 3-14).

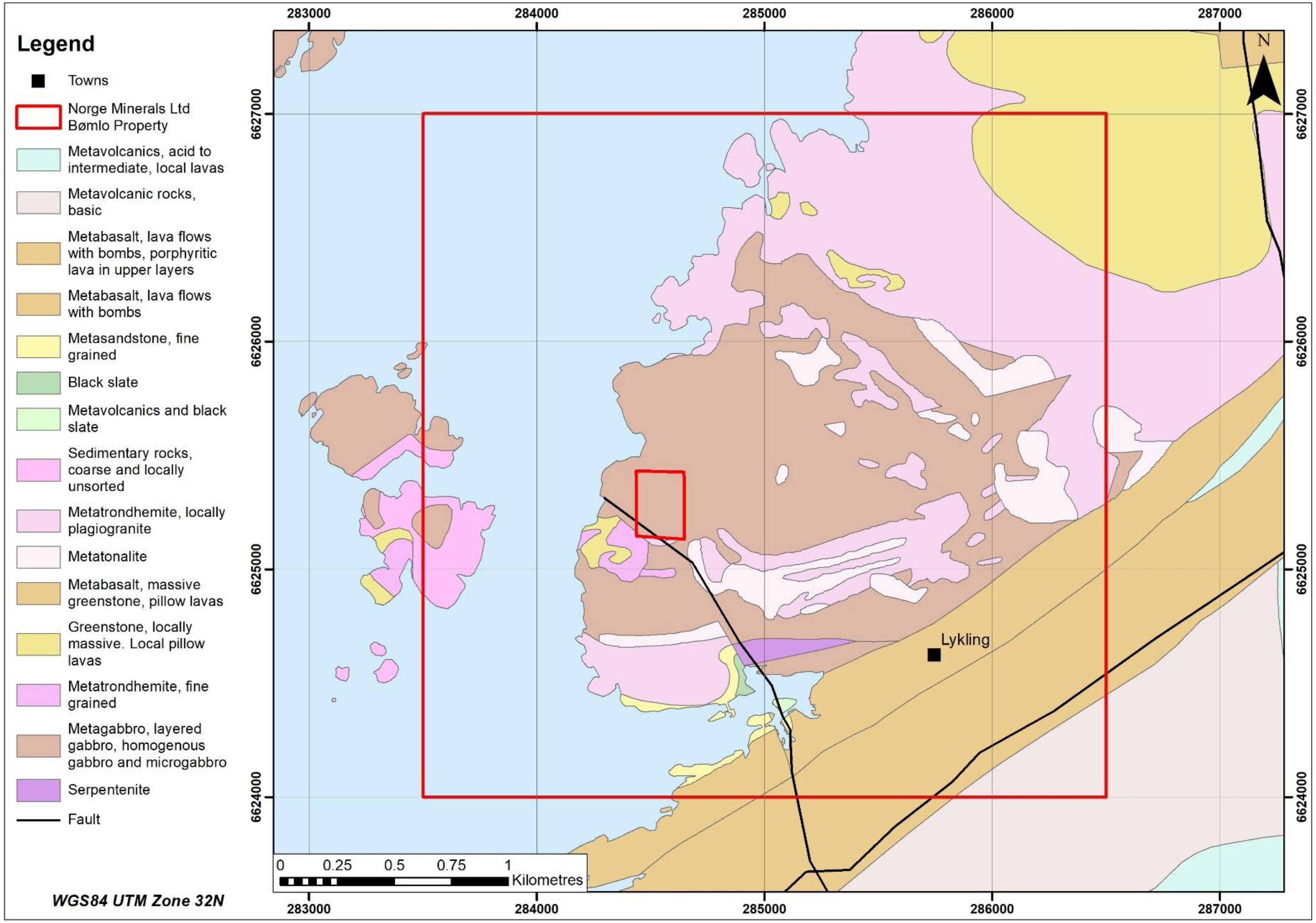


Figure 3-12 Geological map for the Bømlo licence area

Mapping data from NGU 1:50,000 map series and compiled by SRK ES (2018

Figure 3-13 Layered gabbro near the Daw's Lode mine showing a train of small faults. Darker bands are strongly enriched by magnetite (SRK ES, 2018)

Figure 3-14 Sheared contact between gabbros to the left (north) and basaltic rocks to the right (SRK ES, 2018)

3.4.3 Mineralisation

Gold mineralisation on the island of Bømlo occurs in mesothermal (450°-250° C), quartz veins along shear zones that cut the Lykling Ophiolite. The mineralised parts of the veins consist chiefly of multiple generations of milky, homogenous quartz, but grey quartz sometimes occurs with well-developed ribbons. Locally substantial amounts of calcite and ankerite are important constituents of the veins (Figure 3-15), and chlorite, muscovite and rutile are found in minor amounts (Christensen and Stendal, 1995). The rocks of the area, including the gold-bearing veins, have undergone regional deformation and metamorphism at the greenschist facies ,(hence the chlorite). In places, mineralisation is found in the wall rock, but this is at the immediate boundary of the veins in thin stringers and silicified zones rather than pervading into the rock matrix as a disseminated presence. Pyrite and chalcopyrite are common constituents of gold-bearing veins (Figure 3-17).

Figure 3-15 Fragment of quartz vein material from Oscarsgangen showing ribbons of host rock, abundant ankerite and disseminated pyrite (SRK ES, 2018)

All of the historical mines have exploited quartz veins. The host rocks to these veins include layered and foliated gabbros, intruded by fine-grained dolerite dykes, both parallel and at high angles to the layering. Narrow, steeply-dipping dextral shear zones cut through the gabbros and are generally E-W trending. These zones show alteration to chlorite schist. Layering in the gabbros to the north of the Haugesunds mine trends about N-S and dips 60-70 degrees east, but to the south it strikes E-W. SRK ES interprets that this is a result of a fold, this hinge of which is situated about 50 m southeast of the Haugesunds mine entrance.

The quartz veins have exploited shears, as evidenced by them being parallel to local foliation, and trend at a slight angle to the layering in the gabbros, both in the north and in the south. The shears and quartz veins have a predominantly NNE-SSW trend in the northern part of the area, and NW-SE in the south. These are likely two orientations of a conjugate set of faults.

Figure 3-16 Outcrop of gold-mineralised quartz-sulphide vein in sheared gabbros in the southern part of the licence (SRK ES, 2018)

View is to the east. Vein dipping north and outlined by yellow lines. Rock chip sample taken by SRK ES in this location in 2012 graded 5-10 g/t gold.

Figure 3-17 Boulder of quartz veining with abundant pyrite and chalcopyrite at the same location as in Figure 3-16 (SRK ES, 2018)

Note the shearing and chloritisation observed in the hanging wall gabbros at the top of the photo.

3.5 DEPOSIT TYPES

The deposit type for gold mineralisation on Bømlo is best described as narrow-vein orogenic mesothermal quartz-gold. Wulff (1996) divides this into two styles on the basis of their gold-silver metal association as described below. These are thought to be separated in their time of formation, although are intimately intergrown (Abildgaard and Juve, 1999)

1. **Au-Ag-Cu-(Pb-Bi-Te) in Quartz Veins**

    - This association dominates mineralisation in the quartz veins in the Lykling Ophiolite Complex on Bømlo, but also occurs at Hidleneset and Hovdaneset on Bømlo;
    - The quartz veins are 1-2 m in thickness, up to a few hundred metres long and often found parallel to fine-grained dolerite dykes, which are older than the veins;
    - As is common with this type of gold-vein mineralisation, grade is erratic and locally very high; grades of 1,046 g/t gold and 389 g/t silver have been reported. It is notoriously difficult to establish an average grade for this type of deposit, but Wulff and Stendal (1995) report this to be 1-2 g/t;
    - Gold is found as visible grains and aggregates in the quartz veins (Figure 3-18 and Figure 3-19) and in sheared dolerite dykes along the vein contact, and as micro-grains associated with pyrite and chalcopyrite. The gold is intergrown with Cu-Pb-Bi-Te sulphosalts;
    - A mesothermal origin is indicated by homogenisation temperatures of 140°C-325°C, generally low salinity, Au/Ag ratio of about 3.5 and a gold fineness of 750-930 (or silver-poor).

2. **Au-Ag-Pb-Zn-Cu-Bi in Quartz Veins**

    - This is less common than that described above;
    - Gold is more silver-enriched (i.e. lower fineness) and the veins contain galena and sphalerite in greater abundance than chalcopyrite;
    - Gold is very fine-grained (10 µm) and mainly found within galena and chalcopyrite and rarely in pyrite;
    - Grades in 7 grab samples taken by the NGU were reported to be between 1-13 g/t gold and 20-108 g/t silver (Wulff and Stendal, 1995);
    - This mineralisation style probably has a lower formation temperature as suggested by its relatively high content of Pb and Zn compared to Cu and the lower Au/Ag ratio (c. 0.1).

Mineralisation probably took place at a depth of c. 8 km, while the source of the metals was at a depth of c. 14 km (Abildgaard and Juve, 1999). At least two types of fluids, H_2O-NaCl and H_2O-CO_2-NaCl, have formed the quartz veins and it is suggested that the latter is responsible for the gold mineralisation. A typical formation temperature is about 250ºC with indications of temperatures up to 350ºC (Christensen and Stendal, 1995). Fluid inclusion studies indicate that the mineral assemblage detailed in (1) above formed in response to a temperature decrease from 220 to 200 ºC, whereas assemblage (2) was related to increasing pH and/or oxygen activity followed by a decrease in temperature to about 240-220ºC.

Figure 3-18 Gold in quartz from Bømlo (photo: Kenneth Vika, Knuth Langeland)

Figure 3-19 Coarse gold observed in gabboric rocks with quartz stringers at the Modums-Gravene workings (SRK ES, 2018)

3.6 EXPLORATION

3.6.1 Introduction

The ‘exploration’ that would have taken place at the time of 19th Century and early 20th Century mining operations would have been based on a relatively primitive understanding of geology and rudimentary exploration tools; work was limited to finding outcrops of gold-bearing quartz veins and exploiting them along strike and down-dip as far as was possible at the time. As such, it is probable that only near-surface gold occurrences have so far been discovered. In the last 50 years, new methods and knowledge have brought new insight to the area. The following describes some of this more recent work undertaken in the region.

3.6.2 Modern Exploration

Exploration on Bømlo and its surroundings has been conducted by NGU or by companies and individuals on behalf of NGU. Most work has focused on the old gold mining area around Lykling.

NGU sampled and analysed 69 extrusive rocks from Bømlo and Stord from 1971-1974 and presented the results in a report which was published in 1974. Remarkably, this was the first published account on Bømlo’s geology since that of Reusch in 1888. This underlines the fact that the importance of the area wasn’t recognised until recently, and thus hasn’t experienced a great deal of modern exploration.

In 1980, NGU undertook geophysical surveys using Cross Plot and Very Low Frequency methods near the Alsvåg mine on Bømlo. The intention was to test the strike and depth extension of the known gold deposit, or at last its hosting structures. It was interpreted that there were two new zones inside the survey area that could be of economic interest and sampling of these was recommended. Whilst this location is outside NMP’s licence area, the geology is similar and may illustrate the potential for geophysical methods to be applied around Lykling.

In 1993, the Danish geologist Peter Wilhelm Wulff completed a Master thesis on the mineralisation of Bømlo titled “En klassifikation af mineraliseringer på Bømlo, Sundhordland, SV-Norge”. This is one of many academic studies to have been undertaken on Bømlo by various Scandinavian universities. One of the most notable is the work done by Amaliksen in 1983 which resulted in his thesis titled “The geology of the Lykling Ophiolite Complex, Bømlo, SW Norway”. Sampling by Christensen (1994) and Brekke (1983) have also brought new insight to the mineralisation on Bømlo.

In 1994, Wulff visited and sampled about 100 mineral occurrences in Sunnhordland. This resulted in a detailed report called “En befaring af cirka 100 mineraliseringer i Sunnhordland, SV-Norge” (An inspection of about 100 mineralisations in Sunnhordland, SW-Norway). The work was commissioned by NGU, who themselves had carried out a substantial amount of work on the ophiolite and the gold mineralisation in Lykling. Because of NGU’s coverage of the area, Wulff decided not to visit and resample any of the old mines in the Lykling Gold Area but focused instead on lesser-known gold occurrences on Bømlo and the rest of Sunnhordland. All data from this report and a many of the descriptions can be found in the NGU ore database.

Drilling

The only drilling to have been conducted in the area is a small NGU programme in 1980 during which 10 short holes totaling 126 m were drilled using a small ‘backpack drill’ (Amaliksen, 1984). These holes targeted gold-bearing veins along the strike of the Haugesunds mineralisation and the Harald Haarfarge mineralisation, and their locations are shown in Figure 3-21. Holes were inclined towards the projected trace of mineralisation, or at least Amaliksen's interpretation of this.

Whilst the drilling did intercept quartz veining in roughly the expected locations, gold grades were generally low, often at the lower detection limit for the analytical method and always less than 1 g/t with one exception of 6.1 g/t in a 9 cm wide vein. This, however, is not surprising considering the prevalence of coarse gold at this project with highly erratic and unpredictable grades (i.e. high nugget effect) and the fact that the drill diameter was only 22 mm; it is highly likely that these samples did not represent the overall grade of the mineralised features.

Indeed, SRK ES considers it encouraging that the mineralised structure was shown to continue and remain open at a distance of 75 m north of the Haugesunds mine workings, as shown by intersections in holes H2 and H3. The two holes further north from this, H4 and H5, did not intersect mineralisation and SRK ES considers there to be several possible explanations for this, some of which imply that the veins may have more continuity than reported by Amaliksen:

1. The veins are not continuous in this area, either stopping short of these drillholes or pinching out and resuming again further north;
2. The trace of the vein in the vicinity of H4 was mis-interpreted and may be in the opposite direction to the drilling direction;
3. The vein may have been at a greater distance away from the drillhole collars than expected, meaning that they ended before intersecting it.

It is also notable that the veins intersected were variable in thickness, with some indications that they may pinch, swell and bifurcate. The maximum apparent thickness of an individual vein was 1.69 m in hole HH4.

During their site visit in September 2018, SRK ES discovered what appeared to be a drillhole collar about 200 m northeast of the Harald Haarfagres mine (Figure 3-20). This does not relate to the drilling programme described above, and SRK ES has been unable to find any record of other drilling programmes, so it is unclear who carried out this work or what they discovered.

Figure 3-20 Apparent drillhole collar from an unknown programme discovered about 200 m NE of the Harald Haarfagres mine (SRK ES, 2018)

The tag on the drill casing (inset) reads "NM 83 1983 VB…" and is possibly the drillhole number

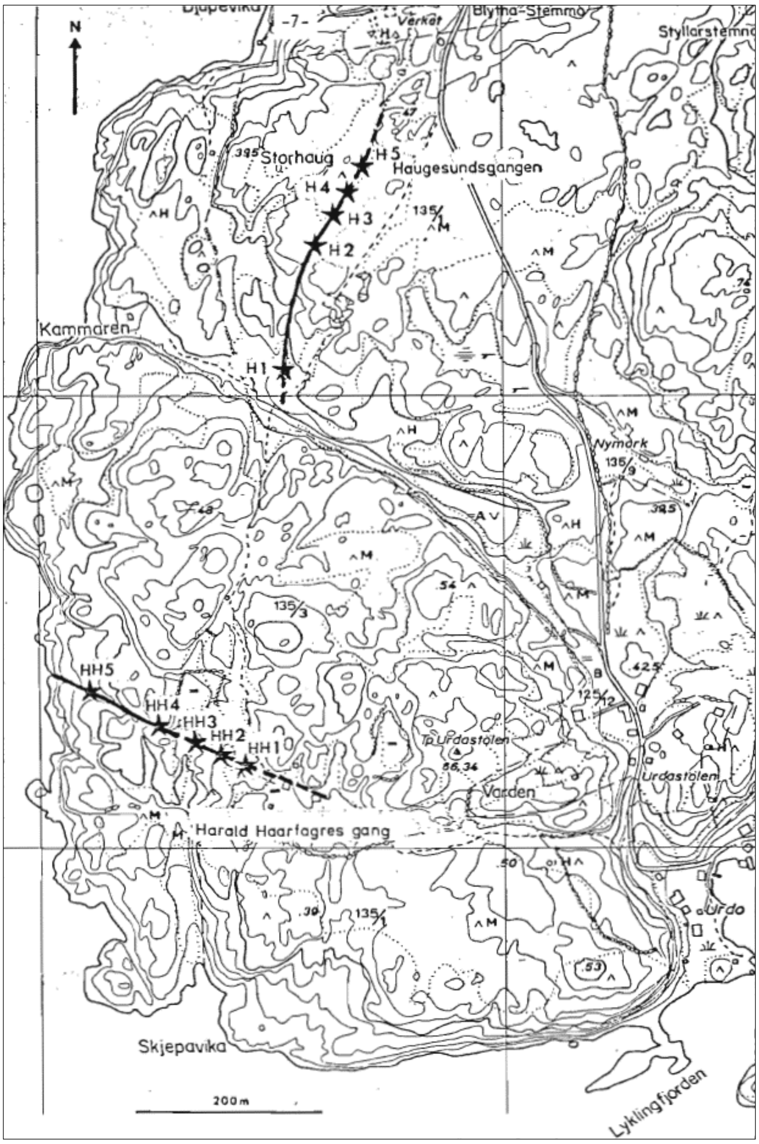


Figure 3-21 Locations of historical backpack drilling (Amaliksen, 1984)

3.6.3 Recent Exploration

SRK ES was commissioned in 2012 by Norwegian West Coast Gold AS to undertake fieldwork in several exploration licences that they held on Bømlo. This included the Lykling area of historical gold mining. Here, a total of 68 samples were collected and all except one reported gold grades above the analytical detection limit. Where possible, these samples were taken from in-situ rock although some were taken from heaps of broken rock next to old mine workings. They were all grab samples representing a single point and thus may not be indicative of the typical grade of the features sampled nor the average grade of the broader mineralised features.

Analytical results indicate a correlation between gold and sulphide minerals (Figure 3-22). Pyrite and chalcopyrite are often abundant in the quartz veins that have been exploited by previous mines. However, this is not always the case; some high-grade gold samples contain minimal sulphides and it is therefore interpreted that gold may be present as both free gold as well as in a more intimate association with sulphides. Correlations between gold and elements that are commonly present in sulphides in this type of setting are most distinct in arsenic (Figure

3-23), indicating that gold may be associated to minerals such as arsenopyrite, tennantite and lollingite.

Maps of sample results show that the highest gold grades according to SRK ES' grab samples occur (from north to south) in the Flatanes, Haugesunds and Harald Haarfagre veins (Figure 3-24 and Figure 3-25). The latter is the best exposed, and yielded samples of over 1 g/t gold from several locations along a 200 m strike length, indicating that mineralisation in this area has potential to show lateral continuity.

To investigate the potential of gold in the wall rock, about one third of the samples taken by SRK ES were from small shear zones, alteration zones and the wall rocks that contact the quartz veins. The data indicate that the wall rocks of the veins have elevated gold grades, but rarely above 0.1 g/t. Schists at the mouth of the small mine at Djupavika have slightly higher gold grades although this seems to be associated with relatively intense alteration: a sericite-ankerite schist with pyrite and a chlorite schist with fuchsite and pyrite contain 0.3 g/t and 0.2 g/t gold respectively.

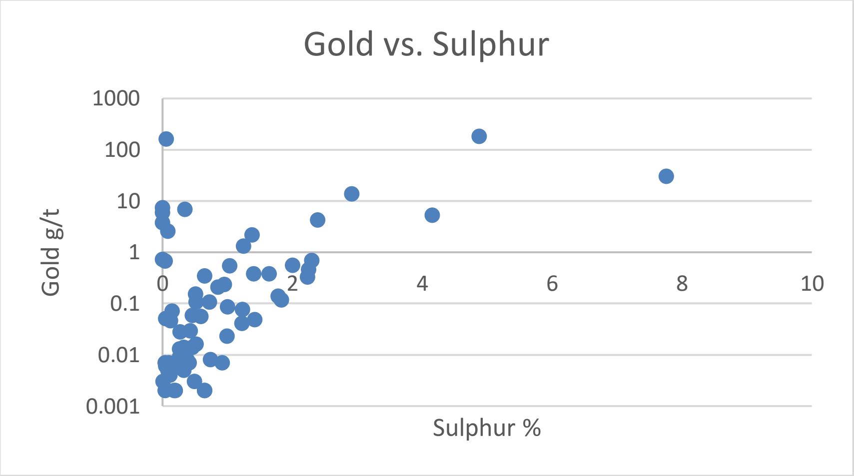


Figure 3-22 Plot showing the correlation between gold and sulphur in grab samples from the Lykling area (SRK ES, 2012)

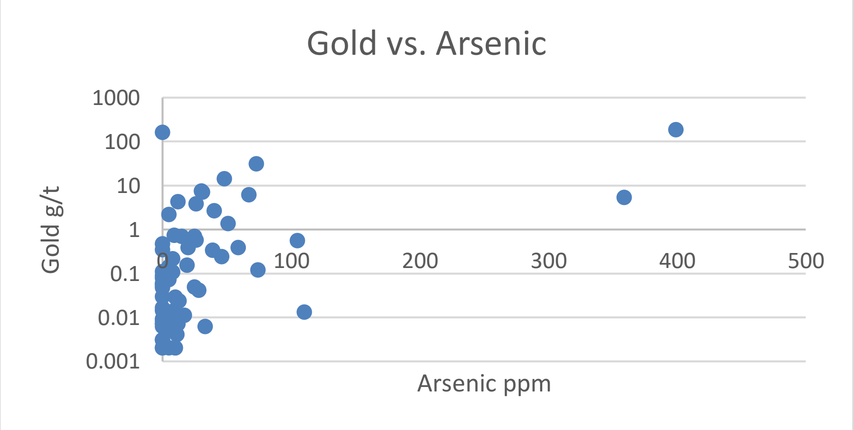


Figure 3-23 Plot showing the correlation between gold and arsenic in grab samples from the Lykling area (SRK ES, 2012)

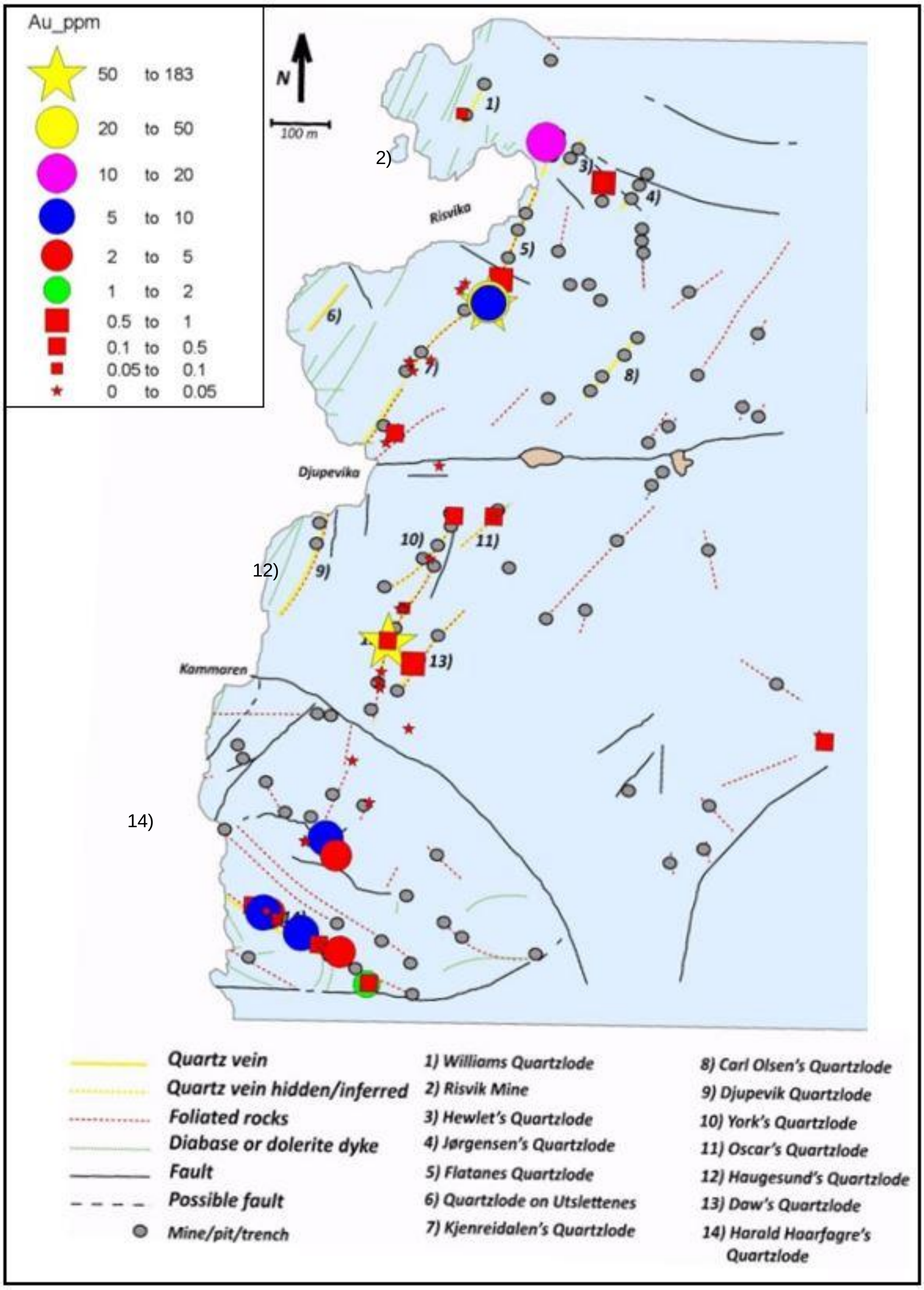


Figure 3-24 Map of the Lykling gold area with gold values of grab samples collected during fieldwork in 2012 (SRK ES, 2012)

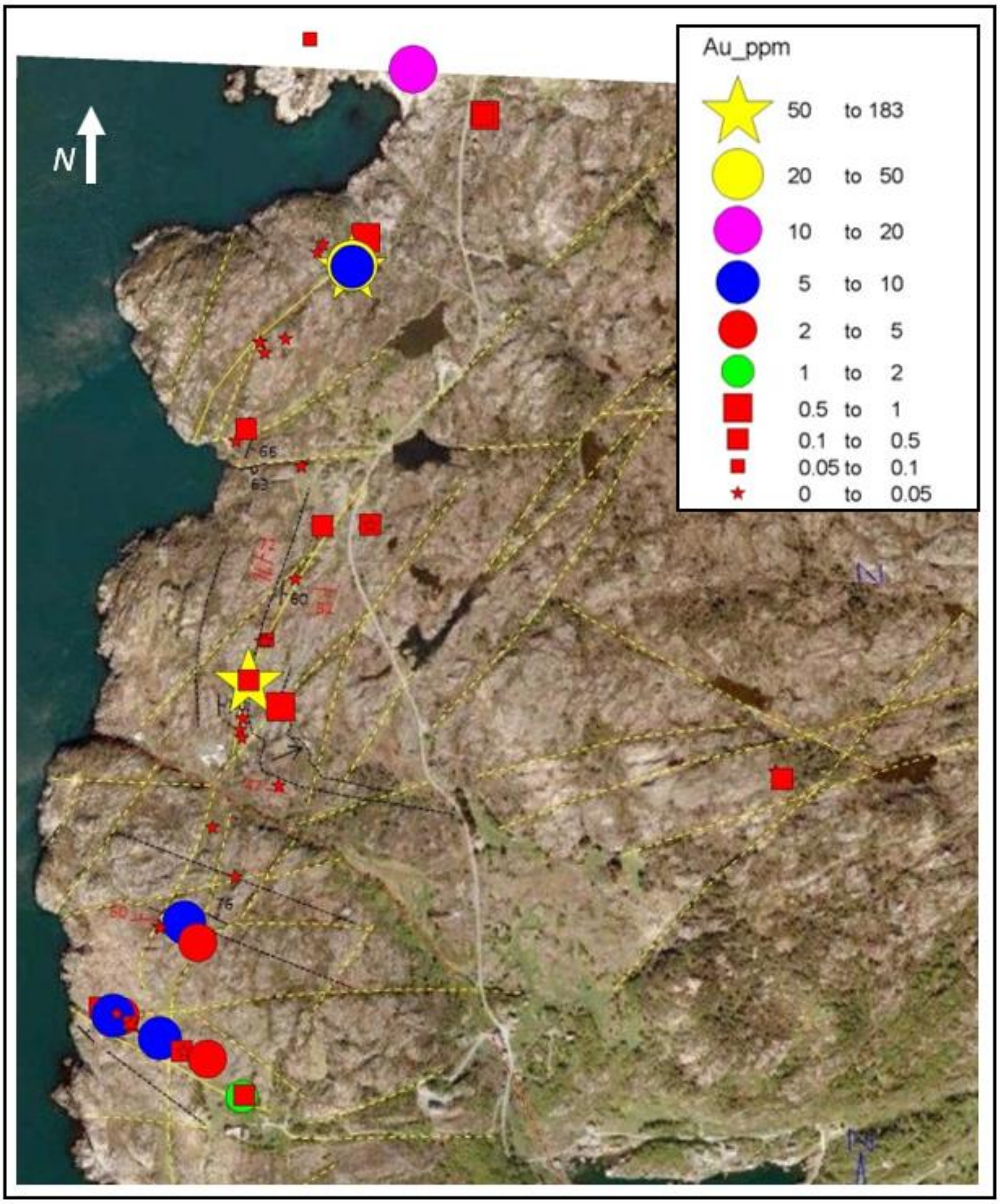


Figure 3-25 Structural map of the Lykling gold area with gold values of samples collected during fieldwork (SRK ES, 2012; Image: Norge i 3D)

Yellow lines are lineaments/faults, black lines represent magmatic layering.

3.7 INTERPRETATION

3.7.1 Mineralisation Model

Historical mining and recent sampling in the licence area shows that there is potential for high grade gold mineralisation. This is hosted in narrow, quartz-sulphide veins that have formed along fault zones within gabbros, dolerites and basalts of the Lykling Ophiolite. These are orogenic gold deposits formed during or just after a period of continental collision and regional metamorphism, most probably in the Caledonian Orogeny.

The source of gold in the hydrothermal fluids circulating at that time may have been the sulphide minerals in the Siggjo Complex, the Geitung Unit and/or the Lyklingfjord Unit. Mineralisation may have formed depths of 14 km and at temperatures close to 400°C. The sulphide minerals within the Lykling Ophiolite are another possible source. In this case, mineralisation would have formed at slightly shallower levels of 13 km and at temperatures of 240-400°C. The fluids in both hypotheses would most likely have been of meteoric origin and their equilibration with the source rock resulted in the mobilisation of gold.

The opening of fissures may have resulted in the equalisation from lithostatic to hydrostatic pressure, serving as a driving force for the stream of fluids. There are indications that fluids followed the contact between the Siggjo Complex and the Lyklingfjord Unit, where the basal conglomerates would have served as an effective fluid pathway.

The faults that host gold-bearing veins in the licence area are third order faults relative to the Hardangerfjord and Sunnhordland Faults, which are first and second order respectively. It is thus likely that the mineralised fluids migrated up and along the first and second order faults and from there into the third order faults, where the mineralisation occurred.

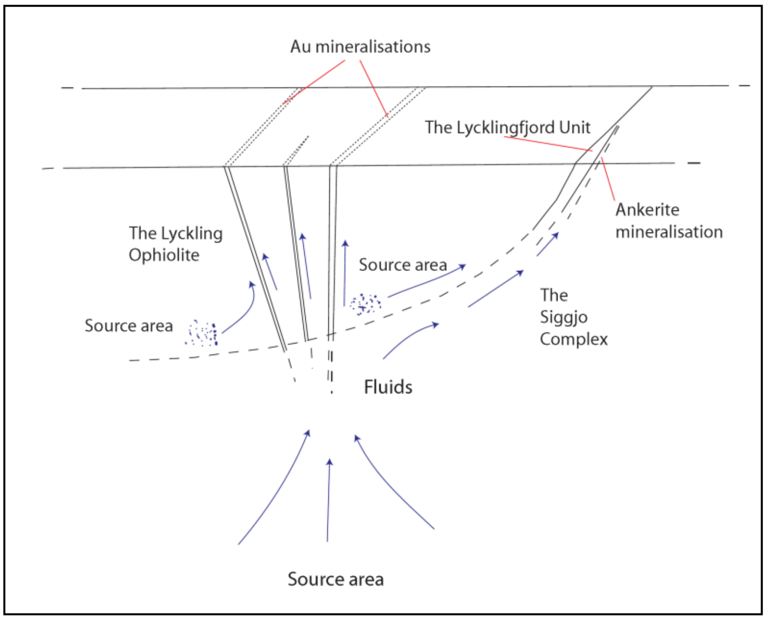


Figure 3-26 Source model for the gold mineralisation on Bømlo (distilled from Berg, H.-J. 1986).

3.7.2 Prospective Structural Settings

It is clear that gold-bearing quartz veins in the licence area are located within and along narrow shear zones that have developed at a shallow angle to the layering in the host gabbros. The old mine workings are found along these shears, with obvious topographic lineaments between them that indicate continuity of the structure (Figure 3-27). It is also notable that mine workings often occur where linear features intersect and the topography opens out into broader, flatter areas. Although quartz veining is rarely exposed or has been mined out in such places, it seems likely that these intersections were zones of structural dilation in which increased fluid flow and gold precipitation were possible (Figure 3-29). This may apply to intersections of structures at depth, as well as laterally as described above. These relationships, if correct, could prove useful in targeting further exploration near former mining areas as well as in the wider area.

Figure 3-27 Example of one of many linear features that host small mine workings (SRK ES, 2018)

Location is about 100 m northwest of the Haugesunds mine and view is to the southwest. Spoil from mining is seen in the foreground and another mine pit is present about 100 m along this feature. Both mining locations occur at intersections of lineaments.

Figure 3-28 Material from mining activities at Modums-Gravene (SRK ES, 2018)

Rock appears to have been mined from a shallow linear pit on the righthand side of the photo. The location is about 70 m NNE of the Haugesunds mine and lies on the same lineament. More mine workings are present about 150 m further along the structure. Where terrain opens out between these locations, this could indicate dilation of the structure and the potential for more mineralisation, although this is covered by bog and not exposed.

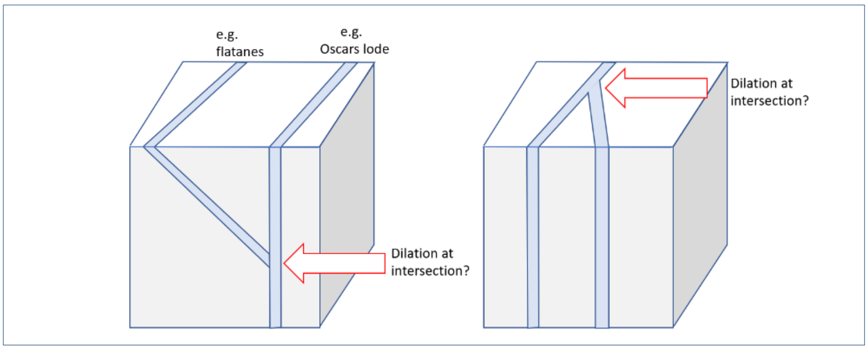


Figure 3-29 Schematic diagram showing examples of where dilation and increased mineralisation may occur where structures intersect (SRK ES, 2018)

3.7.3 Lithological Controls

At this stage, it is unclear whether there are lithological controls on mineralisation, such as changes in rock chemistry or competency leading to increased gold precipitation. However, the darker layering in the gabbros is characterised by an abundance of magnetite and there are some known relationships in other gold deposits between iron-rich rocks and increased gold mineralisation. This is a further exploration targeting method that could be tested locally.

3.7.4 Continuity of Mineralisation

Very little outcrop of quartz veining remains on surface today. Most outcrops, apart from the Harald Haarfagre mine, have been removed by mining or trial mining. In areas between mine workings along lineaments that the veining is thought to follow, there is often little outcrop due to the presence of overburden or boggy ground; furthermore, the rocks along the lineaments are eroded preferentially to form linear depressions and, at intersections of the lineaments, the depressions tend to widen. It is possible that the veins pinch and swell over short distances, limiting their surface expression, or are present as lens-shaped features in areas where lineations intersect.

It is clear however, that prospective structures have some considerable length, sometimes in excess of 1 km, and it is fair to assume that they have also reasonable continuity down-dip. This is supported by somewhat anecdotal evidence that some of the historical mines that reached depths of 165 m below surface. Otherwise, the depth extension of mineralisation is poorly understood, most previous work having focused on lateral distribution of gold, and future exploration must address this. SRK ES considers that testing the down-dip continuity must be an exploration priority.

The continuity of gold-bearing structures may also be complicated by later faulting that caused laterally and vertical offsets. Whilst it is possible that mineralisation continues either side of such faults, this may have limited the extent of former mining operations which would not have had the benefit of being able to drill ahead of mining to properly plan the mining direction. The same reason may apply to the limited depth of mining that was possible.

Grade continuity is likely to be more complicated than that of the hosting structures because of the high nugget effect. Mineralisation is erratic and may vary from very high grades to nothing over short distances. This is not uncommon with this type of gold deposit but does increase the challenge of estimating mineral resources. Drilling can be used to good effect to define the structure and possibly the veining, and may give a relative indication of grade, but more quantitative grade assessment will eventually require bulk sampling or even trial mining development. The old adage of ‘drill for structure, mine for grade’ is clearly applicable to this deposit.

Known gold occurrences and former mine workings are concentrated in the western part of the exploration licence, mostly to the west of the road that runs north to south through the area. The area to the east has several recorded pits or trenches but far fewer mine workings. The geology and structural setting is however very similar to the main mining area and SRK ES considers there to be potential for new (or unrecorded) gold occurrences to be found. It is possible that this area was less developed with respect to mining because it is more distant to infrastructure and the former processing facilities, but also possible that mineralisation simply wanes in this direction. A further possibility is that mineralisation is not exposed at surface and therefore not yet recorded in this area.

3.8 SUMMARY

The Lykling area is well-known for its orogenic gold mineralisation and exhibits many features that are common for this deposit type: narrow quartz veins, structural controls, coarse-grained visible gold, sometimes extremely high but very erratic gold grades and relatively low tonnage.

The erratic grades make it difficult to state a typical gold grade for mineralisation in the area. Grades quoted from historical mining were often calculated based on the tonnage of ore mined or processed and the amount of gold recovered. This data gives an average of about 7 g/t gold in the ore that was processed. However, and importantly, it is not clear how closely the reported tonnages reflect the actual volume of material mined, and it seems that mined material was sorted into high grade feed before processing. Furthermore, it is quite possible that there were significant losses of gold during processing which would lower the apparent grade when calculated on this basis.

Fieldwork in 2012 included the collection of 69 grab samples of surface material including quartz veining and wall rock. The average gold grade for these samples is 6 g/t. When this data is reduced to only samples of quartz vein, the average grade is 14 g/t (range 0 g/t to 183 g/t). The median grade is 0.1 g/t, showing that the average is strongly skewed by very high grades of 160 g/t and 183 g/t from the Haugesunds and Flataneset mine areas respectively.

The distribution of gold occurrences is fairly well-understood through the area's mining history and academic studies, providing a good foundation for targeting new zones of mineralisation. Future mining in this area will most likely be highly selective and focussed on high grade zones, resulting in modest production tonnages but potentially of high grade material that can be processed with simple methods.

It is unlikely that new gold-quartz veins will be found as outcrops at surface; these having been removed by mining. Instead, the opportunity to discover new areas of mineralisation lies in areas *between* the old mine workings, particularly along lineaments and where these intersect. It is also possible that mineralisation may be found down dip or below the old underground workings, as there would have been a limit to the depths that could be profitably mined at the time.

If the flow of mineralised fluids extended beyond the area of known occurrences, there is also good reason to suspect that parts of the licence that exhibit fewer or no mine workings, but have the same structural setting, may host undiscovered deposits. This is true for the area to the east of the road that runs north-south through the licence area. The fact that these potential new occurrences probably do not have any surface expression means that exploration will rely on careful targeting through structural assessment and use of a robust mineralisation model. In all cases, it is most likely that new deposits will be found at depth rather than the shallow material that was targeted by historical miners.

Logistically, and with sufficient funds, exploration should be relatively straightforward although there is likely to be an early requirement to drill. It must be remembered that Mineral Resource estimation through drilling alone will be challenging due to the high nugget effect of gold grades. However, SRK ES considers the project to have good potential for the discovery of new gold-bearing veins and recommends that new exploration is undertaken.

Finally, as a further opportunity, it should be remembered that the project area is underlain by ophiolitic rocks and the mineral potential of these may be of interest. The layered gabbros that cover large areas of the licence are strongly enriched in magnetite, and there are known examples from other parts of the world where similar gabbros show notable grades for titanium and vanadium. With the prices of both metals on the rise, particularly for vanadium, it would be worthwhile investigating these rocks in parallel to gold exploration.

3.9 RECOMMENDATIONS

The following recommendations are made for a first phase of new exploration on this licence area. The overall objective of this will be to produce a selection of exploration targets on which further work, which should include diamond drilling, can take place.

3.9.1 Further Assessment of Historical Mining Records

Maps and sections for the historical mines are not readily available, but it is possible that they are held in archive somewhere. If they can be found, they should be digitised and plotted alongside other data for this area. This will prove useful with respect to understanding how far the workings extend underground and in which directions, thus helping to understand controls on mineralisation and allowing exploration efforts to be focused on mineralised areas that have not been mined or have been missed by former mining due to, for example, structural offsets. Improved knowledge of the underground workings will also help to avoid holing into them during a drilling programme.

3.9.2 Remote Sensing, Structural Mapping and Interpretation

SRK ES' field observations suggest that there is a relationship between certain structural settings and zones of mineralisation. A preliminary interpretation is that intersections of structures and apparent zones of dilation show a spatial correlation to areas that have been mined. It is also possible that adjacent zones of mineralisation with convergent dips may join at depth, with potential for larger volumes of mineralisation. Furthermore, former mine workings may have ended where mineralisation was truncated and offset by faulting and the veins not traced on the other side of the fault, raising the possibility of unidentified extensions to known mineralisation.

All structural relationships need to be better understood so that a model for prospective settings can be applied to exploration targeting elsewhere in the licence area as well as in areas close to known mineralisation. This can be achieved at a relatively low cost through the interpretation of high resolution satellite imagery and detailed structural mapping in the field. This will also allow identification of mineralised features that have been truncated or offset by faulting and that may continue beyond the faults.

Field mapping should also examine the possible relationships between gold mineralisation and its host rocks. Gold-bearing structures appear to have developed at an oblique angle to layering in the gabbros and, if there is a consistent pattern to this, it may be applied to predicting mineralised extensions. Further work is also required to understand if there is any correlation between host rock characteristics and areas of increased gold mineralisation, both on a licence scale and at a deposit scale.

It is envisaged that the bulk of this work would focus on the eastern, less explored side of the licence area but only after there is sufficient understanding of the abovementioned relationships in the former mining areas.

3.9.3 Geophysical Surveys

The type of mineralisation at Bømlo is not particularly detectable with any type of geophysical method. However, a high resolution magnetic survey could be used to refine geological mapping and structural interpretation. The area is small enough for a ground-based (rather than airborne) survey to be undertaken, and the survey should be applied across the whole licence area. It is recommended that some trial profiles are carried out first in order to gauge the response over relatively well-known areas such as along strike from the Haugesunds mine.

An additional method could include Very Low Frequency Electromagnetics ("VLF-EM"). This could prove useful for mapping fractures and faults that host gold mineralisation and may provide some information on their dip and dip direction. It is also possible that zones of massive sulphides in mineralised areas may also be detected, providing they are large enough.

3.9.4 Sampling

As far as SRK ES is aware, gold grades in the licence area produced by recent (post-mining) exploration are largely based on rock chip sampling and grab samples of mined material. These will not necessarily provide representative grades of mineralised features due to the highly erratic nature of gold mineralisation. It is therefore recommended that existing outcrops of veins, although limited in number, should be subject to channel sampling to obtain more representative grades across them. This samples can be taken with a rock saw and, where outcrops show some strike continuity, should be taken at regular intervals to determine lateral variability of gold grades. Sampling should also extend into the hanging walls and footwalls of veins so that the potential for gold mineralisation to extend into the host rocks can be tested. Any new vein outcrops identified during the course of exploration must also be sampled.

Sampling should also include the hosting geology in the wider area. The layered gabbros are strongly enriched in magnetite and have the potential to host iron-titanium-vanadium mineralisation, according to findings from similar geological settings.

3.9.5 Trenching and Pitting

In many cases, prospective lineaments between mine workings form narrow topographic lows with no outcrop due to the presence of overburden. It is not yet known whether mineralised veining continues along these features or if it pinches out between the workings, or simply doesn't reach the surface. It is also possible that exposures of veining have already been mined out.

Excavating trenches or pits along these features to expose and sample the underlying geology would help to understand this. It will be complicated by the fact that these areas are often very boggy and may not be possible at all in many cases. The use of hand augers should also be trialed alongside larger excavations to see if this method can provide any information on the overburden/bedrock interface and the presence of veining. If successful, these techniques could produce useful information prior to a drilling programme.

3.9.6 Diamond Drilling

Ultimately, diamond drilling is required in the licence area and there may be a requirement to start this relatively soon, as it will be the only means of understanding the potential at depth. This information is needed before the project can seriously advance. A rig that is capable of drilling HQ diameter core to at least 100 m depth is recommended. Holes would be drilled along parallel fences to establish the strike and dip continuity. Despite the proximity to good quality roads, the terrain in the licence is very rugged and it is likely that a helicopter could be required to move the rig between drilling locations.

Drilling will be an essential step in exploration but, as has been mentioned before, the nugget effect of gold grades here will most likely mean that Mineral Resource estimation using this alone will be a challenge and may not define anything of a higher category than Inferred. Advancing beyond this will require bulk sampling combined with more, much closer spaced drilling.

4 BJERKREIM

4.1 PROPERTY DESCRIPTION AND LOCATION

4.1.1 Mineral Tenure

The Bjerkreim project is located in Rogaland county, south-western Norway, 40-60 km southeast of the town Stavanger. It comprises five exploration licences for iron, titanium and vanadium, which are held by Teøk A/S (Figure 4-1). Each licence is 10 km^2 (Table 4-1).

Table 4-1 Five exploration licences registered by Teøk A/S in the Bjerkreim area.

Licence Name	Licence number	Date granted
Bjerkreim 1	1065/2018	06/07/2018
Bjerkreim 2	1068/2018	06/07/2018
Bjerkreim 3	1066/2018	06/07/2018
Bjerkreim 4	1069/2018	06/07/2018
Bjerkreim 5	1067/2018	06/07/2018

Inside the Bjerkreim 2 property is a smaller exploration licence (2 km^2) which was acquired in 2017 by Mr Svein Stensrud. SRK ES has been informed by NMP that there are agreements in place between Teøk A/S and Mr Stensrud to allow exploration to continue unhindered, although has not seen any documentation to this effect.

The licences are located geologically in the Bjerkreim-Sokndal layered intrusion ("BSL") and include apatite-ilmenite-magnetite-rich zones that have been defined by NGU (Schiellerup et al., 2001, Ihlen et al., 2014).

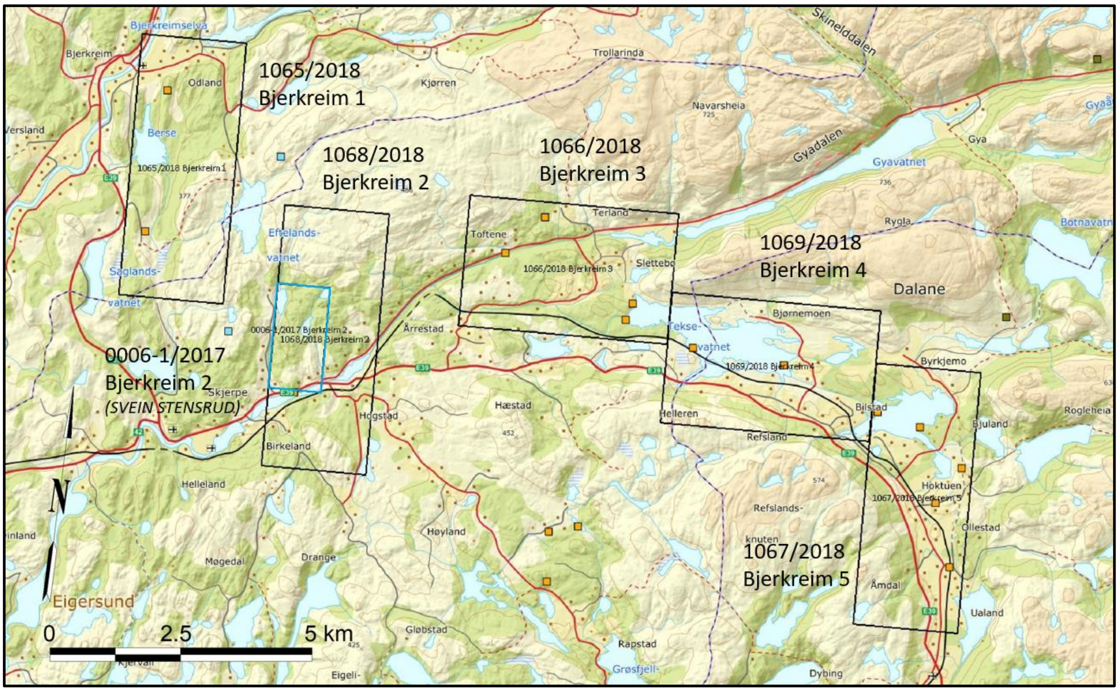


Figure 4-1 Location of the five NMP licences in the Bjerkreim area

Note the additional licence within the Bjerkreim 2 licence, marked in blue. Orange squares mark the locations of mineral occurrences/showings described in the NGU mineral database. See Figure 1-1 for location of the area in SW Norway.

4.2 ACCESSIBILITY, INFRASTRUCTURE, CLIMATE AND PHYSIOGRAPHY

4.2.1 Accessibility

The property can be accessed all year by road, air or waterway. It is located 40-60 km south-southeast of Stavanger, one of Norway's main ports for the offshore industry, and which also hosts the Sola international airport. The main road along Norway's west coast, the E39, runs through the project area. Smaller roads and farm tracks lead off this to allow access to various parts of the intrusion. The distance from Bjerkreim to the international airport in Stavanger constitutes a c. 45 minute car ride. The Tellnes titanium mine with one of the world's largest ilmenite deposits, lies 20 km south of the project area.

4.2.2 Infrastructure

The region has good infrastructure, with good quality roads. Stavanger is the third largest city in Norway (population 300,000 in the greater Stavanger area), and Stavanger harbour is one of the main ports in Norway servicing the offshore oil industry. Bjerkreim, the largest settlement in the licence areas, has almost 3,000 inhabitants. Several small communities, individual dwellings and many farms are scattered through the area. Egersund is the nearest large town to the licence with approximately 10,000 inhabitants. It lies 10 km southwest of Bjerkreim on the coast and has a small harbour. Electricity and water networks exist throughout the area.

4.2.3 Climate

The region has a temperate climate, highly influenced by the proximity to the coast and the North Atlantic current. Western Norway has a high average rainfall, with on average 150 rain days per year in Stavanger. In Bjerkreim, most rainfall occurs in October and averages 197 mm. April is the driest month with 80 mm. Average temperatures in Bjerkreim range from around 0°C in the winter to 14°C in the summer.

4.2.4 Physiography

The dominant topography is that of a broad valley at 80 to 180 m above sea level, with several km-sized lakes and surrounded by rugged mountains up to c. 800 m above sea level (Figure 4-2 and Figure 4-3). The area consists predominantly of forested areas and agricultural land.

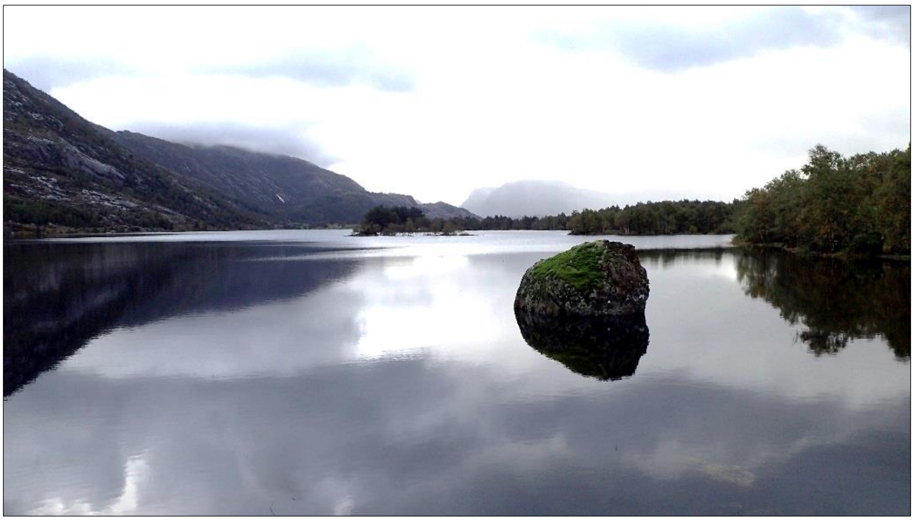


Figure 4-2 View over Teksevatnet in the broad valley that hosts the layered intrusion (SRK ES, 2018)

Sveco-Norwegian gneisses form the hills north of the lake, to the left in the photo. View towards the east.

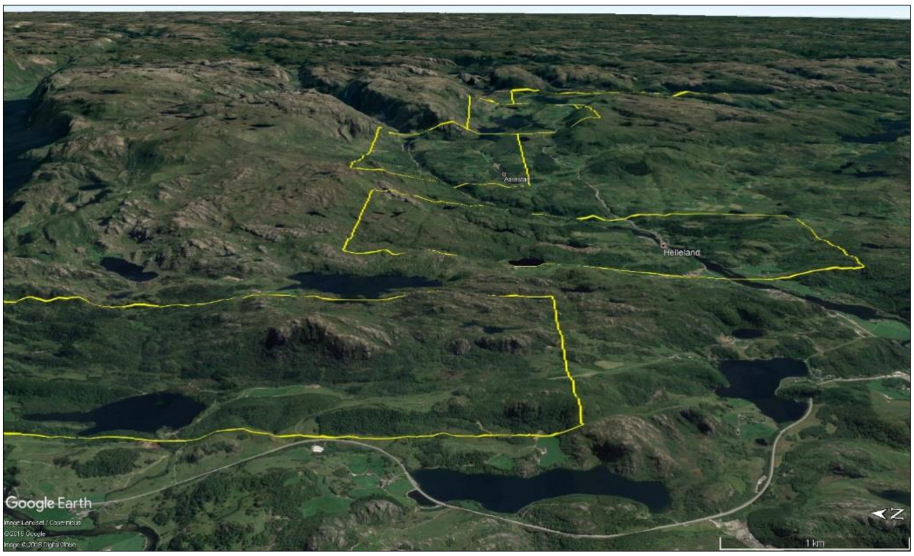


Figure 4-3 Oblique 3D view from Google Earth over the Bjerkreim licence areas, looking east

The TEØK licences are highlighted in yellow. They are located in the open valley at the foot of the mountains to the north (left in the image). Note the deep gorge in the central background. It marks a major fault in the Sveconorwegian gneisses that form the host of the layered intrusions that occur in the valley.

4.3 GEOLOGICAL SETTING AND MINERALISATION

4.3.1 Regional Geology

The Bjerkreim prospect is located in the Bjerkreim-Sokndal Layered Intrusion ("BSL") that forms part of the Rogaland Anorthosite Province ("RAP") in south-western Norway (Figure 4-4). The RAP is of Neoproterozoic age (932-920 Ma) and comprises several massif-type anorthosite bodies, the BSL and a range of other noritic and jotunitic to charnockitic intrusions. Some of the noritic intrusions, such as Tellnes and Storgangen, constitute world class deposits of ilmenite, and the BSL contains important prospects for both apatite, ilmenite and vanadium magnetite. These are therefore the target minerals of the NMP licences.

The RAP is part of the autochthon that appears south of a Caledonian nappe complex in the Stavanger area which, in turn, forms part of the Meso-Proterozoic Sveconorwegian (Grenvillian) Orogen. The autochthon in southwest Norway is composed of migmatitic ortho- and paragneisses, together with isolated occurrences of supracrustal rocks and synorogenic syenites and granitoids. The gneisses and metasediments are intruded by post-Sveconorwegian, Neoproterozoic plutons, including the BSL, that constitute the Egersund-Farsund Igneous Province. Individual intrusions in the province vary in composition from andesine anorthosite and leuconorite to norite, jotunite, syenite, charnockite, and granite. The structural and metamorphic history of the gneissic envelope around the BSL is complex and protracted. Intense Sveconorwegian deformation was coeval with upper amphibolite to granulite facies metamorphism. Later intermediate pressure (4-6 kb) granulite-facies metamorphism increased in grade towards the Egersund-Farsund Igneous Province, which was variably overprinted during the retrogressive metamorphic event.

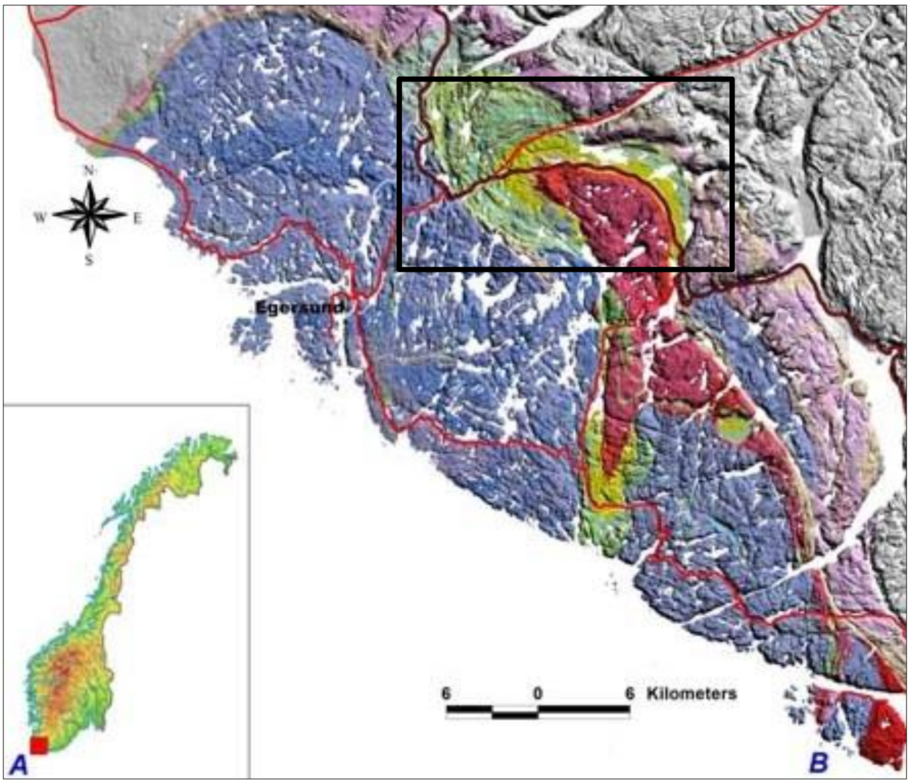


Figure 4-4 Geological map of the Rogaland Anorthosite Province in south-western Norway (inset Map A)

Anorthosites are shown in blue, The Bjerkreim-Sokndal intrusion is shown in green colours (layered intrusion) and red (mangerite suite). In pink and grey are the surrounding Sveconorwegian gneisses. The outlined area shows the position of Figure 4-1and Figure 4-7.

4.3.2 Local Geology

The parts of the BSL that underlie NMP's exploration licences consist of a wide variety of generally gabbroic-noritic layered intrusions overlain by a mangerite suite. It is the largest layered intrusion in Western Europe, covering 230 km^2 and comprises a Layered Series that is more than 7,000 m thick (Michot, 1960, 1965; Duchesne, 1987; Wilson et al., 1996). The BSL forms an irregular trough structure that overlies the anorthosite massifs to the west and Sveconorwegian gneisses to the east.

The BSL consists of three lobes (Figure 4-4, Figure 4-5), and Company's licences lie in the northernmost of these, the Bjerkreim lobe. The Sokndal and Mydland lobes consist of similar layered intrusions but are not well-exposed due to thicker cover and therefore have not been studied as intensively as the Bjerkreim lobe.

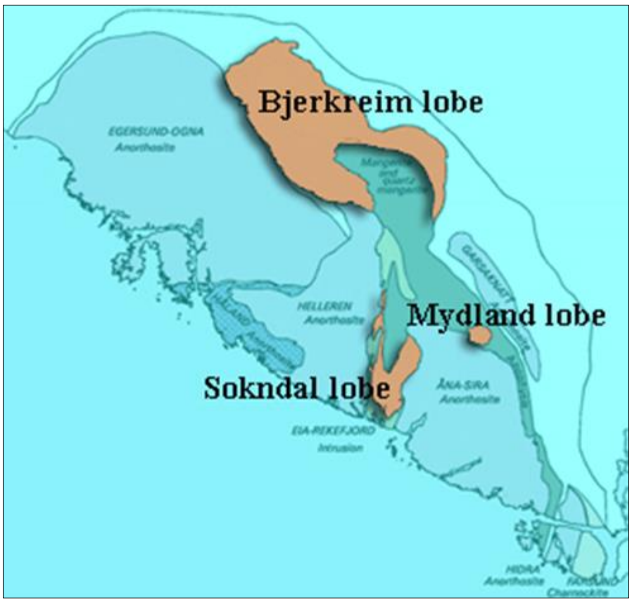


Figure 4-5 The three lobes of the Bjerkreim-Sokndal layered intrusion in the Rogaland Anorthosite Province

Geology of the Bjerkreim Lobe

The BSL exhibits magmatic modal layering defined by variable amounts of mafic (dark) and felsic (light) minerals in an overall noritic to gabbroic composition. The repeated pattern of gradual variation of most mafic (most primitive) compositions of the rocks in the bottom of a layer to most felsic (most evolved) rocks in the top occurs not only on the scale of centimeters (Figure 4-7), but also on the scale of tens of meters, hundreds of meters and kilometers. Repeated influxes of the evolving magma caused a consistent rhythmic variation in the composition of the rocks.

Figure 4-6 Modal graded layering in gabbro-norite at Teksevatnet west (SRK ES, 2018)

Zone MCU IIIe. Top to the left.

In the Bjerkreim lobe, the systematic variation of the mineral content led to the recognition of repetitive sequences with similar mineral assemblages, and these were defined as megacycles (Michot, 1960, 1965; Duchesne, 1987, Wilson et al., 1996). A single megacycle can be many hundreds of meters to more than a kilometre wide. Each megacycle shows from bottom to top a gradually more evolved composition of the layers and overlain again by more primitive rocks at the base of the next megacycle. The following points are key to understanding the descriptions of the megacycles, the zones within them and how they relate to each other:

- One complete megacycle consists of six mineral assemblage zones, each defined by the disappearance or appearance of seven main minerals: plagioclase, apatite, clinopyroxene, orthopyroxene, olivine, ilmenite and magnetite. The zones are named a to f in connection with the megagycle in which they occur (e.g. zone CMU II a). The magmatic stratigraphic sequence of the megacycles and their constituent zones is shown in Figure 4-8. Each zone is at least several tens of meters thick, but can be up to a kilometre in stratigraphic thickness, as, for example, MCU II c. The target minerals mentioned above are concentrated in certain zones of the megacycles;
- Six megacycles have been recognised, named Megacycle Unit 0, IA, IB, II, III and IV (abbreviated to MCU 0, MCU IA etc). Each megacycle has the potential to host all 6 mineral assemblage zones but only the upper megacycle shows the full magmatic stratigraphy, albeit with a very thin lower zone a. MCU 0 consists of only a very narrow slice of zone c rocks;
- In general, the lower megacycle units have the better developed lower part of the stratigraphy, while the upper zones with the most evolved rock compositions almost exclusively occur in the highest megacycle units.

The distribution of the megacycle units and mineral zones is shown in Figure 4-9.

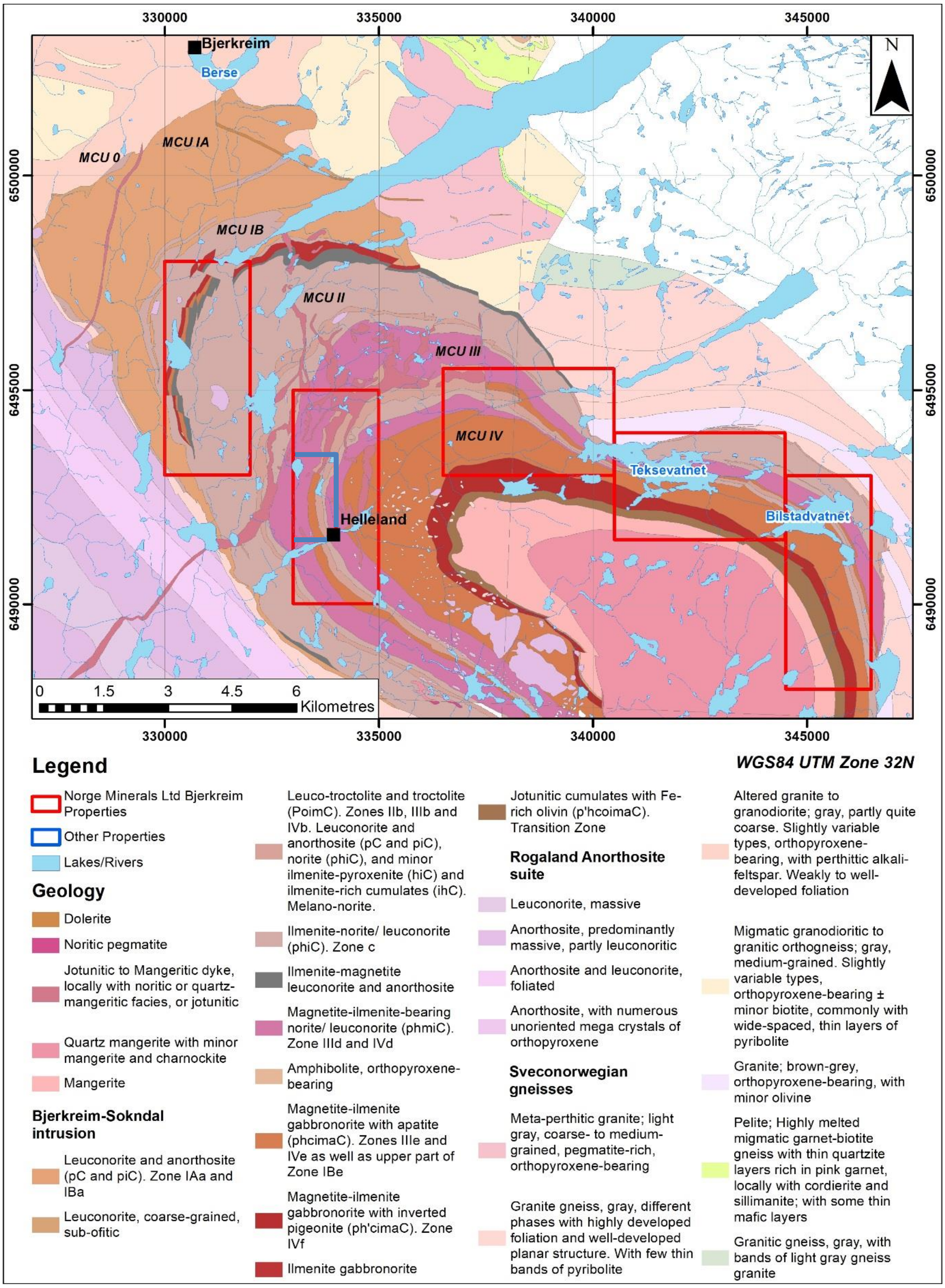


Figure 4-7 Geological map of the Bjerkreim lobe showing the location of the five NMP licences

Map location is shown in Figure 4-4. Source: NGU map database, after Marker et al. (2003).

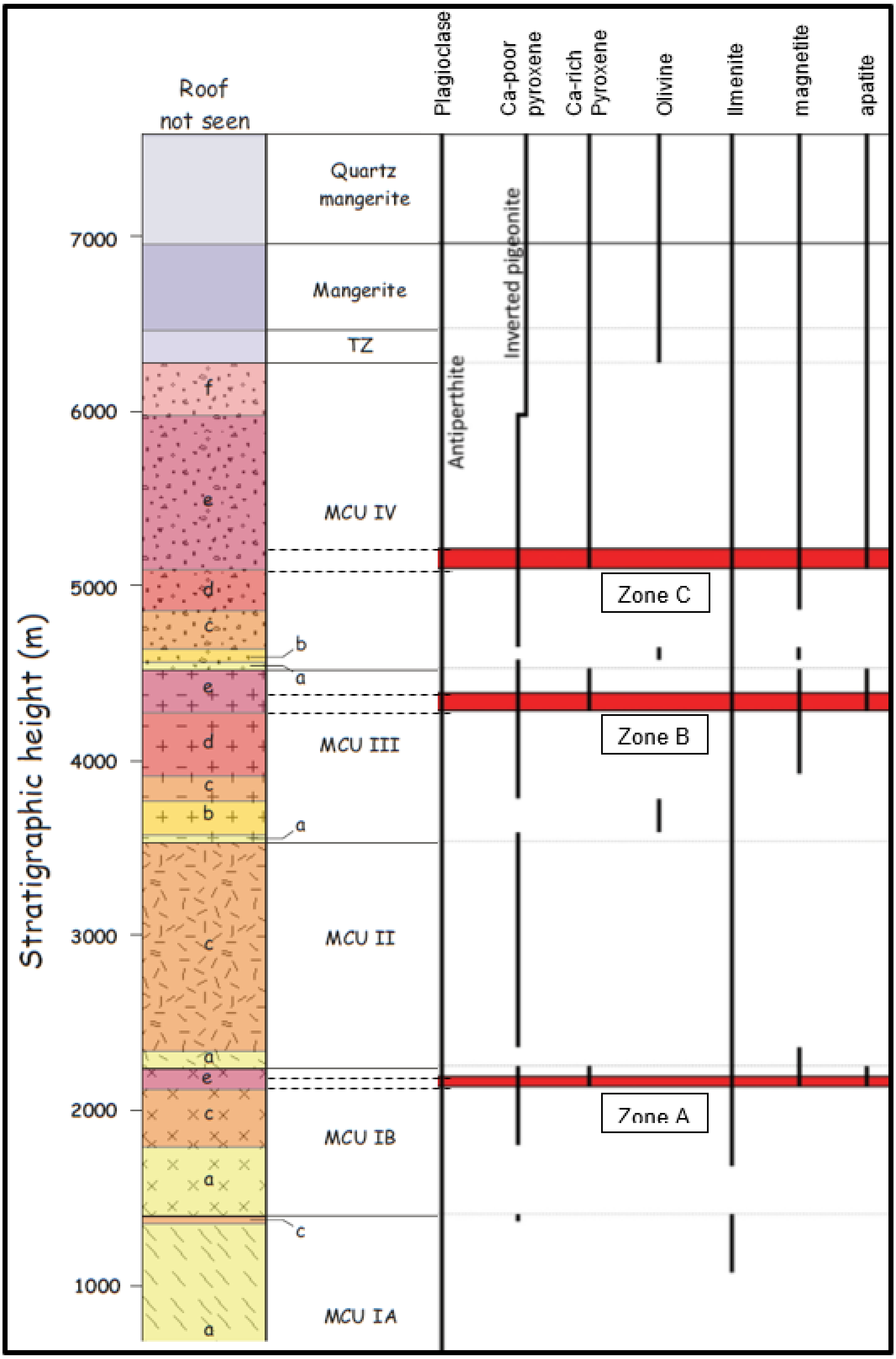


Figure 4-8 Magmatic stratigraphy in the Bjerkreim-lobe of the Bjerkreim-Sokndal Layered Intrusion

Three mineralised cumulate zones (A, B and C) that are enriched in apatite, ilmenite and vanadium-bearing magnetite are highlighted in red: the bases of MCU IBe, MCU IIIe, MCU IVe. The thickness of the zones varies laterally and is therefore interpreted differently in the various reports. Adapted from Schiellerup et al. (2001) and Ihlen et al. (2014).

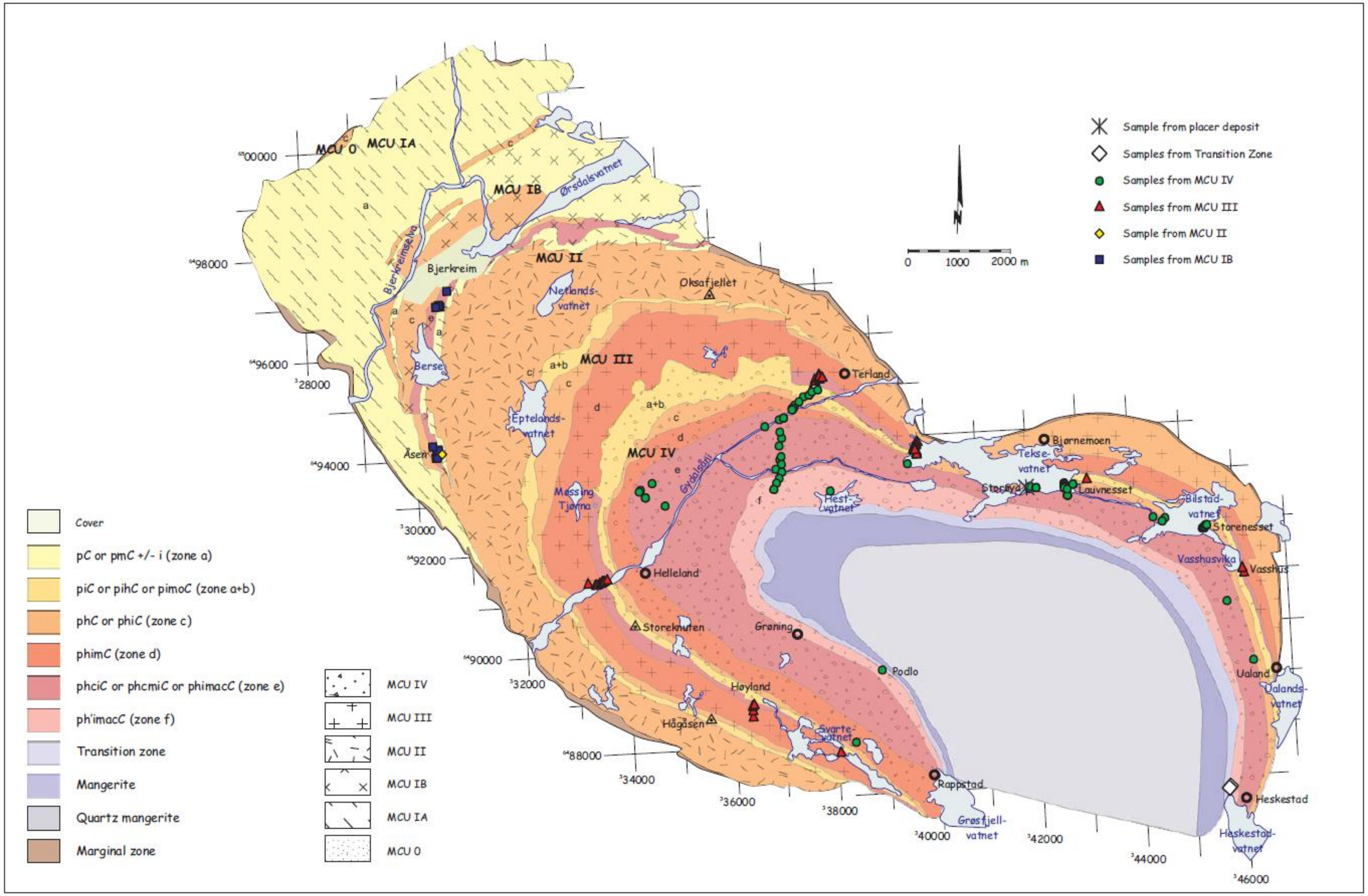


Figure 4-9 Geological map of the Bjerkreim lobe highlighting the megacyclic units and their constituent zones

Map and sample locations from Schiellerup, et al. (2001).

The zones a to f are defined by the occurrence of the following index minerals:

zone a: plagioclase + ilmenite (piC)

zone b: plagioclase + olivine + ilmenite + magnetite (poimC)

zone c: plagioclase + orthopyroxene (hyperstene) + ilmenite (phiC)

zone d: plagioclase + orthopyroxene + ilmenite + magnetite (phimC)

zone e: plagioclase + orthopyroxene + clinopyroxene + apatite + ilmenite + magnetite (phcaimC)

zone f: plagioclase + inverted pigeonite + clinopyroxene + apatite + ilmenite + magnetite (ph'caimC)

in which capital C stands for cumulate.

Of these zones, only e and f contain the three target minerals combined, and only these two zones, repeated in the megacycle units, have therefore been targets for exploration (see Sections 4.3.3 and 4.5 for further discussion of the mineralisation).

The highest part of MCU IV, zone f, is overlain by an olivine-bearing jotunitic transition zone ("TZ"), which is followed upwards by a mangerite and a quartz mangerite. The TZ in the Sokndal lobe is characterized by the occurrence of homogeneous ultramafic layers up to 4 m thick consisting of cumulus Fe-Ti oxides, pyroxene and Fe-rich olivine.

Neither top nor bottom of the BSL are exposed. Deeper, more primitive parts of the sequence are assumed to occur at depth, while the top of the sequence, consisting of the most evolved magmatic rock types have been removed by erosion Variations to the mineral composition occur, and not every zone has the complete set of minerals. Most zones are laterally extensive, but not all of them are continuous throughout the intrusion and they can show significant lateral variations in thickness.

Inside each magmatic layer, a modal grading is commonly observed on centimetre-scale from pyroxene, ilmenite or magnetite-rich bases to plagioclase-rich tops (Figure 4-6). Individual mafic layers range in width from few centimetres to 10 cm, rarely more. Felsic intervals between mafic layers are commonly 10 to 50 cm thick. Slump structures, trough structures and minor unconformities occur locally and testify to the dynamic intrusive environment.

In the zones of economic interest, as defined by NGU, modal layering is generally thinner and on a scale of 5-10 cm, but locally less or more (up to 0.5-1 m or non-layered sequences of several metres). Modally graded layering, isomodal 'average' layers and alternating isomodal felsic and mafic layers occur.

Shape and Structure of the Bjerkreim Lobe

The layered intrusions of the Bjerkreim lobe occur in a tight, discordant trough-like structure (or synform) that plunges moderately (30-40°) to the ESE (Figure 4-7, Figure 4-9). The northeast and southwest limbs are steeply dipping, locally even slightly overturned northeast and southwest of the mangerites. Modelling of a +10-30 mgal gravity anomaly in a regional dataset that covers the area gives a minimum depth to the base of the intrusion of about 4 km (Smithson and Ramberg, 1979).

The rocks are moderately foliated parallel to the layering, defined by elongated grain shapes (Figure 4-10). In the core of the structure, an axis-parallel linear fabric occurs. Petrographic studies have shown that feldspar and pyroxene grains exhibit signs of syn-intrusion high temperature deformation (above 550-650°C; Wilson et al., 1996).

Figure 4-10 Close-up photo of the layering and foliation in a modally layered gabbro-norite (SRK ES, 2018)

The foliation in the rocks is parallel with the layering. MCU IIIe at Teksevatnet west.

Foliation and lineation can be either primary magmatic fabrics or tectonic fabrics. Wilson et al. (1996) observed that the intrusion of the Bjerkreim lobe post-dated regional tectonic activity by c. 70 million years and suggest that “The foliation, mineral lineation and the synformal disposition of the Layered Series seem, therefore, to be due to high-temperature, gravitational foundering consequent on the crustal-scale density inversion (demonstrated by the present gravity anomaly) that resulted from the location of the BSL within lower-density gneiss and anorthosite”. This may explain the local overturning of the two limbs of the trough around the mangerite core.

Distribution and Configuration of the Megacycles and Mineral Zones

The following description is adapted from Wilson et al. (1996), with some edits: The megacyclic units vary in stratigraphic thickness, lateral persistence and in the nature of the layer sequences they exhibit. The megacyclic units MCU IA, IB and II, are exposed mainly in the hinge of the trough in the northwest.

MCU IA has a maximum thickness of c. 1300 m and thins rapidly towards the fold limbs to the south and east. It consists predominantly of leuconorite and anorthosite of zone a (pC, piC and phC).

Much of **MCU 1B** shows the same sequence, but in addition it is the lowest stratigraphic unit that carries apatite, ilmenite and magnetite (phimacC) of zone e. The unit is rather thin and it wedges out from a thickness of c. 875 m in the north to less than 100 m in the south, before pinching out towards the southern limb.

MCU II consists of (leuco-) norites containing a thin layer of magnetite-bearing piC (pimC – zone a) at the base, overlain by hypersthene-ilmenite-bearing zone c phiC that forms most of this cycle. MCU II reaches a thickness of 1300 m in the hinge and continues towards the southern and northern limbs with a fairly consistent thickness of c. 700-800 m. This forms the lowest unit in most of the BSL.

MCU III has, in places, a thin zone consisting mainly of pC, but with interlayered iC, phiC, and hiC at the base (Zone IIIa), overlain by leucotroctolite that contains cumulus magnetite in addition to plagioclase, olivine and ilmenite. The leuco-troctolite is in turn overlain by phiC (in places with an intervening thin piC), followed by magnetite norite and gabbronorite with the successive (re-) entry of cumulus magnetite and then apatite together with Ca-rich pyroxene (zone e). Zone e is not present in the hinge but occurs along c. 3 km of the northern limb and c. 6 km of the southern limb. MCU III has a maximum thickness of 1,300 m but thins out towards both limbs. In the southern limb it tapers to c. 400 m width, consisting predominantly of zone d. In the northern limb it slowly pinches out eastwards and seems to be absent (or indistinguishable from MCU II rocks) east of Teksevatnet.

MCU IV repeats the same sequence as in MCU III but contains, additionally, more-evolved cumulates in the top part (zone f), while the magnetite-ilmenite apatite-bearing gabbronorite of zone e is significantly thicker than in any of the other units. It is the only megacycle unit that includes the complete sequence from zone a to f. The whole unit has a maximum thickness of c. 1,800 m in the hinge and southern limb, and c. 1000 m in the northern/eastern limb.

MCU IV grades into overlying mangerite through a jotunitic Transition Zone (**TZ**) whose base is defined by the entry of Fe-rich olivine, which more or less coincides with the appearance of interstitial alkali feldspar.

4.3.3 Mineral Potential of the Bjerkreim Area

A comprehensive assessment of the Bjerkreim lobe's mineral potential was reported by Schiellerup et al. (2001). The material presented here is, to a large extent, based on this report and the NGU report on mineral chemistry by Meyer et al. (2002). The results of these investigations are mainly derived from detailed mapping and chemical analyses of 148 grab samples of the mineralised zones. The data for 91 samples are available for review (Schiellerup et al., 2001).

NGU presented the BSL as an important resource for apatite (Boyd et al., 2012), and described it as "a group of occurrences of ilmenite and vanadium-bearing magnetite in the Bjerkreim-Sokndal intrusion constitute together a resource of world class" (Boyd et al., 2012).

Apatite, ilmenite and magnetite cumulates constitute 30% to 35%, and in some samples up to 40% of the rock in some of the zones in the BSL (Schiellerup et al, 2001). An exploration programme must be designed to evaluate which part of the magmatic stratigraphy has the highest economic potential. Important factors in this are not only the quantities, but also the compositions of the different minerals which can have a large influence on their value:

- **Apatite**, a calcium phosphate mineral, can contain significant levels of U, Cd, Th and other toxic trace elements, which reduce the value of the mineral as a source of phosphate;
- **Ilmenite** commonly contains impurities, of which magnesium (in form of MgO) is the most common. The MgO content of the ilmenite is an important factor that determines its value, with ilmenite quality increasing with decreasing MgO contents;
- **Vanadium**, the third commodity of interest in the intrusion, occurs as vanadium oxide (V_2O_5) in magnetite. Therefore, both the modal fraction of magnetite in the rocks and the concentration of vanadium in this magnetite are factors that determine its value.

At the time of the NGU project in the early 2000s, the apatite-rich layers were considered the part of the intrusion that had the highest economic potential, especially because these layers also tend to be rich in ilmenite and vanadium-bearing magnetite. Presently, with commodity prices changing, and the expectation that vanadium could become an important commodity soon, the focus of the exploration may change and other less-explored parts of the BSL could be of interest. This part of the report, however, describes the findings of the work carried out by NGU and partners.

4.3.4 Cumulates in an Evolving Magma – the Key to Exploration

Exploration of the BSL requires a thorough understanding of the geological processes that formed the mineral deposits, and its petrological evolution is key to understanding the distribution of the different minerals.

The modal composition and mineral chemistry of the layered intrusion is controlled by the fractionating, crystallising magma. The constantly changing composition of the magma determines which minerals crystallise as cumulates as well as their quantities and composition. There are **four important aspects** of the evolving crystallising magma that determine the occurrence and composition of apatite and the oxides in the BSL intrusion. It is, therefore essential to understand these processes in order to understand which parts of the stratigraphy have the highest economic potential.

1. ***Apatite occurs rather late in the fractionation process and is stratigraphically constrained to the e- and f-zones of the megacycles***, i.e., the upper parts. In these zones, apatite coexists with plagioclase, Ca-poor and Ca-rich pyroxene, ilmenite and magnetite. **The transition zone** (TZ), overlying the layered series, **may also contain abundant apatite as well as magnetite and ilmenite**. In the mangerites and quartz mangerites in the centre of the complex, apatite is found only as an accessory. In the evolving magma, apatite is most abundant during the initial stages of apatite crystallisation, i.e. in the basal portions of the e-zones;

2. ***The quality/value of ilmenite increases with a decreasing Mg content***. In the Bjerkreim intrusions the composition of ilmenite, and most notably its Mg-content, is controlled primarily by the evolving composition of the crystallizing magmas. ***As the magma evolves, the Mg content of the melt will progressively decrease. Low-Mg ilmenite is therefore most likely to be found in the more evolved, stratigraphically higher zones of the megacycle units, i.e. predominantly in the e-and f zones***. All apatite-bearing units are thus likely to carry ilmenite with relatively low MgO concentrations;

3. In a similar way, the vanadium content of magnetite evolves with the crystallising magma. Vanadium is strongly partitioned into magnetite and ***the vanadium concentration in an evolving magma will tend to increase up to the point where magnetite starts to crystallise and vanadium will subsequently decrease rapidly as it is extracted from the magma. The most vanadium-rich magnetites are therefore expected to form at the base of the b- and d-zones where magnetite first appears***. High-V magnetite in combination with apatite and ilmenite, is therefore most likely to be found in the stratigraphically lowermost part of the e-zones. Favourable scenarios may develop where the underlying d-zone is relatively thin, such as for MCU IVe on the northern flank of the Bjerkreim-lobe, or in the actual absence of b- and d-zones, such as for MCU IBe.

4. ***The P_2O_5 (in apatite) content of the Bjerkreim-Sokndal cumulates displays a positive correlation with Mg, Ti and Fe (the oxides), and a negative correlation with Na (in plagioclase).*** This correlation shows that apatite is more abundant in dark (mafic) layers than in light coloured layers. These are also the most interesting in terms of oxide-contents.

In summary:

Apatite concentrations fall from their first occurrence within a cycle, i.e., they are highest where they occur first, in the bottom of zone e. Furthermore, on a smaller scale, apatite is most abundant in the mafic, oxide rich layers. The quality of the ilmenite improves with falling MgO content towards the higher parts of a megacycle and is best in the e and f zones. The vanadium concentration in magnetite decreases after the first appearance and is best in the lower part of the cycle. Therefore, the magnetite quality in the e and f zones should be best where the lower zones with magnetite are absent, assuming that the magnetite did not crystallise previously. Because the e and f zones are missing in MCU IA and MCU II, these megacycles were not regarded to be of economic interest. The e and f zones of megacycles MCU 1B, MCU III and MCU IV contain the best options for finding high concentrations of apatite together with ilmenite and magnetite of good quality. Concentrations of apatite and oxides are highest in the lower parts of the e-zones.

4.4 EXPLORATION

Geological investigations in the Rogaland anorthosite province have been predominantly of a scientific character. There is little evidence of systematic commercial exploration work by the mineral industry in the public records. Most of the exploration work has been carried out by NGU in cooperation with various universities, to a minor extent in cooperation with industry.

Paul Michot was one of the first to start work in the region, producing the first geological maps and unraveling the petrological evolution of the Rogaland intrusions. This resulted in the first version of the framework of the megacyclic units in the Bjerkreim-Sokndal layered intrusion (Michot 1960, 1965), which forms the basis for the modern exploration. From the 1980s, scientific investigations were intensified, involving universities of Århus (Denmark), Bergen (Norway) and Liège (Belgium). In the late 1990s and early 2000s, the geological survey of Norway ("NGU") became involved. This work resulted in the refinement of Michot's version of the magmatic stratigraphy (Wilson et al. 1996).

In the 1990s, Titania A/S, the owners/operators of the Tellness mine some 20 km south of the Bjerkreim area, became interested in finding a higher quality ilmenite to mix with the high-Mg ilmenite that is produced at Tellnes. They supported a NGU/university project investigating the ilmenite occurrences in the region. From 2001, Norsk Hydro Agri supported a similar NGU/university project with the main focus on apatite resources. The work carried out by this group of researchers, published in 2001-2003, attempted to quantify the occurrence of apatite, ilmenite and vanadium-magnetite and locate exploitable resources of these minerals. A programme of mapping and sampling to both the whole rock chemistry and mineral chemistry of the mineralised parts of the intrusion was undertaken to meet this aim (Korneliussen et al., 2001, Schiellerup et al., 2001, Meyer et al., 2002). Preliminary estimates for mineral resources were also produced, based on this work (Boyd et al., 2012a, 2012b, Ihlen et al., 2014).

4.4.1 Sampling strategy

The definition of areas with mineral potential by NGU in cooperation with university researchers and industry was based on field observations and on the chemical analyses of collected grab samples. 149 samples were collected along profiles through the e-zones of the three megacycle units MCU IB, III and IV and analysed for major and trace elements (Korneliussen et al. 2001, Schiellerup et al., 2001). Thin sections of a large selection of these samples were also analysed by electron microprobe to determine mineral chemistry (Meyer et al., 2002). This work focussed mainly on the composition of ilmenite, in which MgO is an unwanted phase, and on the vanadium concentration in magnetite. Vanadium grades are expressed as V_2O_3.

An attempt was made to sample pairs of mafic (dark, oxide-rich) and felsic (light, oxide-poor) layers adjacent to each other so that an average composition was attained, and that mineralisation in the different rock types in an outcrop could be compared. In outcrops where this was not possible, it was attempted to sample 'average' layers, in other words, layers that visually seemed most representative of the local sampling point. NGU also attempted to maintain a uniform spacing between individual samples of 10-15 m. However, this strategy was only practical along lakeshores and road cuts. The spacing between samples is irregular in areas covered by Quaternary sediments and/or dense vegetation.

Normative concentrations of the three minerals of interest were calculated from their oxide concentrations in whole rock analyses. Apatite, ilmenite and magnetite are calculated from the concentrations of P_2O_5, TiO_2 and Fe_2O_3 respectively. MgO and V_2O_3 are reported as concentrations in respectively ilmenite and magnetite. Average compositions reported here are mainly from Ihlen et al. (2014) and Schiellerup et al. (internet presentation). Mineral chemistry data of selected samples is presented by Meyer et al. (2002).

4.5 MINERALISATION

The Bjerkreim lobe of the BSL is described by the NGU as a significant resource for apatite, ilmenite and vanadium-bearing magnetite, and their work aimed to investigate the economic potential of the various parts of the intrusion. **The e and f zones of several megacycles where ilmenite and magnetite occur together with apatite, were of the greatest interest and exploration activity focussed on these zones.** Based on the chemistry of samples from these sequences, NGU **defined three zones that have mineral potential, confusingly named Zone A, Zone B and Zone C (**Figure 4-11**),** not to be confused with zones a to f of the megacycle units. **These are the parts of the magmatic sequences that generally contain between 30 and 35% of the three target minerals.** The three zones A, B and C correspond to parts of the e-zones in respectively MCU IB, MCU III and MCU IV (Figure 4-9, Figure 4-11). These zones are in general some tens of meters to well over 100 meters wide. They include most of zone MCU IBe (= Zone A), segments of the base of MCU IIIe (=Zone B), and the lower c.100 m of zone MCU IVe in the northern flank of the fold (= Zone C). In some of the early reports the whole e-zones were defined as mineralised zones of economic interest.

Several publications and reports have presented results of evaluations of the potential of the rocks in the Bjerkreim Lobe. These include Korneliussen et al. (2001), Schiellerup et al. (2001) and Meyer et al. (2002) whose data have been compiled and interpreted by (amongst others) Ihlen et al. (2014), Duchesne and Korneliussen (2003), and an excellent synopsis in an NGU internet presentation by Schiellerup et al. (no date). Although the describe similar results, based largely on the same dataset, there is a degree of inconsistency between the interpretation of the data. Presumably, inconsistencies between the extents and grades of the mineralised zones presented in the various reports could be a result of differences in the method of calculation of averages, and the choice of which part of a profile was included for the calculation.

The rocks of the layered intrusion are generally poorly exposed, but with locally excellent exposures of longer sections through the magmatic stratigraphic sequence, especially at lakeshores. The evaluation of the potential of the area is based on surface samples of these exposures, and on the inferred continuity between exposures, based on regional geological mapping. Sample locations of the work by the group led by Schiellerup are shown in Figure 4-9.

Profile plots of the chemical data (both whole rock chemistry and mineral chemistry) are presented in Appendix A. An example of this is shown for mineralised Zone A (Figure 4-13 and Figure 4-14).

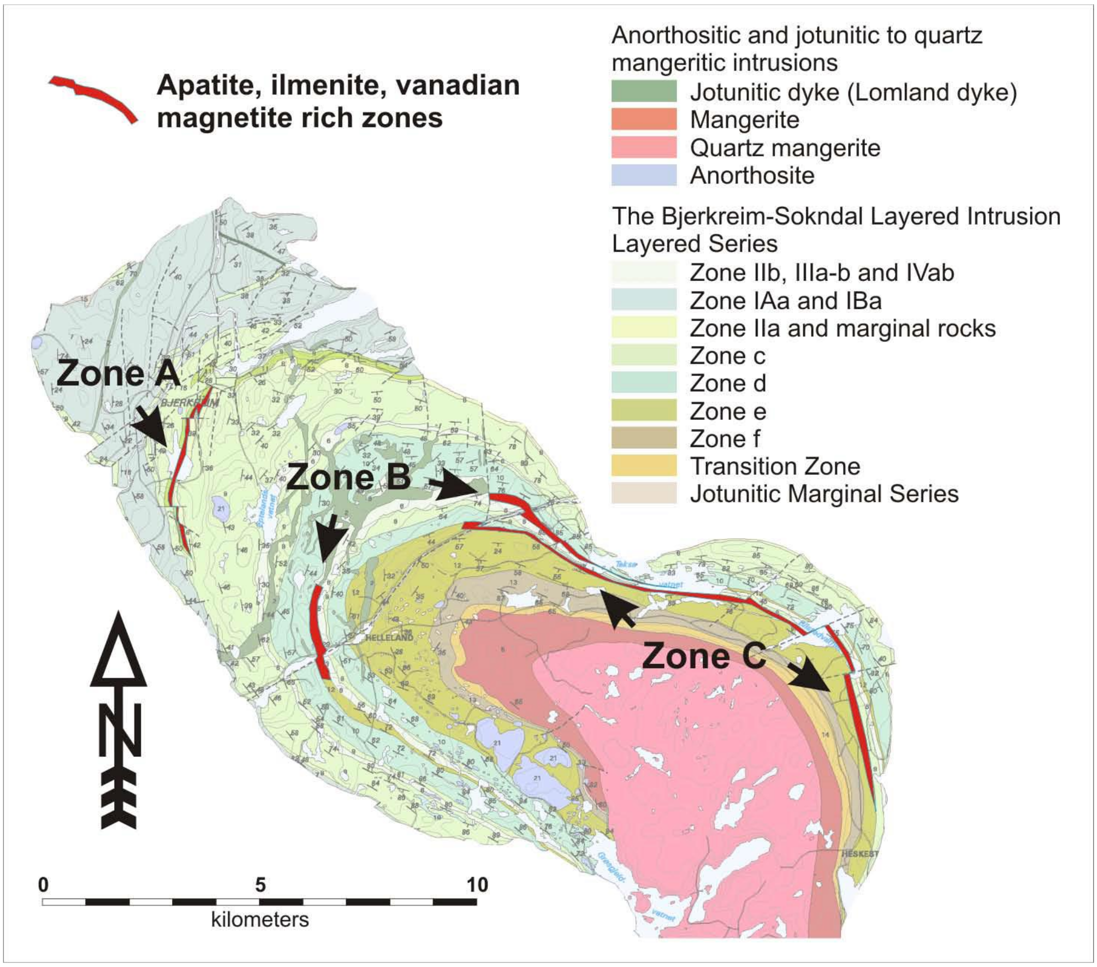


Figure 4-11 Geological map of the Bjerkreim lobe of the BS Layered Intrusion

The three mineralised cumulate zones, enriched in apatite, ilmenite and vanadium-magnetite are highlighted in red. From Ihlen et al. (2014).

4.5.1 Comment on the Expression of Vanadium Grades

It should be noted that the vanadium grades of the rocks can be (and are) expressed in several different ways. They can be expressed as percentages of V, V_2O_3 or V_2O_5. Furthermore, they can be reported as concentrations in whole rock analyses or as concentrations within magnetite, this being the principal mineral in which it occurs.

In the mineral industry, quoting vanadium grades as the whole rock concentration of V_2O_5 is the most common approach. V percentages (i.e. the element, instead of the oxide) are rarely used. ***The grades used by NGU, which is the format used in this report, is V_2O_3 in magnetite***.

To re-calculate these V_2O_3 concentrations in magnetite to the more commonly used V_2O_5 whole rock concentration, the following calculations are used:

- From V_2O_3 to V_2O_5: multiply by 1.2;
- From mineral concertation to whole rock concentration: multiply the V_2O_5 concentration in magnetite by the concentration of magnetite in the rock.

Therefore, a concentration of up to c. 1% V_2O_3 in magnetite as reported by NGU gives a grade of 1.2% V_2O_5. This then must be multiplied by the concentration of the magnetite in the rock, e.g. 10%, which results in a whole rock grade of c. 0.12% V_2O_5.

4.5.2 Zone MCU IBe – Zone A

Results from this lowest e-zone in the stratigraphy in the west of the area are based on two profiles, south of Bjerkreim and at Åsen farm (Figure 4-9, Figure 4-12), of which the latter is the best exposed. Mineralised Zone A is included in Teøk A/S licence Bjerkreim 1 (Figure 4-7).

Zone MCU IBe is about 4 km long and 20-90 m wide but only a 3 km long stretch is reported as being of economic interest, consisting of layered gabbro-norites containing abundant oxides beside the apatite (Figure 4-15). In several locations, the oxides are absent from the stratigraphic top and bottom of the e-zone. Therefore, the economic part of the zone varies in thickness from 45-50 m in the central part to about 15-20 m in the northern and southern ends. An 800 m long stretch of the zone is covered by lake Berse, and it is not obvious whether this segment is included in the reported lengths of the mineralised zone.

The zone averages about 8.3% apatite (3.3% P_2O_5), 15.2% ilmenite (7.6% TiO_2, 1.7% MgO) and 10.2% magnetite (containing 0.92% V_2O_3).

Figure 4-13 shows plots of the XRF data from the two profiles in this zone, and Figure 4-14 shows the mineral chemistry data.

Figure 4-12 Location of the sampled profile (central section) at Åsen farm, zone MCU IBe / Zone A (SRK ES, 2018)

Looking north. Note that the outcrops are heavily overgrown since the sampling in c. 2000 (compare with Figure 3 in Schiellerup et al., 2001).

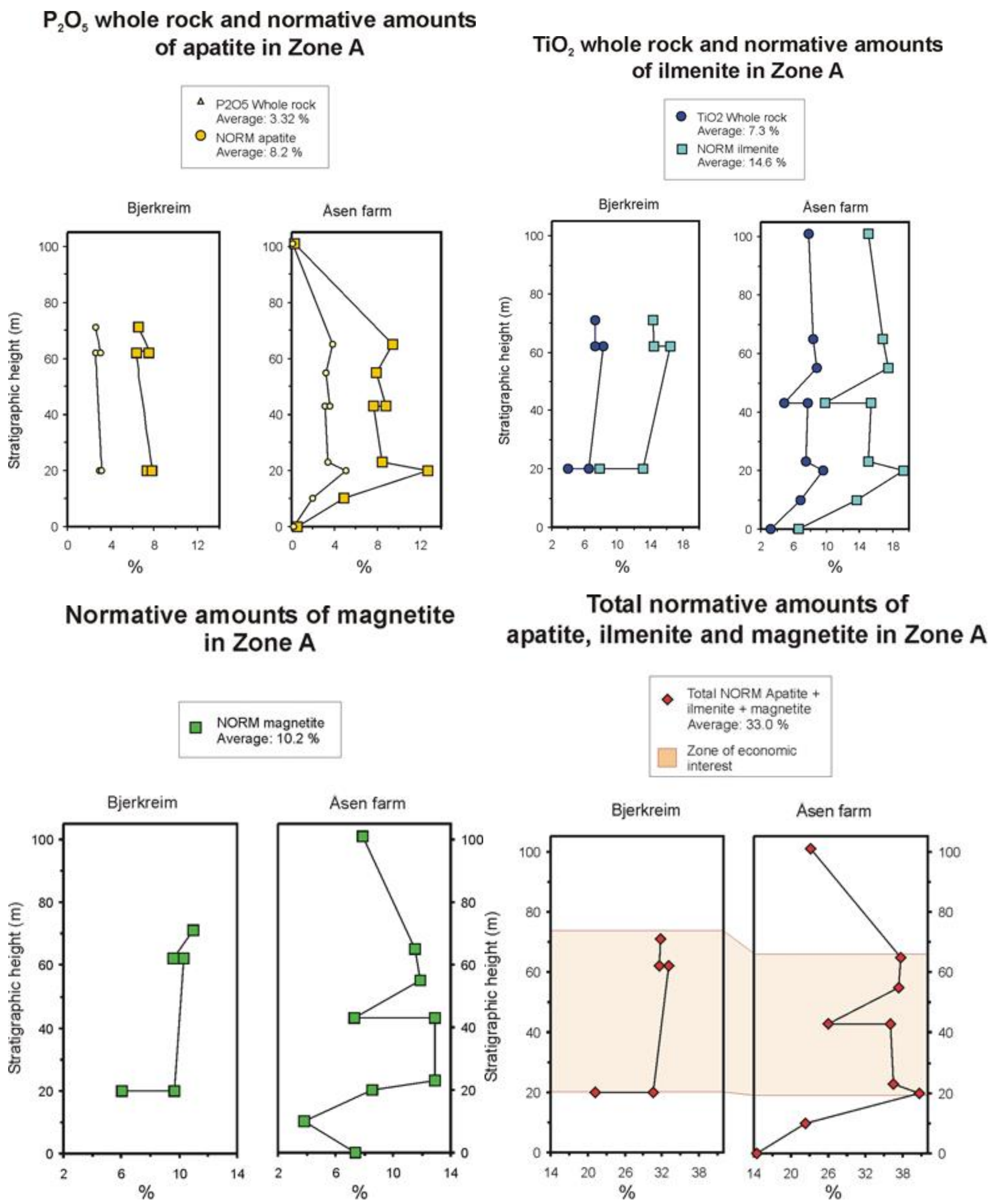


Figure 4-13 Whole rock chemical data of the two profiles in zone MCU IBe / zone A

The pale red zone indicates the mineralised part (Zone A) of the stratigraphic zone e. From Schiellerup et al. (internet presentation).

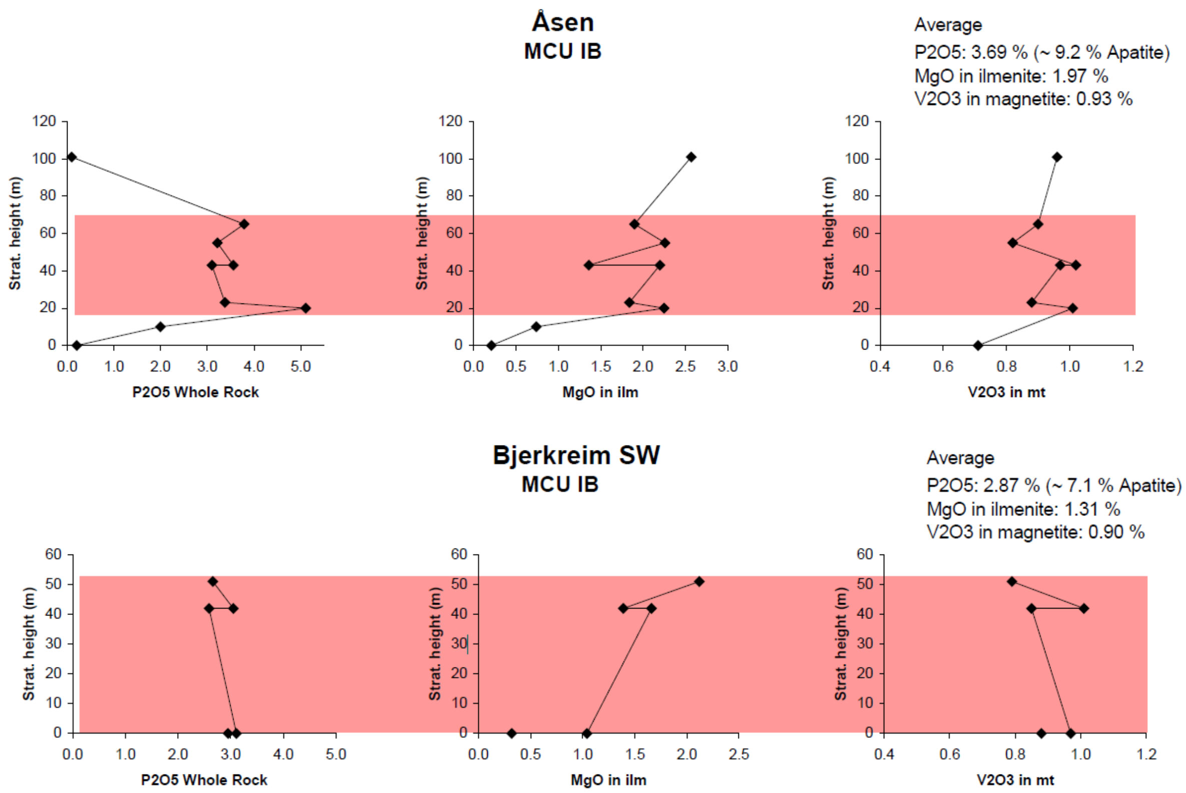


Figure 4-14 XRF whole rock P_2O_5 analyses and electron probe microanalyses of MgO in ilmenite and V_2O_3 in magnetite

Samples from the two profiles in zone MCU IBe. The red bands show the extent of the mineralised cumulate zone A within the section. From Meyer et al. (2002).

Figure 4-15 Layering in gabbro-norite at Åsen farm, mainly defined by variation of oxide phases. Top up and to the right (SRK ES, 2018)

4.5.3 Zone MCU IIIe – Zone B

Zone B consists of two isolated parts. The southern part lies south of the fold core. Its lateral extent is poorly documented but is reported to be no more than 1,500 m long, although the extent of the zone as shown on geological maps (Figure 4-11) is well over 2 km long. This zone lies totally within exploration licence Bjerkreim 2. The profile at Helleland is well documented. The mineralised part of the zone is 116-130 m wide and contains 8.3% apatite (3.4% P_2O_5), 13.4% ilmenite (6.7% TiO_2, 2.2% MgO) and 8% magnetite (0.97% V_2O_3).

The northern part of zone MCU IIIe / Zone B in the northern limb of the fold is best defined between the two profiles at Terland and at Teksevatnet West. The profile at Terland consists of only six samples, of which one lies outside the mineralised zone. The profile at Teksevatnet shows that mafic layers are enriched in apatite relative to felsic layers. Grades and width decrease from Terland to the east. The distance between the two profiles is 2.35 km, but the lateral extent of the mineralised zone is reported to be poorly defined and estimated at 1,000-2,000 m, and the width varies from 90 to 120 m. Average grades are 7.8% apatite (c. 3.2 % P_2O_5), 11.4 % ilmenite (c. 5.7% TiO_2, 2,0% MgO) and 6.9 % magnetite (0,97 % V_2O_3). Isolated samples further east indicate that the mineralised zone IIIe continues with similar grades, but as a very thin layer. Recently acquired aeromagnetic data indicate that a well mineralised cumulate sequence southeast of Bilstadvatnet could be part of the eastern extension of Mineralised Zone B instead of Zone C (see Section 4.6). This would increase the lateral extent of zone B significantly, although not necessarily with a consistent thickness.

Figure 4-16 Road section along Highway E39 at Helleland in MCU IIIe. Stratigraphic up is to the right (photo: A. Korneliussen, NGU)

4.5.4 Zone MCU IVe – Zone C

Zone MCU IVe/Zone C is the most extensive mineralised sequence of the BSL Bjerkreim lobe. Furthermore, zone f and the transition zone also contain the characteristic assemblage apatite-ilmenite-magnetite, but at a lower grade. Most of the exploration focussed on the northern limb of the zone, while, for reasons that are unclear, the southern limb remains underexplored. The southern-most part of zone IVe is intruded by three kilometre-sized anorthosite bodies.

Based on their chemical data, Schiellerup et al., (2001) found only a c. 100 m section near the base of zone MCU IVe in the northern fold limb to be of economic interest according to the apatite content of the rocks and the combined contents of the three economic minerals between 30 and 35%. This zone was later defined as Zone C which is 30-90 m wide – possibly up to 100 m at Terland – and can be recognised laterally over a distance of more than 10 km. All of Zone C lies within exploration licences Bjerkreim 3, 4 and 5. Average compositions of the zone as published by Ihlen et al. (2014) are 10.2% apatite (4.1% P_2O_5), 13.4% ilmenite (12.4% TiO_2, MgO between 1.0% and 1.8%) and 7.3% magnetite (V_2O_3 between 0.84% and 0.98%) (mineral chemistry data from three profiles from Meyer et al., 2002).

Judging from the plotted data in Appendix A, the zone appears to be present but its extent is poorly defined (as mentioned by Schiellerup et al., 2001), partly because it runs through the two large lakes of Teksevatnet and Bilstadvatnet. Most of the profiles through the zone are either too short, or the sample points too wide-spread to define the boundaries. The definition of the zone is based on four profiles at Terland, Lauvneset/Teksevatnet, Bilstadvatnet north bank and Bilstadvatnet/Storeneset. Although the apatite content appears to drop above the Zone C to about 3%, TiO_2 concentration does not to drop significantly and the Lauvneset profile shows that the MgO contents drops from 1-1.5% to around 0.5%, implying an upwards improvement in ilmenite purity, which is in accord with the magmatic processes. Magnetite concentration and V_2O_3 concentration in magnetite drop only marginally above Zone C.

It should be noted that the profile at Storeneset could be part of zone B instead, and that Zone A continues here in the poorly exposed area south of Lake Bilstadvatnet (see Section 4.6).

Figure 4-17 Apatite and oxide-rich layered sequence of the MCU IVe zone at Lauvneset-Bilstadvatnet

From NGU internet presentation (Schiellerup et al. no date).

4.5.5 Drilling in the Eastern Bjerkreim Area

Two 30 m deep exploration drillholes were sunk by NGU in what was expected to be the mineralised Zone C at the base of MCU IVe in the eastern part of the area, south of Bilstadvatnet (Figure 4-18). These aimed to test the southern continuation of Zone C, and to test the continuity of the mineralisation within the zone across the layering. Because all other zones are sampled along profiles by surface grab samples commonly with 10-15 m intervals, this drilling provides the only evidence so far that the mineralisation is continuous as assumed in NGU publications. The NGU chemical data from the drill cores were sent to SRK ES by NMP without specification of analysis methods. These data appear not to be published in any NGU report, but the mineral chemistry data are included in an NGU presentation of the BSL.

The drillhole at Mjåsund (drilled towards 164° at a -50° angle) intersects only 10.2 m of the steeply east-dipping stratigraphy. The orientation of the drillhole is at only 11° to the strike of the layering. The hole at Ollestad was drilled towards 252° at a -10° angle which is virtually perpendicular to the layering. This hole intersected 29.5 m of the stratigraphy.

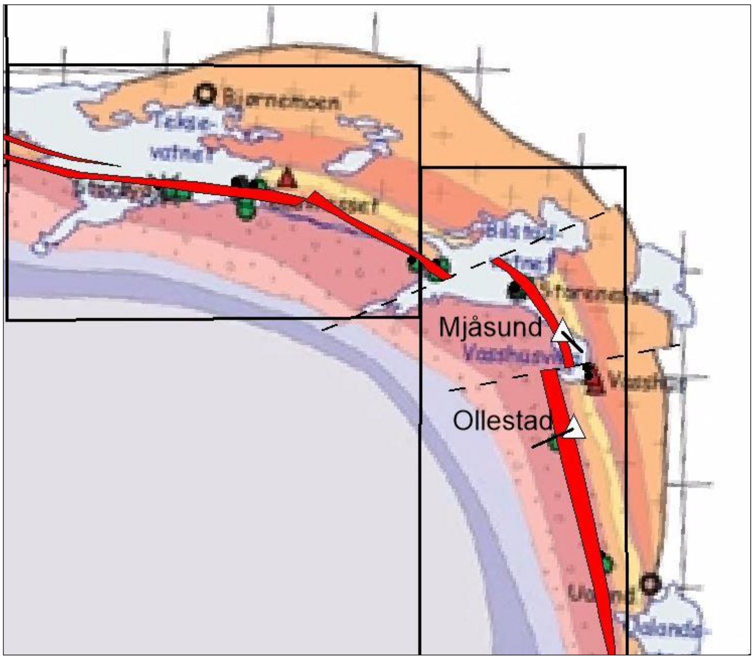


Figure 4-18 Drill hole locations in the eastern part of the area, indicated by white triangles

The drill holes are named after their locations at Mjåsund and Ollestad. The black lines indicate the orientations of the drill holes. The drilled target is mineralised Zone C, indicated by the red areas.

The drill core was analysed over 2 m intervals. In addition to whole-rock chemical analysis by XRF, ilmenite and magnetite mineral chemistry was determined. Table 4-2 and Table 4-3 show a selection of the data, and the whole dataset is included in Appendix B.

The Mjåsund drill core contains on average (whole rock analyses):

- 23.7% Fe_2O_3 (+3.0%/-3.6%);
- 6.75% TiO_2 (+0.7/-1.0%);
- 4.13% P_2O_5 (+0.7%/-1.0%); and
- 903 ppm V_2O_3 (+179/-186 ppm).

This is a variation of 14% in the Fe_2O_3 content, 13% in the TiO_2 content, 20% in P_2O_5 and 20% V_2O_3 over the length of the drill core (over 9 m of the stratigraphy).

For the Ollestad drill core the averages are (whole rock analyses):

- 17.3% Fe_2O_3 (+2.3%/-4.0%);
- 4.5% TiO_2 (+0.4/-1.3%);
- 3.6% P_2O_5 (+0.7%/-1.0%); and
- 578 ppm V_2O_3 (+110/-159 ppm).

This is a variation of 18% in the Fe_2O_3 content, 19% in the TiO_2 content, 24% in P_2O_5 and 23% V_2O_3 over 29.5 m of the stratigraphy.

Table 4-2 Whole rock chemistry of drill core – selected elements only

Mjåsund ID	Strat/m	Fe2O3 %	TiO2 %	P2O5 %	V2O3* mg/kg	Ollestad ID	Strat/m	Fe2O3 %	TiO2 %	P2O5 %	V2O3* mg/kg
MJÅ 2.5-4m	1.2	23.52	6.95	4.80	883	OLL 0-2m	1	19.66	4.94	3.30	688
MJÅ 4-6m	1.8	24.07	6.73	4.44	959	OLL 2-4m	3.0	18.26	4.59	3.44	602
MJÅ 6-8m	2.5	25.02	7.11	4.52	950	OLL 4-6m	5	17.88	4.37	3.13	566
MJÅ 8-10m	3.2	26.75	7.46	4.41	1083	OLL 6-8m	7.0	18.31	4.52	3.17	640
MJÅ 10-12m	3.9	25.74	7.14	4.43	965	OLL 8-10m	9	17.69	4.60	3.86	594
MJÅ 12-14m	4.6	25.54	7.33	4.49	983	OLL 10-12m	11.0	17.43	4.45	3.51	596
MJÅ 14-16m	5.3	23.61	6.82	4.01	886	OLL 12-14m	13	17.34	4.57	3.43	618
MJÅ 16-18m	6.0	22.09	5.96	3.21	843	OLL 14-16m	15.0	17.88	4.90	3.74	622
MJÅ 18-20m	6.7	24.27	6.44	3.74	921	OLL 16-18m	17	17.27	4.85	4.13	568
MJÅ 20-22m	7.4	25.17	6.45	3.87	994	OLL 18-20m	19.0	16.65	4.61	3.90	550
MJÅ 22.24m	8.1	20.77	5.73	3.15	764	OLL 20-22m	21	13.37	3.19	2.54	419
MJÅ 24-26m	8.8	20.10	6.58	3.53	716	OLL 22-24m	23.0	16.69	4.12	3.33	540
MJÅ 26-28m	9.5	22.54	6.96	4.59	864	OLL 24-26m	25	17.79	4.67	4.24	559
MJÅ 28-30m	10.2	22.07	6.87	4.56	836	OLL 26-28m	27.0	17.26	4.74	4.05	549
						OLL 28-30m	29	16.25	4.67	3.67	559

** V_2O_3 is re-calculated from V data in the original dataset. The complete dataset is in Appendix B*

Mineral chemistry analyses are shown in Table 4-3. The averages for the two drill holes are:

Mjåsund (average mineral chemistry)

- ilmenite 2.21% MgO (max 2.6%, min 1.7%).
- magnetite 0.88% V_2O_3 (max 0.99%, min 0.59%), but without the one sample at 0.59% the average is 0.94% V_2O_3.

Ollestad (average mineral chemistry)

- ilmenite 1.29% MgO (max 1.9%, min 0.7%)
- magnetite 0.91% V_2O_3 (max 0.97%, min 0.84%).

Table 4-3 Mineral chemistry data of drill core – selected elements

	Sample	Stratigraphic depth (m)	ILMENITE MgO %	ILMENITE TiO2 %	ILMENITE FeO %	MAGNETITE V2O3 %	MAGNETITE FeO %
Mjåsund	MJÅ 2.69	-0.91	2.57	51.76	44.92	0.92	85.91
	MJÅ 6.28	-2.14	1.98	49.96	46.33	0.59	86.13
	MJÅ 14.57	-4.95	1.67	49.92	46.29	0.90	86.94
	MJÅ 19.54	-6.64	2.42	50.50	44.57	0.92	84.65
	MJÅ 24.63	-8.37	2.00	49.43	46.41	0.99	87.00
	MJÅ 29.68	-10.09	2.59	49.95	44.88	0.98	87.64
Ollestad	OLL_1.9	-1.87	1.29	49.14	49.00	0.89	91.52
	OLL_5.85	-5.75	1.28	49.19	48.05	0.97	89.79
	OLL10.15	-9.98	1.29	48.49	48.10	0.89	89.93
	OLL_17.18	-16.89	0.70	49.31	49.00	0.92	90.38
	OLL_23.17	-22.78	1.92	49.83	48.74	0.84	91.65
	OLL29.73	-29.23	1.23	48.75	47.98	0.92	89.58

The complete dataset is in Appendix B

Comments on Drilling Data

Comparing the economic potential of the two drillhole sections, the Mjåsund drill hole has significantly higher TiO_2 and V_2O_3, but the quality of the ilmenites in Ollestad is significantly better in terms of MgO content.

The mineral compositions and grade variations in the drill core are similar to the variations between samples in the surface rock chip profiles. This provides some support to the assumption that the rock chip profiles have provided a reasonable indication of average compositions for the zones in each location sampled. However, it is important to note that the Mjåsund hole was drilled at a very shallow angle to the strike of stratigraphy, meaning that variations between layers may not be sufficiently represented. Ideally, holes should always be drilled as close to perpendicular to both strike and dip as possible. The fact that only two boreholes have been drilled and at questionable orientations but still gave reasonable results suggests that there is great scope for future drill programmes in this deposit.

Following a review of aeromagnetic data for the area (Section 4.6), it is SRK ES' opinion that the mineralised zone intersected by the Mjåsund drillhole is very likely the eastern continuation of zone MCU IIIe (mineralised Zone B) and not zone MCU IVe (mineralised Zone C) as assumed at the time the holes were drilled.

4.5.6 Summary of the Mineral Potential in the Bjerkreim Area

The three zones with economic potential, Zones A, B and C, lie within the e zones of megacycles MCU IB, III and IV respectively. Their stratigraphic thickness is measured in tens of metres (15-130m wide) and they stretch along strike for kilometres (2 to 10km). Table 4-4 shows a summary of the data. The occurrence of apatite together with ilmenite and vanadium-bearing magnetite in modal concentrations between 25% and 35% (in much of the area between 30% and 35%) defines the zones. Individual samples can have a combined content of the three economic minerals of up to 41%. MgO contents in Ilmenite generally lies between 1.0 and 1.5%. Vanadium in magnetite ranges between approximately 0.9 and 1.0% V_2O_3.

Table 4-4 Summary of mineralised zones

zone	MCU	Length meters	Width meters	apa %	ilm %	mag %	total %	V_2O_3 % in mag	MgO % in ilm
A	MCU Ibe	< 3000	40-50	8.3	15.2	10.6	34.1	0.90-0.93	1.3-2.0
B SW	MCU IIIe	1500	(116)130*	8.3	13.4	8	29.7	0.91	1.8
B NE	MCU IIIe	2700	90-120	7.8	11.4	6.9	26.1	0.94-0.99	1.4-2.5
C	MCU IVe	>10000	50-100	10.2	12.4	7.3	29.9**	0.84-0.98	1.0-1.8

Data from Schiellerup et al. (2001), Meyer et l. (2002) and Ihlen et al. (2014)

** 130 m reported by Schiellerup et al. (2001), 116 m by Meyer et al. (2002)*

*** Although the three minerals together add up to 29.9%, Ihlen et al. 2014 report a total of 32%*

The zone lengths reported here include km-size lakes, apart from zone B SW

Zone A in the western part of the Bjerkreim lobe is the smallest, 15 to 50 m wide and potentially up to 3 km long, but ilmenite and magnetite grades are some of the highest in the area, 15.2% and 10.6% respectively.

Zone B comprises a south-western and a north-eastern part. The southern part (Zone B-SW) is best defined at the road intersection at Helleland and can be traced in total over c. 1,500 m, although the lateral extents are poorly defined. The width is reported both as 116-130 m. On average, the three economic minerals combined make up about 29.7% of the rock. The north-eastern part (Zone B-NE) extends from Terland in the west to Teksevatnet in the east. Grades decreases eastwards as does the width from 120 m to 90 m. Average economic mineral content of the rock falls from 34% at Terland to 25.6% at Teksevatnet. MgO content in ilmenite is relatively high, up to 2.5% in Terland. Interpretation by SRK ES of aeromagnetic data suggest that zone could occur again 6 km further east at Bilstadvatnet.

Zone C is the most extensive, but also very poorly defined. It is recognised in the northern fold limb, while the southern fold limb appears underexplored (and extends outside the exploration licences considered by this report). The zone is recognised (but its limits not defined) over a distance of about 12 km, widest at Terland in the west (90 -100 m), decreasing eastwards to c. 30 m. The 170 m width reported by Ihlen et al. (2014) appears highly exaggerated or a typing mistake. Grades are lowest at Terland (25% combined apatite-ilmenite-magnetite), but due to limited exposure, it could be higher. The remainder of the zone has combined grades of economic minerals at 31-32%. MgO in ilmenite varies between 1.0% and 1.8%, and V_2O_3 in magnetite ranges from 0.84% to 0.98%. Grades of the three economic minerals do not drop very much stratigraphically above the mineralised zone as defined by NGU, implying a greater thickness, and further investigation in this direction (up the stratigraphy) would be worthwhile.

4.5.7 Tonnage and Grade Estimates by NGU

Several attempts have been made to quantify the amounts of the three economic minerals in the Bjerkreim area, and some estimates of tonnage, grade and in-situ values have been published by NGU (Korneliussen, 2012; Boyd et al., 2012a, 2012b; Ihlen et al., 2014). These are all based on the data from Korneliussen et al. (2001), Schiellerup et al. (2001) and Meyer et al. (2002) (including some older sample data), and the mineralised zones presented by them. The early reports state that the extents of the various mineralised zones are poorly defined, and as a result the size of the mineralised bodies changes significantly between reports.

Table 4-5 shows an estimate that was presented by Korneliussen (2012):

Table 4-5 Dimensions of mineralised zones in the Bjerkreim area (Korneliussen, 2012)

				Dimensions (distances in metre)				Mineral composition**	
Deposit	Zone	Unit	Length	Width*	Area	Depth	Mt	MgO% in ilm	V_2O_3% in mag
Åsen	A	MCU IB	2000	50	100 000	100	29	2.0 %	0.9 %
Helleland	B SW	MCU III	2000	130	260 000	100	75	2.1 %	1.0 %
Terland	B NE	MCU III	4000	120	480 000	100	139	2.5 %	0.9 %
Lauvneset	C		12000	90	1 080 000	100	313	1.5 %	0.8 %
				Sum:	1 920 000	m²	557	million metric tons	

** The width presented here is that at the named section (deposit column);*

*** Mineral compositions represent the named sections, not the whole length of the zone. These two columns are reversed in the publication, i.e. they have the wrong headings there.*

The resource estimates are based on the following assumptions, which are of key importance in understanding how robust (or otherwise) the estimates by NGU are:

1. The grab samples that form the basis of the grade calculations are assumed to be representative for the whole mineralised zone. Although there is little doubt that an attempt was made to collect a sample set that was as representative as possible, sample collection in this way is prone to misrepresenting average grades across a wide and variable geological unit. Furthermore, the low amount of exposure in some of the

sampled profiles hampers representative sampling. This said, analyses of cores from two drillholes that were sunk by NGU in the lowest part of MCU IVe (mineralised Zone C) in the eastern part of BSL give some indication of continuity of mineralisation across the layering. These data show that, over the short stretches of the stratigraphy that were sampled (29.5 m and 10.2 m respectively) the concentrations of the elements of interest (P, Ti and V) were fairly consistent with the average determined for the whole zone. This observation lends some support to the estimation method and the interpretations thereof;

2. Continuity of the grade is assumed over many kilometres between sample profiles but has not been confirmed. Between these profiles, there are observations of isolated outcrops that show similar rock types with approximately the same modal mineral composition, but chemical data to confirm the continuity are generally lacking;
3. The width of each of the mineralised zones is generally defined from only one or two profiles through each zone, with isolated observations in between. Not all profiles cover the whole mineralised zone (where the top and/or bottom are not observed). In the case of the Terland profile through Zone C, the spacing between samples/observations is so wide that the exact location of the top and bottom of the mineralised zone – and therefore its width – is poorly constrained. Similarly, the lateral extents of the mineralised zones are poorly defined. Finally, except for Zone B SW at Helleland, the zones run through lakes. In some publications, tonnage beneath these lakes is subtracted from the length of the zone, in others it is not;
4. A depth (down-dip) continuity of 100 m of the mineralised layers was assumed. However, because the mineralised zones are laterally continuous for many hundreds of metres, often several kilometres, it is quite possible that the layers show substantially more continuity than this;
5. Previous exploration has focussed on the apatite-ilmenite-magnetite enriched zones. Current economics may show that other zones could be of interest, and these are not reflected in NGU's estimates.

SRK ES considers that NGU's work provides a useful indication of the potential order of magnitude of mineralised zones and how these compare relative to each other. However, considering the broad assumptions used, their estimates must be treated with caution; they are not compliant to any international mineral resource reporting code and should not be presented as such. Despite this, SRK ES is of the opinion that the BSL has potential to host high-tonnage mineral deposits, and the possibility that these could be larger than NGU's estimates cannot be ruled out.

It is the opinion of SRK ES that this deposit as exposed in the licences is underexplored and needs to be evaluated to the standards now expected for mining projects..

4.5.8 Characterisation of Apatite and Oxide Grains

No extensive metallurgical studies have been carried out on the mineralised rocks of the BSL. However, in a short report by Gautneb (2003), the results of an SEM study of 35 samples of the MCU III and MCU IV of the whole BS intrusion are presented. Element maps were made of thin sections of the samples (e.g. Figure 4-19). These were then used to calculate the modal concentrations of apatite, ilmenite and magnetite, as well as their grain size distribution (Figure 4-20).

Apatite commonly forms the smallest grains. The average mode in the analysed samples is 5.7% (max. 12.8%). The D_{50} grain size (d-circle) is 523 μm in diameter.

Ilmenite has the highest modal concentrations of the three minerals, on average 14.2% (max 54.7%). The D_{50} grain size is 2,850 μm.

Magnetite has an average mode of 11.4% (max 52.0%) with a D_{50} grain size of 2,400 μm.

All three minerals usually occur as disseminations.

Due to the fact that the results from Gautneb (2003) include data from both the Bjerkreim and the Sokndal lobes of the intrusion, it is not totally representative for the Bjerkreim area (17 of the samples are from the Bjerkreim lobe, 16 from Sokndal and two from Mydland). Furthermore, most of the samples of the MCU IV are from the upper part of the e zone and the f zone, whereas the lower part of the MCU IVe zone has been recognised to have the larger potential.

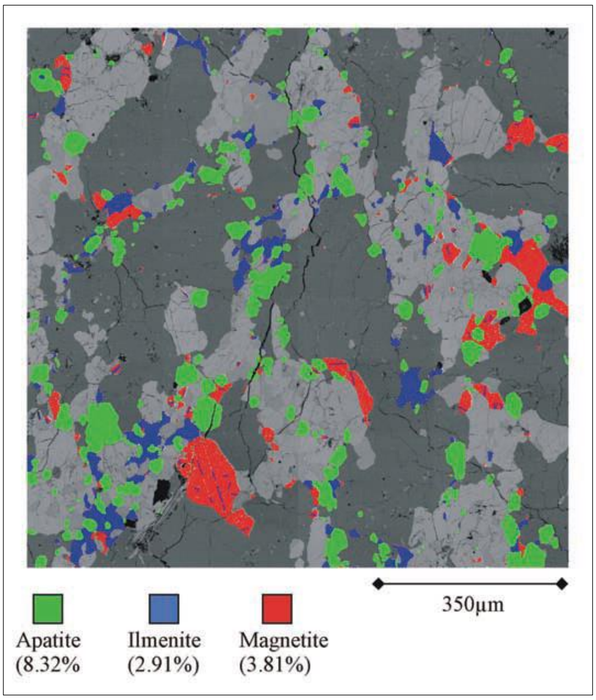


Figure 4-19 Example of coloured SEM backscatter image

Highlighted is the modal content of apatite, ilmenite and magnetite. Sample from zone MCU IVe near Orrestad, in the SW corner of licence Bjerkreim 3 (see Figure 4-1). From Gautneb (2003).

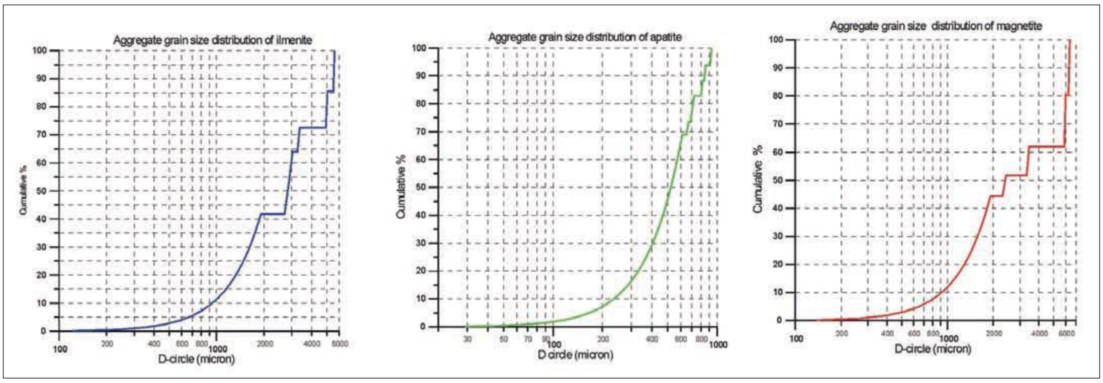


Figure 4-20 Grain size distribution for apatite, ilmenite and magnetite in 35 analysed samples from the BS Layered intrusion

Measured by SEM imaging and processing. D-circle is the diameter of a circle with the same area as the measured grain. From Gautneb (2003).

4.6 AEROMAGNETIC DATA

4.6.1 Introduction

NMP acquired a set of aeromagnetic data from NGU shortly before the writing of this report. These are part of a regional survey flown with 200 m line spacing along E-W lines. Further details of the survey are not known at the time of writing.

The primary use of the data in the context of this project is to investigate whether the magnetic data can add information about continuity of the mineralised zones or refine the current understanding. Figure 4-21 shows a map of the (total field) magnetic data overlain by the positions of the mineralised zones as delineated by previous work. The following observations can be made regarding the relationship between the surface geology and the anomalies.

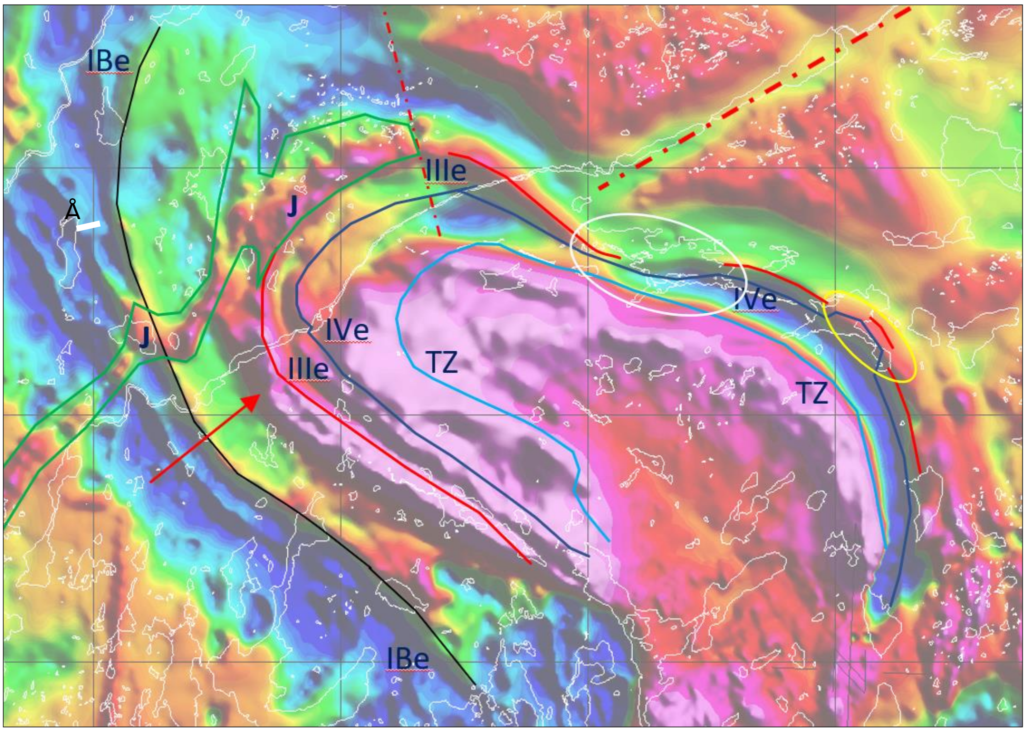


Figure 4-21 Total field aeromagnetic anomaly map of the Bjerkreim lobe of the BSL

The positions of different stratigraphic levels are indicated with coloured lines as explained in the text.

4.6.2 Preliminary Interpretations

The area outlined in **green**, marked with a J, highlights a late **jotunitic dyke**. The dyke is rather straight-walled in the anorthosites to the west, gets more irregular and wider where it hits the layered intrusion and gets very irregular in the hinge zone of the trough (compare with Figure 4-7). It truncates the MCU IIIe layer, both to the south and the east.

The **top of MCU IBe** is indicated by a **thin black line** and follows a narrow linear anomaly which can be traced for about 15 km to the southeast. The mineralised zone lies on the western side of the anomaly. This anomaly may either mark the top of the zone MCU IBe or the base of MCU IIa, and therefore does not necessarily show the continuation of the mineralised zone. The **short white line** crossing the anomaly at Å marks the location of the Åsen farm profile, where mineralised Zone A was defined. This is next to the strongest part of the anomaly and could suggest that the magnetite mineralisation does not continue with the same strength, or with the same width, as at Åsen farm. The profile is possibly not representative for the whole zone. These issues need to be investigated during exploration.

The base of the **MCU IIIe** layer, which is also the base of mineralised **Zone B**, is marked in **red**. The zone does not strictly follow a single anomaly but does coincide with several anomalies for shorter stretches of a few kilometres. In the fold hinge, the zone is truncated by the jotunitic dyke. From there southwards, the mineralised **Zone B-SW** stops at the red arrow. The magnetic anomaly clearly sidesteps here with a sinistral offset of about 200 m, and it would be reasonable to assume that the mineralised zone is also displaced by this offset, rather than being truncated. The mineralised zone could continue further southeast from here, possibly along the sharp linear anomaly that is observed.

On the north limb in the area of the white circle in Figure 4-21 (which is largely occupied by lake Teksevatnet), the magnetic anomaly that approximately traces **Zone B-NE** wedges out, or becomes very thin, only to appear again at the eastern side of the lake. The reasons for the disappearance of the magnetic anomaly are unclear. The cumulates of the zone may have been eroded away by later intruding higher zones or may never have been deposited due to topography of the floor of the magma chamber.

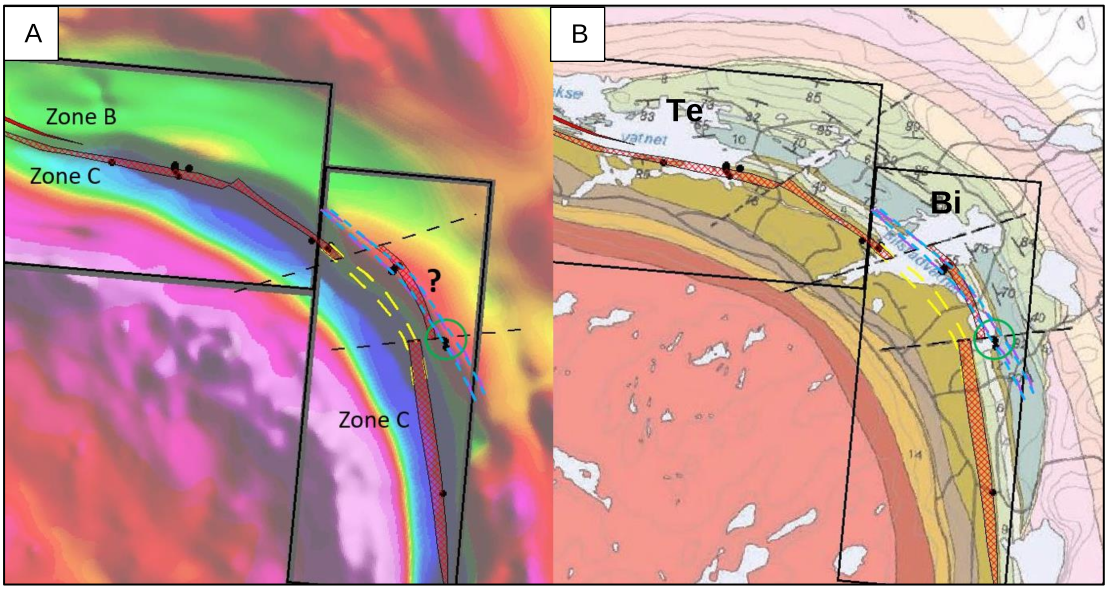


Figure 4-22 Comparison of the magnetic anomaly map (A) and geology map (B) in the Teksevatnet-Bilstadvatnet area.

The two maps show the mineralised zone C with a c. 400 m offset south of Bilstadvatnet between two faults, marked by the question mark. The magnetic anomaly map shows no sign of such an offset. The red, cross-hatched areas form mineralised Zone C as reported by NGU. The yellow dashed lines show the proposed continuation of Zone C. Blue dashed lines show the proposed continuation of Zone B, following a magnetic high. Mineralised samples in the green circle confirm the continuation of mineralisation there. Black dots are samples described by Schiellerup et al. (2001). ***Te*** *marks Lake Teksevatnet, Bi marks Lake Bilstadvatnet. Geology map from Marker et al. (2003). The maps represent approximately the area indicated with a yellow ellipse in Figure 4-21.*

In the area of the yellow ellipse in Figure 4-21, at the eastern continuation of zone Zone B-SE east of the lake Bilstadvatnet, the geological map shows a short (1.2 km) side-step of the cumulate sequence 400 m to the northeast, between two faults (Figure 4-22). This is also obvious in the trace of mineralised zone C in Figure 4-11. There is no indication of such a side-step in the magnetic data; it is proposed by SRK ES that the mineralised zone likely continues with no offset as shown in Figure 4-22. Three samples collected by Schiellerup et al (2001), indicated by the green circle in Figure 4-22, could suggest that the mineralised zone B continues here. In that case, the Mjåsund drill hole is drilled into Zone B and not in Zone C. On the other hand, during SRK ES' site visit, inconsistent (NE-trending) orientations of the layering were observed east of Bilstadvatnet, which suggest that local complexities exist in the layering.

These observations require further investigation.

Further towards the southeast, where the MCU III sequence in the geological map is very thin, and observations are probably scarce, the map boundaries of MCU IIIe no longer follow the top of the magnetic anomaly but lie on the steep gradient towards the deep magnetic low to the west.

The base of MCU IVe, marked by the **dark blue line**, lies in the linear magnetic low for most of the eastern and northern part of this geological contact. The mineralised layer **Zone C** therefore lies on the strong magnetic gradient.

In the hinge area, the base of MCU IVe does not clearly follow a single magnetic anomaly. It is also here that mineralised Zone C cannot be traced further west. It is therefore reasonable to assume that there is no western continuation. On the southern limb of the fold, there again appears to be a relationship between the base of MCU IVe and a magnetic lineament, but without a strong magnetic gradient.

The **light blue line** is the base of the **Transition Zone** that forms the transition to the overlying mangerites. On the northern and eastern limb of the trough, the transition zone follows the magnetic gradient. By contrast, in the hinge zone the mapped geological contact crosses the magnetic gradient and is not obviously parallel with any magnetic feature, until it starts running parallel with a small, linear magnetic high on the southern limb.

The shape of the very **large magnetic high** (pink colours in Figure 4-21) in the core of the trough follows the geological boundaries on the northern and eastern limb but crosses all geological boundaries to the west and south. It is therefore likely that this magnetic high is caused by a feature at depth and does not so much reflect surface geology. Therefore, it likely that the strong magnetic gradient on the north and east side of the trough are not linked with the mineralised zone C, but with this deeper geological feature.

North of the BSL, north of the white ellipse, a **major fault** is marked in the underlying gneisses. In the field, this fault is marked by a > 400 m high escarpment, and there could well be several hundreds of metres of displacement on this fault. However, the western continuation of the fault, where it enters the BSL, shows only minor offset of the layered sequence in the geological map, and no displacement at all in the anomaly marked by the red line. It is therefore assumed that the main displacement of this fault occurred before the intrusion of the layered sequences, with possibly some minor adjustments along it afterwards.

4.6.3 General Observations

The overall magnetic anomaly pattern fits well with the geological map, but at a local scale there are some inconsistencies. Further investigations of these could result in the possible extension of Zone B-SW further to the southwest. It must be remembered that the magnetic map predominantly reflects the distribution of magnetite in the rocks; because the mineralised zones are defined on the basis of the occurrence of magnetite together with ilmenite and apatite, one should not expect an exact correlation between magnetic anomalies and mineralised zones. Indeed, it is possible that other zones of the BSL that have not historically been recognised as being mineralised (on account of reduced amounts of apatite) contain more magnetite and therefore relate to stronger anomalies.

Notwithstanding this, the magnetic data is highly useful in understanding the geology of the BSL and identifying new exploration targets or extensions of known mineralised zones. Further processing and modelling of the magnetic data is required to separate near-surface effects from deeper anomalies. This will further improve the geological model for the area and may provide information on the deeper structure of the BSL and the down-dip continuity of mineralised zones that can be used for planning exploration such as drilling.

4.7 SUMMARY

The Bjerkreim-Sokndal layered intrusion is one of largest of its kind in the world. It shows modal layering in predominantly gabbro-noritic rocks defined by the occurrence of cumulate apatite, ilmenite, magnetite and pyroxenes in a matrix dominated by plagioclase. A magmatic stratigraphy that reflects the evolving-crystallising magma is repeated seven times and forms seven megacycle units. In general, the later, more evolved parts of the intrusion occur in the higher megacycle units, whereas the more primitive parts are most abundant in the lowest megacycles. The Company's exploration licences occur in the northern – and largest – of three lobes of the intrusion, the Bjerkreim lobe. The whole layered stratigraphy is about 7 km thick, and the lobe has the form of a syncline or trough, plunging c. 40° to the southeast, with sub-vertical northern and southern limbs. The trough shape is assumed to have formed during intrusion by gravity-induced sagging of the relatively heavy cumulate sequences.

Most of the exploration and scientific work that provides the current understanding of the BSL's mineral potential was carried out by the NGU in cooperation with researchers from universities in Aarhus (Denmark), Bergen (Norway) and Liége (Belgium), supported by industry. Their interpretations are mainly based on field observations and chemical analyses of surface grab samples of representative rocks along profiles through the sequences that are richest in magnetite and ilmenite, which also are the rocks with the highest apatite concentrations. The profiles are generally spaced several kilometres apart. Mineralised zones were defined by correlation between the profiles.

Apatite, ilmenite and vanadium-bearing magnetite are the three minerals of economic interest in the area. Apatite is a relatively pure fluor apatite, with low Cl and very low concentrations of U, Th Cd and rare earth elements. Ilmenite is generally inclusion-free and has MgO concentrations that range between about 1% and 1.5%. Magnetite has fairly consistent concentrations of ferro-vanadium between 0.9% and 1.0%.

Apatite occurs in the higher parts of a cycle in the e- and f-zones as a cumulate together with ilmenite and magnetite. These zones are not developed in all megacycles, but occur in MCU IB, MCU III and MCU IV. In the e- (and f-) zones. In the parts of the e-zones with the highest concentrations of these three minerals they form, on average, collectively 30% to 35% of the rock volume. These highly mineralised cumulate sequences form three zones, from west to east Zone A, Zone B and Zone C, that have the highest economic potential and are all covered by NMP's exploration licences. In general, based on current data, the northern limb of the trough appears to be more mineralised than the southern limb, but it but it is possible that this is reflects greater exploration coverage on the northern limb. Uncertainties in the extent of the mineralised zones, largely to due limited exposure of geology, have led to variable interpretations of their widths and lengths as reported in the different NGU reports.

- Zone A in the west is the smallest and occurs in the hinge zone of the synform/trough. It is up to about 50 m wide and about 3 km long, but is part-covered by a km-size lake. It has the highest concentration of ilmenite and magnetite;
- Zone B is split in two and occurs south and east of the hinge. In the hinge zone, it is truncated by a late jotunitic intrusion. The southwestern part, Zone B-SW, is defined in one profile and interpreted to be up to c. 120 m wide and c. 1,500 m long. It may well extend further southeast than shown in current data, beyond a faulted offset shown in magnetic data.

The northern part of zone B is poorly defined because of lacking exposure, and has the lowest combined concentration of the three economic minerals. It is c. 100 m wide in the west and slowly wedges out to the east, with a lateral extent of c. 2,700 m. A 93 m thick sequence of mineralised rocks with on average c. 32% combined target minerals at Storaneset on the southeastern end of Bilstadvatnet is re-interpreted as part of Zone B-NE, based on aeromagnetic data. This greatly adds to the mineral potential of Zone B.

- Zone C is the highest in the stratigraphy and occurs exclusively in the northern and eastern part of the intrusion. The extents of this zone are poorly defined because of poor exposure. In the main defining profile at Terland, the distance between exposures is so large that the bottom and top of the mineralised sequence are poorly constrained. Other parallel sampling profiles are generally too short to cross both bottom and top of the mineralised zone. Notwithstanding the difficulty of defining its extents, this is the largest of the three mineralised cumulate zones. It can be traced for about 12 km but is overlain by two km-sized lakes. Over much of its length, the width of this zone is up to 100 m and the combined three economic minerals form on average c. 30% of the rock volume. All three economic minerals still occur above the delineated zone, but in lower concentrations. The quality of ilmenite improves upwards in the stratigraphy, while vanadium grades in magnetite seem to decrease slowly.

The definition of the mineralised zones by the NGU was to a large extent based on the appearance of apatite in the sequence, in association with the two oxide minerals. The focus on apatite was partly because the work was financed by agricultural organisations who had interest in the phosphate-bearing apatite as a source of fertiliser. Although these zones are still likely to have the highest economic potential, SRK ES considers it likely that other areas that may have high concentrates of ilmenite and vanadium-bearing magnetite are poorly understood from an economic perspective. There are also indications that mineralised zones, as defined, could be more extensive than shown by previous work, and new potential may exist in the under-explored southern limb of the BSL.

4.8 RECOMMENDATIONS

The BSL has significant mineral potential; preliminary indications of grade and tonnage in defined mineralised zones have been provided by previous research, but significant work is required to develop the project towards a Mineral Resource Estimate ("MRE") in accordance with international reporting codes. SRK ES considers that the project's potential is such that this work would be worthwhile. Previous estimates of tonnage and grade published by the NGU are not considered valid and would not stand up to scrutiny in terms of code-compliant reporting of Mineral Resources.

A new exploration programme should focus first on better definition of the known mineralised zones, confirm the continuity of mineralisation within the zones both across the layering and laterally. In parallel to this, reconnaissance work can be undertaken to assess new areas of mineralisation in less explored parts of the licences. This requires both desktop and fieldwork. The key to exploration targeting will be an understanding how the cumulate sequences evolved and how the BSL has been modified through deformation.

SRK ES provides the following recommendations of the next stages of exploration. The overarching objective of this work will be to generate drilling targets for which, if successful, Mineral Resource Estimates can be produced.

4.8.1 Geophysical Data Processing and Modelling

SRK ES' preliminary interpretations of the magnetic data suggest that it does have potential for use in exploration targeting and refining the geological model. Further processing and interpretation is recommended to define the lateral extent of known mineralised zones and to improve the understanding of geology at depth. Gravity data should be incorporated in the geophysical investigation of the area.

It should be remembered that the magnetic data available has been acquired on a regional scale and not in a way that was tailored to the BSL. The data is therefore unlikely to reveal the finer detail. If it is found that magnetic data has an important role to play in exploration, new and higher resolution surveys may be recommended. This can be either a helicopter borne survey, covering a larger area, or ground surveys over selected targets that are smaller in size.

4.8.2 Reinterpretation of Geochemical Data

Further work can be done on the geochemical data that exists in NGU reports. A more detailed review may highlight other mineralised areas that have not yet been included as defined mineralised zones, particularly when viewed in the context of the magnetic data. A priority for this work is the sample data from rocks above Zone C where mineralisation seems to persist beyond the defined zone and ilmenite quality improves.

This work would also allow a more detailed appraisal of ilmenite- and magnetite-dominated mineralisation. Such areas have not been studied in so much detail as the apatite-bearing zones and better understanding is needed of their grades to determine whether they, in themselves, could represent economic targets.

4.8.3 Social and Environmental Review

Before undertaking any exploration, it is strongly recommended that a review of the area's environmental setting and sociopolitical context is carried out. There are several reasons for doing so:

- The area's population distribution, governance, social structure and land use are complex and need to be understood so that the potential impact of exploration, and the implications of the community's potential reaction to exploration, can be assessed and understood;
- There is a legal requirement to inform landowners and land users before any exploration takes place, furthermore landowner permission is required before undertaking any activities that may cause 'substantial damage'. SRK ES recommend that a full stakeholder analysis should be carried out to identify who needs to be contacted and who needs to be informed and consulted with, so that stakeholder consents and permissions are granted prior to any exploration activity is undertaken;
- Areas with environmental protection or similar sensitivities need to be known and, if these coincide with proposed exploration areas, any restrictions or limitations to the work that can be performed must be established.

The ability to continue exploration in an area for the long term and, should exploration be successful, open a mine will be strongly influenced by and dependent on societal and community acceptance of the Company's activities and ambitions. It is therefore critical at an early stage that the analysis of stakeholders is carried out so that their potential interest, importance and influence is established, and their concerns and perceptions understood.

From this, a stakeholder engagement plan can be produced which will enable the project to be presented in a consistent and transparent manner. It will also challenge the potential of misinformation and disinformation by enabling all stakeholders to make informed opinions and decisions. All forms of feedback should be recorded and factored into an exploration plan so as maintain the highest degree of social acceptance possible. Insufficient or poor engagement, even at the outset of exploration, can lead to deterioration of trust and increased opposition which could affect the long-term outlook for the project.

4.8.4 Field Sampling

A new phase of fieldwork is required. The priority for this is the collection of continuous channel samples taken with a diamond saw across mineralised zones in order to test grade continuity and obtain more representative data than what was possible via historical rock chip sampling. Sampling should be carried out along the same profiles as previous work for the sake of comparison and verification of historical data, and then expanded to provide confirmation of grade continuity along strike if sufficient exposure can be found.

Furthermore, potential extensions of the mineralised zones must be targeted by sampling. Areas can be selected based on the geological map and the aeromagnetic data, and efforts should be made to find new areas of exposure that may not have been present during historical work (e.g. new road cuts, cleared forestry etc.). The whole southern part of the Bjerkreim intrusion appears to be under-explored.

4.8.5 Trenching and Drilling

The definition of the three mineralised zones A, B and C is based on sampling along profiles that are often separated by several kilometres, due to poor exposure in the areas in between. Lateral continuity of the mineralisation needs to be proven through these areas of poor exposure.

Excavating trenches in poorly exposed areas could be a relatively low cost first step before drilling to test the lateral continuity of the mineralised zones and their grade. A limiting factor here could be that Quaternary cover can be quite thick. The locations for such trenching can be selected based on processed magnetic data.

The low amount of exposure in the area and large distances between exposed sections through the mineralised sequences means that diamond drilling may be required during an early stage of exploration in order to delineate the target zones and test the lateral continuity of grades of mineralisation.

4.8.6 Metallurgical Testwork

It may be advantageous at an early stage to obtain sufficiently large samples of mineralised material from the various mineralised zones to conduct metallurgical testwork. This would be done in parallel to a mineralogical study. The objective would be to understand how mineralogy changes between zones, how the three economic minerals relate to each other, and what the best options could be for mineral processing and recovery. It would also provide further information on the potential quality of each product that a mine could produce at Bjerkreim. Not only would this work provide, hopefully, some degree of comfort that mineral recovery is possible, but it may also provide a further factor for exploration prioritisation if it is shown that certain zones are more amendable to processing than others.

4.8.7 Conceptual Economic Analysis

The economics of potential mineral resources in the BSL have changed substantially since the NGU assessed the area, particularly with respect to recent strong increases in vanadium prices. A conceptual economic analysis of the project would therefore be worthwhile to obtain a very preliminary indication that the known mineralised zones have the potential to host viable mining operations, and whether minimum grades can be estimated below which areas can be disregarded for exploration.

This type of analysis is often useful in complex projects such as this where there are several potential economic drivers. It would also allow the economics of areas where the only mineralisation is ilmenite and magnetite (with no apatite) to be reviewed to understand whether they are worthwhile exploration targets, or if it is the case that all three commodities are required to develop a profitable mine. The analysis could also illustrate which of the three commodities is the principal economic driver.

It must be noted that this exercise, when conducted before a Mineral Resource Estimate has been conducted, is purely conceptual and designed to highlight opportunities or any serious economic flaws in the project. The outcome can also be used as a factor in the ranking of exploration targets so that those with greatest economic potential can be prioritised, not just based on their grade but also on their technical merits as a future mine.

5 OPPORTUNITIES AND RISKS

In this section, SRK ES summarises what are, in its opinion, the key opportunities and risks for the projects at this stage of their development.

5.1 BOMLO

5.1.1 Project Opportunities

- Mineralisation is fairly well-understood and a model for generating new exploration targets should be relatively straightforward to develop;
- There is a good possibility of finding new gold occurrences or strike/dip extensions of known occurrences in the licence area;
- Land use in the licence area appears to be fairly limited to tourism and agriculture in very localised parts, and there is a small limited number of dwellings. Whilst this represents an opportunity with respect to understanding land use and engaging with land owners and users, this does not lessen the importance of good stakeholder engagement;
- The style of mineralisation, should new deposits be found of economic significance, lends itself to mining and processing methods that could have a relatively low environmental impact on the area, although they would represent fairly small, underground, operations;
- The mineral potential of the ophiolitic host rocks is not yet understood, and similar geology has been known to host titanium and vanadium mineralisation of interest.

5.1.2 Project Risks

- The limited outcrop of mineralised zones and the fact that there is little overburden to make use of geochemical survey methods, mean that large diameter diamond drilling may be required at an early stage compared to some other gold exploration projects. It is also the case that the options for robust targeting and drillhole design prior to drilling may be comparatively difficult, increasing the risk of unsuccessful drilling;
- Despite the proximity to good roads, drilling may still require man-portable or helicopter-portable rigs due to the extremely rugged terrain and the impracticalities of building

access roads at an early stage of the project. Man-portable rigs limit the depth and drilling diameter that is possible, and the use of helicopters for larger rigs will increase costs;

- The nature of the gold mineralisation (high nugget effect) means that it is unlikely that drilling will yield grades that are representative of any mineralised feature that is intersected. This is normal for orogenic gold exploration but may lead to difficulties with respect to expectation management during exploration and implies that more costly bulk sampling through trial mining/development may be needed at an early stage.

5.2 BJERKREIM

5.2.1 Opportunities

- The area's infrastructure and terrain mean that many parts of the licence have good access for exploration activities, including for future drilling programmes;
- Previous work has provided a good understanding of geology and the main mineralised zones, although some aspects may be refined. There are indications that the area has potential to host very high tonnage mineral deposits;
- Mineralised areas that have been already delineated by previous workers have been selected according to the co-existence of ilmenite, apatite and vanadium-rich magnetite in the same geological units and appeared to focus primarily on whether apatite is present or not. Should project economics support areas that include only ilmenite and vanadium-rich magnetite as commodities, then this may open up new targets that have not yet been evaluated;
- Further to the above, SRK ES considers it possible that known areas of mineralisation may have greater extents than shown by previous work, but have not yet been delineated due to the lack of outcrop in some areas;
- The BSL is considered to be a deposit of national importance by the Norwegian state. This implies that there could be good support for exploration and future development from the Government's perspective;
- The mineralisation present in the BSL could lead to a future mine producing an attractive range of products. Ilmenite is currently showing steady demand, as are phosphate minerals for fertilizer production. In recent months, prices for vanadium have increased sharply and there is likely to be increasing demand from the battery sector as well as for its use in steel making. This is in the context of a current supply shortage, indicating that the economics for vanadium could be very positive.

5.2.2 Risks

- Although mineralisation may be present in large tonnages, vanadium grades are relatively low compared to some other similar projects. It remains to be seen how this would impact this project's economics, but it is worth noting that production of ilmenite and apatite would necessarily also lead to a magnetite concentrate, which is what contains the vanadium. The question is which commodity the economic driver for the selection of exploration targets should be;
- The exploration licences cover a large area and the situation with regards land owners and existing land use is likely to be complex. Some of the principal mineralised areas include numerous dwellings and agricultural land. It will require time and care to identify and engage with land owners and users, following good practice with respect to

stakeholder engagement. Some degree of opposition to exploration and mining in certain areas is possible; this needs to be understood from an early stage and factored into a stakeholder management plan and possibly into exploration target selection;

- The exploration licence is valid for iron and titanium. Apatite is not included in the licence description, but on the other hand it is not a mineral that is included under state ownership. NMP believes that they would be able to sell the mineral as a byproduct of ilmenite and magnetite but this needs to be confirmed. Furthermore, if apatite is technically owned by the landowner, there is a chance that a third party could operate in the area on an 'apatite-only' basis but they would have to respect the terms of NMP's exploration licence and not interfere with their operations.

6 EXPLORATION BUDGET

SRK ES has prepared preliminary budgets for both project areas to advance them through the next stages of exploration. Many of these costs are based on assumptions and SRK ES' experience of similar work; they are intended to provide an order of magnitude of potential costs actual costs. Actual costs may be different according to quotations and proposals from suppliers and more detailed assessment of logistical requirements once particular exploration targets have been selected.

It is important to note that the costs presented below refer to the technical exploration requirements. No allowance has been made for corporate costs, licence fees, stakeholder engagement or landowner compensation (if appropriate). Furthermore, costs for access to drilling areas (e.g. road construction or helicopter lifting) cannot yet be estimated with accuracy.

6.1 BØMLO

The costs presented in Table 6-1 are an estimate for the exploration work required up to and including the first diamond drilling programme for the project. It is unlikely that this programme would result in a MRE but would provide a decision point as to how and where to proceed in the next phase of work.

With respect to the drilling phase, the cost estimate is based on 10 holes along a 300 m strike length for a total of 1,500 m of drilling. Drilling would be carried out in two holes every 75 m along strike in order to intersect mineralisation in two locations down-dip, thus providing some indication of depth continuity.

Table 6-1 Indicative first-phase exploration costs for Bømlo

Item	Cost, GBP
Further data review and target selection	8,500
Channel sampling	16,000
Structural mapping and pitting/trenching	35,000
Diamond drilling	460,000
Sub-total	520,000
15% Contingency	78,000
Total	**598,000**

6.2 BJERKREIM

The cost estimate for Bjerkreim (Table 6-2) is also based on the work required up to and including the first drilling programme. In this case, though, an estimate for drilling has been made that may have the potential to produce an initial MRE for one of the mineralised zones (or part thereof) in the project area. This is based on assumptions of mineralisation continuity along strike and down-dip. An allowance of 6,600 m of drilling in 33 holes has been made, designed to cover a strike length of 2,000 m. Holes would be drilled on lines spaced every 200 m with three holes per line so that several depth intersections can be made.

Table 6-2 Indicative first-phase exploration costs for Bjerkreim

Item	Cost, GBP
Further data review, geophysical data processing/interpretation	10,000
Conceptual economic analysis	25,000
Channel sampling	40,000
Mapping, pitting/trenching, ground geophysical surveys	70,000
Diamond drilling	1,940,000
Mineral resource estimate	45,000
Diamond drilling	460,000
Sub-total	2,590,000
15% Contingency	389,000
Total	**2,979,000**

7 CONCLUSIONS

Bømlo and Bjerkreim are two very different, early-stage exploration projects that both present good opportunities for the Company. The licences have been carefully selected to include what are currently considered to be the principal zones of economic interest, and SRK ES believes that both projects merit further exploration and recommend that it is carried out.

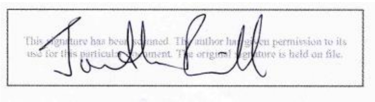
Bømlo is perhaps one of Norway's most important areas for orogenic gold with a long history of mining and research. There are numerous gold showings within a small area, and there is potential to find new mineralisation through carefully targeted exploration that may include diamond drilling at a relatively early stage to identify structures that host veins. Large-scale sampling will also be important in obtaining a more quantitative indication of gold grades. Overall, SRK ES considers that the Bømlo licence has potential for low-tonnage but high-grade narrow-vein gold mineralisation that lends itself to relatively small-scale, selective mining methods. The hosting geology at Bømlo should also be investigated further; ophiolitic rocks such as the layered gabbros in which the veins have formed can be of economic interest on account of their enrichment in ilmenite and magnetite, with the latter sometimes being a source of vanadium.

Bjerkreim, by contrast, has good potential to host deposits in a very large layered intrusion with moderate grades of phosphate, titanium and vanadium but very high tonnages. Work by the NGU and others has attempted to estimate of the grade and tonnage of the main mineralised zones; although some significant assumptions have been applied to these estimates with respect to geological and grade continuity, SRK ES considers them to be a fair reflection of the potential order of magnitude of mineral resources that should be targeted by further exploration.

Indeed, there are indications that mineralised zones could be larger than those delineated by the NGU, plus there are under-explored areas that share the same geology but have not yet been assessed; these could host new deposits or continuations of known mineralisation. The fact that this project has the potential to produce three different commodities for which there are fairly strong markets makes it an attractive proposition and implies some resilience in times of changeable commodity prices. Further economic analysis is needed to understand whether phosphate, titanium or vanadium will be the main driver here, but the recent sharp increase in vanadium price is encouraging. It is certainly likely that the project economics are very different now compared to when they were assessed by NGU.

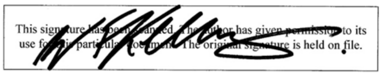
SRK ES has provided several recommendations for exploration at each project, all designed to lead towards drilling and, eventually, definition of mineral resources. This work can commence immediately, and it is critical that the Company takes the time to inform the host communities of their plans and accommodate their feedback. Fostering good relationships with stakeholders at all levels will be key to the success of both projects.

For and on behalf of SRK Exploration Services Limited



Jon Russill
Principal Exploration Geologist
SRK Exploration Services Limited
14/11/2018

Jeroen van Gool
Senior Exploration Geologist
SRK Exploration Services Limited
14/11/2018



William Kellaway
Principal Exploration Geologist
Director
SRK Exploration Services Limited
14/11/2018

8 REFERENCES

Abildgaard, N.J., Juve, G.1999. Bømlo gold deposits, south-western Norway. *Abstract volume, Gold '99Trondheim, Norway*

Amaliksen, K.G., 1980. Gullforekomster på Bømlo. Bømlo, Hordaland. *Undersøkelser av Statens Bergrettigheter. NGU Rapport nr. 1750/35 A.*

Amaliksen, K.G., 1983. The geology of the Lykling Ophiolite Complex, Bømlo, SW Norway. *Upupl. Master Thesis, University of Bergen*.

Andersen, T.B., Nielsen, P., Rykkelid, E., Sølna, H., 1991. Melt-enhanced deformation during emplacement of gabbro and granodiorite in the Sunnhordland Batholith, west Norway. *Geol. Mag. 128 (3), 207-226.*

Berg, H.-J., 1986. De geokjemiske forutsetninger for gullmineralsiringer på Bømlo.

Boyd, R., Gautneb, H., Ihlen, P.M., Korneliussen, A., Müller, A., Wanvik, J.E., 2012a. Mineral- og metallressurser i Norge: Verdien av industrimineralforekomster av nasjonal betydning. *Norges geol. Unders, Report nr. 2012.053.*

Boyd, R., Bjerkgård, T., Ihlen, P.M., Korneliussen, A., Sandstad, J.S., Schiellerup, H., 2012b. Mineral- og metallressurser i Norge: "In situ" verdi av metallforekomster av nasjonal betydning. *Norges geol. Unders, Report nr. 2012.048.*

Boyd, R, Nilsson, L.-P., Pedersen, R.-B, Bakke, S., Boassen, T., Grenne, T., Grønlie & Johannesen, G.M., 1990. NTNF project no. MB10.20346 Geochemistry of platinum metals in ophiolites in Norway, final report. *Norges geol. Unders, Report nr 90.065.*

Brekke, H., 1983. The Caledonian geological patterns of Moster and southern Bømlo. Evidence for lower Palaeozoic magmatic arc development. *Upupl. Master Thesis, University of Bergen*.

Brekke, H., Furnes H., Nordås, J., Hertogen, J., 1984. Lower Palaeozoic convergent plate margin volcanism on Bømlo, SW Norway, and its bearing on the tectonic environments of the Norwegian Caledonides. *Journal of the Geological Society. London, Vol. 14, 1015-1032.*

Christensen, K., 1994. En geokemisk undersøgelse af guldmineraliseringerne I Lykling, Bømlo, SV-Norge. *Upupl. Master Thesis,University of Copenhagen.*

Christensen, K., Stendal, H., 1995. Gold mineralisation at Lykling, Bømlo, The Caledonides of southwestern Norway. *In*: *Gold Mineralisation in the Nordic countries, 20-24.*

Dalsegg, E., 1981. CP- og VLF-målinger Alsvåg gruve. *Norges geol. Unders, Report nr 1800/35C.*

Duchesne, J.C., 1987. The Bjerkreim-Sokndal massif. In: C. Maijer and P. Padget (Editors), The geology of southernmost Norway. *Norges Geol. Unders. Spec. Pub. 1., p. 56-59.*

Duchesne, J.C. (Ed.) and Korneliussen, A. (Ed.), 2003. Ilmenite deposits and their geological environment*. Norges Geol. Unders. Spec. Pub. 9, 134 pp.*

Eilu, P. (Editor), 2012. Mineral deposits and metallogeny of Fennoscandia. *Geological Survey of Finland, Special Paper 53. 402 pp.*

Fossen, H., Hurich, C.A., 2005. The Hardangerfjord shear zone in SW Norway and the North Sea: a large-scale low-angle shear zone in the Caledonian crust. *Journal of the Geological Society. London, Vol. 162, 675-687.*

Færseth, R.B., Ryan, P.D., 1975. The geology of the Dyvikvågen Group, Stord, western Norway and its bearing on the lithostratigraphic correlation of polymict conglomerates. *Norges geol. Unders. 319, 37-45.*

Færseth, R.B., Thon, A., Larsen, S:G:, Sivertsen, A., Elvestad, L., 1977. Geology of the Lower Palaeozoic rocks in the Samnanger-Osterøy area, Major Bergen Arc, western Norway. *Norges geol. Unders. 334, 19-58.*

Færseth, R.B., 1982. Geology of southern Stord and adjacent islands, southwest Norwegian Caledonides. *Norges geol.Unders*. 319, 37-45.

Gale, G.H., 1974. Geokjemiske undersøkelser av Kaledonske vulkanitter og intrusiver I midt- og syd-Norge. *Norges geol.Under, repoprt nr 1223 A, 68-94.*

Gale, G.H., 1974. Geokjemiske undersøkelser av Kaledonske vulkanitter og intrusiver I midt- og syd-Norge. *Norges geol.Under, repoprt nr 1223 B, Del II – analytisk data.*

Gautneb, H., 2003. SEM elemental mapping and characterisation of ilmenite, magnetite and apatite from the Bjerkreim-Sokndal layered intrusion. *In: J.-C. Duchesne and A. Korneliussen (Editors), Ilmenite deposits and their geological environment. Special publication 9. Geological Survey of Norway, Trondheim, p. 65-67.*

Heskestad, B., Hofshaugen, N.H., Furnes, H., Pedersen, R-B. The geochemical evolution of the Gulfjellet Ophiolite Complex, west Norwegian Caledonides. *Norsk geologisk tidsskrift, Vol. 74, 77-88.*

Ihlen, P, Schiellerup, H., Gautneb, H., and Skår Ø, 2014. Characterization of apatite resources in Norway and their REE potential — A review. *Ore Geology Reviews 58, p. 126–147*.

Inderhaug, J., 1975. Liafjellområdets geologi. *Unpupl. Master Thesis, University of Bergen*.

Ingahl, S.E., 1985. Stratigraphy, structural geology and metamorphism in the Os area, Major Bergen Arc. *Unpupl. Master Thesis, University of Bergen*.

Korneliussen, A., 2012. Rogaland Fe-Ti-V; Sunnfjord Ti; Møre Fe-Ti. In: Eilu, P. (ed.) 2012. Mineral deposits and metallogeny of Fennoscandia. *Geological Survey of Finland, Special Paper 53, 401 p.*

Korneliussen, A., Furuhaug, L., Gautned, H., McEnroe, S., Nilsson, L.P. and Sørdal, T., 2001. Forekomster med ilmenitt, vanadiumholdig magnetitt og apatitt i norittiske bergarter i Egersundfeltet, Rogaland. *Norges Geol.Unders report 2001.014.*

Marker, M., Schiellerup, H., Meyer, G.B., Robins, B. and Bolle, O. 2003: The Rogaland Anorthosite Province. Geological map 1:75000. Norges Geologiske Undersøkelse Special Publication 9, p. 109-116.

Meisfjord, N., 1981. Packsackboringer 1980 for USB. *Norges geol. Unders, Report nr 1801/1.*

Reusch, H., 1888. Bømmeløen og Karmøen med omgivelser. *NGU, Book, 422 p*.

Saltnes, M. 1984. Deformation of quartzite conglomerates, Ulven, Os, Western Norway. *Upupl. Master Thesis, University of Bergen*.

Smithson, S.B., & Ramberg, I.B., 1979. Gravity interpretation of the Egersund anorthosite complex, Norway: Its petrological and geothermal significance. *Geol. Soc. Am. Bull. 90, p. 199-204.*

Songstad, P., 1971. Geologiske undersøkelser av den Ordoviciske lagrekken mellem Løkling og Vikafjord, Bømlo, Sunnhordland. *Upupl. Master Thesis, University of Bergen*.

Thon, A., Magnus, C., Breivik, H., 1980. The stratigraphy of the Dyvikvågen Group, Stord: a revision. *Norges geol. Undres. 339, 31-42.*

Wilson, J.R., Robins, B., Nielsen, F.M., Duchesne, J.C., Vander Auwera, J., 1996. The Bjerkreim–Sokndal layered intrusion, southwest Norway. *In: Cawthorn, R.G. (Ed.), Layered Intrusions. Elsevier Science B.V., Amsterdam, p. 231–256.*

Wulff, P. 1993. En klassifikation af mineraliseringer på Bømlo, Sundhordland, SV-Norge. *Upupl. Master Thesis,University of Copenhagen.*

Wulff, P.W., 1996. En befaring af circa 100 mineraliseringer I Sunnhordland, SV-Norge.. *Norges geol. Unders, Report nr 96-139.*

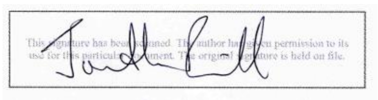
Wulff, P.W. and Christensen K. 1991. Malmgeologiske undersøgelse af det gamle guldmineområde ved Lykling samt tilgrænsende områders mineraliseringer. Bømlo SV Norge. Feltrapport for sommerene 1990 og 1991*. Københavns universitet. Afdeling for Malmgeologi. Vejleder Henrik Stendahl.*

REPORT DISTRIBUTION RECORD

Report No.	ES7775
Copy No.	v1-0

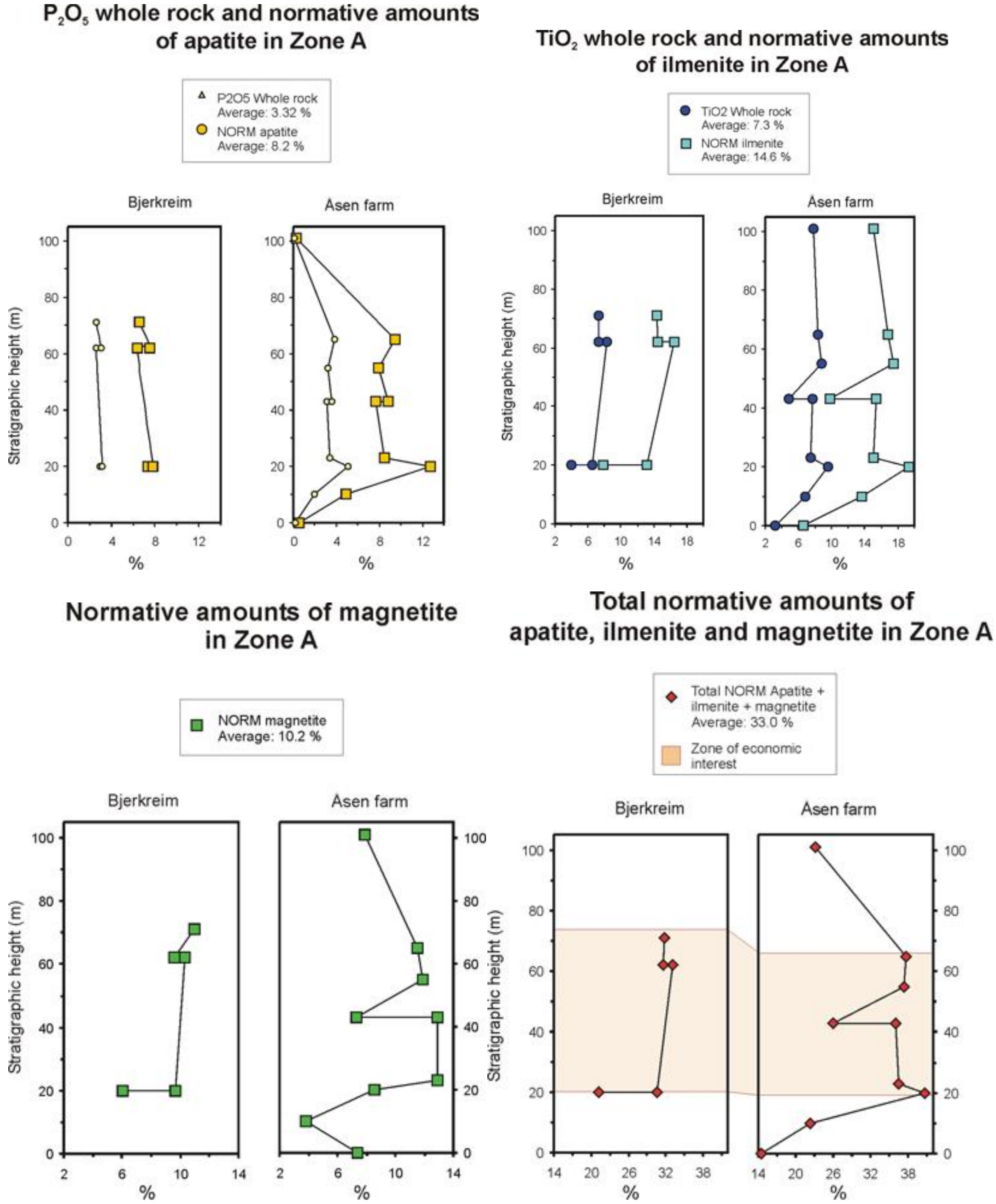
Name/Title	Company	Copy	Date	Authorised by
Michael Wurmser	NMP	PDF	14/11/18	Jon Russill
Gunnar Holen	NMP	PDF	14/11/18	Jon Russill

Approval Signature:



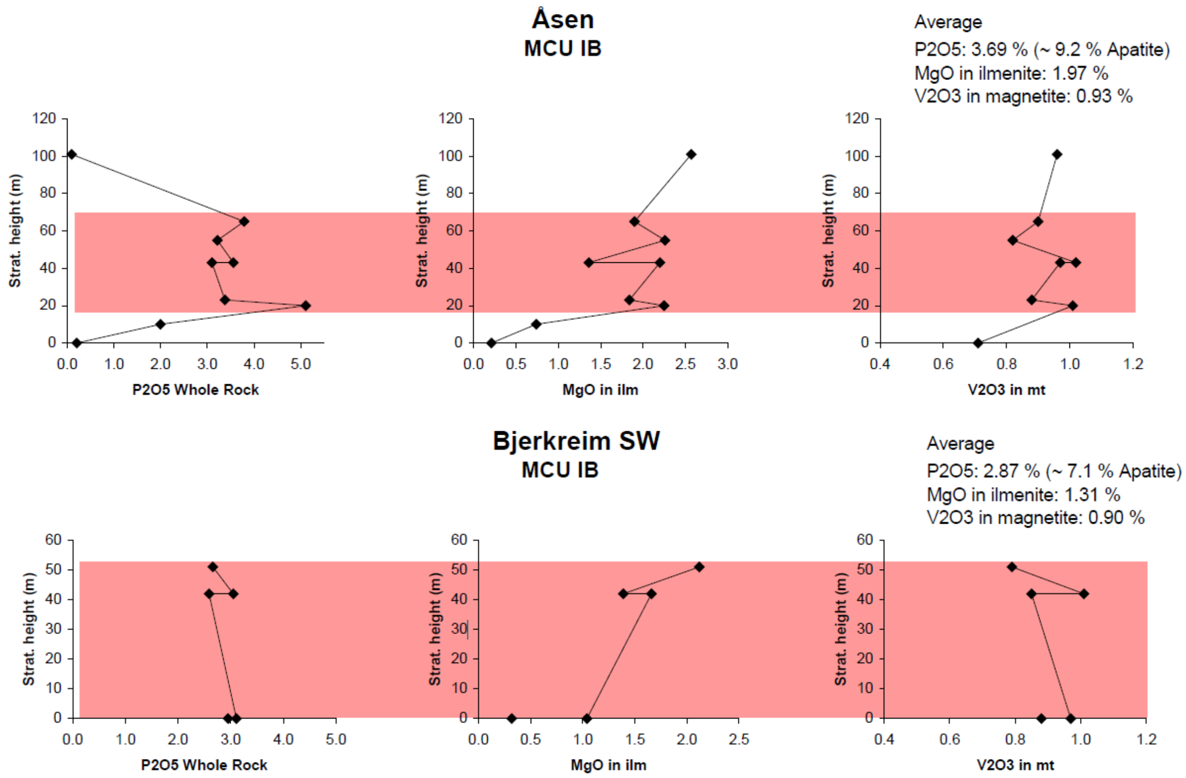
APPENDIX A WHOLE ROCK AND MINERAL CHEMISTRY DATA FROM THE BJERKREIM AREA PLOTTED ALONG NAMED PROFILES.

Mineralised Zone A



Whole rock chemical data of the two profiles in zone MCU IBe / zone A

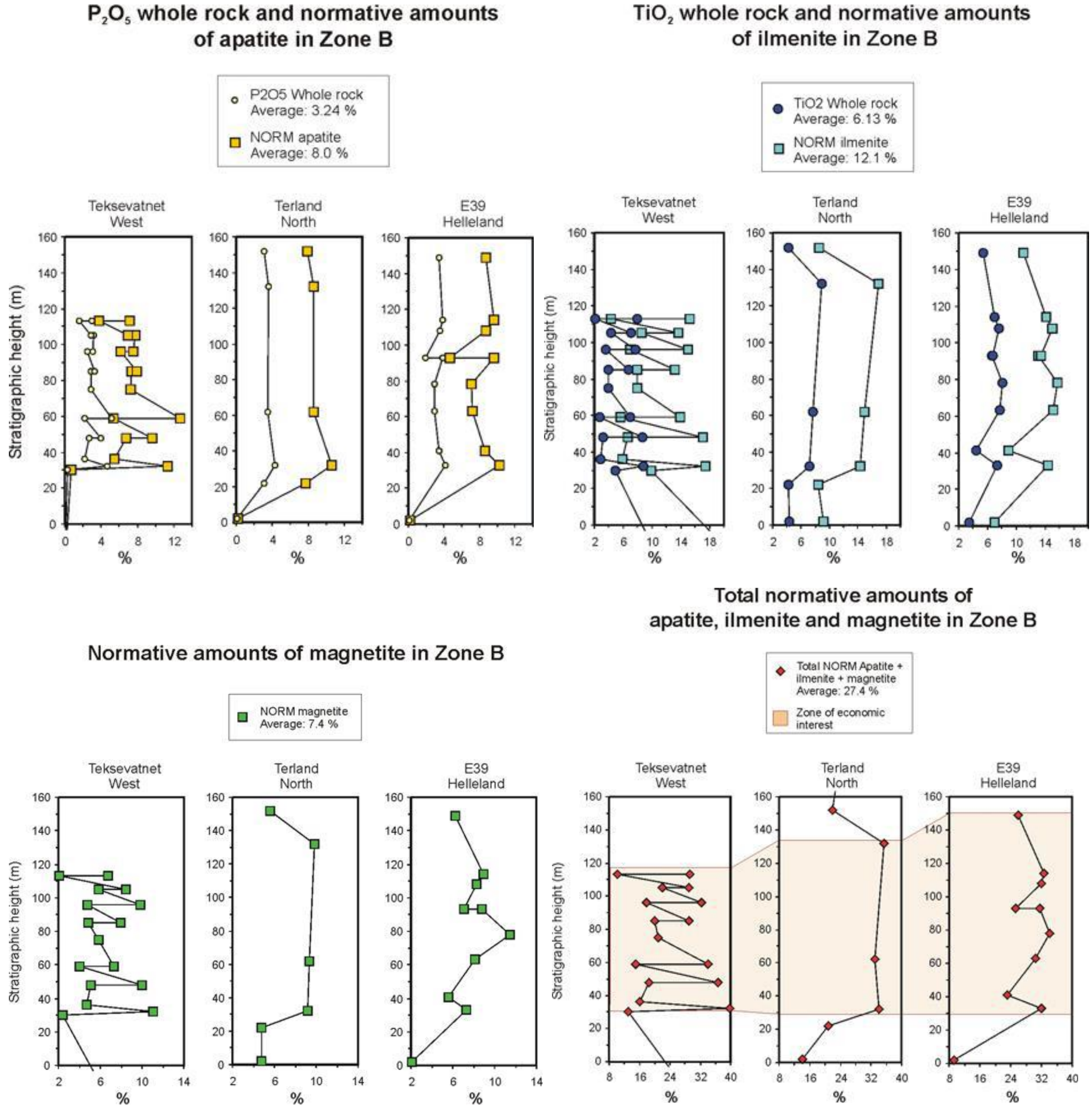
The pale red zone indicates the mineralised part (Zone A) of the stratigraphic zone e. From Schiellerup et al. (internet presentation).



XRF whole rock P_2O_5 analyses and electron probe microanalyses of MgO in ilmenite and V_2O_3 in magnetite

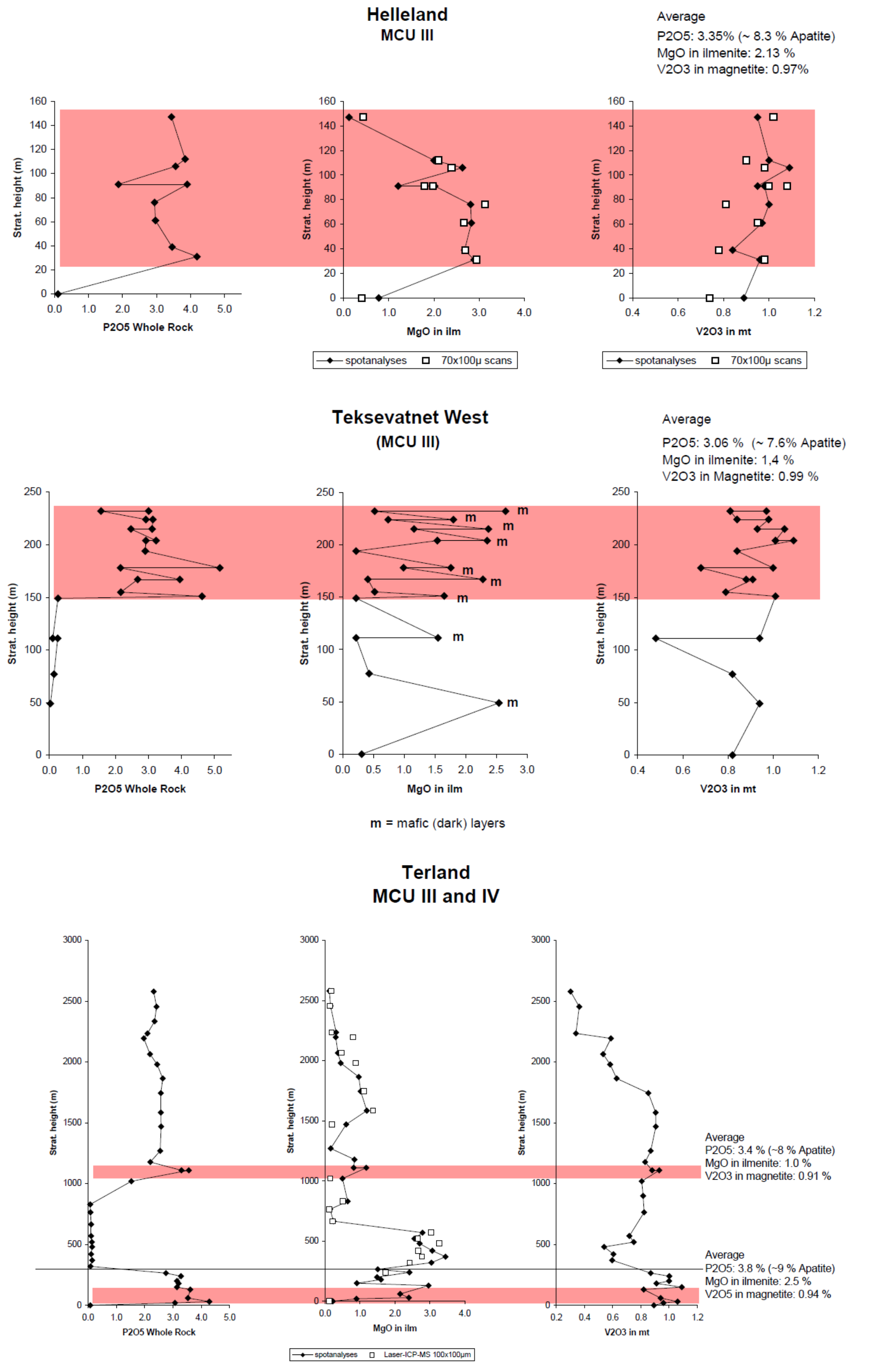
Samples from the two profiles in zone MCU IBe. The red bands show the extent of the mineralised cumulate zone A within the section. From Meyer et al. (2002).

Mineralised Zone B



Whole rock chemical data of the three profiles in zone MCU IIIe / zone B

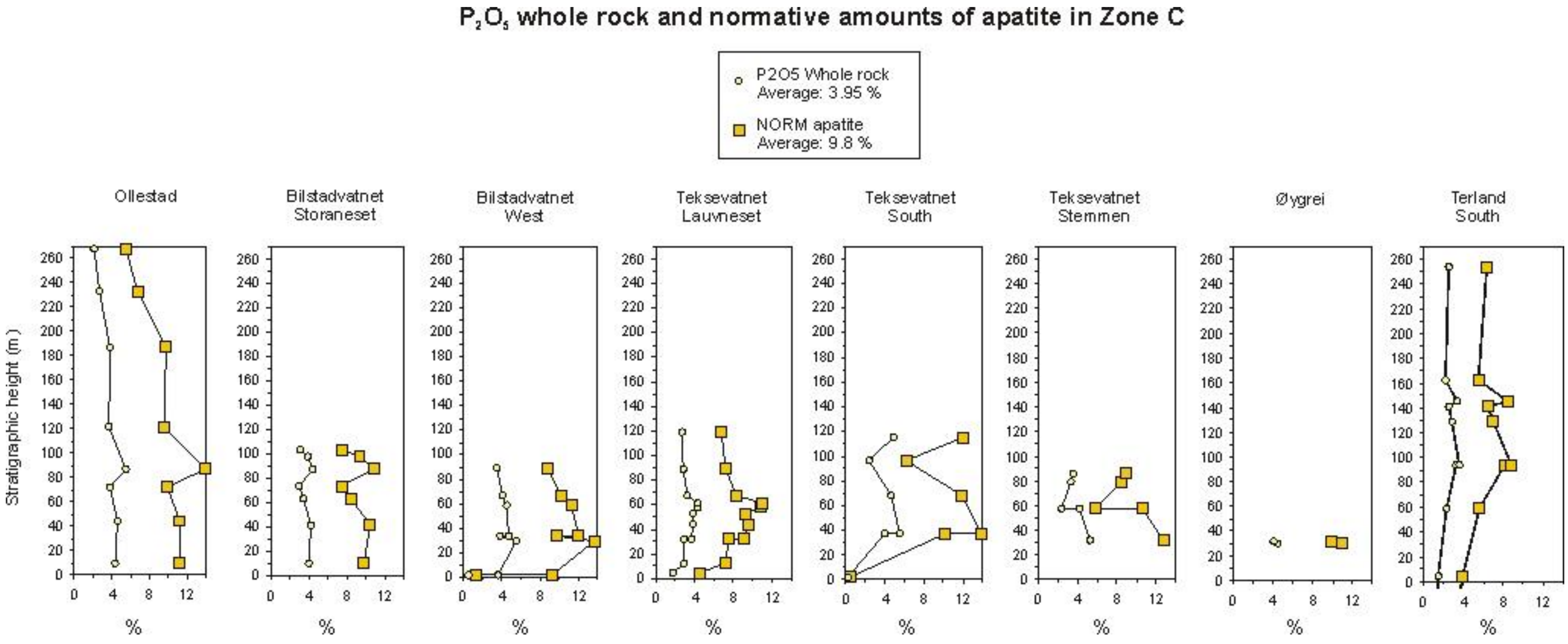
The pale red zone indicates the mineralised part of the stratigraphic zone e. From Schiellerup et al. (internet presentation).



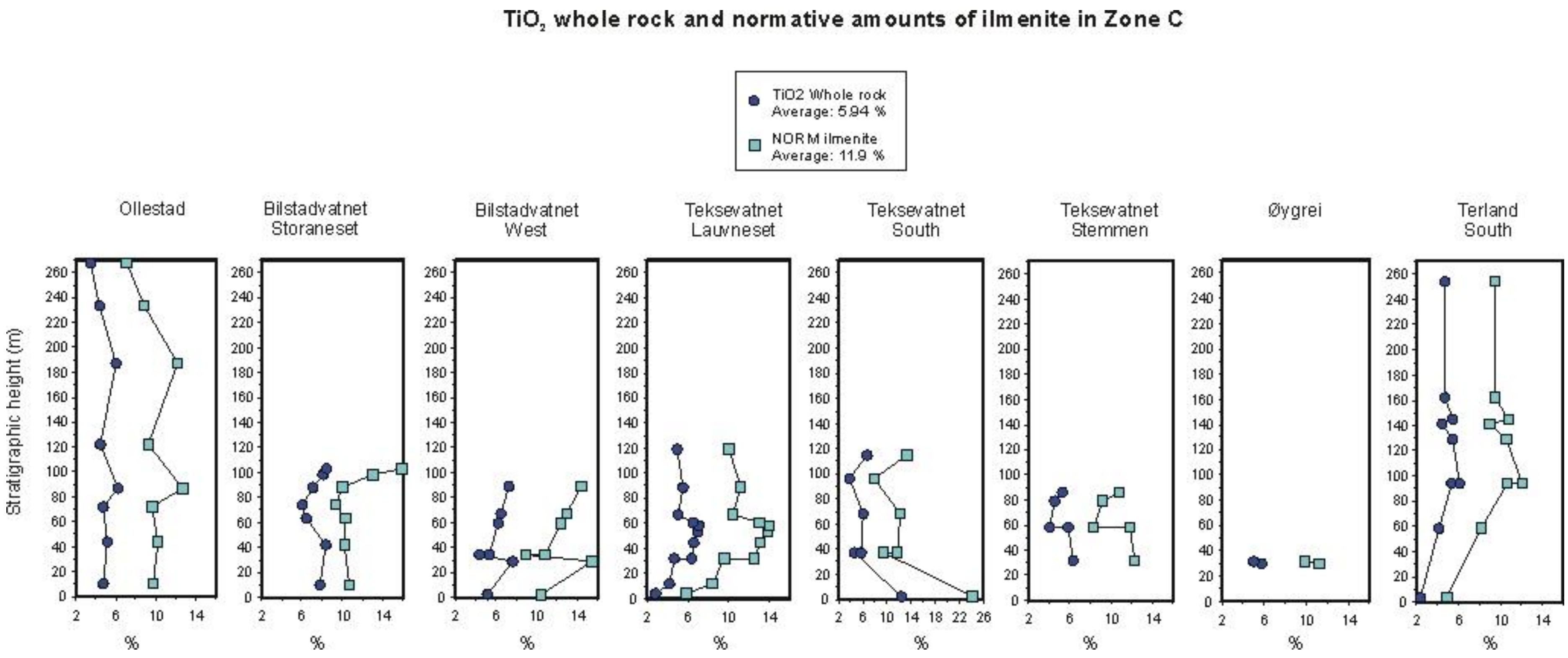
XRF whole rock P_2O_5 analyses and electron probe microanalyses of MgO in ilmenite and V_2O_3 in magnetite

Samples from the three profiles in zone MCU IIIe. The red bands show the extent of the mineralised zones B and C within the section. From Meyer et al. (2002).

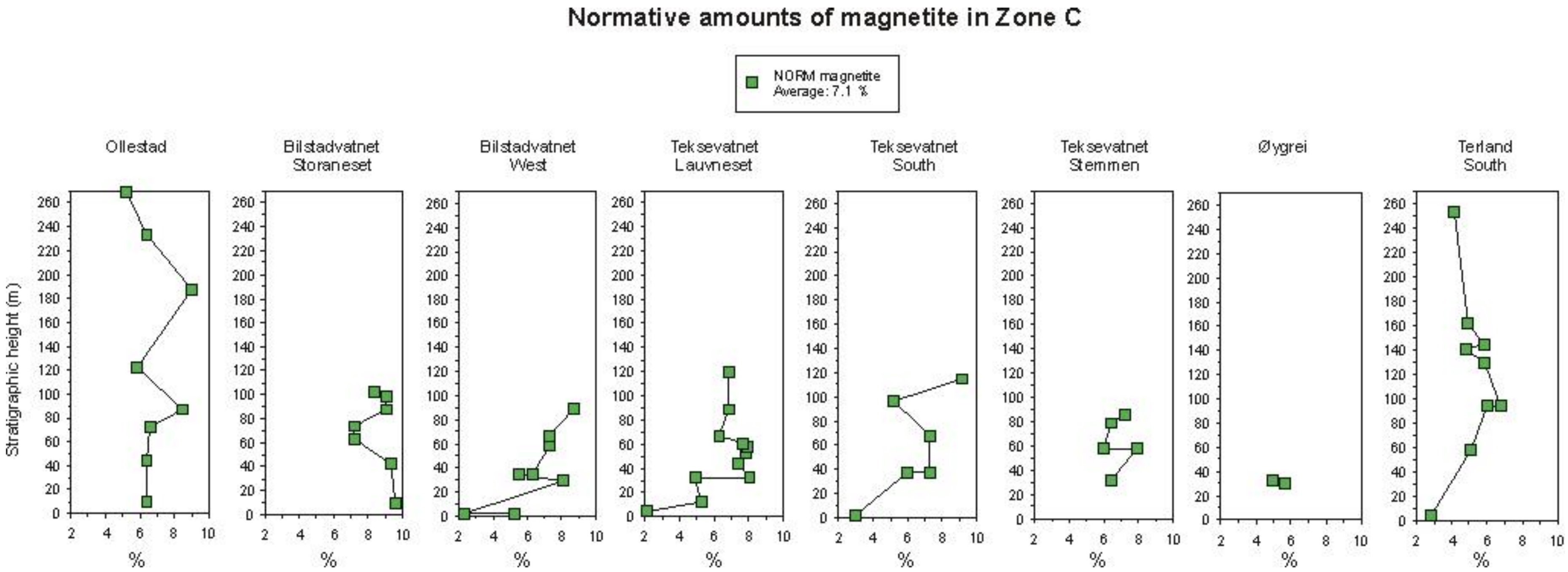
Mineralised Zone C



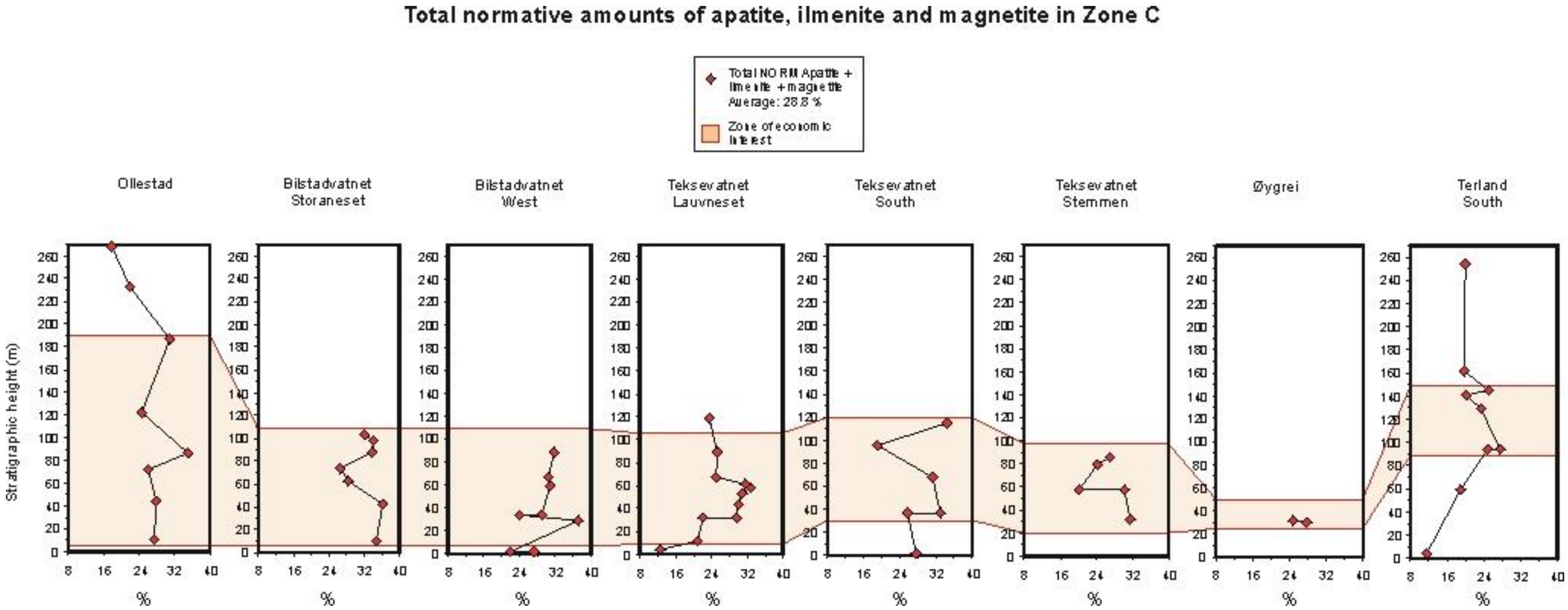
Continued on next page



Continued on next page

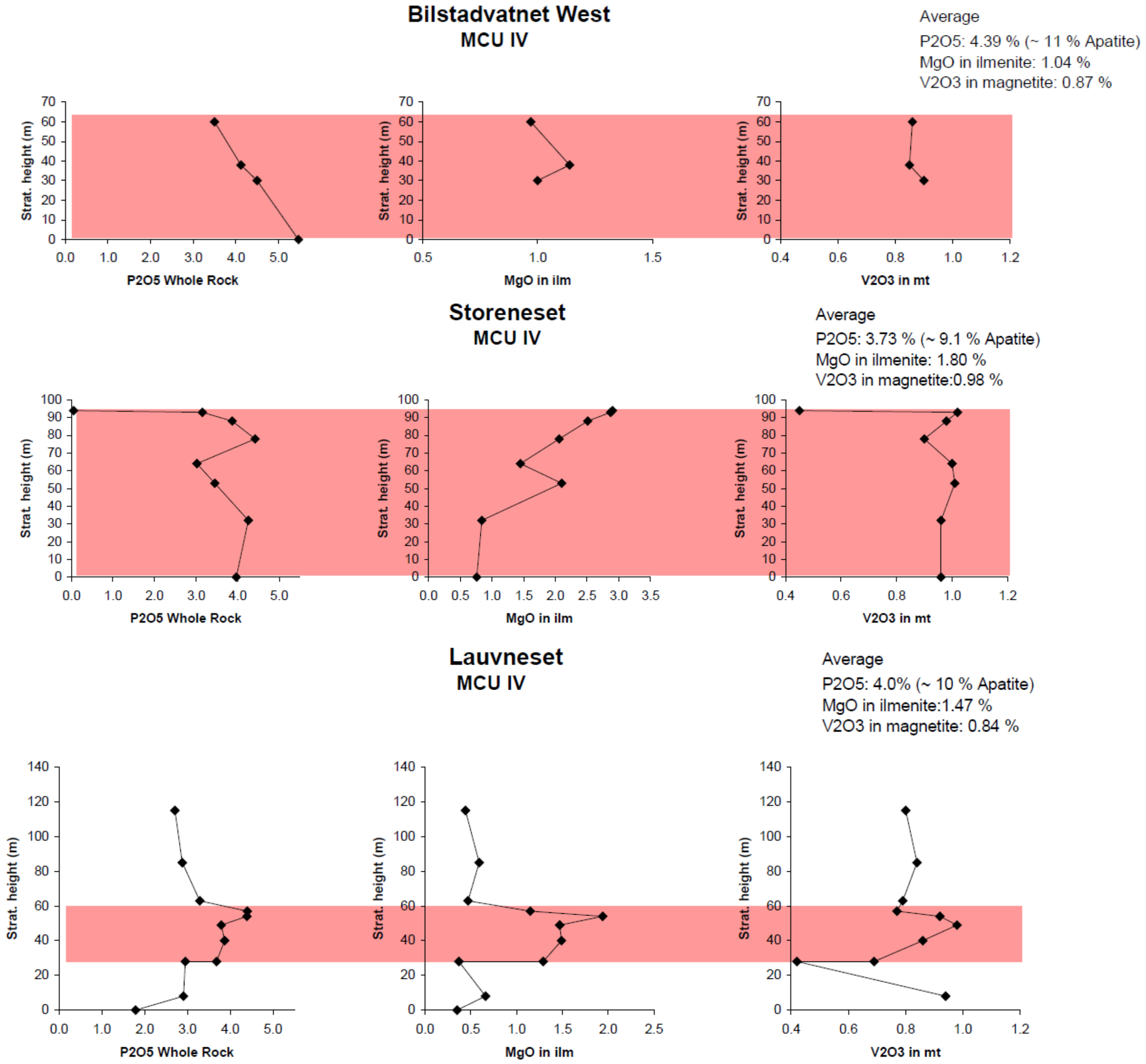


Continued on next page



Whole rock chemical data of the profiles in zone MCU IVe / zone C.

The pale red zone indicates the mineralised part of the stratigraphic zone e = zone C. From Schiellerup et al. (internet presentation).



XRF whole rock P_2O_5 analyses and electron probe microanalyses of MgO in ilmenite and V_2O_3 in magnetite

Samples from three of the profiles in zone MCU IVe. The red bands show the extent of the mineralised zone C within the sections. From Meyer et al. (2002)

APPENDIX B CHEMICAL DATA OF DRILL CORE FROM THE EASTERN BJERKREIM AREA

DRILLING	Coordinates			Drillcore orientation (360)		Orientation of modal layering		Drill depth	True stratigraphic
Locality	Zone	East	North	direction	plunge	Strike	Dip		
Mjåsund	32W	345872	6491435	164	-50	335	70	30 m	10.2 m
Ollestad	32W	345976	6490502	252	-10	340	90	30 m	29.5 m

WHOLE ROCK GEOCHEMISTRY

Mjåsund		SiO_2	Al_2O_3	Fe_2O_3	TiO_2	MgO	CaO	Na_2O	K_2O	MnO	P_2O_5	Gl.tap	SUM
ID	Strat/m	%	%	%	%	%	%	%	%	%	%	%	%
MJÅ 2.5-4m	1.2	34.04	7.39	23.52	6.95	9.32	10.69	1.30	0.24	0.18	4.80	-0.49	97.93
MJÅ 4-6m	1.8	34.18	6.96	24.07	6.73	9.75	10.47	1.34	0.22	0.18	4.44	-0.69	97.65
MJÅ 6-8m	2.5	33.63	6.42	25.02	7.11	10.05	10.59	1.15	0.20	0.19	4.52	-0.86	98.03
MJÅ 8-10m	3.2	32.61	5.35	26.75	7.46	10.79	10.13	0.96	0.17	0.20	4.41	-0.98	97.86
MJÅ 10-12m	3.9	33.55	5.93	25.74	7.14	10.42	10.10	0.98	0.20	0.20	4.43	-0.88	97.80
MJÅ 12-14m	4.6	32.90	6.28	25.54	7.33	10.02	10.41	1.07	0.20	0.20	4.49	-0.83	97.60
MJÅ 14-16m	5.3	35.30	7.38	23.61	6.82	9.50	10.34	1.63	0.26	0.19	4.01	-0.69	98.36
MJÅ 16-18m	6.0	38.32	8.17	22.09	5.96	9.93	9.48	1.55	0.30	0.18	3.21	-0.74	98.43
MJÅ 18-20m	6.7	35.68	6.35	24.27	6.44	10.84	9.97	1.19	0.21	0.19	3.74	-0.85	98.03
MJÅ 20-22m	7.4	35.39	6.17	25.17	6.45	10.99	9.77	1.02	0.19	0.20	3.87	-0.87	98.34
MJÅ 22.24m	8.1	38.81	8.19	20.77	5.73	9.97	9.90	1.58	0.27	0.18	3.15	-0.73	97.82
MJÅ 24-26m	8.8	38.13	9.36	20.10	6.58	8.75	10.06	1.92	0.31	0.16	3.53	-0.77	98.12
MJÅ 26-28m	9.5	34.80	7.67	22.54	6.96	9.25	11.02	1.52	0.24	0.17	4.59	-0.83	97.94
MJÅ 28-30m	10.2	35.19	8.16	22.07	6.87	9.09	10.92	1.52	0.27	0.17	4.56	-0.81	98.02
Ollestad													
OLL 0-2m	1	40.15	10.45	19.66	4.94	8.76	8.22	2.12	0.39	0.16	3.30	-0.28	97.88
OLL 2-4m	3.0	40.81	10.82	18.26	4.59	8.84	8.58	2.28	0.43	0.16	3.44	-0.30	97.91
OLL 4-6m	5	41.86	11.20	17.88	4.37	8.89	8.38	2.34	0.51	0.16	3.13	-0.25	98.46
OLL 6-8m	7.0	41.04	11.25	18.31	4.52	8.63	8.33	2.40	0.46	0.15	3.17	-0.30	97.97
OLL 8-10m	9	40.31	11.18	17.69	4.60	8.37	9.25	2.27	0.46	0.15	3.86	-0.18	97.96
OLL 10-12m	11.0	41.07	11.70	17.43	4.45	8.12	9.04	2.51	0.46	0.15	3.51	-0.12	98.34
OLL 12-14m	13	40.85	12.53	17.34	4.57	7.21	8.87	2.59	0.51	0.14	3.43	-0.10	97.94
OLL 14-16m	15.0	39.94	11.69	17.88	4.90	7.69	9.09	2.46	0.49	0.15	3.74	-0.15	97.87
OLL 16-18m	17	39.98	11.86	17.27	4.85	7.45	9.85	2.55	0.46	0.15	4.13	-0.05	98.50
OLL 18-20m	19.0	40.96	12.45	16.65	4.61	7.29	9.73	2.63	0.49	0.14	3.90	-0.08	98.76
OLL 20-22m	21	44.13	14.41	13.37	3.19	6.01	9.12	3.09	0.58	0.13	2.54	1.32	97.89
OLL 22-24m	23.0	41.84	12.02	16.69	4.12	7.95	8.81	2.58	0.50	0.15	3.33	0.19	98.18
OLL 24-26m	25	39.98	10.64	17.79	4.67	8.62	9.68	2.31	0.43	0.16	4.24	-0.04	98.49
OLL 26-28m	27.0	40.23	11.45	17.26	4.74	7.84	9.68	2.37	0.46	0.15	4.05	-0.25	97.98
OLL 28-30m	29	40.92	12.97	16.25	4.67	6.49	9.80	2.76	0.53	0.14	3.67	-0.27	97.91

WHOLE ROCK GEOCHEMISTRY

Mjåsund	Mo	Nb	Zr	Y	Sr	Rb	U	Th	Pb	Cr	V2O3*	V	As	Sc	Hf	S
ID	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	%
MJÅ 2.5-4m	<5	5	39	39	297	<5	<10	6	<10	<10	883	600	<5	26	<10	0.44
MJÅ 4-6m	5	8	38	40	277	5	<10	11	11	11	959	652	<5	27	<10	0.43
MJÅ 6-8m	<5	8	40	42	256	5	<10	9	<10	<10	950	646	<5	27	<10	0.48
MJÅ 8-10m	5	8	41	42	212	<5	<10	5	<10	<10	1083	736	<5	26	<10	0.50
MJÅ 10-12m	5	7	43	41	234	<5	<10	6	<10	<10	965	656	<5	33	<10	0.45
MJÅ 12-14m	5	8	39	41	246	<5	<10	5	<10	<10	983	668	<5	28	<10	0.45
MJÅ 14-16m	<5	8	44	38	278	6	<10	7	<10	11	886	602	<5	26	<10	0.40
MJÅ 16-18m	<5	6	37	32	293	7	<10	<5	<10	11	843	573	<5	23	<10	0.31
MJÅ 18-20m	5	5	37	33	246	7	<10	5	<10	<10	921	626	<5	25	<10	0.36
MJÅ 20-22m	<5	8	38	37	233	<5	<10	7	<10	16	994	676	<5	33	<10	0.36
MJÅ 22.24m	<5	6	38	34	313	8	<10	7	<10	17	764	519	<5	26	<10	0.30
MJÅ 24-26m	<5	7	38	32	344	6	<10	6	<10	10	716	487	<5	30	<10	0.27
MJÅ 26-28m	<5	8	41	41	307	<5	<10	5	<10	<10	864	587	<5	23	<10	0.34
MJÅ 28-30m	<5	8	42	38	316	5	<10	6	<10	16	836	568	<5	25	<10	0.33
Ollestad																
OLL 0-2m	<5	7	50	26	384	5	<10	7	<10	<10	688	468	<5	23	<10	<0.1
OLL 2-4m	<5	6	52	26	409	7	<10	5	<10	<10	602	409	6	15	<10	0.19
OLL 4-6m	<5	5	45	25	415	8	<10	5	<10	18	566	385	<5	15	<10	0.27
OLL 6-8m	<5	7	42	26	427	6	<10	7	<10	11	640	435	<5	18	<10	0.23
OLL 8-10m	<5	5	46	30	431	6	<10	5	10	<10	594	404	<5	22	<10	0.28
OLL 10-12m	<5	6	47	27	452	6	<10	5	<10	19	596	405	<5	24	<10	0.26
OLL 12-14m	<5	5	43	23	483	6	<10	8	<10	18	618	420	<5	18	<10	0.24
OLL 14-16m	<5	7	48	30	455	9	<10	8	<10	13	622	423	<5	18	<10	0.18
OLL 16-18m	<5	7	48	33	467	7	<10	5	<10	18	568	386	<5	22	<10	0.20
OLL 18-20m	<5	6	46	30	473	7	<10	5	<10	19	550	374	<5	17	<10	0.22
OLL 20-22m	<5	6	44	25	533	7	<10	<5	<10	28	419	285	<5	21	<10	0.11
OLL 22-24m	<5	7	44	26	452	5	<10	<5	<10	13	540	367	<5	19	<10	0.21
OLL 24-26m	<5	6	46	33	424	5	<10	6	<10	<10	559	380	<5	20	<10	0.24
OLL 26-28m	<5	6	49	34	453	6	<10	<5	10	19	549	373	<5	19	<10	0.25
OLL 28-30m	<5	7	53	32	500	7	<10	10	<10	22	559	380	<5	22	<10	0.21

V_2O_3 calculated from V concentrations in the original dataset

WHOLE ROCK GEOCHEMISTRY

Mjåsund	Cl	F	Ba	Sb	Sn	Ga	Zn	Cu	Ni	Yb	Co	Ce	La	Nd	W	Cs	Ta	Pr
ID	%	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
MJÅ 2.5-4m	<0.1	0.21	80	11	<10	<10	172	16	<5	<15	143	96	31	79	<10	<10	20	13
MJÅ 4-6m	<0.1	0.3	74	12	<10	13	166	20	<5	29	139	63	26	75	<10	<10	31	<10
MJÅ 6-8m	<0.1	0.26	66	<10	<10	<10	181	23	<5	<15	144	70	29	72	<10	<10	30	14
MJÅ 8-10m	<0.1	0.25	54	17	<10	10	191	27	<5	<15	156	72	31	78	<10	<10	32	<10
MJÅ 10-12m	<0.1	0.24	68	10	<10	14	184	23	<5	<15	144	78	31	99	<10	<10	29	<10
MJÅ 12-14m	<0.1	0.23	61	12	10	<10	176	28	<5	<15	145	99	27	78	<10	<10	34	<10
MJÅ 14-16m	<0.1	0.18	76	<10	<10	10	162	20	<5	<15	139	83	32	80	<10	<10	24	<10
MJÅ 16-18m	<0.1	0.18	90	10	<10	<10	168	17	<5	<15	121	37	27	52	<10	<10	30	<10
MJÅ 18-20m	<0.1	0.28	70	<10	<10	<10	181	25	<5	<15	145	91	25	49	<10	<10	32	<10
MJÅ 20-22m	<0.1	0.23	65	13	<10	10	185	20	<5	<15	136	90	30	65	<10	<10	24	<10
MJÅ 22.24m	<0.1	0.14	92	16	<10	<10	149	26	<5	<15	119	57	22	48	<10	<10	22	<10
MJÅ 24-26m	<0.1	0.12	102	12	<10	<10	143	16	<5	<15	107	76	16	52	<10	<10	22	<10
MJÅ 26-28m	<0.1	0.17	76	<10	<10	<10	161	21	<5	<15	117	67	32	72	<10	<10	20	<10
MJÅ 28-30m	<0.1	0.2	91	12	10	11	149	22	<5	<15	117	113	25	86	<10	<10	32	<10
Ollestad																		
OLL 0-2m	<0.1	<0.1	136	10	<10	13	141	39	14	16	98	67	18	43	<10	<10	15	10
OLL 2-4m	<0.1	<0.1	144	<10	<10	13	133	36	15	<15	99	36	18	50	<10	<10	29	12
OLL 4-6m	<0.1	0.19	152	<10	<10	<10	124	34	16	<15	91	50	27	40	<10	<10	15	<10
OLL 6-8m	<0.1	0.1	147	<10	<10	13	132	32	12	<15	93	20	33	49	<10	<10	24	<10
OLL 8-10m	<0.1	0.12	141	13	<10	12	128	26	10	<15	93	67	34	52	<10	<10	19	10
OLL 10-12m	<0.1	0.23	159	12	10	16	121	36	8	<15	89	49	25	55	<10	<10	20	14
OLL 12-14m	<0.1	0.25	148	<10	<10	<10	118	38	6	<15	87	58	24	53	<10	<10	14	21
OLL 14-16m	<0.1	0.23	151	15	<10	10	123	34	7	<15	87	58	24	48	<10	<10	21	10
OLL 16-18m	<0.1	0.26	146	10	<10	11	121	35	12	<15	84	64	24	55	<10	<10	20	14
OLL 18-20m	<0.1	0.16	158	<10	<10	13	117	36	11	<15	85	84	23	58	<10	<10	18	<10
OLL 20-22m	<0.1	0.1	201	16	<10	14	100	27	<5	<15	60	49	17	30	<10	<10	16	10
OLL 22-24m	<0.1	0.15	160	<10	<10	<10	124	34	9	<15	79	71	21	46	<10	<10	22	14
OLL 24-26m	<0.1	0.19	139	15	<10	<10	127	37	9	<15	93	69	31	63	<10	<10	25	<10
OLL 26-28m	<0.1	0.2	147	11	<10	<10	128	36	<5	<15	80	53	30	48	<10	<10	21	17
OLL 28-30m	<0.1	0.18	170	15	<10	13	111	36	<5	<15	80	82	28	51	<10	<10	25	<10

MINERAL CHEMISTRY

ILMENITE	Stratigraphic depth (m)	MgO	Al2O3	TiO2	V2O3	Cr2O3	MnO	FeO	Total
Sample: MJÅ 2.69	-0.91	2.57	0.15	51.76	0.35	-0.01	0.23	44.92	99.97
Sample: MJÅ 6.28	-2.14	1.98	0.12	49.96	0.50	-0.02	0.51	46.33	99.38
Sample: MJÅ 14.57	-4.95	1.67	0.13	49.92	0.37	-0.02	0.24	46.29	98.60
Sample: MJÅ 19.54	-6.64	2.42	0.14	50.50	0.40	0.02	0.22	44.57	98.27
Sample: MJÅ 24.63 (29712)	-8.37	2.00	0.20	49.43	0.44	-0.01	0.21	46.41	98.68
Sample: MJÅ 29.68	-10.09	2.59	0.15	49.95	0.35	-0.01	0.23	44.88	98.14
Sample: OLL_1.9	-1.87	1.29	0.10	49.14	0.43	-0.01	0.23	49.00	100.18
Sample: OLL_5.85	-5.75	1.28	0.20	49.19	0.42	0.00	0.23	48.05	99.37
Sample: OLL10.15	-9.98	1.29	0.22	48.49	0.41	0.00	0.25	48.10	98.76
Sample: OLL_17.18	-16.89	0.70	0.14	49.31	0.39	0.00	0.25	49.00	99.79
Sample: OLL_23.17	-22.78	1.92	0.06	49.83	0.37	-0.02	0.25	48.74	101.15
Sample: OLL29.73	-29.23	1.23	0.26	48.75	0.45	0.00	0.26	47.98	98.93

MAGNETITE	Stratigraphic depth (m)	MgO	Al2O3	TiO2	V2O3	Cr2O3	MnO	FeO	Total
Sample: MJÅ 2.69	-0.91	0.43	2.90	2.89	0.92	0.02	0.03	85.91	93.10
Sample: MJÅ 6.28	-2.14	0.14	1.55	3.01	0.59	0.00	0.03	86.13	91.45
Sample: MJÅ 14.57	-4.95	0.20	2.63	3.00	0.90	0.04	0.03	86.94	93.74
Sample: MJÅ 19.54	-6.64	0.34	4.14	3.46	0.92	0.01	0.04	84.65	93.56
Sample: MJÅ 24.63	-8.37	0.29	1.83	0.80	0.99	0.03	-0.02	87.00	90.92
Sample: MJÅ 29.68	-10.09	0.36	2.17	1.86	0.98	0.02	0.01	87.64	93.04
Sample: OLL_1.9	-1.87	0.11	0.69	0.08	0.89	0.03	0.00	91.52	93.32
Sample: OLL_5.85	-5.75	0.13	0.66	0.04	0.97	0.03	-0.01	89.79	91.61
Sample: OLL10.15	-9.98	0.20	0.72	0.20	0.89	0.01	0.00	89.93	91.95
Sample: OLL_17.18	-16.89	0.17	0.66	0.16	0.92	0.03	-0.02	90.38	92.30
Sample: OLL_23.17	-22.78	0.12	0.75	0.11	0.84	0.02	0.01	91.65	93.50
Sample: OLL29.73	-29.23	0.05	0.78	0.04	0.92	0.04	-0.01	89.58	91.40