Natural Environment Research Council

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Mineral Reconnaissance Programme Report

A report prepared for the Department of Industry

No. 3

Molybdenite mineralisation in Precambrian rocks near Lairg, Scotland

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Molybdenite mineralisation in Precambrian rocks, near Lairg, Scotland

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Summary

Low grade molybdenite mineralisation is intermittently exposed in Moinian and Lewisian rocks intruded by Caledonian granites to the west of Lairg in Sutherland, Scotland. Molybdenite occurs predominantly with pyrite in thin post-foliation quartz veins and as coatings to joints and foliation planes in the schists and gneisses. Chalcopyrite, fluorite and bismuth minerals sometimes occur as accessories. Galena, baryte and sphalerite are also present in narrow brecciated zones and small veins. Sampling of sparse rock exposures and of cores from a series of shallow boreholes drilled through peat and glacial deposits shows the molybdenum and copper concentrations to average less than 100 ppm. The regional distribution of mineralisation appears to be related to the presence of small late-Caledonian granites containing traces of molybdenite, but the local controls are mainly structural and include zones of thrusting associated with the Moine-Lewisian boundary.

Introduction

Earlier investigations in the Lairg area of Scotland indicated the presence of small amounts of molybdenite in two Caledonian granites and some enrichment of Mo in later galena-fluorite veins (Gallagher, 1970; Gallagher and others, 1971; Michie and others, 1973). Molybdenum anomalies were subsequently identified from the geochemical map of the region (Plant and others, 1972), in streams draining the Precambrian metamorphic rocks intruded by these granites. In this region, recognition of significant Mo anomalies is enhanced by the low geochemical relief of this metal, values of 6 ppm Mo and above being rare except in some localised areas of Lewisian gneiss, Caledonian granite and Devonian (Old Red Sandstone) sediments. The present investigation comprised revision geological mapping (J. D. P.), drainage and soil sampling, the examination of outcrops and boulders for mineralisation, shallow drilling for overburden and bedrock samples, petrographical and mineralogical studies (L. H.), geochemical analysis of more than 1000 samples, and geophysical surveys in and around the area depicted in Figs. 1 and 2. Full details of the geochemistry, mineralogy and petrographical characteristics of the surface and borehole rock samples are listed in Appendices 1 and 2 respectively. These investigations formed part of the Mineral Reconnaissance Programme being undertaken in several areas of the UK on behalf of the Department of Industry. The investigations so far completed have established that molybdenite mineralisation occurs intermittently in the Precambrian metamorphic rocks over a wide zone roughly defined by the molybdenite-bearing granites, namely the small granite referred to here as the Shin mass in the north-east and the Grudie boss in the south-west. Further mineralogical, isotopic and geochemical studies of the new mineralisation will be reported later.

General Geology

The Lairg area is situated centrally in the belt of Moine metamorphic rocks extending from the Great Glen to the north coast of Scotland. The metamorphic rocks give rise to undulating moorlands which reach a height of about 400 m but fall away rapidly to the valleys occupied by Loch Shin and by the major east and south-east draining rivers. Since the publication of the Geological Survey One-Inch Lairg (102) Sheet and the accompanying memoir (Read and others, 1926) there has been no general re-examination of the ground. However, certain hornblendic rocks have been further investigated (Winchester and Lambert, 1970) and work has been carried out on the metamorphic and structual history of the region as a whole (Soper and Brown, 1971).

The area, over most of which rock exposure is poor, is underlain by metamorphic

rocks of the Moine assemblage together with subsidiary sheets of Lewisian gneisses (in part hornblendic rocks of Durcha Type (Read and others, 1926)). Between Lairg and the lower Grudie Burn there are a number of major and minor intrusions of late Caledonian pink granite (including the Grudie granite) and earlier foliated granodiorite allied to the Rogart granodiorite (Soper, 1963) to the east. Scyelite, appinite, and microgranite form a number of small bosses and sills and there are intercalations of hornblende-schist (Read and others, 1926).

The Moine strata comprise for the most part sparsely micaceous psammites. Thick bands composed mainly of micaceous psammite with subsidiary semipelite[1] are also present, but are difficult or impossible to map because of poor exposure. An additional complication is the presence within the broad band of micaceous psammite west of the Grudie granite (Fig. 1) of numerous sheets of fine grained Lewisian acid gneiss. These may be inter-banded on a very fine scale with Moinian rocks, bands being of the order of centimetres rather than metres, and compositionally they differ from the Moinian rocks in containing slightly more biotite and occasional hornblende and epidote-rich partings. Moinian, micaceous and sparsely micaceous psammites are locally pebbly with clasts of quartz and feldspar; cross-bedding is retained in a few places. Calc-silicate ribs are rare. Laminae of heavy minerals (mainly hematite and magnetite) are present at some localities in siliceous psammite. Segregation of, or introduction of, quartz and feldspar to form augen and lit-par-lit gneisses is sometimes seen in more micaceous rocks and bands of red feldspar were noted in pink sparsely micaceous psammite in boreholes 14 and 15 west of the head of the Allt a'Chlaonaidh.

The Lewisian rocks are mainly quartzo-feldspathic, biotitic, and hornblendic gneisses and schists with subsidiary calc-silicate gneisses and marble (the Shinness Limestone (Read and others, 1926; Winchester and Lambert, 1970)). In the Grudie Burn north-east of the Grudie granite and in cores from boreholes west of the granite, they are intimately intercalated with stripes and bands of siliceous granulite and semipelite of Moine aspect. The contacts of some of the Lewisian sheets are marked by platy muscovitic schists and gneisses. In such rocks there is an unusually well marked platy foliation and they contain a much higher proportion of muscovite than is normal in either the Moine or Lewisian. They are thought to be 'slide rocks' which were reconsituted from other rock types during the movements which led to the intercalation of Lewisian and Moine (Peacock, 1975).

The Moine rocks with the subsidiary sheets of Lewisian are disposed as a complex dome, the longer axis of which is parallel to but several kilometres west of Loch Shin. In the Loch Shin area there is a structural succession in which massive psammites retaining eastward-facing cross-bedding are interbedded with Lewisian sheets and slide rocks and with thinly bedded strata with numerous 'stacked' tight minor folds characterised by axial-plane schistosity and a strong east or south-east plunging lineation. This type of succession can be traced from Loch Shin southwards and westwards of the area in Fig. 1 to the River Cassley. The minor folds, which can be correlated with the 'F2' folds of the area, are poorly developed in the slide rocks, and it is not clear whether or not they fold the foliation, including the platiness. Late, open to very tight brittle folds account for major swings of strike in the area south and east of the Grudie granite.

The igneous rocks within the area of the map comprise granite of Grudie type, a foliated granodiorite referred to here as the Claonel mass, and minor intrusions of granitic rocks. Pink granite of Grudie type forms two discrete cross-cutting bodies, the Grudie granite proper and the smaller Shin granite. In addition, veins of microgranite and felsite in the Allt a'Chlaonaidh section resemble the two larger bodies both mineralogically and texturally. The granite is strictly an adamellite with sparse biotite, and plagioclase in excess of orthoclase. Some of the quartz characteristically occurs as blebs. The Claonel granodiorite is grey in hand specimen, and differs from the Grudie type in that it contains altered biotite and hornblende each forming about 10 per cent by volume, and is commonly foliated. It is seen to be intrusive and the foliation is parallel to that in the country rock. In the Grudie Burn (594 053) [2]

[1] The mica content of various rock types is very approximately as follows: pelite 40%, semipelite 20–40%, psammite 20%

[2] National Grid References in this Report fall within the 100 km grid square NC unless otherwise stated.

Table 1. Concentrations of some metals in major rock-types of the Lairg area, Sutherland.

		No. of samples	Mn	Ni	Cu	Zn	Mo	Pb	U
1a.	Shin granite, surface samples.	4	220	5	8	30	3	25	8
b.	Shin granite, drill cores from boreholes 2, 3, 5, 6 and 8.		nd	3	3	38	6	6	
2a.	Grudie granite, surface samples*	11	220	5	8	70	3·5	40	9
b.	Grudie granite, drill cores from boreholes 33 and 50.		nd	2	4	28	3	14	
3.	Claonel granodiorite.	4	1000	70	2	70	0	10	2
4.	Moinian rocks, mainly psammite.	40	400	12	7	18	0	10	1
5.	Probable Lewisian.	21	800	30	15	30	0	10	2

* From Gallagher and others (1971), Table 2; one sample containing 160 ppm Mo was excluded in calculating the average Mo content.
nd: below the limit of detection.

there is a sheet of hornblende adamellite, and several sheets of biotite microgranodiorite occur in the Allt a Mhuic section (553 074). None of the minor intrusions is obviously related to the major bodies.

Deep decomposition in the metamorphic rocks west of the Grudie granite (indicated in Fig. 1) is now known from boreholes, to be more extensive than originally inferred from surface exposures. Elsewhere it occurs in stream exposures south of the Grudie granite, and pockets of decomposition are developed in rocks exposed north of the Shin granite. Bleaching and disaggregation of the rocks reaches depths of only 14 m (as in Borehole 26) suggesting that the decomposition is almost certainly a weathering effect and not related to hydrothermal activity connected with the mineralisation.

Trace metal content of major rock-types: The concentrations of some trace metals in surface samples of the three principal Caledonian granitic masses of the Lairg area (A1T3-4)[1] are given in Table 1 together with comparable data on Moine (A1T2) and probable Lewisian (A1T1) rocks free of visible mineralisation. From these data it can be concluded that Mo, U, Pb, and Cu are enriched in the adamellites of the Shin and Grudie masses compared with the Claonel granodiorite. Analysis of drill cores confirms the higher Mo and U contents of the adamellites but Cu and Pb values are similar to those of the granodiorite (see Table 1). The mainly Moine psammites are low in all these metals and compared with those rocks regarded as Lewisian they are somewhat depleted in Mo, Ni, Zn, Cu and U. The Claonel granodiorite shows the highest Ni and Mn values (A1T3).

[1] Appendix 1, Tables 3 and 4.

Geochemical Anomalies

Stream sediments: Guided by the results of the regional geochemical mapping (Plant and others, 1972), drainage sampling to the higher density of 3 to 5 samples/km^2 has been carried out over an area of some 200 km^2 and results available for Mo in a central 30 km^2 district are presented in Fig. 2. Molybdenum dispersion in -150 m sediment from streams eroding mainly peat and glacial till is

especially pronounced in districts of poor relief, for example, in the area underlain by superficially decomposed metamorphic rocks to the north-west of the Grudie granite where the alluvial sediments are typically fine grained and organic-rich. Comparison of Figs. 1 and 2 shows that almost all Mo anomalies in stream sediments are traceable to mineralised bedrock sources either in outcrop or borehole. Further work is in progress to determine the source of Mo (and Cu) anomalies developed in stream courses running southwards to the Grudie Burn in the district of the Grudie granite. The anomalous value shown in the extreme south-west of Fig. 2 has been traced to minor molybdenite mineralisation in schists.

Some limonitic precipitates developed on small spring sites were sampled to provide supplementary geochemical coverage but Mo was enriched only in districts where molybdenite mineralisation was known to occur. Experimentation with a water-suspended 'fines' fraction of alluvial sediment, comprising organic matter plus silt and clay-grade material, demonstrated improved contrast for Cu as well as Mo compared with normal stream sediment samples (Leake and Smith, in press). But, this method of sampling did not lead to the detection of new Mo anomalies. In all sample types the correlation between Mo and other metals is low, with the exception of Mn which is significantly correlated at the 95 per cent confidence level. Molybdenum anomalies attributable to discrete mineralisation however, are not obscured by such co-precipitation of Mo with either Mn or Fe in the stream sediment samples.

Widespread Ba anomalies were also detected in the area and traced to baryte mineralisation principally in the form of veins and breccias with minor amounts of galena. Analysis of panned concentrates is a particularly effective means of locating mineralisation of this type (Leake and Smith, in press). Ba, Cu and Pb are also anomalous in streams north of the Shin granite where fracture-bound polymetallic mineralisation is located (Fig. 1).

Glacial deposits: The till deposits of the Lairg area usually consist of angular fragments up to boulder size set in a matrix of sand and clay. They appear to be lodgement or melt-out tills in which material related closely to the local bedrock is concentrated towards the profile base. The middle and upper parts of the till are rich in farther-travelled clasts, and debris derived by solifluction from nearby solid exposures sometimes occurs in the uppermost parts of the profiles. Small morainic deposits occurring on the southern extrapolation of the galena-fluorite veins exposed at the south-east edge of the Grudie granite contain metal concentrations, notably Pb, which is enriched in the lower horizons of overburden profiles 1.5 to 2.5 m thick (A1T5). Analysis of 50 channel samples from 80 m of trenched moraine yielded averages of 12 ppm Cu, 125 ppm Zn, 30 ppm Mo, 400 ppm Pb, and 2 ppm U (A1T6-7).

Because of the variation in the depth and nature of overburden in the area, and the general lack of rock exposures, shallow drill holes were used to establish geochemical profiles through the peat and till deposits, in order to determine the role of both mechanical and hydromorphic factors in metal transport through overburden. The mean overburden thickness was 4.3 m (range 1 to 15 m) with till as the main component.

After initial difficulties in recovering the sand and clay fractions of till (in boreholes 1-10, Table 2) satisfactory recovery was achieved in almost all later boreholes using a specially modified rotary drilling technique. Preliminary geochemical analysis of till cores from localities now known to be underlain by mineralised schists and gneisses suggest that Mo is concentrated in the finer fractions of basal till. Further studies are in hand however, to identify the optimum sampling horizons and the particle size fractions best suited for chemical analysis. Results from this orientation study in the Lairg area should provide a basis for applying this type of sampling to comparable glaciated areas of Britain.

Soils: The enrichment of Mo, Pb, U and other metals in peat and organic-rich soils has already been noted from the south-east margin of the Grudie granite (Gallagher and others, 1971). There is also a striking accumulation of Mo in the surficial waterlogged organic debris of a small basin peat bog west of the Grudie granite (515 045). Anomalies of up to 300 ppm Mo occurring in organic samples from shallow drainage channels at the margins of the basin can be related to heavy precipitation of iron-hydroxide. In contrast, Mo seldom exceeds 20 ppm in the more freely drained peats from the hill slopes west of the bog where molybdenite mineralisation is known to occur. However, values can increase to 50 to 100 ppm Mo in the podsolic soils (pH 5.0 to 6.0) beneath the hill peats (pH 3.3 to 4.5).

Molybdenite mineralisation in stream exposures of the upper Allt a'Chlaonaidh has been traced for a short distance south-westwards by sampling of surficial peat and, more satisfactorily, the clay-rich B-horizon podsolic soils which are geochemically less susceptible to variable drainage and topographic conditions. The thickness of peat cover can, however, preclude sampling of this soil horizon by manual auger. Recently, soil sampling in the area has been effected successfully with a mechanical auger.

Mineralisation

Molybdenite has been recognised in sparse rock outcrops, transported boulders, and cores from shallow boreholes, in a zone up to 3 km in width extending for some 6 km south-westwards from lower Loch Shin. Several other ore minerals are also present in small amounts (chalcopyrite, galena, fluorite and baryte), while traces of bismuth minerals, sphalerite and scheelite also occur. In the Precambrian schists and gneisses molybdenite is mainly found with major pyrite, in post-foliation quartz veinlets and as coatings to foliation planes and joints. Chalcopyrite, fluorite, bismuth minerals and scheelite are accessories. Molybdenite in the Shin and Grudie granites is developed with pyrite and fluorite either in quartz veinlets or as scattered grains. Chalcopyrite and galena occur locally in small veins and breccia zones in the metamorphic rocks with fluorite or baryte, and are associated with the only significant development of sphalerite in the area, in a quartz vein cutting the Shin granite.

Galena has previously been described from quartz-hematite-baryte-fluorite veins cutting the Grudie granite and adjacent Moinian rocks (Gallagher, 1970); it also occurs with baryte in fault fillings (520 002). The traces of Sn, W and Bi accompanying minor Mo enrichments in the Grudie galena veins (A1T4) were also noted in some of the new occurences of molybdenite and other sulphides. Among these, members of the bismuthinite [Bi_2S_3] - aikinite [$2PbS,Cu_2S,Bi_2S_3$] series have been identified from the Shin granite as well as from quartz veins and joint coatings in the metamorphic rocks (C. M. Rice, personal cummunication). The rare mineral betechtinite [$Pb_2(Cu,Fe)_{21}S_{15}$] is associated with the Grudie galena veins.

Drilling results: Some evidence of the lithology and mineralisation of the concealed rocks in a central zone of some 7 km^2 between lower Loch Shin and the area to the south and west of the Grudie granite, has been obtained from short bedrock intersections in most of the 52 shallow boreholes drilled for overburden sampling (see Fig. 1 and the 52 tables forming Appendix 2). Molybdenite is present in cores from 21 of the 46 holes that penetrated bedrock, the most notable concentrations occurring in two districts: west of the head of Allt a'Chlaonaidh (550 058); and north-west of the Grudie granite (512 045). Both have an elevation of around 260 m OD. From borehole and outcrop evidence it is estimated that molybdenite mineralisation could extend over at least 500 by 400 m in the first district and in the second over a minimum of 800 by 600 m.

Mineralised schists were intersected in five boreholes (Nos. 13-17) near Allt a'Chlaonaidh, while 9 of the 19 boreholes drilled to bedrock in the schists and gneisses of the west Grudie district proved molybdenite (Nos. 26, 29, 38, 41-43, 46-48).

Descriptions of the principal mineral localities follow.

Loch Shin: In the north-east of the map area (Fig. 1) there are numerous small mineral occurrences of which the most conspicuous lies in the Shin granite near the edge of Loch Shin (563 066). Fine grained sulphides (pyrite, sphalerite, chalcopyrite, covellite and galena (Rice and Cope, 1973)) occur in a zone of grey quartz veining trending 150°, 1·8 m wide over 12·5 m of exposed strike. Specimens of the sulphide assemblage grade 0·57 per cent Cu, 3·05 per cent Zn and 0·05 per cent Pb (CBR 319) and are enriched in Bi (4200 ppm) Ag and Cd but contain only 3 ppm Mo. Traces of U (3 ppm) and Hg (60 ppb) are also present. Barren quartz veining extends into the hanging-wall (south-west) and the adjacent granite is locally enriched in molybdenite. A comparison can be drawn between the polymetallic mineralisation associated with the Shin granite and that developed at Alice Arm, B. C., where bismuth minerals occur with sphalerite and galena in late fractures post-dating the main phase of molybdenite mineralisation (Woodcock and others, 1966). Although molybdenite pyrite and fluorite are scattered throughout the Shin granite, only a few ppm Mo are shown by analysis of small rock samples (Table 1 and A1T3) and drill cores (borehole nos. 2-3, 5-6, 8-9 in Table 2; A2T2-3, 5-6, 8-9). The same minerals occur with chalcopyrite and galena in the surrounding schists and gneisses coating joint and foliation planes and in thin quartz veins (as in boreholes 7 and 10). The relatively high Mo content (60 ppm) shown by

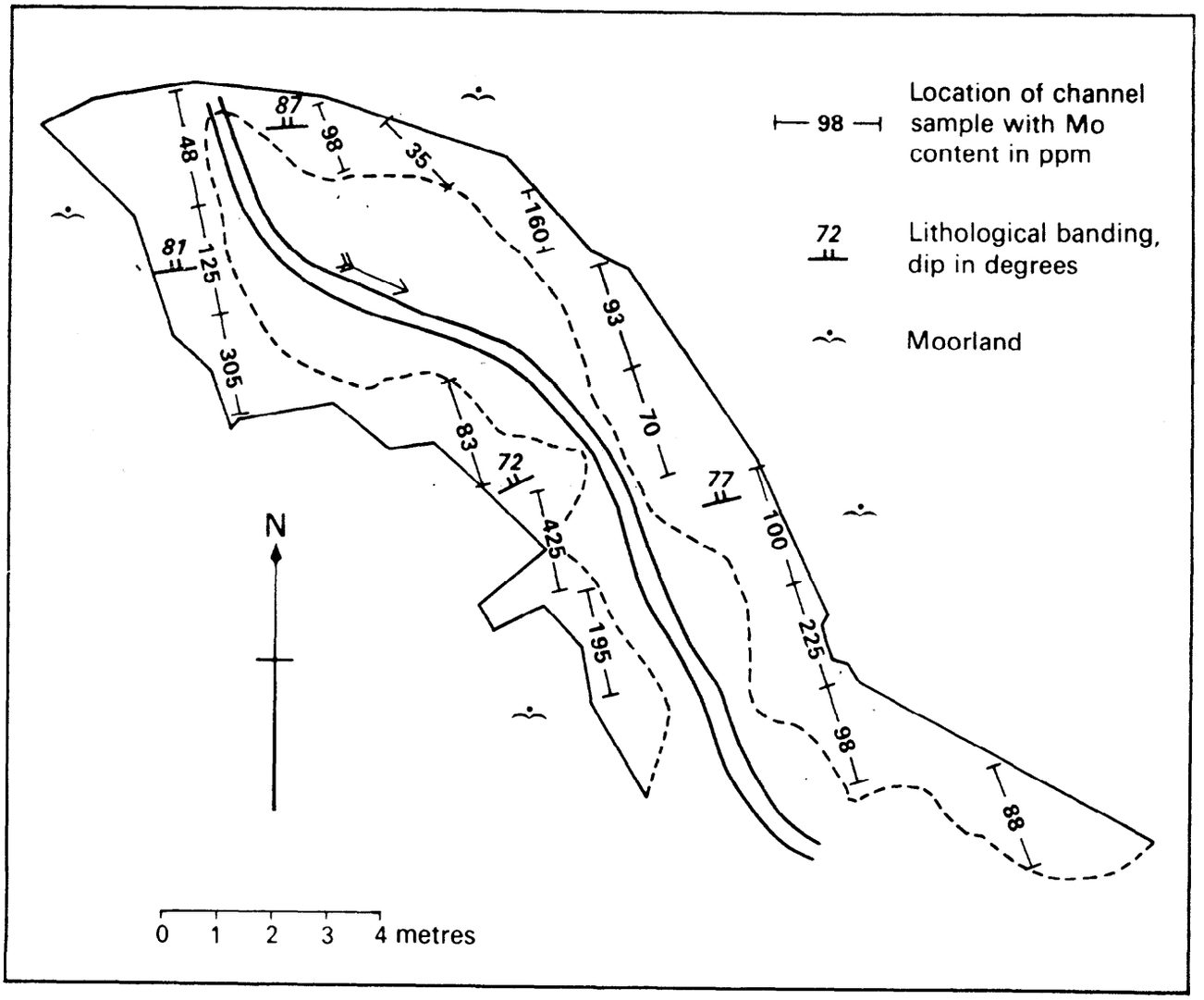

Fig. 3. Molybdenum content of channel samples from mineralised schists exposed in the stream banks of upper Allt a'Chlaonaidh (553 658), west of Lairg

a small bedrock sample from borehole 4 (A2T4) is contained in a rock similar to the platy schists of upper Allt a'Chlaonaidh described below. High Ni, Cu and Zn values shown against Borehole 9 are concentrated in a calcareous schist (thought to be Lewisian) in psammites beneath what appears to be a shallow-dipping south-east contact to the Shin granite. Biotite gneiss intersected by Borehole 7 (A2T7) is also enriched in these metals.

North of the Shin granite chalcopyrite, galena and fluorite are present in small quartz-baryte breccia veins in Moine schists and brecciated Lewisian gneisses (A1T8; CBR 344, 345, 330). These exposures are in approximate alignment with the polymetallic quartz vein in the Shin granite. Near the north-eastern edge of the map area a narrow quartz-pyrite-molybdenite vein in gneiss is enriched in Cu and Bi. Further north, several mineralised boulders have been found which are regarded as Lewisian calcereous rocks displaying mineral assemblages representative of several metamorphic grades. In a banded quartz-tremolite-diopside rock containing 0·2 per cent Cu, the diopside is unaltered despite the presence of abundant granular pyrite and minor chalcopyrite, indicating that this sulphide mineralisation was contemporaneous with high-grade metamorphism (A1T8: CBR 3100). Although only traces of Mo are associated with the sulphides, it may be significant in considering possible loci of metal enrichment that molybdenite is known from the Shinness marble (Gallagher and others, 1971), now regarded as Lewisian (Winchester and Lambert, 1970), on the east side of Loch Shin.

Claonel: The principal exposure of molybdenite mineralisation in the area is in platy schists located at the head of Allt a'Chlaonaidh (Fig. 1). The molybdenite occurs with titaniferous magnetite and hematite in quartz-pyrite veinlets 1 to 5 cm in thickness generally trending east-north-east closely parallel to, or occasionally crosscutting, the pronounced platy foliation in the schists which are regarded as slide rocks probably related to a Moinian-Lewisian boundary.

Mineralogically the rocks are semipelitic and psammitic schists in which plagioclase is at least as abundant as quartz, potassium-feldspar is rare and garnet pseudomorphs may be present (Haynes, 1974a). Locally, particularly in the vicinity of larger quartz veins, the rock is granitised and gneissose texture is sometimes developed. The quartz veins themselves are often brecciated, and contain rare granitic or pegmatitic inclusions as well as abundant pyrite and molybdenite, the latter usually confined to vein margins. Along quartz-vein boundaries a zone of orthoclase-quartz may be developed, passing outwards into zones where sericite (after plagioclase) has been upgraded to muscovite and eventually into unaltered rock over a distance of only a few centimetres from the vein. The relatively unaltered rock contains a low grade assemblage of quartz, sericitised plagioclase and chlorite occasionally intergrown with muscovite and hematite. Green biotite is sometimes present and chlorite is upgraded to biotite in areas where fresh muscovite porphyroblasts have grown from sericite.

Textural evidence suggests that the introduction of high temperature quartz-sulphide veins is accompanied by granitisation in the immediately adjacent schists resulting in quartz-feldspar 'lits', that is, overgrowths of microcline on plagioclase, and the formation of zones of intimately intergrown quartz and potassium-feldspar. New growth of muscovite and biotite occurs locally in the immediately adjacent schists but only one or two centimetres away the schists have suffered low grade retrogressive metamorphism causing sericitisation of plagioclase and regression of garnet and biotite to chlorite and iron oxide. Occasionally, even the chlorite and sericite is partially replaced by carbonate. Late carbonate-hematite-sericite-quartz veinlets with little or no sulphides are sometimes present.

The quartz veins being mainly concordant with the platy foliation, have clearly been introduced along well defined structural lines. The Mo contents of channel samples taken from an excavated exposure on the banks of the stream is shown in Fig. 3. These average 110 ppm Mo over 15·7 m on the east bank and 200 ppm Mo over 12·0 m on the west bank (A1T10). Molybdenite-bearing quartz veins are sporadically exposed in schists to the south-east of this location for some 60 m across the strike and there are minor molybdenite-pyrite showings in psammites cut by the stream before it enters the Claonel granodiorite. Except in a 15 cm thick gouge developed on a small fault where Pb and Cu are enriched (A1T9; CBR 544), the only other valuable metals associated with the molybdenite mineralisation are Bi and W which reach maximum values of 75 ppm and 100 ppm respectively in a rock locally containing 1 per cent Mo. Anomalous W values also occur in quartz-hematite breccias sporadically exposed in psammitic schists and granite cut by the upper course of

Allt a'Chlaonaidh and shown as a fault line on the One-Inch Lairg (102) Sheet.

A line of shallow boreholes (Nos. 13 to 20; A2T13-20), drilled westwards of the head of Allt a'Chlaonaidh, intersected weak molybdenite-pyrite mineralisation in psammite and micaceous psammite affected by fracturing, quartz veining and granite veining. The rocks in these boreholes show many textural features similar to those from the Allt a'Chlaonaidh section, although the rocks are generally more psammitic and less platy (Haynes, 1974b). Quartz vein boundaries are characterised by the development of quartz-potassium feldspar zones and microcline overgrowths on plagioclase in granitised psammite, while a few centimetres away plagioclase is heavily sericitised, chlorite replaced by carbonate and iron oxide, and cross-cutting carbonate-quartz-pyrite-rutile veinlets are present. Minor amounts of a yellowish-coloured secondary molybdenum compound absorbed on clay coating joint surfaces were noted in core from Borehole 17.

Mineralisation associated with the Claonel granodiorite appears to be limited to small chalcopyrite occurrences at its contact. Recent drilling on induced polarisation anomalies detected by colleagues in the Applied Geophysics Unit has located only traces of galena, chalcopyrite and molybdenite occurring with pyrite at or near the north-west contact of the mass.

Grudie Burn: North-westerly trending quartz-hematite breccias are exposed at several localities in an area of Moine schists between Allt a'Chlaonaidh and Grudie Burn (A1T11; CBR 630 for example). The fault marked on the One-Inch Lairg (102) Sheet running east-south-east from the A839 road (south of the map area in Fig. 1) to the River Shin is also accompanied by quartz-hematite veining and irregular baryte veinlets up to 50 cm in thickness (A1T11; CBR 108). This surface mineralisation does not include galena in contrast to the north-north-westerly trending quartz-hematite-baryte veining at the south-east margin of the Grudie granite which carries galena and fluorite (A1T4). Here the Moine rocks are somewhat brecciated psammites, locally recrystallised and granite-veined near the granite contact. The new mapping of stream exposures in lower Grudie Burn shows that galena-chalcopyrite-fluorite mineralisation at the A839 road bridge (Gallagher, 1970) occurs in chlorite-rich schist (A1T12; CBR 590). A boulder of semipelitic schist, found near the north-east edge of the Grudie granite, contains galena in a narrow vein with smithsonite and purple fluorite (A1T12; CBR 396).

Boreholes drilled across the valley of Grudie Burn intersected mainly barren psammite and micaceous psammite (Nos. 21, 22, 24, 25) and granitised schist (27) near the northern contact of the Grudie granite, but small enrichments of Pb and Zn were observed in psammite in Borehole 23 and high Mo, Pb and Cu values in the basal till at Borehole 24 (A2T24). Traces of joint-surface molybdenite are present in Lewisian rocks north of the granite (533 061).

West Grudie: In the metamorphic rocks north-west of the Grudie granite molybdenite is developed in two stream exposures forming the only significant outcrops in an area of some 2 km^2. Near the head of the 'Moly' burn (514 044) molybdenite occurs with pyrite and traces of chalcopyrite, fluorite, a bismuth mineral and scheelite on joint surfaces and in quartz veins within micaceous psammite and interbanded Lewisian rocks (A1T13). Analyses show ranges of 30 to 360 ppm Mo and 20 to 90 ppm Cu in small selected samples (A1T14). A relatively deep borehole drilled a short distance to the north (No. 26; A2T26) intersected mainly Lewisian gneisses with intermittent molybdenite-chalcopyrite mineralisation occuring chiefly in quartz veins. Averages of 37 ppm Mo and 58 ppm Cu were obtained on some 30 m of core (30 samples). The second stream exposure of note is in the middle reaches of Allt a'Choire (515 052) where molybdenite occurs with pyrite in bands of quartz-feldspar and quartz in micaceous psammite and semipelite (A1T13). Analysis of two small samples yielded 14 and 53 ppm Mo (A1T14) while from an adjacent shallow borehole some 3 m of core averaged 74 ppm Mo and 60 ppm Cu (Borehole 48, Table 2; A2T48). Numerous mineralised boulders occur in the headwaters of both burns.

Of 7 boreholes drilled to bedrock within 0.5 km of the north-western edge of the Grudie granite (Nos. 28, 29, 32, 34 - 37) only two proved molybdenite, whereas mineralisation was detected in 8 of 11 successful holes (Nos. 26, 38, 40 - 48) drilled at distances of 0.5 to 1.25 km from the granite contact (see relevant tables in Appendix 2). The first group of holes intersected predominantly Moine psammites but in the second group micaceous psammite, psammite and a variety of rocks regarded as Lewisian are present (Haynes, 1974a; 1974b). As in the Allt a'Chlaonaidh section, quartz veins are

Table 2. Concentrations of some metals in drill core samples of Precambrian rocks and Caledonian granite from shallow boreholes near Lairg, Sutherland.

Borehole No.	Overburden thickness m	Bedrock intersection m	Main bedrock type (s)	Weighted average ppm						Borehole No.	Overburden thickness m	Bedrock intersection m	Main bedrock type(s)	Weighted average ppm					
				Ni	Cu	Zn	Mo	Pb	U					Ni	Cu	Zn	Mo	Pb	U
1	8.84	-	? Shin granite	-	-	-	-	-		27	11.66	10.91	granitoid psammite, schist	6	8	29	2	31	5.9
2	2.30	2.95	Shin granite	6	nd	40	4	nd	6.5	28	11.20	0.35	micaceous psammite	nd	5	20	4	10	8.0
3	3.25	0.25	Shin granite	5	nd	40	8	nd	13.0	29	2.54	8.69	micaceous psammite	12	54	19	25	5	1.4
4	7.40	0.22	*micaceous psammite	35	150	70	60	10	4.8	30	10.92	-	? psammite	-	-	-	-	-	
5	3.50	11.41	Shin granite	4	4	35	6	5	11.0	31	15.50	-	? psammite	-	-	-	-	-	
6	4.07	2.84	Shin granite	nd	nd	38	8	6	8.5	32	7.22	1.63	psammite	5	8	10	1	nd	2.3
7	4.72	1.20	Lewisian	62	58	80	16	nd	3.1	33	1.10	8.00	Grudie granite	2	3	26	4	15	7.5
8	2.28	1.56	Shin granite	nd	nd	50	2	20	5.5	34	2.22	2.50	psammite	5	6	7	3	nd	0.8
9	3.80	4.30	Shin granite, psammite & Lewisian	159	42	58	2	11	2.8	35	4.76	2.81	psammite	8	13	30	1	nd	2.1
10	6.83	2.13	micaceous psammite	15	29	40	32	5	2.3	36	4.41	3.04	psammite	4	16	28	6	7	2.3
11	3.20	3.40	micaceous psammite	7	15	37	2	nd	3.8	37	2.61	3.89	psammite	54	330	48	11	14	3.4
12	3.90	-	? psammite	-	-	-	-	-		38	4.03	3.87	psammite, ? Lewisian	19	19	31	17	7	1.8
13	2.16	5.14	psammite	12	7	22	27	8	1.7	39	4.51	-	? psammite	-	-	-	-	-	-
14	2.08	2.67	psammite	13	18	28	30	15	2.1	40	2.75	2.79	psammite	6	14	24	6	9	1.0
15	4.65	7.71	psammite and semipelite	28	51	52	23	13	2.5	41	5.20	3.87	psammite	5	64	26	9	14	1.7
16	1.28	4.19	micaceous psammite	35	9	66	75	30	3.6	42	1.89	3.81	psammite	11	23	25	18	nd	1.9
17	1.65	5.35	psammite	nd	10	10	46	10	1.1	43	5.90	3.18	probable Lewisian	10	47	10	29	nd	1.2
18	2.51	1.96	psammite	3	8	15	2	10	1.4	44	2.96	1.88	micaceous psammite	8	21	nd	24	nd	1.3
19	1.47	2.56	micaceous psammite	nd	5	10	1	10	1.1	45	4.32	6.35	micaceous psammite	27	27	29	7	4	1.6
20	1.65	1.02	micaceous psammite	nd	5	10	2	10	1.4	46	4.80	2.86	Lewisian	28	22	32	18	nd	1.7
21	0.90	2.07	psammite, semipelite	5	10	24	6	10	1.6	47	1.40	4.14	Lewisian	32	30	32	12	5	1.3
22	2.20	1.66	micaceous psammite	10	25	20	2	10	3.0	48	2.51	2.97	Lewisian	9	60	20	74	nd	1.3
23	2.30	0.86	psammite	10	5	200	4	110	1.7	49	5.21	2.67	semipelite psammite	10	15	30	3	10	0.8
24	4.30	2.21	micaceous psammite	10	9	33	4	13	2.3	50	1.25	3.24	Grudie granite	3	6	34	2	10	5.1
25	10.40	-	? psammite	-	-	-	-	-		51	1.90	0.23	semipelite	-	-	-	-	-	-
26	2.23	29.92	Lewisian	18	58	27	37	3	1.4	52	2.81	4.78	psammite and platy schist	16	10	46	18	6	1.0

* Psammite, micaceous psammite and semipelite are varieties of the Moinian assemblage.
nd: below limit of detection.

accompanied by local granitisation and the growth of microcline and muscovite. From this distribution of molybdenum it might be inferred that the relatively micaceous Moine rocks and closely associated Lewisian rocks are the more favourable hosts of molybdenite mineralisation. Although molybdenite is apparently absent from boreholes intersecting granite at the west and south-west contacts of the Grudie granite (Nos. 33 and 50), it does occur with fluorite in quartz veins in platy schists and psammite near the south-west contact (Borehole 52; A2T52).

In stream exposures of Allt Sron nan Iarnachan south-west of the Grudie granite, traces of molybdenite occur with bismuthinite (Rice and Cope, 1973) and chalcopyrite in a quartz (quartz-feldspar) vein 2 to 3 cm thick (A1T15: CBR 054) running parallel to the foliation of the enclosing gneisses (529 034). Fluorite and carbonate are associated minerals and a similar mineral assemblage is developed in the vein wall-rock where garnet pseudomorphs and rutile are present (CBR 055). Copper and bismuth minerals (CBR 034) were also observed in quartz-feldspar veins in platy schists nearby (527 034).

Conclusions

Although the Mo and Cu grades obtained from exposures and shallow boreholes are well below the level for economic exploitation, the broad area over which molybdenite has been recorded would seem to justify further investigations in the Lairg area. The regional distribution of molybdenite mineralisation appears to be related to two small late-Caledonian granites which are themselves weakly enriched in molybdenite. Only traces of mineralisation have so far been detected in a foliated Caledonian granodiorite mass.

The mineralisation so far observed is best developed in the more micaceous rock types of the Moinian, in platy schists and in the newly recognised Lewisian acid gneisses, particularly near the head of Allt a'Chlaonaidh and in an area about 1 km north-west of the Grudie granite. Platy schists are not present at all the areas of molybdenite mineralisation, but petrographic features consistent with those described from the Allt a'Chlaonaidh exposures, where molybdenite mineralisation is associated with high temperature quartz veining, are present in all the principal molybdenite localities. It is concluded on this evidence that there is a structural control to the mineralisation related to the proximity of 'slide rocks' and Lewisian thrust slices. The high temperature quartz veins containing the molybdenite are assumed to have been developed by magmatic processes associated with the emplacement of the molybdenite-bearing Shin and Grudie granites. These granites are regarded as high level intrusions and are petrologically similar to molybdenum-bearing granites at Wolfram Camp, North Queensland (Plimer, 1974). Mineralisation in the Elizabeth Creek Granite at Wolfram Camp is associated with quartz-rich pipes and greisens and is thought to have resulted from resurgent boiling of the magma's aqueous phase on intrusion to higher levels in the crust. Plimer concludes that zoning around silica-rich pipes 'is probably a result of an increase away from the pipes of the pH of initially weakly acidic solutions which have altered the original Elizabeth Creek Granite to a muscovite-rich greisen (+ kaolinite) close to the pipes and further away have sericitised it' (p. 104). Whilst a zonal pattern is not developed in the Shin area, there is evidence that the quartz veining has been produced by similar processes although the silica-rich solutions have entered pre-existing channel ways in the country rocks rather than in the granites themselves.

The paucity of exposure that results from the widespread glacial and peat deposits precludes the establishment of relationships between mineralisation and structure. However, the pattern drilling through overburden into bedrock has established the presence of two areas that seem to merit further investigation. These are west of the head of Allt a'Chlaonaidh and north-west of the Grudie granite. To assist any follow-up that may be deemed worth while, some tentative conclusions relating to the mineralisation are given below.

1. Mo, Cu (Bi) mineralisation is spatially related to the Shin and Grudie granites and formed during or soon after granite emplacement. It appears likely that both the granites and mineralisation are genetically related to a deeper parent magmatic body.

2. Cu, Pb (Zn) mineralisation is probably of later origin although still occurring in close proximity to the granites.

3. Baryte and galena in post-granite veins probably belong to a final phase of mineralisation.

4. Chalcopyrite-pyrite in high-grade metamorphic Lewisian rocks is regarded as a very early mineralisation, which may provide

some clue to the origins of the later ore-forming fluids.

5. The most favourable target areas would seem to be where 'slide rocks' and Lewisian thrust slices occur in proximity to the granites.

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Appendix 1: Geochemical Analyses

Methods of Analysis: The analyses presented in the tables forming Appendix 1 and Appendix 2 were obtained by atomic absorption spectrophotometry (Ni, Cu, Zn, Pb); optical emission spectroscopy (Be, B, Mn, Fe_2O_3, Co, Ni, Sn, Bi); streamlined wet chemistry method (Mo, W, As) and delayed neutron activation analysis (U). In general, the analyses made by optical emission spectroscopy are regarded only as semiquantitative. Some comparative analyses are shown in Table 4. Values are given in ppm unless otherwise stated.

Table 1: Concentrations of some metals in probable Lewisian rocks of the Lairg area, Sutherland

Sample No. (CBR)	Grid Ref.	ppm Be	ppm B	ppm Mn	% Fe_2O_3	ppm Co	ppm Ni	ppm Cu	ppm Zn	ppm Mo	ppm Sn	ppm Pb	ppm Bi	ppm U	Other	Comments
295	519 144	0	0	2400	13.0	56	56	40	30	0	1	10	6	0.3	-	hornblende-schist
555	550 092	2	0	2400	7.5	42	32	20	10	0	3	10	6	1.0	-	amphibolite
556	550 092	0	0	180	0.0	3	6	10	10	0	0	10	6	20	-	acid gneiss
558	550 091	0	32	420	4.2	8	6	30	40	0	2	0	3	0.3	-	biotite-gneiss
559	548 090	0	0	2400	10.0	56	75	20	10	0	3	0	6	0.1	-	hornblende-schist
585	552 089	2	0	320	10.0	32	100	180	60	0	2	10	6	10	-	biotite-gneiss boulder
575	556 075	0	0	560	1.8	8	13	10	20	0	0	10	0	1.3	1.1%K_2O	psammitic gneiss
339	557 075	0	10	100	0.0	2	13	5	0	1	0	0	4	0.3	-	)
338	557 075	0	10	320	1.8	3	10	0	10	0	1	10	0	0.7	-	) acid gneisses
337	557 075	0	0	180	0.0	3	10	0	0	0	0	0	6	0.5	-	)
574	557 075	0	0	130	0.0	6	6	5	0	0	0	10	3	0.4	-	)
570	553 074	4	0	180	1.3	6	3	5	30	0	1	10	2	1.6	3.35%K_2O	pyrite-quartz veins
571	552 073	3	0	320	1.8	4	2	15	40	0	0	10	2	2.1	3.55%K_2O	granitic aspect
240	534 066	0	0	420	1.3	13	32	0	20	1	1	20	3	0.8	-	biotite gneiss
238	534 062	2	0	560	1.3	8	24	0	10	0	2	20	2	0.4	0A_g, 0W	hornblende gneiss
237	533 061	0	13	320	0.0	4	10	0	10	0	1	10	2	0.2	0A_g, 0W	tremolite calcsilicate
236	532 059	13	0	560	2.4	24	42	10	30	0	2	90	4	3.0	0A_g, 5W	tremolite-quartz gneiss
541	558 055	2	0	1000	5.6	32	75	45	130	0	3	10	0	3.1	-	hornblende-gneiss with pyrite-bearing feldspar veins baryte and calcite
540	558 055	3	10	1800	7.5	56	130	40	140	0	2	20	2	1.7	-	hornblende-gneiss
539	560 054	2	10	1300	4.2	18	18	20	60	0	1	20	2	2.5	0As, 0W 3.5%K_2O	biotite-schist
174	541 996*	0	10	560	2.4	13	10	0	20	0	10	10	3	2.5	0A_g	hornblende-gneiss
Averages+		1	5	806	3.3	18	29	15	30	0.1	2	10	3	2.1		

* This grid reference falls in the 100 km square NH

\+ Excluding Sample No. CBR 585

Table 2. Concentrations of some metals in Moine psammites of the Lairg district, Sutherland

Sample No. (CBR)	Grid Ref.		ppm Be	B	Mn	% Fe_2O_3	ppm Co	Ni	Cu	Zn	Mo	Sn	Pb	Bi	U	Other	Comments
																	PSAMMITES
376	492	099	2	0	320	1.3	6	13	0	10	0	1	0	2	1.1	-	
560	520	105	2	13	1000	1.0	6	8	0	10	0	4	10	2	0.8	-	
375	533	107	0	24	100	1.8	6	10	15	10	0	0	0	6	0.7	-	brecciated with baryte
605	523	103	0	13	320	1.8	3	4	5	10	0	0	10	0	0.8	-	
576	527	102	0	10	180	1.0	6	8	0	10	0	0	10	0	0.9	-	
380	501	083	0	0	75	0.0	3	6	10	0	0	2	0	0	0.6	-	baryte veinlets
379	504	083	0	13	320	1.3	4	10	5	10	0	1	0	2	0.6	-	
378	505	083	0	13	1000	1.3	6	10	0	0	0	0	10	2	0.5	-	
377	506	083	0	10	420	1.0	4	10	5	10	0	3	10	2	0.7	-	
235	519	079	0	10	130	0.0	4	6	20	10	1	1	10	2	0.9	-	traces of sulphide
190	483	068	1	13	560	4.2	10	18	5	40	1	18	10	3	1.7	-	pyrite on joint surfaces
078	587	076	0	0	560	1.3	13	18	0	20	0	2	20	3	0.6	0Ag 0W	sheared with hematite
568	553	074	4	0	130	1.0	4	2	5	40	0	0	10	2	1.8	3.45%K_2O	pyrite-quartz veins
567	554	074	0	10	320	1.8	4	8	5	10	0	0	10	3	0.7	4.60%K_2O	muscovitic
266	559	058	0	10	320	1.3	4	10	0	10	1	2	10	8	0.7	-	calcite veinlets
514	555	057	0	10	42	1.8	18	13	10	10	1	1	10	10	1.9	-	minor pyrite
513	555	057	0	10	1300	1.8	24	10	20	10	1	0	10	13	2.9	-	
543	555	057	0	0	320	3.2	13	42	5	20	0	6	0	0	0.8	-	(?) Lewisian psammite
508	555	057	0	10	420	2.4	24	13	10	20	1	6	20	6	1.3	-	
450	553	050	0	0	56	10.0	6	13	5	10	0	8	10	3	1.6	-	hematite laminae
631	550	049	0	13	420	4.2	8	32	5	20	0	2	40	2	1.3	-	
643	554	047	0	32	42	1.0	10	13	10	10	0	2	0	8	0.8	-	
636	550	046	2	24	560	2.4	13	18	5	10	0	2	10	2	1.2	-	hematite veinlets
562	547	046	0	18	750	2.4	8	10	5	20	0	3	0	2	0.6	-	
564	551	045	0	13	180	3.2	10	8	5	10	1	3	20	4	1.3	-	hematite veinlets
456	550	040	6	13	420	3.2	8	13	15	30	0	3	10	0	2.4	-	traces of pyrite
561	553	035	2	13	320	1.3	8	8	10	20	0	3	10	2	1.1	-	
239	523	067	0	0	320	1.0	2	3	0	30	0	1	10	3	1.2	-	cut by calcite
228	529	060	0	10	130	0.0	2	4	0	0	0	1	10	3	0.5	-	granitic aspect;
230	530	057	0	0	240	1.3	4	2	15	40	0	3	10	6	1.8	3.65%K_2O	traces of pyrite
394	544	042	0	0	180	1.0	4	8	5	10	0	2	10	6	0.6	-	
393	550	035	2	10	750	2.4	8	13	0	20	1	2	0	2	2.1	-	granitic veins
140	523	032	0	0	750	1.0	4	10	0	0	0	3	0	0	0.4	0Ag 0W	
057	532	029	0	0	420	2.4	10	10	0	10	0	3	10	2	1.5	0Ag 0W	
162	542	992*	0	0	420	1.0	6	8	10	40	0	3	30	3	2.1	0Ag 0W	
552	581	982*	0	10	240	2.4	13	18	0	30	0	2	0	0	0.9	-	biotitic
																	OTHER ROCKS
563	539	051	8	10	1300	5.6	24	24	10	80	0	4	10	3	4.2	-	Semipelitic schist
167	539	003	2	10	420	3.2	13	42	40	50	0	2	30	4	1.9	0Ag 0W	Semipelitic schist, traces of sulphide
551	580	002	0	10	750	3.2	4	13	0	0	0	1	0	0	1.1	-	calc-silicate band
553	580	975*	4	0	1300	7.5	42	180	45	90	0	2	10	2	0.6	-	biotite-hornblende schist dyke, 2 m wide
Averages			1	9	412	2.1	8	12	7	18	0.2	2	10	3	1.2	-	-

* Falls in the 100 km square NH

Table 3. Concentrations of some metals in granitic rocks of the Lairg area, Sutherland

Sample No. (CBR)	Grid Ref.	Be	B	Mn	Fe_2O_3	Co	Ni	Cu	Zn	Mo	Sn	Pb	Bi	U	Other	Comments
SHIN GRANITE																
2003	563 067	-	-	-	-	-	-	-	-	-	-	-	-	36	-	molybdenite-rich altered granite
320	561 066	6	10	420	1.3	8	8	60	110		0	20	10	19	-	weakly brecciated uraniferous band in Moinian with pyrite, fluorite and carbonate in veinlets
549	562 065	8	0	240	1.8	6	10	10	30	0	3	20	0	11	4.3%K_2O 0As, 0W	pyrite present
2010	560 065	-	-	-	-	-	-	10	10	3	-	20	-	-	0Ag, 0Au 5W, 4ppbHg	structureless granitic rock with molybdenite-coated surfaces and with K-spar overgrowths on plagioclase, carbonate common (boulder)
2012	560 065	-	-	-	-	-	-	15	20	0	-	20	-	-	0Ag, 0Au 5W, 5ppbHg	quartz-rich granite with molybdenite-coated surfaces (boulder)
325	563 064	6	0	130	1.8	2	4	5	30	10	1	10	13	5.5	-	disseminated pyrite and molybdenite
324	564 062	8	10	320	1.8	2	3	5	40	1	1	10	4	8.0	-	molybdenite in coarser patches
550	562 062	4	10	180	1.3	1	3	10	30	0	2	60	24	6.2	-	disseminated minor pyrite, chalcopyrite and fluorite; aikinite on joint surface
CLAONEL GRANODIORITE																
278	560 055	3	0	1300	7.5	32	100	0	70	1	1	10	0	1.3	-)	a foliated granodiorite
391	563 055	4	0	1300	4.2	13	56	0	70	0	3	10	3	2.7	-)	composed of altered
440	559 039	3	0	1000	4.2	13	56	5	70	0	4	10	3	1.2	-)	plagioclase-amphibole-quartz
542	559 056	2	10	560	4.2	18	56	5	60	0	2	10	0	2.4	-)	assemblages
OTHER																
557	550 092	6	0	420	3.2	18	75	20	50	0	2	10	6	4.9	-	micromonzonite

Table 4. Minor element composition of the Grudie granite and attendant vein mineralisation, Lairg area, Sutherland.

SAMPLE							Cu		Zn						Mo		Ag		Sn				Pb			U		Location
No. (UL/FN)	Ti	V	Cr	Mn	Co	Ni	a	b	a	b	Ga	Ge	As	Sr	a	b	a	b	a	b	Ba	W	a	b	Bi	a	b	NGR or local grid (ft)
GRANITE (11)																												
401	850	13	2	160	85	10	5	7.5	-	25	85	600	0	300	10	7	-	x	-	x	3000	0	60	30	-	11	12	80E 760N
1165	600	20	2	130	20	-	13	10	-	60	30	500	x	85	8	x	-	x	-	x	600	x	20	30	-	5	5	870W 2210N
1535	1600	20	6	200	50	5	30	15	-	40	40	500	x	100	3	x	-	x	-	x	500	x	20		-	9	7	820W 3020N
1551	1300	30	4	85	30	-	10	75	50	35	40	500	0	130	200	160	-	x	-	x	850	4	85	45	-	4	4	960W 2990N
1656	600	16	8	200	85	10	20	10	-	80	40	600	x	130	-	x	-	x	-	x	400	x	300	100	-	14	14	230E 745N
1657	500	13	2	400	60	-	8	5	-	90	40	600	x	160	4	x	-	x	-	x	600	x	85	40	-	24	24	270E 935N
1665	1300	13	8	400	60	-	13	10	-	70	40	600	0	160	-	3	-	x	-	x	1300	4	85	50	-	6	6.5	720W 2850N
1666	850	13	8	400	60	-	4	5	-	60	30	500	0	300	-	4	-	x	-	x	1300	4	60	30	-	5	4.6	NC 535 040
1667,O	600	10	2	60	40	-	4	5	-	60	40	600	x	300	-	x	-	x	-	x	2000	x	85	30	-	6	5.2	NC 526 040
1668	1300	16	4	85	60	-	10	10	-	20	40	600	0	400	-	6	-	x	-	x	4000	4	60	20	-	4	3.9	NC 523 040
1669	1600	20	6	300	60	10	10	10	-	90	40	600	x	400	-	x	-	x	-	x	2000	x	100	60	-	11	11	NC 525 045
SCHIST (1)																												
1664	2000	130	850	1600	40	300	4	5	100	200	13	300	x	500	-	x	-	x	-	x	2000	x	40	60	-	2	x	NC 5522 0335
GRANITE AND VEIN MINERALISATION (9)																												
403	300	10	5	300	300	8	5	5	-	50	8	1000	x	600	5	x	-	x	-	x	300	x	20	30	-	1	x	140E 730N
1654, O	130	16	4	160	100	20	5	5	-	50	20	1000	x	100	16	x	-	x	-	x	3000	x	400	250	-	3	x	185E 917N
1654, D	130	20	3	400	85	13	10	5	200	80	13	1300	x	130	60	x	-	x	-	x	3000	x	850	360	-	6	x	185E 917N
1655, O	200	10	2	85	50	5	2	5	-	50	8	600	x	3000	16	x	0.2	x	-	x	1%	x	4000	1300	-	2	x	185E 917N
1655, D	300	400	2	200	50	-	85	5	600	40	5	600	x	850	2	x	8	x	13	x	1%	x	300	1000	-	3	x	185E 917N
1659, O	200	200	2	400	40	-	300	120	600	220	8	1300	x	1000	-	7	8	55	13	4	1%	-	1300	100	5+	2	x	700W 2860N
1659, D	160	10	4	130	60	5	3	35	-	270	4	850	x	5000	30	x	4	x	-	x	1%	x	80	80	5	2	x	700W 1860N
1660	20	10	2	50	45	-	4	5	-	80	-	1000	x	160	-	x	-	x	-	x	8500	x	50	20	-	1	x	700W 2860N
1662	600	300	8	130	10	-	16	15	200	80	20	850	x	6000	5	x	0.8	x	8	x	1%	x	300	80	-	4	x	700W 2860N
MOINIAN ROCKS AND VEIN MINERALISATION (12 + [2])																												
404, O	60	40	3	130	100	-	130	50	-	140	2	1300	0	300	2	9	3.0	14	5	5	1%	x	1%	2.3%	130+	1	x	140E 730N
404, D	130	60	2	850	85	5	50	15	-	50	2	850	x	2000	13	x	6	x	5	x	1%	x	1%	600	100	1	x	140E 730N
405, O	850	13	30	130	30	20	16	10	-	80	10	800	x	40	20	x	-	x	-	x	4000	x	85	30	-	2	x	300E 845N
405, D	3000	20	20	400	160	16	13	5	200	70	10	850	x	40	30	x	-	x	5	x	1600	x	30	30	-	1x	x	300E 845N
407	600	40	30	5000	40	8	20	10	-	120	10	500	x	40	8	x	0.5	x	-	x	5000	x	400	120	-	1	x	300E 845N
408	50	50	2	100	50	-	13	15	50	40	-	600	x	600	-	x	-	x	-	x	1%	x	30	30	-	1	x	294E 802N
1651, O	600	30	10	100	50	-	8	5	60	100	8	600	x	30	10	x	-	x	-	x	600	x	140	140	-	1	x	294E 802N
1651, D	100	50	2	85	160	-	2	5	50	50	3	600	x	50	2	x	-	x	-	x	850	x	20	50	-	1	x	294E 802N
1652, O	300	160	5	1300	20	-	60	55	-	150	2	850	x	50	10	x	13	x	13	x	4000	x	1%	7800	-	4	x	230E 745N
1652, D	300	160	4	600	40	-	50	33	100	180	4	600	0	40	2	5	13	10	6	5	1300	12	1%	1.8%	50+	2	x	230E 745N
1653	400	10	2	160	60	-	40	25	-	60	30	400	x	85	2	x	-	x	-	x	3000	x	1600	640	-	15	x	230E 745N
1658	300	10	8	160	85	-	4	5	85	80	4	1000	x	850	10	x	1.6	x	-	x	1%	x	1300	130	-	1	x	340E 745N
[1663]	5000	130	3000	3000	60	300	1300	530	500	280	30	850	x	100	-	x	5	x	-	x	400	x	6000	6100	-	5	x	NC 5522 0335
[68.02.01]	x	x	x	850	x	x	5	5	600	160	x	x	x	x	16	3	x	x	x	x	x	x	850	550	x	1	x	NC 5465 0345

- Not detected
+ OES Bi analysis confirmed by SWC
x No analysis

Metal	Analytical Method
Ti V Cr Mn Co Cu(a) Zn(a) Ga Ge Sr Mo(a) Ag(a) Sn(a) Ba Pb(a) Bi	OES: Optical emission spectroscopy
Cu(b) Zn(b) Pb(b)	AAS: Atomic absorption spectrophotometry
As Mo(b) Ag(b) Sn(b) W	SWC: Stream-lined wet chemical methods
U(a) - U(b) is a duplicate analysis of same sub-sample	DNA: Delayed neutron activation analysis

Table 5. Distribution of some metals through overburden adjacent to Grudie galena mineralisation in the western section of Trench 4, Lairg area, Sutherland.

Distance from western end of trench, m

1.52	3.05	4.57	6.10	7.62	1.52	3.05	4.57	6.10	7.62
ppm Cu					ppm Zn				
10	5	5	10	5	50	50	50	50	50
5	5	5	5	5	50	50	50	50	50
10	10	5	5	10	50	50	50	50	50
5	25	10	5	10	90	160	120	50	30
-	10	-	10	-	-	50	-	80	-
10	5	10	5	10	90	50	60	50	60
ppm Mo					ppm Pb				
13	13	10	10	2	80	70	20	70	30
0	15	12	11	6	0	30	30	30	20
0	4	2	10	2	50	50	50	30	70
0	2	4	6	2	80	130	330	70	100
-	2	-	10	-	-	120	-	260	-
20	11	8	4	4	360	170	280	210	190
ppm U					Depth, cm				
					0	0	0	0	0
4	2	2	4	2	-15	-30	-38	-25	-36
1	2	2	1	1	-46	-71	-84	-53	-71
2	3	2	1	2	-79	-112	-119	-89	-112
3	5	4	2	3	-185	-155	-157	-112	-152
-	5	-	5	-	-	-165	-	-165	-
7	5	5	4	5	-234	-221	221	-203	-191

Table 6. Concentrations of some metals in channel samples from Trench 4 through overburden adjacent to Grudie galena mineralisation, Lairg area, Sutherland.

Distance from western end of trench, m	Depth cm	ppm Cu	Zn	Mo	Pb	U
1.52	234	7	77	5	124	3.5
3.05	221	10	74	8	98	3.8
4.57	221	7	65	8	155	3.2
6.10	203	7	58	9	133	3.1
7.62	191	8	48	3	84	2.7
9.14	168	5	80	4	120	2.8
10.67	175	5	50	5	50	2.2
12.19	130	5	50	5	50	2.3
13.72	91	5	70	2	320	2.8
15.24	71	20	80	0	1210	3.6
16.76	61	10	70	2	660	4.7
18.29	46	5	50	2	70	2.3
19.81	69	5	70	0	350	2.1
21.34	102	5	60	0	130	1.4
22.86	122	5	110	0	70	1.6
24.38	114	5	120	0	170	1.7
25.90	137	10	80	0	150	1.8
27.43	137	10	150	0	240	1.7
28.96	183	20	110	0	130	1.7
30.48	152	25	160	0	130	1.9
32.00	221	10	90	1	120	1.5
33.52	252	10	160	0	240	1.5
35.05	244	30	120	0	450	1.4
36.57	251	5	110	0	170	1.6
38.10	234	10	160	0	120	1.3
39.62	229	10	110	0	340	1.8
41.15	193	10	220	0	220	1.7
42.67	183	5	300	2	630	2.0
44.20	198	10	290	5	340	2.7
45.72	191	10	200	1	220	2.1
47.24	183	20	150	0	1660	2.1
48.76	213	40	860	110	6810	2.3
50.29	221	10	270	2	330	2.3
51.81	198	10	290	0	380	1.5
53.34	152	10	180	2	220	1.8
Averages (35 channels)		11	147	5	477	2.2

Table 7. Concentrations of some metals in channel samples from trenches 5 and 6 through overburden adjacent to Grudie galena mineralisation, Lairg area, Sutherland.

Distance from western end of trench, m	Depth cm	Cu	Zn	ppm Mo	Pb	U
TRENCH 5						
4.57	0-191	5	60	0	100	1.7
6.10	0-119	10	110	0	100	1.5
	-142	5	70	0	30	1.5
	-206	10	50	0	110	2.1
	Av.	9	87	0	95	1.7
7.62	0-208	5	60	4	100	1.7
9.14	0-36	5	50	2	100	1.1
	-56	15	280	10	2200	2.2
	-127	10	70	0	140	1.7
	-150	10	70	4	90	1.7
	-196	10	60	0	70	2.7
	-229	15	70	0	50	2.8
	Av.	10	83	2	282	2.0
10.67	0-213	10	70	0	90	1.8
12.19	0-30	10	70	13	350	1.7
	-107	10	110	0	160	1.2
	-140	20	70	2	100	1.8
	-213	10	60	4	70	1.9
	-329	5	40	4	50	1.8
	Av.	11	78	4	99	1.6
Averages (6 channels)		8	73	2	128	1.8
TRENCH 6						
						Ag
1.52	61-76	20	110	300	520	1
3.05	45-61	50	210	900	800	2
4.57	84-91	10	50	8	80	1
6.10	61-76	10	50	3	70	1
7.62	0-84	10	30	15	80	0
9.14	0-15	15	40	12	130	0
	15-46	15	70	10	190	1
	46-76	15	70	5	410	0
	Av.	15	60	9	240	0
10.67	0-91	15	50	30	430	1
12.19	0-76	15	80	3	350	1
13.72	0-69	10	30	9	50	0
Averages (9 channels)		17	74	142	291	1

Table 8. Geochemistry and mineralogy of mineralised rocks exposed near lower Loch Shin, Lairg, Sutherland

Sample No. CBR	Grid Ref.	ppm Cu	Zn	Mo	Bi	Pb	U	Other	Ore minerals	Comments
3133	505 143	5	10	2	-	0	-	-	-	Disseminated pyrite in probable Lewisian calc-silicate boulder.
3100	522 122	2050	10	4	-	10	-	-	chalcopyrite	Granular with pyrite in boulder of diopside-tremolite-quartz rock (Lewisian).
3132	508 143	4850	60	8	-	30	-	-	-	20-30% pyrite (altering to goethite) in boulder of brecciated rock rich in phlogopitic biotite (after ?tremolite) the pyrite is presumably cupriferous as only a trace of chalcopyrite is present.
524	550 092	-	-	-	-	-	-	-	sulphur	In quartz band with pyrrhotite in Lewisian hornblende rock.
2001	552 088	640	20	25	-	10	-	-	-	Magnesian schist with abundant amphibole and traces of chalcopyrite and pyrite (Lewisian).
341	557 074	320	10	450	5600	50	-	4200 ppm Bi (repeat anal.)	molybdenite	With pyrite in 30 cm wide quartz vein in Lewisian gneiss.
342	557 074	25	40	1	3	20	3.2	-	-	Lewisian gneiss adjacent to CBR 341.
344	555 072	2500	70	40	240	720	1.3	-	chalcopyrite galena	With bornite and possible molybdenite in quartz-carbonate matrix of beccia vein trending 030° in Lewisian gneiss.
345	555 072	2500	10	1	240	40	0.7	-	chalcopyrite	With pyrite and fluorite in quartz matrix of brecciated Lewisian gneiss.
330	558 069	-	-	-	-	-	-	-	chalcopyrite galena	In quartz-baryte-fluorite breccia veins trending 150° in micaceous psammite.
2000	560 067	20	40	8	-	20	-	-	-	Disseminated euhedral pyrite in brecciated psammite boulder.
317	561 066	-	-	-	-	-	-	-	chalcopyrite	With pyrite and fluorite at edge of 3 cm quartz vein adjacent to CBR 318, 2002.
318	561 066	5	20	15	6	20	6.1	3.7% K_2O 0ppm As, W	galena, molybdenite	Lewisian gneiss with disseminated pyrite and galena plus molybdenite on joint; at northern edge of Shin granite.
2000	561 060	15	0	100	-	10	-	-	molybdenite	With pyrite on joints.
2011	560 065	20	30	22	-	0	-	0 ppm Ag, Au; 10 ppm W, 2 ppb Hg	molybdenite	Boulder of granitised psammite containing pyrite and early carbonate veinlets; molybdenite and fluorite occur on joints.

Table 9. Geochemistry and mineralogy of mineralised metamorphic and granitic rocks exposed in the Allt a' Chlaonaidh stream section and adjacent Claonel district, Lairg area, Sutherland.

Sample No. (CBR)	Grid Ref	ppm Cu	Zn	As	Mo	W	Pb	Bi	U	Other	Ore minerals	Comments
297	556 059	10	0	0	80	0	10	4	0.5		? molybdenite	Psammite boulder veined by quartz, pyrite and hematite, 300 m NE of 286.
286	553 058	5	40	0	200	25	10	8	3.2	0 ppm Au, 6 ppb Hg	molybdenite	Platy muscovite schist cut by sub-parallel pyrite-molybdenite veins mainly 1 to 5 cm thick trending 070°-080° (see text).
289	553 058	30	30	0	9400	100	50	75	4.8	0 ppm Au, 60 ppb Hg	molybdenite	
287	553 058	20	10	0	30	0	30	8	5.0	-	molybdenite	With pyrite in quartz.
288	553 058	20	30	0	200	20	10	8	1.4	-	molybdenite	Veins, iron-stained.
515	554 057	25	40	-	5	-	10	8	6.5	-	-	Psammitic hornfels containing andalusite with quartz-hematite veinlets and pyrite on joint surfaces.
544	554 057	840	50	0	0	0	1820	42	1.3	1.9%K_2O	-	Fault gouge 15 cm thick on vertical fault face.
545	554 057	-	-	-	-	-	-	-	-	-	molybdenite	In quartz veins trending 090° in micaceous psammite.
512	555 057	10	30	0	1	275	0	2	1.2	0.25%K_2O	-	Brecciated psammite with a quartz-hematite matrix; hematite unusually thick.
509	555 056	10	10	0	60	0	20	0	5.9	0 ppm Au, 12 ppb Hg 2.5%K_2O	molybdenite	Granitic rock with a small cluster of molybdenite grains.
281	558 055	20	10	-	150	-	10	3	0.4	-	molybdenite	Psammite boulder cut by molybdenite-pyrite bearing quartz veins.
449	559 047	20	0	-	4	-	280	18	0.8	-	? galena	Psammite with disseminated pyrite.
445	560 047	1.33%	30	0	0	0	10	8	1.4	2.0%K_2O	chalcopyrite	With pyrite and fluorite in a band in foliated and rather fractured and altered quartz-feldspar rock with ophitic texture.
612	565 041	-	-	-	-	-	-	-	-	-	chalcopyrite (minor)	Disseminated in granitic band in psammite boulder.

Table 10. Molybdenum content of channel samples from the molybdenite occurrence in upper Allt a' Chlaonaidh, Lairg area, Sutherland.

EAST WALL. CHANNEL SAMPLE No.(CBR)	LENGTH OF CHANNEL m	ppm Mo*	WEST WALL. CHANNEL SAMPLE No.(CBR)	LENGTH OF CHANNEL m	ppm Mo
2013	2.0	88	2022	2.0	48
2014	2.0	98	2023	2.0	125
2015	2.0	225	2024	2.0	305
2016	2.0	100	2025	2.0	83
2017	2.0	70	2026	2.0	425
2018	2.0	93	2027	2.0	195
2019	1.0	160			
2020	1.5	35			
2021	1.2	98			
Totals and averages	15.7	109		12.0	196

*Means of analysis on four sub-samples per channel sample.

Table 11. Concentration of some metals associated with hematite-quartz-baryte veining in Moine psammites, Raemore and Achany districts, Lairg area, Sutherland.

Sample No. (CBR)	Grid Ref.	Cu	Zn	ppm Mo	Pb	Bi	U	Other	Comments
RAEMORE									
620	549 052	5	0	1	10	4	2.3	250 ppm W 0 ppm As 1.7%K_2O	Hematite-ilmenite intergrowths in goethite/limonite with quartz in stockwork in boulders of brecciated psammite.
630	551 049	5	10	0	10	2	0.6	-	Quartz-hematite veins trending 150° in psammite.
629	551 049	5	10	0	10	2	0.4	-	Quartz-hematite veins in psammite.
626	552 049	5	20	1	10	6	1.5	-	Quartz-hematite veins trending 125° in psammite.
441	558 042	10	10	0	10	6	0.7	-	Quartz breccia with quartz vugs and minor hematite veinlets up to 1cm thick.
442	558 042	5	10	0	10	6	0.6	-	
ACHANY									
478	553 015	0	0	0	10	4	0.4	0 ppm As, W	Banded psammite adjacent to 479-480
479	554 014	25	0	0	10	10	0.4	0 ppm As, W	Brecciated psammite with baryte and hematite.
480	554 014	10	0	0	30	6	0.5	10 ppm As, 0 ppm W	Brecciated psammite with hematite veinlets trending 155°.
180	568 005	30	0	1	10	10	0.7	0 ppm As, W 0.23%K_2O	Baryte vein 50 cm thick trending 100° with hematite and trace pyrite in brecciated psammite.
181	570 003	10	150	0	20	3	3.8	5.10%K_2O	Baryte vein 7 cm thick trending 080° in decomposed fine grained mâfic rock with minor pyrite.

Table 12. Geochemistry and mineralogy of mineralisation in metamorphic and granitic rocks exposed in the valley of Grudie Burn, Lairg area, Sutherland.

Sample No. (CBR)	Grid Ref.	Cu (ppm)	Zn (ppm)	As (ppm)	Mo (ppm)	W (ppm)	Pb (ppm)	Bi (ppm)	U (ppm)	Other	Ore minerals	Comments
064	541 051	-	-	-	-	-	-	-	-	-	-	Semipelite boulder with pyrite and probable hematite on joint surface.
272	538 051	10	10	-	0	-	0	56	0.2	iron-rich	-	Disseminated sulphide on joint surface of psammite boulder.
396	541 047	20	300	0	1	0	130	6	3.7	5.5% K_2O	galena	Purple fluorite with minor galena and smithsonite in thin vein in boulder of semipelite or altered Lewisian rock.
397	545 044	-	-	-	-	-	-	-	-	-	-	Boulder of pink shattered recrystallised psammite with quartz veins and chlorite veins, the latter containing ovoid masses of a yellow mixed-layer clay mineral.
395	548 040	-	-	-	-	-	-	-	-	-	-	Brecciated psammite with quartz-calcite-chlorite matrix and minor pyrite.
259	551 035	5	10	0	15	0	10	6		-	molybdenite	Boulder of Grudie granite with molybdenite and pyrite both in quartz veinlet and disseminated
590	553 034	60	200	0	0	0	2330	32	4.4	-	galena, chalcopyrite	chlorite schist (Zn in chlorite) with ore minerals in band 20 cm in width and trending 040° parallel to foliation; fluorite and pyrite present (Gallagher, 1970). Chlorite and iron oxide after amphibole; Lewisian intermediate gneiss.
307	569 021	310	20	-	0	-	20	0	0.9	-	chalcopyrite	With pyrite in quartz-feldspar vein 3 cm wide trending 090° in psammite
554	570 021	5	20	-	5	-	0	8	1.5	-		Micaceous psammite adjacent to CBR 307.

Table 13. Geochemistry and mineralogy of mineralisation in metamorphic rocks exposed west of the Grudie granite, Lairg area, Sutherland.

Sample No.(CBR)	Grid Ref.	ppm Cu	Zn	As	Mo	W	Pb	Bi	U	Other	Ore minerals	Comments
												ALLT A' CHOIRE SECTION
261	514 052	50	30	0	30	0	0	4	1.7	3.2%K_2O	molybdenite	With pyrite in quartz-feldspar vein 5 cm thick trending 180°(dip 30°E) in micaceous psammite.
262	514 052	15	40	0	35	0	10	6	1.4	-	molybdenite	With pyrite in thin quartz band in Lewisian acid gneiss.
252	514 052	15	20	0	400	0	10	-	1.5	-	molybdenite	
258	511 050	-	-	-	-	-	-	-	-	-	molybdenite	With pyrite on joint surface oblique to second surface with pyrite only; boulder
256	513 050	80	20	0	700	0	10	13	2.7	2.3%K_2O	molybdenite	With pyrite at edge of quartz vein in micaceous psammite boulder.
												'MOLY' BURN SECTION
260	515 048	-	-	-	-	-	-	-	-	-	molybdenite	Disseminated with pyrite through quartz vein; boulder.
142	514 044	35	20	-	1	0	10	0	1.5	0 ppm Ag	-	Micaceous psammite strike 015° (dip 40°E) adjacent to CBR 145.
145	514 044	25	20	0	150	5	40	6	1.0	0 ppm Ag 0 ppm Au 3 ppb Hg 2.8%K_2O	molybdenite	In quartz veins with fluorite and on chlorite coated surfaces; minor pyrite; Lewisian acid gneiss. Biotite altered to chlorite on joint surface; pyrite present; from boulders adjacent to CBR 145; Lewisian acid gneiss with disseminated pyrite and chalcopyrite in rock (boulder); Lewisian intermediate gneiss (altered).
146	514 044	-	-	-	-	-	-	-	-	-	molybdenite	With pyrite, scheelite and unknown Cu-Pb-sulphide phases on joint surface (boulder). Biotite altered to chlorite and feldspar to sericite.
144	514 044	10	20	0	5	5	20	3	1.8	0 ppm Ag	molybdenite	On joint surface; pyrite present; from boulders adjacent to CBR 145; Lewisian acid gneiss.
143	514 044	40	30	0	80	15	10	3	1.8	0 ppm Ag	molybdenite	With quartz and pyrite on joint surfaces; traces of disseminated pyrite and chalcopyrite in rock (boulder); Lewisian intermediate gneiss (altered).

Table 14. Molybdenum and copper contents of small bulk samples of mineralised Moinian rocks from two localities north west of the Grudie granite, Lairg area, Sutherland.

Sample Nos. (CBR)	Mo mean ppm	Mo range ppm	C %	Cu mean ppm	Cu range ppm	C %
Moly Burn exposure (5140 0440)						
876, 885, 890, 899	32.5	15-60	62	22.5	20-50	12
877, 893, 895, 896	77.5	60-100	22	45	40-50	9
878, 884, 887, 909	290	230-350	17	51	50-55	4
879, 886, 897, 903	362	250-400	20	86	80-90	5
882, 891, 904, 905	262	100-350	41	47	40-50	9
Allt a'Choire exposure (5140 519)						
880, 889, 898, 902	14	10-20	29	16	15-20	15
881, 888, 894, 900	53	40-60	12	23	20-25	18

Table 14. Molybdenum and copper contents of small bulk samples of mineralised Moinian rocks from two localities north west of the Grudie granite, Lairg area, Sutherland.

Sample Nos. (CBR)	Mo mean ppm	Mo range ppm	C %	Cu mean ppm	Cu range ppm	C %
Moly Burn exposure (5140 0440)						
876, 885, 890, 899	32.5	15-60	62	22.5	20-50	12
877, 893, 895, 896	77.5	60-100	22	45	40-50	9
878, 884, 887, 909	290	230-350	17	51	50-55	4
879, 886, 897, 903	362	250-400	20	86	80-90	5
882, 891, 904, 905	262	100-350	41	47	40-50	9
Allt a'Choire exposure (5140 519)						
880, 889, 898, 902	14	10-20	29	16	15-20	15
881, 888, 894, 900	53	40-60	12	23	20-25	18

Table 15. Geochemistry and mineralogy of polymetallic mineralisation in the metamorphic rocks south of the Grudie granite, Lairg area, Sutherland.

Sample No. (CBR)	Grid Ref.	ppm Cu	Zn	As	Mo	W	Pb	Bi	U	Other	Ore minerals	Comments
033	528 037	35	40	0	0	0	20	3	1.3	0 ppm Ag 5.2%K_2O	-	Banded gneiss boulder with pyrite in quartz-perthite veins. Microcline plagioclase and biotite occur in Lewisian gneiss.
049	531 037	0	30	-	0	0	20	0	1.5	0 ppm Ag	-	Biotite-psammite boulder with pyrite in quartz-feldspar veins, altered Lewisian acid gneiss.
051	529 036	-	-	-	-	-	-	-	-	-	-	Pyrite on joints and in quartz-felspar veins.
038	527 035	-	-	-	-	-	-	-	-	-	molybdenite	Psammite boulder with joint surface molybdenite and pyrite-quartz vein.
039	527 035	-	-	-	-	-	-	-	-	-	-	Psammite boulder with common pyrite disseminated and on joints.
040	526 035		20	3	5	20	30	10	3.2	0 ppm Ag 2.8%K_2O	-	Micaceous ?Lewisian gneiss with pyrite and hematite.
034	527 034	10	20	-	0	5	20	3	1.3	0 ppm Ag, Au; 4 ppb Hg: 2.6%K_2O	aikinite, trace chalcopyrite	With pyrite and fluorite in quartz-orthoclase (perthitic) veins in platy schist.
035	528 033	5	20	-	0	5	40	56	1.6	0 ppm Ag	-	?Lewisian rock.
054	529 034	425	70	3	3	20	50	180	2.1	0 ppm Ag Au 0 ppb Hg	bismuthinite chalcopyrite molybdenite	Granite vein 2 to 3 m thick trending 120°(dip 15°S) with fluorite, carbonate and pyrite.
055	529 034	155	170	3	15	30	40	6	3.8	1 ppm Ag	molybdenite, trace bismuthinite, chalcopyrite	In formerly garnetiferous ?Lewisian rock with pyrite and rutile aggregates at margin of vein CBR 054, fluorite and carbonate present.
056	529 034	15	10	-	0	0	20	3	8.4	0 ppm Ag	-	?Lewisian rock adjacent to CBR 054.
268	543 032	30	80	-	5	-	90	2	3.5		-	Boulder of quartz-feldspar-hematite.
052	543 031	-	-	-	-	-	-					Pyrite-bearing boulder of Lewisian biotite gneiss.
043	541 024	0	50	3	0	0	30	2	2.8	0 ppm Ag 3.8%K_2O	-	Pyrite-bearing orthoclase-quartz carbonate veins in psammite.

Table 16. Supplementary semi-quantitative analyses of mineralised rocks listed in Tables 8-15.

Sample No. (CBR)	Table No.	Be	ppm B	Mn	% Fe_2O_3	Co	ppm Ni	Sn
342	8	2	10	1800	4.2	10	10	0
341		0	10	320	5.6	42	32	3
344		0	10	1000	2.4	18	56	0
345		0	10	750	2.4	24	24	1
318		0	10	320	2.4	8	13	1
297	9	0	10	100	0.0	3	8	0
286		4	10	1000	4.2	56	56	2
289		3	0	320	4.2	24	32	2
287		2	10	240	4.2	32	24	2
288		2	10	320	4.2	56	32	1
515		2	10	1300	1.8	32	13	1
544		2	10	240	2.4	32	32	1
512		0	13	180	24.0	1	0	130
509		2	10	130	0.0	4	8	1
281		0	10	320	0.0	8	13	0
449		0	0	24	1.0	8	10	3
445		2	0	180	4.2	6	24	2
620	11	0	0	32	24.0	0	1	13
630		0	18	420	2.4	13	18	2
629		0	0	130	0.0	0	2	0
626		0	18	240	7.5	8	10	6
441		0	18	42	4.2	3	13	0
442		0	32	100	2.4	6	18	0
478		0	18	24	1.3	4	13	4
479		0	10	42	0.0	3	10	2
480		0	13	32	2.4	2	10	2
180		0	0	26	1.8	1		
181		0	0	1300	4.2	42	75	4
272	12	0	32	100	24.0	42	8	2
396		3	0	750	5.6	13	42	6
259		4	0	240	0.0	3	2	3
590		2	0	3200	18.0	75	420	0
307		0	10	320	1.8	13	13	1
554		0	10	240	3.2	8	18	3
261	13	0	10	1800	4.2	10	32	0
262		0	10	1000	4.2	13	56	0
252		8	10	750	1.8	10	24	3
256		2	10	750	1.8	8	24	1
142		1	10	420	2.4	13	32	4
145		1	10	180	1.3	10	10	2
144		0	10	320	2.4	8	10	3
143		2	10	750	4.2	13	24	3
033	15	2	0	420	4.2	6	10	3
049		2	0	560	2.4	10	13	3
040		6	0	560	4.2	13	18	8
034		3	0	240	3.2	10	18	4
035		0	0	240	1.8	8	13	0
054		4	0	1300	7.5	75	100	18
055		4	0	3200	13.0	56	100	32

Sample No.(CBR)	Table No.	ppm Be	ppm B	ppm Mn	% Fe_2O_3	ppm Co	ppm Ni	ppm Sn
056		10	0	75	0.0	3	6	3
268		0	0	240	0.0	0	10	0
043		4	0	1000	4.2	13	13	3

Note: All analyses by optical emission spectroscopy.

Appendix 2 : Borehole Records

Table 1. BH No. SPD1
Location: 200 m W of Loch Shin uphill of Sallachy Road
NGR 5620 0620 Collar elevation 126 m, vertical hole

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		TILL								
1.70	1.70	Boulders and	5	0	10	6	0		1.6	1001
3.25	1.55	pebbles.	10	5	20	7	0		2.4	1002
4.98	1.73	Fine grained granite boulders.	5	0	40	9	0		4.5	1003
8.84	3.86	Sludge sample.	25	125	70	12	10	5	4.8	1004

Table 2. BH No. SPD2
Location: 300 m W of Loch Shin, 100 m uphill of Sallachy road
NGR 5610 0620 Collar elevation 148 m, vertical hole

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.20	0.20	A_o - organic litter.	0	5	10	8	20	0	1.9	1005
0.60	0.40	B - orange brown sandy clay.	20	10	30	2	20	5	1.8	1006
0.76	0.16	B/C - coarse granitic sand	15	15	40	0	10	5	2.6	1007
		TILL								
1.26	0.50	T_1 - leached sandy till with granitic pebbles	35	25	60	2	20	20	2.2	1008
2.30	1.04	$T_{\frac{1}{2}}$ - leached sandy till with minor clay, overlying boulders.	20	35	50	8	30	15	3.0	1009
		GRANITE								
2.51	0.21	? bedrock or large	5	0	40	4	0		6.7	1010
2.90	0.39	granite boulders.	10	10	40	2	20		6.0	1011
5.25	2.35	Fine grained granite with quartz veins.	5	0	40	4	0		6.6	1012
	Total bedrock intersection 2.95		average ppm of bedrock							
			6	1	40	4	2		6.5	-

Appendix 2 : Borehole Records
Table 3. BH No. SPD3
Location: 400 m W of Loch Shin, 200 m uphill of Sallachy Road
NGR 5600 0620 Collar elevation 162 m, vertical hole

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.14	0.14	A_o - dry organic horizon.	0	5	10	3	10	0	2.1	1013
0.32	0.18	A_1 - dark brown organic, with decomposed rock fragments	5	10	10	10	10	0	1.8	1014
0.48	0.16	B - detrital quartz with a little clay and rock fragments.	5	15	10	8	20	5	2.7	1015
		TILL								
0.77	0.29	T_1 - compact orange sandy till	10	15	20	5	20	5	2.7	1016
1.20	0.43	T_2 - leached sandy till with small rock fragments	15	25	20	10	20	5	1.2	1017
1.53	0.33	T_2 - very leached sandy till with rock fragments	10	30	40	12	30	10	2.4	1018
3.25	1.72	T_2 - cored boulders and pebbles, increasingly granitic with depth. Molybdenite in small quartz vein in fine grained granite.	5	10	0	0	0		1.0	1019
		GRANITE								
3.50	0.25	Fine grained granite with disseminated pyrite and fluorite.	5	0	40	8	0		13	1020

Appendix 2 : Borehole Records

Table 4 BH No. SPD4

Location: 500 m W of Loch Shin, 300 m uphill of Sallachy Road
NGR 5590 0620 Collar elevation 178 m, vertical hole

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.18	0.18	A_o - black, dry peat with detrital quartz grains		0	10	3	10		2.9	1021
0.47	0.29	B_1 - fine sandy soil with limonitic patches, moderate clay	0	5	10	20	10	5	2.4	1022
0.56	0.09	B_2 - fine sandy, gleyed and more decomposed.	5	10	10	10	20	5	2.4	1023
		TILL								
0.76	0.20	T_1 - orange-brown sandy till with numerous rock fragments.	10	15	30	8	20	5	2.3	1024
0.91	0.15	T_1 - brown sandy till with small rock fragments	10	15	20	4	20	5	1.7	1025
3.58	2.67	T_1 - cored psammite boulders	5	0	0	0	0		1.4	1026
3.70	0.12	T_1 - joint face baryte in two small psammite fragments.								
3.78	0.08	T_1 - pink psammite boulder with thin quartz coating	5	220	150	0	10		9.1	1027
6.48	2.70	T_1 - cored psammite and granite boulders. molybdenite on joint in granite.								
6.56	0.08	T_1 - cored psammite boulder with pyrite and calcite on joint and disseminated pyrite-flourite								
7.40	0.84	T_1 - boulder fragments of psammite, semi-pelite and granitic Moinian								
		MICACEOUS PSAMMITE								
7.62	0.22	Quartz-plagioclase-muscovite rock with minor microcline and carbonate replacing ferro-magnesian minerals. A quartz vein containing large euhedral pyrites is bordered by a muscovite-rich pelitic selvage. Also pyrite-chalcopyrite-fluorite-calcite on joints.	35	150	70	60	10		4.8	1030

Appendix 2 : Borehole Records
Table 5 BH No. SPD5
Location: Drift cutting beside Sallachy Road, 200 m W of Loch Shin
NGR 5612 0649 Collar elevation 129 m, vertical hole

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL (from road cutting)								
0.10	0.10	A_o/A_1 - organic, with clay-sand.	0	0	10	3	10	0	2.6	1031
0.55	0.45	B - sandy limonite staining on Moine fragments	55	20	50	6	30	20	2.4	1032
		TILL								
1.10	0.55	Leached sandy till with Moine, granite and amphibolite pebbles.	100	55	70	4	60	20	2.3	1033
2.10	1.00	Leached sandy till with decomposing	35	35	60	6	60	10	6.2	1034
3.20	1.10	granite pebbles	30	35	50	9	60	10	7.9	1035
0.00		GRANITE (collared in bedrock)								
0.76	0.76	Weathered fine grained granite.	5	0	30	0	0		9.7	1036
2.40	1.64	Weathered and broken fine grained granite with pyrite and fluorite on joints also traces of disseminated fluorite, pyrite, chalcopyrite and molybdenite.	5	2	30	3	0		11	1037
3.30	0.90	Broken and weathered fine grained granite with	5	0	60	5	0		7.0	1038
4.65	1.35	minor sulphide, calcite, fluorite and clay on joints	5	0	20	0	0		15	1039
5.05	0.40	Massive fine grained granite	5	0	20	1	0		13	1040
5.45	0.40		5	20	50	2	0		11	1041
5.85	0.40	Fine grained granite with thin quartz-molybdenite vein	5	0	40	25	0		14	1042
6.25	0.40	Fine grained granite with 2 cm wide quartz vein with pyrite, molybdenite	5	0	80	20	30		10	1043
6.65	0.40	Broken granite with disseminated molybdenite; pyrite and fluorite on joints	5	0	50	20	10		13	1044
7.05	0.40	Finer grained granite; pyrite, molybdenite and fluorite on joints.	5	5	30	4	0			1740
7.45	0.40	Fine grained and fresher granite with a little	0	5	40	0	10			1741
7.85	0.40	pyrite and fluorite on joints.	5	5	20	2	0			1742
8.25	0.40	Fine grained granite; 5 cm wide quartz vein with pyrite	5	5	30	1	10			1743
8.65	0.40	Granite with 2 cm vein of quartz-pyrite-trace molybdenite	5	10	30	1	10			1744
9.05	0.40	Fine grained granite with a little disseminated	0	5	30	1	10			1745
9.45	0.40	pyrite and fluorite	5	25	30	0	10			1746
9.85	0.40	(" " ")	5	5	30	2	10			1747

Table 5: continued

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
10.25	0.40	Broken fine grained granite, rich pyrite and fluorite on joints	0	5	30	6	10			1748
10.65	0.40	Pyritiferous patches in locally reddened granite: pale yellow mineral on some joint surfaces.	5	5	20	17	0			1749
11.05	0.40	Biotite-rich segregation following near vertical joint	0	5	40	0	10			1750
11.45	0.40	Local enrichment of quartz-feldspar: rare molybdenite grains; pyrite in a veinlet.	5	5	30	45	10			1751
	Total bedrock intersection 11.45		average ppm of bedrock							
			4	4	35	6	5		11	-

Appendix 2 : Borehole Records
Table 6 BH No. SPD6
Location: 100 m W of Loch Shin and 30 m E of Sallachy Road
NGR 5620 0640 Collar elevation: 120 m, vertical hole

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL (from pit)								
0.10	0.10	A_o - black organic material with much root matter		5	30	3	30			1045
0.20	0.10	A_1/A_2 - dark brown clay grading to grey sand.	0	0	10	5	10	0	2.3	1046
0.55	0.35	B - light brown, limonitic soil with moderate clay; schist boulders.	5	10	10	8	30	5	3.9	1047
0.00		SOIL								
0.26	0.26	A_o - dark brown organic soil with root material		5	30	3	10			1048
0.36	0.10	A_1 + B - light brown, clay rich with decomposed pebbles	10	10	20	13	30	5	6.8	1049
		TILL								
3.66	3.30	Mixture of schist and granite boulders with pyrite	5	0	40	2	0		4.7	1050
3.78	0.12	More abundant granite boulders with disseminated pyrite								-
3.96	0.18	Very broken but fresh granite boulders								-
4.07	0.11	Cored schist boulder								-
		GRANITE								
4.62	0.55	Granite with numerous quartz veins with pyrite fluorspar and a grain of molybdenite	0	0	20	4	0		10	1051
5.10	0.48	Granite with quartz veinlets containing	0	0	30	3	0		6.1	1052
5.28	0.18	pyrite, molybdenite and fluorite	0	10	30	80	0		7.9	1053
6.18	0.90	Granite	0	0	50	0	10		10	1054
6.91	0.73	Granite with cross-cutting veinlets of fluorite; a little pyrite on majore joints; disseminated fluorite and a grain of molybdenite	0	0	50	8	10		7.3	1055
	Total bedrock intersection 2.84		average ppm of bedrock							
			0	1	38	8	6		8.5	-

Appendix 2 : Borehole Records
Table 7 BH No. SPD7
Location: 400 m W of Loch Shin
NGR 5590 0640 Collar elevation 168 m, vertical hole.

Depth m	Thickness m	Section depth m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL (from pit)								
0.19	0.19		A_o - well drained peat with roots and a little detrital material.		5	10	1	20			1056
0.40	0.21		B_1 - gleyed, coarse sandy with limonitic patches	5	5	10	8	10	5	2.3	1057
0.60	0.20		B_2 - limonitic with pale brown clay rich patches and 2 mm of bog iron ore.								
0.82	0.22		B_3 - sandy with limonitic enrichment; schist fragments.	5	5	10	9	20	5		1059
0.00			SOIL								
0.30			A_o - well drained peat.	5	5	20	20	20	5	3.6	1060
0.70			B_1 - brown, sandy and gleyed.	15	5	20	3	20	5	2.7	1061
0.92			B_2 - sandy with limonitic enrichment.	10	5	30	3	20	5	3.1	1062
4.72	3.80		TILL Granite and schist pebbles								
5.08	0.36	4.88	? LEWISIAN Banded psammitic gneiss with quartz-feldspar-pyrite veins; one grain of molybdenite noted in quartz vein in banded gneiss.	10	10	30	2	0		2.6	1065
6.02	0.94		Banded gneiss with abundant pyrite; pyrite and minor molybdenite. Chalcopyrite along foliation plane	75	70	90	20	0		3.3	1066
	Total bedrock intersection					average ppm of bedrock					
-	1.20			62	58	80	16	0		3.1	-

Appendix 2 : Borehole Records

Table 8 BH No. SPD8
Location: 20 m W of Loch Shin
NGR 5630 0640 Collar elevation: 100 m vertical hole

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.29	0.29	B_1 - light brown clay rich with eluvial sand	5	5	20	15	20	20	10	1067
0.54	0.25	and granitic pebbles becoming sandier and less ferruginous towards base.	5	5	20	10	30	5	7.5	1068
2.28	1.74	- weathered granite boulders.	0	0	20	2	20		5.7	1069
		GRANITE								
2.28	0.54	Fine grained highly jointed granite with quartz-	0	0	50	2	20		5.9	1070
3.84	1.02	pyrite veins.	0	0	50	2	20		5.3	1071
	Total bedrock intersection					average ppm of bedrock				
-	1.56		0	0	50	2	20		5.5	-

Table 9 BH No. SPD9
Locations: 100 m W of Loch Shin
NGR 5630 0620 Collar elevation 110 m vertical hole

Depth m	Thickness m	Section depth m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.23	0.23		A_1 - grey brown humic soil with schist and granite pebbles.	5	0	10	4	10	5	3.6	1072
0.46	0.23		B_1 - grey-brown sandy soil with schist and granite pebbles.	0	0	20	12	20	5	3.1	1073
0.61	0.15		B_2 - grey-brown, richer in clay but fewer pebbles.	25	5	40	6	20	10	3.6	1074
			TILL								
3.80	3.19		Cored granite boulders and schist pebbles.								
			GRANITE, GRANITISED MOINIAN AND ? LEWISIAN								
4.45	0.65		Fine grained granite at 3.8 m grading into granitised Moinian, finely fractured and containing pyrite both in thin stringers and also disseminated.	0	15	40	6	0		7.5	1075
5.37	0.92		Stringers of quartz and fine pyrite in pink psammitic Moine. Less sulphide: chlorite developed along fracture surfaces. Smoky quartz veinlets increasing to 5.37m.	5	10	10	1	0		1.4	1076

Table 9 continued

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
				ppm							
6.55	1.18	5.60	Abrupt change to chlorite-muscovite-carbonate schist (? Lewisian) with well developed crenulation cleavage; grey pyrite? veinlets dipping 30°to 40°; barren quartz veins in foliation; soft grey bands containing pyrite.	535	105	170	0	40		1.0	1077
8.10	1.55	7.12 7.64	Platy quartz-plagioclase-microcline. Psammite with extensive replacement of plagioclase and ?micas by sericite-calcite and opaques Quartz veins with fine pyrite and ?grey sulphide.	30	25	10	2	0		3.0	1078
Total bedrock intersection 4.30				average ppm of bedrock							
				159	42	58	2	11		2.8	-

Appendix 2 : Borehole Records
Table 10 BH No. SPD 10
Location: 300 m W of Loch Shin
NGR 5600 0640 Collar elevation 163 m, vertical hole

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
1.00	1.00	A_1 - grey-brown sandy-clay	15	35	30	4	20	15	3.7	1080
1.40	0.40	B_1 - grey brown with some schist fragments	15	30	30	4	20	5	3.8	1081
1.82	0.42	B_1 + C - lighter brown with coarse schist	10	25	40	3	40	5	5.4	1082
2.33	0.51	fragments	10	30	50	4	40	10	8.2	1083
		TILL								
4.11	1.78	Boulder fine grained granite with minor pyrite and thin quartz veins.	0	5	10	0	0		3.2	1084
4.62	0.51	Drill sludge; granite and psammite rock	10	180	150	13	40	30	4.8	1085
6.83	2.21	fragments.	65	210	190	15	40	30	5.6	1086
		MOINIAN								
7.82	0.99	Micaceous psammite with pyrite along foliation, and in fractures where molybdenite may be associated.	20	40	40	60	0		2.2	1087
8.36	0.54	Schist with quartz-feldspar and quartz-pyrite veins	15	25	50	9	20		1.6	1088
8.96	0.60	Schist with some pyrite and a concordant calcite vein; foliation dips 55°.	5	15	30	5	0		3.3	1089
	Total bedrock intersection		average ppm of bedrock							
	2.13		15	29	40	32	5		2.3	-

Appendix 2: Borehole Records

Table 11 BH No. SPD11
Location: 190 m W of Loch Shin
NGR 5610 0660 Collar elevation 109.5 m, vertical hole

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.38	0.38	A_o/A_1 - organic and sandy clay	80	15	40	10	20	10	2.9	1090
0.61	0.23	B_1 - brown sandy-clay soil.	35	50	80	2	20	15	2.0	1091
1.52	0.91	B_2 - light brown sandy clay	25	20	30	2	10	10	2.6	1092
		TILL								
3.00	1.48	Cored schist boulders (not sampled) and sludge.	35	120	60	6	10	10	2.2	1093
		MOINIAN								
5.25	2.25	Feldspathised semipelite grading to sparsely micaceous psammite; ? molybdenite associated with pyrite in a biotitic band.								
6.40	1.15	Schist with concordant granitic bands (60 cm).	10	15	50	1	0		4.1	1095
	Total bedrock intersection				average ppm of bedrock					
	3.40		7	15	37	2	0		3.8	-

Table 12 BH No. SPD12
Location: 290 m W of Loch Shin; 40 m W of Sallachy Road
NGR 5600 0660 Collar elevation 131.8 m, vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		TILL								
1.06	1.06	T_1 - greyish brown till with large Moinian rock fragments.	20	10	20	6	10	10	2.2	1096
2.17	1.11	T_2 - orange brown till with caved material	30	40	20	8	20	25	3.8	1097
3.17	1.00	T_2 - orange brown till becoming grey/brown	30	50	40	8	20	10	6.0	1098
3.90	0.73	T_2 - grey/brown till mixed with some sludge	20	45	60	14	20	55	4.7	1099

Appendix 2 : Borehole Records
Table 13 BH No. SPD13
Location: 250 m NNW of head of Allt a'Chlaonaidh, Claonel district
NGR 5500 0610 Collar elevation 278 m, vertical hole

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.16	0.16		A_o - poorly decomposed peat and litter.		0	10	1	10			1100
0.28	0.12		A_1/B - organic-rich soil with mineral matter.		0	10	0	10			1101
			TILL								
0.98	0.70		T_1 - clay and sand cementing fragments and	20	10	30	4	40	5		1102
1.38	0.40		pebbles of Moinian.	25	25	50	22	60	10		1103
2.16	0.78			20	20	40	15	40	15		1104
			MOINIAN								
2.52	0.36		Psammitic schist with quartz-feldspar veins	20	5	20	0	0		2.0	1105
3.43	0.91	2.90	Psammite composed of quartz sericitised plagioclase, microcline and lesser muscovite, magnetite and pyrite.	5	15	10	23	0		1.2	1106
		3.07	Bi-Pb sulphide probably of the aikinite group partly replaced by covellite in quartz vein; molybdenite in quartz veinlet.								
3.79	0.36		Concordant quartz-feldspar veins in psammite.	30	5	50	5	10		1.8	1107
5.95	2.16	4.57	Psammite composed of quartz, plagioclase, K-spar, muscovite and lesser magnetite and chlorite; K-spar and quartz inter-grown; trace of chalcopyrite; two generations of quartz veins.	10	5	20	6	10		1.6	1108
6.20	0.25		Psammite with quartz-K-spar veins, both	10	5	20	0	10		2.2	1109
6.51	0.31		concordant and somewhat cross-cutting.	15	10	30	5	10		2.2	1110
6.96	0.45	6.82	Psammite with quartz veins and segregations; composed of quartz, sericitised plagioclase, fresh microcline and muscovite; molybdenite in cross-cutting quartz veinlets.	20	5	20	220	10		2.4	1111
7.30	0.34		Psammite with cross-cutting quartz-pyrite and feldspar veinlets.	15	10	30	6	10			1112
	Total bedrock intersection 5.14						average ppm of bedrock				
				12	7	22	27	8		1.7	-

Appendix 2 : Borehole Records
Table 14 BH No. SPD14
Location: 200 m NW of head of Allt a'Chlaonaidh, Claonel District
NGR 5500 0600 Collar elevation 270 m, vertical hole.

Depth m	Thickness m	Section depth m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.21	0.21		A - peat with rootlets		5	20	130	40			1113
0.59	0.30		A_o/A_1 - peat with sand and rock fragments.		10	20	25	30			1132
			TILL								
1.07	0.48		T_1 - fine, leached, sandy till with angular rock	15	10	70	8	10	10	7.3	1114
1.55	0.48		fragments.	15	40	20	9	20	10	5.9	1115
2.08	0.53		T_2 - clay rich till with decayed rock fragments and pebbles at base.	10	55	70	20	30	5	5.9	1116
			MOINIAN								
3.38	1.30		Weathered psammite or micaceous psammite with quartz-pyrite veinlets.	15	10	30	9	10		1.9	1117
3.86	0.48		Psammite with minor pyrite and carbonate	15	15	40	70	0		2.5	1118
4.75	0.89	4.26	Psammite composed of quartz, plagioclase, K-spar, muscovite (in partings) and chlorite; cross-cutting quartz-carbonate-pyrite veinlets contain molybdenite and hematite; alteration along joints.	10	30	20	30	30		2.1	1119
	Total bedrock intersection						average ppm of bedrock				
	2.67			13	18	28	30	15		2.1	-

Appendix 2 : Borehole Records
Table 15 BH No. SPD15
Location: 100 m WNW of head of Allt a'Chlaonaidh, Claonel district.
NGR 5500 0590 Collar elevation 266 m, vertical hole.

Depth m	Thickness m	Section depth m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.20	0.20		A_o - peat with much undecomposed vegetation		5	20	12	30		2.4	1120
			TILL								
0.60	0.40		T_1 - grey sandy till with schist fragments,		0	20	5	20		2.9	1121
1.55	0.95		probably leached.	25	15	30	15	40	15	3.0	1122
2.55	1.00		T_2 - compact sandy till with schist fragments.	30	35	50	25	40	25	3.8	1123
3.55	1.00		reddened in places.	45	50	70	35	40	30	5.1	1124
4.65	1.10		T_3 - compact stony till with red and green patches.	50	70	80	20	30	40	3.9	1125
			MOINIAN								
5.26	0.61		Micaceous psammite with cross-cutting quartz pyrite veinlets trace molybdenite.	30	45	30	120	20		1.7	1126
7.95	2.69	6.55	Pink psammite composed of quartz. plagioclase, K-spar and minor green biotite, pyrite and chalcopyrite; concordant quartz-pyrite-molybdenite and cross-cutting carbonate-pyrite-hematite rutile veinlets; abrupt changes in dip of foliation (20° to 45°).	40	110	80	25	10		2.0	1127
8.89	0.94		Psammite with hematite veinlets (vertical), calcite.	55	25	100	8	10		3.0	1128
9.45	0.56		Common on joint, some disseminated pyrite	15	15	30	6	20		4.3	1129
10.75	1.30		and molybdenite in quartz veinlets foliation.	10	10	20	7	20		3.0	1130
12.36	1.61	12.35	Banded semipelitic schist composed of quartz, sericitised plagioclase, microcline, muscovite (in foliae) and biotite (or chlorite) replaced by carbonate and iron oxides; veinlets of hematite and of K-spar with minor carbonate and sulphide.	10	15	20	12	10		2.1	1131
	Total bedrock intersection 7.71			average ppm of bedrock							
				28	51	52	23	13		2.5	-

Appendix 2 : Borehole Records
Table 16 BH No. SPD16
Location: 100 m WSW of head of Allt a'Chlaonaidh, Claonel district
NGR 5500 0580 Collar elevation 269 m, vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Cu	U	Sample No. CBD
0.00		SOIL								
0.70	0.70	A_o - fairly well decomposed peat.		0	30	4	20			1133
		TILL								
1.28	0.58	T_1- grey sandy till with decomposed schist fragments.	30	15	60	60	70	20	3.7	1134
		MOINIAN								
2.00	0.72	Weathered micaceous psammite, foliation dips 50° to 60°.	35	10	70	90	60		3.7	1135
3.37	1.37	Micaceous psammite showing minor folding; limonitic and trace of molybdenite.	30	10	60	85	20		3.4	1136
4.45	1.17	Micaceous and chloritic psammite with two generations of quartz veinlets, one with minor pyrite.	40	10	70	100	30		3.9	1137
5.47	0.93	Micaceous and chloritic psammite with drusy quartz veinlets and minor disseminated pyrite.	35	5	70	17	20		3.6	1138
	Total bedrock intersection 4.19		35	9	average ppm of bedrock 66	75	30		3.6	-

Appendix 2 : Borehole Records
Table 17 BH No. SPD17
Location: 200 m SSW of head of Allt a'Chlaonaidh, Claonel district
NGR 5500 0570 Collar elevation 273 m, vertical hole.

Depth m	Thickness m	Section depth m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.33	0.33		A_o - partly decomposed brownish-black peat with rootlets		5	40	15	40			1139
0.83	0.50		A_o - black peat.		55	10	4	20			1140
			TILL								
1.15	0.32		T_1 - grey grading into brown sandy till with	15	25	30	60	30	15	2.5	1141
1.65	0.50		numerous subangular schist fragments	10	35	50	150	30	10	2.8	1142
			MOINIAN								
2.45	0.80		Weathered psammite with trace of molybdenite.	0	10	10	17	10		0.8	1143
2.65	0.20	2.60	Vein quartz with subhedral pyrite, also containing leucoxene and sericitised feldspar.	0	15	0	130	0		0.7	1144
3.40	0.75		Fractured silicious psammite, somewhat altered.	0	15	10	23	10		1.1	1145
3.77	0.37	3.50	Quartz-sericite-muscovite psammite with some quartz veins and molybdenum-bearing yellowish-brown clay on one joint surface; foliation dips at 70°.	0	10	10	27	10		1.7	1146
4.30	0.53		Psammite with quartz veins containing traces of molybdenite	0	10	30	16	10		1.2	1147
5.10	0.80		Psammite with quartz-pyrite-molybdenite veins	0	10	10	40	10		0.8	1148
5.80	0.70		Psammite with quartz veins; brown staining	0	10	10	130	10		1.0	1149
7.00	1.20		on slickenside and joint surface contains Mo.	0	5	10	40	10		1.2	1150
	Total bedrock intersection 5.35			average ppm of bedrock							
				0	10	10	46	10		1.1	-

Appendix 2 : Borehole Records

Table 18 BH No. SPD18

Location: 280 m SSW of head of Allt a'Chlaonaidh Claonel district.

NGR 5500 0560 Collar elevation 276 m, vertical hole.

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.55	0.55	A_o - brown peat with rootlets.		20	20	2	10			1151
1.25	0.70	A_o - chocolate-brown fairly well decomposed peat		0	10	2	20			1152
		TILL								
1.92	0.67	T_1 - greyish brown sandy till with schist fragments.	20	10	50	5	20	10	3.4	1153
2.51	0.59	T_1 - till with large psammite boulder.	20	10	45	5	20	15	3.5	1154
		MOINIAN								
3.55	0.04	Sparsely micaceous psammite, foliation dips 50°	5	10	20	2	10		1.4	1155
4.47	0.92	minor quartz veins and sulphide.	0	5	10	3	10		1.5	1156
	Total bedrock intersection				average	ppm of bedrock				
	1.96		3	8	15	2	10		1.4	-

Table 19 BH No. SPD19

Location: 360 m S of head of Allt a'Chlaonaidh, Claonel district

NGR 5500 0550 Collar elevation 279 m, vertical hole.

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.80	0.80	A_o - peat with rootlets.		0	10	2	0			1157
		TILL								
1.47	0.67	T_1 - silt-sized till with schist fragments, more sandy at base.	5	5	40	3	20	10	2.5	1158
		MOINIAN								
2.13	0.66	Fresh micaceous psammite with hematite stringers.	0	5	10	1	10		1.7	1159
2.64	0.51	Buff-coloured psammite with some cross-cutting	0	5	10	1	10		1.0	1160
4.05	1.41	quartz veins and hematite stringers; foliation dips 30°	0	5	10	2	10		0.9	1162
	Total bedrock intersection				average	ppm of bedrock				
	2.58		0	5	10	1	10		1.1	-

Appendix 2 : Borehole Records

Table 20 BH No. SPD20

Location: 460 m S of head of Allt a'Chlaonaidh Claonel district

NGR 5500 0540 Collar elevation 284 m, vertical hole.

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
1.30	1.30	A_o - dark brown well decomposed peat with rootlets.		0	10	0	10			1163
		TILL								
1.65	0.35	T_1 - orange brown sandy till with schist fragments; bottom 10 cm clay-rich and leached.								
		MOINIAN								
2.67	1.02	Micaceous psammite.	0	5	10	2	10		1.4	1165

Table 21 BH No. SPD21

Location: 650 m N of Grudie Burn, 200 m E of Allt na Caillich Beag

NGR 5350 0600 Collar elevation 236 m, vertical hole.

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.28	0.28	A_o - dark brown peat with roots passing into black peat.		5	10	6	30			1166
		TILL								
0.83	0.55	T_1 - 8 cm white sand with pebbles of quartz and psammite; brown sandy clay and green compact	10	10	10	5	20	5	1.7	1167
0.97	0.07	sandy till angular psammite fragments.								
		MOINIAN								
2.07	1.17	Sparsely micaceous psammitic schist with regular banding dipping at 20°.	5	10	20	5	10		1.3	1168
2.97	0.90	Semipelite, no evidence of mineralisation.	5	10	30	8	10		2.0	1169
Total bedrock intersection			average ppm of bedrock							
	2.07		5	10	24	6	10		1.6	-

Appendix 2 : Borehole Records

Table 22 BH No. SPD22

Location: 450 m N of Grudie Burn and 300 m E of Allt na Caillich Beag

NGR 5350 0580 Collar elevation 217 m, vertical hole.

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.65	0.65	A_o - dark brown peat (0.18 m) overlying black peat.		5	10	9	20			1170
		TILL								
1.04	0.39	T_1 - sandy clay grading to green, clay-rich till with large angular quartz and psammite pebbles.	30	15	40	12	40	15	1.6	1171
1.53	0.49	T_2 - green, clay-rich till with large angular psammite pebbles.	55	80	70	17	90	20	2.3	1172
2.20	0.67	Psammite fragments overlying bedrock.	30	60	50	17	40	15	3.0	1173
		? LEWISIAN								
3.86	1.66	Schist or gneiss with occasional quartz-feldspar veinlets containing pyrite.	10	25	20	2	10		3.0	1174

Table 23 BH No. SPD23

Location: 250 m N of Grudie Burn and 500 m E of Allt na Caillich Beag

NGR 5350 0560 Collar elevation 186 m, vertical hole.

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.30	0.30	A_o - peat intermixed with detrital material.	20	15	50	12	20	10	3.6	1175
		TILL								
0.36	0.06	T_1 - very thin sandy till.								-
2.30	1.94	Boulders of psammite and quartz								-
		MOINIAN								
3.16	0.86	Finely banded psammitic gneiss with occasional biotite partings.	10	5	200	4	110		1.7	1177

Appendix 2 : Borehole Records
Table 24 BH No: SPD24
Location: 400 m S of Grudie Burn; N of Meall'a Ghruididh
NGR 5350 0490 Collar elevation 188 m, vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
1.07	1.07	A_o - very wet dark brown peat.								
1.27	0.20	A_o - dark brown wet peat with roots, poorly decomposed		25	40	20	40			1178
		TILL								
1.70	0.43	T_1 - fine grey till with many angular semipelite fragments.	60	40	70	5	40	30	4.8	1179
1.89	0.19	T_2 - red-brown oxidised till, fine grained with rock fragments	50	60	100	4	20	30	3.5	1180
2.64	0.75	T_2 - cored fragments of semipelite								-
3.25	0.61	T_2 - sandy brown till with many angular	30	35	50	2	20	20	3.6	1181
3.87	0.62	T_2 - rock fragments	40	40	110	40	400	20	8.4	1182
4.12	0.25	T_3 - deeply weathered semipelite boulder? with quartz veins	300	45	470	200	470	40	20.3	1183
4.25	0.13	T_3 - light brown sandy-clay with rock fragments	60	60	160	35	190	130	5.9	1184
4.30	0.05	T_3 - contaminated with drill bit.								-
		MOINIAN								
4.91	0.61	Psammite with sparse pyrite; a few quartz veins	10	5	40	2	20		2.1	1185
6.51	1.60	parallel to foliation contain pyrite, also iron rich bands.	10	10	30	5	10		2.3	1186
	Total bedrock intersection 2.21		10	9	average ppm of bedrock 33	4	13		2.3	-

Appendix 2: Borehole Record
Table 25. BH No. SPD 25
Location: 550 m S of Grudie Burn, : N of Meall'a Ghruididh
NGR 5350 0475 Collar elevation 208 m vertical hole

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.33	0.33	A_o - dark brown poorly decomposed peat.		10	30	4	30			1187
1.03	0.70	A_o - black, well decomposed peat.		5	10	5	20			1188
1.22	0.19	B_1 - brown-grey sandy find-grained soil with rock fragments.	15	25	50	0	10	10	2.5	1189
1.58	0.36	B_2 - grey clay rich with caved materials.								
		TILL								
2.51	0.93	T_1 - cored semi-polite boulders; sparse pyrite along foliation (70°).							1.7	1193
2.87	0.36	T_2 - fine grained grey-green sandy till with rock fragments.	30	30	60	0	10	10	5.0	1190
3.24	0.37	T_2 - coarse grained sandy till .	20	20	50	0	10	10	3.5	1191
4.22	0.98		15	15	30	1	10	10	3.2	1192
5.00	0.78	T_2 - washed sand and Moinian rock fragments	20	15	30	1	20	5	3.0	1194
5.60	0.60	T_3 - grey sandy till with some caved material.	45	20	20	0	20	15	6.1	1195
5.70	0.10		25	85	130	0	400	10	3.7	1196
5.80	0.10		30	85	70	3	30	10	2.9	1197
6.20	0.40	T_3 - grey-brown sandy clay with small	25	60	60	0	40	10	4.1	1198
6.60	0.40	fragments of psammite and granitised schist.	10	30	50	0	10	10	4.5	1199
7.02	0.42	T_3 - green-grey till angular granite and micaceous psammite fragments.	25	15	40	3	20	10	4.2	1200
7.50	0.48	T_3 - orange-brown clay-sand with many feldspar grains	25	20	40	1	20	15	5.6	1201
7.70	0.20	T_3 - grey-brown till with psammite fragments	25	20	40	0	10	10	4.3	1202
8.00	0.30	T_3 - grey-brown sandy clay with scarce rock fragments	25	30	50	1	10	20	4.0	1203
9.00	1.00	)	45	90	100	3	10	15	5.1	1204
9.57	0.57	) Grey sandy clay	45	110	90	3	30	260	4.4	1205
10.07	0.50	)	40	60	80	3	20	10	7.4	1206
10.37	0.30	)	15	50	50	3	20	10	4.0	1207

Appendix 2: Borehole Record
Table 26 BH No. SPD 26
Location: E Bank of 'Moly' Burn, W Grudie district
NGR: 5139 0452 Collar elevation 259 m (approx.) vertical hole

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. C BD
0.00			SOIL								
0.13	0.13		A_o - black peat.	10	15	20	18	20	0		1208
0.29	0.16		B-sandy orange-brown soil.	40	110	50	40	20	10		1209
			TILL								
0.73	0.44		T_1 - brown sandy till with rock fragments.	45	120	80	40	30	20		1210
0.90	0.17		T_2 - light brown sandy till with fragments.	35	115	60	30	20	5		1211
1.93	1.03		T_2 - brown sandy till with increased clay content.	50	190	100	35	30	10		1312
2.33	0.40		T_3 - clay rich basal till with large fragments.	80	250	190	70	40	25		1213
			LEWISIAN								
2.77	0.44		Weathered ? schist and hard silicious schist	10	50	3	8	0		1.2	1214
3.43	0.66		with quartz veins cutting foliation planes (dip 45° to 50°).	0	5	20	2	10		1.6	1215
4.60	1.17	4.35	Bleached gneiss with varying amounts of	15	60	40	12	0		1.6	1216
7.40	2.80	5.56	epidote and hornblende; some veining.	25	85	40	15	0		1.9	1217
7.95	0.55		Quartz-feldspar pegmatite.	10	0	0	3	0		0.1	1218
9.85	1.90	9.45	Banded psammite, apparently weathered but probably bleached (plagioclase is fresh); minor apatite.	15	55	30	9	0		1.2	1219
11.33	1.48		Apparently weathered schist or gneiss with	15	85	40	15	10		1.3	1220
11.80	0.47		quartz veins and some green alteration.	20	90	40	20	50		1.0	1221
12.35	0.55	12.30	Altered rock from fault zone (? slide rock) and silicic gneiss with pyrite, molybdenite, chalcopyrite and trace covellite.	25	130	40	120	10		1.2	1222
13.22	0.87		Apparently somewhat weathered schist or	35	105	40	25	0		1.4	1223
14.58	1.36		gneiss; foliation dip 35° to 50°; some quartz-	15	45	20	10	0		1.4	1224
15.57	0.99		pyrite veinlets	20	60	20	0	0		1.0	1225
16.40	0.83	15.72	Fresh silicic gneiss (quartz-plagioclase-biotite) with concordant vein with K-spar (in places myrmekitic) and molybdenite.	30	120	30	50	0		1.2	1226
17.63	1.23		Fresh gneissose rock, in places fractured, with	20	55	30	15	0		1.4	1227
18.45	0.82		drusy quartz and pyrite in veinlets.	15	45	20	9	0		0.9	1228
19.27	0.82	18.62	Somewhat altered silicic gneiss (quartz-plagioclase-K-spar) with accessory apatite, zircon and wispy molybdenite.	35	50	30	30	0		1.3	1229

Table 26 cont.

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
20.20	0.93	20.10	Altered intermediate gneiss (quartz-plagioclase-chlorite) with chalcopyrite in vertical fractures.	25	110	60	10	0		1.1	1230
21.71	1.51	21.54	Intermediate gneiss with epidote, hornblende and lesser sphene, apatite and allanite.	15	45	30	40	0		1.3	1231
22.50	0.79		Chloritic and biotitic schist or gneiss	30	40	20	25	0		1.2	1232
23.69	1.19		with cross-cutting quartz-pyrite-molybdenite	20	50	30	90	0		1.0	1233
24.44	0.75		veinlets and K-spar veinlets; foliation dips 28°.	20	95	30	150	0		1.3	1234
25.21	0.77		Variably chloritic, biotitic and laminated schist	30	50	30	10	0		1.3	1235
26.30	1.09		gneiss with cross-cutting K-spar and quartz-	35	100	30	24	10		1.2	1236
27.65	1.35		pyrite veinlets.	15	15	30	10	10		3.1	1237
28.60	0.95		More psammitic, cut by numerous feldspar-quartz veinlets with pyrite and fine grained molybdenite.	10	50	20	120	10		1.4	1238
29.00	0.40	28.65	Gneiss (quartz-plagioclase-muscovite-biotite) tending to exhibit augen texture with pyrite, chalcopyrite and sphalerite; molybdenite in cross-cutting quartz vein.	15	75	20	650	10		1.4	1239
29.30	0.30		Gneiss with quartz-pyrite veins containing	20	80	30	250	20		1.6	1240
30.00	0.70		molybdenite and chalcopyrite; epidote on	15	40	30	22	10		1.5	1241
31.10	1.10		joint surfaces; foliation dips 35°	25	85	40	100	10		2.0	1242
32.25	1.15	31.13	Fine grained gneiss with sericite and poikilitic biotite (? replacing staurolite or kyanite).	20	20	30	8	20		1.6	1243
	Total bedrock intersection 29.92						average ppm of bedrock				
				18	58	27	37	3		1.4	

Appendix 2 Borehole Records

Table 27. BH No. SPD 27 Location: 700 m S of Grudie Burn N of Meall a'Ghruididh
NGR 5350 0460 Collar elevation 231 m, vertical hole.

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.15	0.15	A_o - thin peat with roots.	0	0	10	2	20			1244
0.35	0.20	B_1 - brown clay with fine sand.	0	0	10	7	0	0	2.0	1245
0.57	0.22	B_2 - orange and sandy with occasional Moinian fragments.	0	0	10	0	10	0	2.0	1246
		TILL								
0.90	0.33	T_1 - light brown sandy till with occasional Moinian fragments.	0	0	10	0	10	5	1.9	1247
1.22	0.32	T_2 - very light brown sandy till with small rock fragments.	0	0	10	0	10	0	1.8	1248
1.71	0.49	T_2 - grey, clay-sand with rounded	0	5	10	0	10	0	1.5	1249
2.14	0.43	psammitic pebbles.	10	10	20	0	10	0	2.9	1250
2.51	0.37	T_2 - grey till with common quartz fragments	5	15	30	nd	0	5	3.5	1251
2.92	0.41	and rounded semipelite fragments.	5	5	20	0	10	0	3.7	1252
3.48	0.56	T_2 - grey, clay-sand with Moinian fragments of various sizes.	5	5	10	0	10	0	3.3	1253
4.07	0.59	T_3 - grey, clay-sand with small fragments of feldspar and granite.	5	5	10	nd	10	0	2.6	1254
4.75	0.68	T_3 - grey, clay-rich with increasing feldspar fragments.	5	10	10	nd	10	5	2.5	1255
5.64	0.89	T_3 - brown till, with numerous feldspar fragments.	15	40	60	3	30	30	9.7	1256
6.18	0.54	T_3 - red-brown clay rich due to weathered feldspar and muscovite.	30	20	80	2	10	15	16	1257
6.89	0.71	yellow-brown	15	25	60	3	10	15	16	1258
7.61	0.72	clay sand	10	15	60	3	10	15	15	1259
8.18	0.57	no rock fragments.	15	15	75	2	20	15	18	1260
8.69	0.51	T_3 - clay-rich, pale grey-brown with coarse fragments of weathered feldspar and bands of muscovite.	25	15	80	2	10	20	18	1261
9.20	0.51	T_3 - clay-rich, light brown with bands of feldspar and biotite sand	15	60	70	3	10	10	18	1262
9.68	0.48	T_3 - sandy clay with very weathered biotite rich pebbles	20	26	80	3	20	20	17	1263
10.43	0.75	T_3 - clay-sand, rich in biotite and weathered feldspar fragments	10	10	40	1	10	10	18	1264
10.98	0.55	T_3 - sandy clay with fewer rock fragments but a few large	20	25	80	0	10	15	37	1265
11.66	0.68	quartz grains.	20	10	70	8	10	15	35	1266
		MOINIAN								
15.32	3.66	Highly altered psammite with quartz veins containing iron oxides	5	5	20	2	10		6.0	1267
16.77	1.45	Micaceous to sparsely micaceous psammite.	5	10	30	1	10		5.5	1268
17.76	0.99	" "	10	5	30	2	10		5.6	1269
19.50	1.74	" "	10	15	50	1	60		7.1	1270
20.36	0.86	Granitised schist containing pink feldspar, quartz and biotite.	5	5	20	10	120		3.6	1271
22.57	2.21	Pink granitised schist; heavily fractured with black staining on surfaces; occasional quartz phenocrysts.	sample missing							
Total bedrock intersection			average ppm of bedrock							
-	10.91		6	8	29	2	31		5.9	-

Appendix 2 Borehole Records

Table 28. BH No. SPD 28 Location: 1000 m S of Grudie Burn on NW slope of Cnoc na Cloich-bhuaile NGR 5200 0450 Collar elevation 282 m vertical hole.

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.50	0.50	A_o - black homogenous peat.		5	20	4	20			1273
0.72	0.22	A_1 - black peat with sand and Moinian rock fragments.	0	20	10	8	10	0	2.3	1274
0.99	0.27	A_2 - grey-green and sandy grading downwards to clay rich soil.	5	20	20	9	10	5	2.6	1275
1.07	0.08	B_2 - red-brown sandy clay with Moinian fragments.	5	20	20	6	0	5	2.2	1276
		TILL								
1.68	0.61	T_1 - grey-brown sandy clay containing semipelite fragments.	5	20	20	6	0	5	1.9	1277
2.03	0.35	T_1 - light brown, sandy clay; no rock fragments.	10	20	20	6	10	5	4.4	1278
2.50	0.47	T_1 - light brown, and sandy with patches of decomposed granite.	65	100	70	17	20	10	3.5	1279
3.00	0.50	T_1 - light brown, sandy clay with angular granite and quartz fragments.	0	20	30	7	10	10	15.	1280
4.30	1.30	T_1 - light brown, and clay-rich with weathered semipelite and granite fragments.	5	35	50	5	10	10	11	1281
4.70	0.40	T_1 - light brown powdery till with red stained semipelite pebbles	5	10	50	7	10	10	16	1282
5.50	0.80	T_1 - light brown sandy-clay with weathered feldspars	5	25	40	10	20	10	13	1283
6.80	1.30	T_1 - deeply weathered semipelite with abundant pink feldspar; foliation 50°, concordant quartz veins.								-
8.30	1.50	T_1 - cuttings sample.	15	85	50	4	10	5	18	1284
9.72	1.42	T_1 - light brown sandy till with a few rock fragments.	0	10	30	5	0	5	20	1285
9.82	0.10	T_2 - grey-brown clay rich till with coarse semipelite fragments.	10	35	50	6	10	20	15	1287
10.10	0.28	T_2 - brown and clay-rich with numerous weathered feldspars.								1288
10.20	0.10	T_2 - brown sandy clay with iron stained semipelite fragments.	5	35	30	5	10	5	19	1289
10.30	0.10	T_2 - grey powdery till with numerous semipelite and feldspar fragments	5	40	40	2	10	60	11	1290
10.60	0.30	T_2 - light brown sandy clay with with weathered feldspar and	5	20	30	4	10	5	40	1291
10.80	0.20	semipelite fragments.	0	5	20	2	10	5	23	1292
11.20	0.40	T_2 - red sandy clay with granitic fragments and much biotite.	10	60	50	2	20	5	13	1293
		MOINIAN								
11.55	0.35	Micaceous psammitic schist with numerous quartz veins in foliation planes (dip, 40°).	0	5	20	4	10		8.0	1294

Appendix 2: Borehole Records
Table 29. BH No. SPD 29
Location: W Grudie district; 200 m E of Moly Burn outcrop
NGR: 5160 0450 Collar elevation 271 m, vertical hole

Depth m	Thickness m	Core description	Ni	Cu	Zc	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
1.36	0.36	A_o - black moderately decomposed peat		10	30	1	60			1295
0.58	0.22	B_1 - very dark brown clay-sand soil with semipelite fragments	0	5	10	5	10	0	1.5	1296
1.05	0.47	B_2 - light brown soil with angular semipelite or micaceous psammite fragments	0	25	20	6	10	0	6.9	1297
		TILL								
1.47	0.42	T_1 - brown, medium grained sandy till	10	95	60	15	30	5	2.7	1298
1.99	0.52	T_1 - brown, sandy till with abundant schist fragments	10	65	40	12	20	5	2.8	1299
2.21	0.22	T_2 - greyish-green fine-grained sandy till with schist fragments	10	25	40	7	10	5	11	1300
2.54	0.33	T_2 - very fine grained sandy till, light brown with schist fragments becoming larger with depth	15	90	40	15	10	5	2.7	1301
		MOINIAN								
3.30	0.76	Micaceous psammite with narrow bands of granitic material; foliation 40°.	10	60	20	40	10		1.4	1302
4.00	0.70	Well foliated micaceous psammite with	10	55	20	40	10		1.5	1303
4.80	0.80	muscovite, deeply weathered	10	70	20	30	10		1.1	1304
5.67	0.87	Micaceous psammite containing granitic veins with pyrite-molybdenite	10	70	10	1	10		1.2	1305
6.60	0.93	Less micaceous with quartz-feldspar veinlets containing pyrite-molybdenite; cross cutting veinlets of molybdenite, and abundant hematite	10	65	10	35	10		1.0	1306
7.19	0.59	Weathered micaceous psammite with large barren quartz vein	30	50	30	40	0		1.5	1307
8.00	0.81	Disseminated hematite in fresher micaceous psammite	15	40	20	10	0		1.2	1308
9.06	1.06	Quartz-feldspar veins with pyrite-molybdenite-chalcopyrite	10	40	20	40	0		1.5	1309
10.11	1.05	Variably weathered micaceous psammite	10	70	20	20	0		1.8	1310
11.23	1.12	Rock more fractured and minerals leached	15	30	20	12	0		1.4	1311
Total bedrock intersection			average ppm of bedrock							
	8.69		12	54	19	25	5		1.4	-

Appendix 2: Borehole Records
Table 30. BH No. SPD 30
Location: 350 m NW of top of Cnoc na Cloich-bhuaile
NGR 5200 0430 Collar elevation 320 m, vertical hole

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.25	0.25	A_o - dark brown, poorly decomposed peat		5	20	4	40			1312
0.47	0.22	A_o - black, well decomposed peat		15	10	3	30			1313
0.60	0.13	A_2 - light brown peat with eluvial sand	0	5	10	8	10	0	3.3	1314
1.02	0.42	B_1 - brown sandy-clay with some organic material	0	20	20	5	40	0	5.8	1315
1.22	0.20	B_2 - brown to green clay with feldspar: quartz and granite fragments	0	15	10	5	20	0	13	1316
		TILL								
1.85	0.63	T_1 - pink clay till, with deeply weathered granite and feldspars	5	10	10	2	40	0	11	1317
2.23	0.47	T_1 - pink clay till, with relict granite, felspar, quartz	5	10	10	0	30	0	10	1318
2.67	0.35	T_1 - light brown sandy clay with yellow and white feldspar fragments	0	30	10	6	50	0	25	1319
3.35	0.68	T_1 - pink clay till; deeply weathered	5	15	30	0	30	5	10	1320
3.90	0.55	T_1 - granite rimmed	0	20	10	1	40	5	15	1321
4.25	0.35	" "	0	15	10	0	20	0	15	1322
4.75	0.50	" "	0	5	20	1	10	0	17	1323
5.45	0.70	T_1 - unconsolidated sandy clay terminated	5	10	20	0	10	0	20	1324
6.02	0.57	by deeply weathered granite	5	10	20	1	20	0	16	1325
6.70	0.68	T_1 - finer grained weathered	5	15	20	1	30	0	17	1326
7.34	0.64	granite in pink clay-rich matrix	5	20	20	0	35	0	17	1327
7.70	0.36	containing quartz fragments	5	10	20	1	20	0	17	1328
8.30	0.60	T_2 - medium grained pink sandy till with	5	20	30	1	20	0	17	1329
8.93	0.63	decomposing granite with abundant soft	5	45	40	1	10	0	13	1330
9.40	0.47	green mineral, grading to fine grained	5	35	30	0	10	0	7.8	1331
9.90	0.50	clay with large cored granite fragments	10	120	60	1	10	0	10	1 1332

Appendix 2: Borehole Records
Table 31. BH No. SPD 31
Location: 650 m NW of top of Cnoc na Cloich-bhuaile; 400 m E of Moly Burn outcrop
NGR 5180 0450 Collar elevation 271 m, vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.48	0.48	A_o - moderately decomposed dark brown peat		10	30	4	30			1333
1.33	0.85	A_o - black peat; less root material		5	10	0	10			1334
1.85	0.52	A_o - black, very well decomposed peat		20	20	6	10			1335
		TILL								
2.38	0.53	T_1 - large semipelite pebbles in grey sandy till							1.0	1336
2.68	0.30	T_1 - light grey sandy till with pebbles of angular	10	40	40	3	20	5	2.4	1337
3.30	0.62	semipelite and quartz	10	30	30	4	20	5	2.2	1338
4.19	0.89	T_1 - cored pebbles and boulders of semipelite with							0.9	1339
4.88	0.69	a little disseminated pyrite, quartz-feldspar							1.0	1340
10.62	5.74	rich and pink psammite; no fines recovered							2.4	1341
13.27	2.65	" "								-
14.00	0.73	T_1 - wet, limonitic stony till containing granitised Moine schist	45	90	110	17	40	15	6.4	1342
15.25	1.25	T_2 - limonitic clay rich till	50	65	100	17	30	20	9.1	1343
15.50	0.25	T_2 - sandy till probably caved material	30	65	70	18	50	40	2.6	1344
		DRILL CUTTINGS SAMPLES								
4.00		T_1 - washed sand with dominant feldspar and	10	20	20	3	0	0	2.0	1345
4.88		biotite grains	70	75	50	4	10	35	2.9	1346
6.86		T_1 - clay-sand	5	15	10	1	10	0	2.3	1347
7.50		T_1 - coarser grained sand containing more feldspar	30	65	40	15	10	10	6.1	1348
8.23		T_2 - red-brown sand with limonitic staining and abundant feldapar	60	105	80	23	60	10	7.9	1349
9.23		T_2 - sandy till very rich in muscovite	60	120	100	7	10	25	3.1	1350
10.49		and biotite	50	70	40	10	10	15	3.2	1351
11.90		T_2 - limonitic micaceous sandy till	105	150	130	25	20	45	4.2	1352
12.45		T_2 - limonitic feldspar rich sandy-clay till	50	95	110	25	90	20	9.8	1353
13.27		T_2 - light brown mica-rich sandy till	60	140	110	20	40	15	6.3	1354
15.50		T_2 - limonitic, muscovite-feldspar rich sandy till	65	135	80	9	30	10	4.1	1355

Appendix 2: Borehole Records
Table 32. BH No. SPD 32
Location: 400 m W of Cnoc na Cloich-bhuaile, W Grudie district
NGR 5200 0410 Collar elevation 312 m vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.37	0.37	A_o - dark brown moderately decomposed peat with eluvial sand.	5	5	10	1	20			1356
0.48	0.11	A_1 - abundant organic material with eluvial iron stained quartz.	5	10	10	5	20	0	2.3	1357
0.60	0.12	B_1 - red-brown limonitic sandy soil.	5	15	20	8	10	0	3.5	1358
		TILL								
0.85	0.25	T_1 - light brown fine grained sandy till.	10	10	20	5	20	0	4.2	1359
1.25	0.40	T_1 - light brown sandy till with fragments of feldspathic schist.	15	25	50	7	30	10	7.2	1360
1.85	0.60	T_1 - pink sandy till with feldspathic quartz veined schist;	10	15	30	5	20	5	5.1	1361
2.35	0.50	more clay-rich at base.	5	35	30	5	10	5	3.6	1362
3.20	0.85	T_1 - buff sandy till.	5	25	20	3	20	5	5.5	1363
4.00	0.80	T_1 - light brown clay till containing weathered psammite fragments.	15	15	40	4	10	10	5.6	1364
4.70	0.70	T_1 - light brown clay with hematised clay patches and more rock fragments.	10	35	40	4	20	10	7.6	1365
5.20	0.50	T_1 - brown clay, containing many psammitic fragments.	10	20	30	5	20	5	4.6	1366
5.30	0.10	T_1 - fragments of well jointed granite with disseminated hematite.	10	20	30	3	70	10	7.1	1367
5.90	0.60	T_2 - clay-rich brown till with fragments of semipelite (granite veined) and granite with black precipitate on joints	25	30	80	9	20	20	8.6	1368
6.66	0.76	T_2 - clay-rich brown till with weathered and stained mica schist fragments.	40	25	110	8	20	25	9.5	1369
7.22	0.56	T_2 - clay-rich brown till with quartz and mica-schist fragments containing quartz-feldspar-hematite veins.	30	50	90	6	20	25	6.3	1370
		MOINIAN								
8.30	1.08	Psammitic schist with quartz-hematite and feldspar veinlets.	5	10	10	0	0		1.9	1371
8.85	0.55	Vertical contact between psammite and a pink granitised schist containing feldspar-quartz-weathered biotite.	5	5	10	2	0		3.2	1372
	Total bedrock intersection 1.63		average ppm of bedrock							
			5	8	10	1	0		2.3	-

Appendix Table 2: Borehole Records
Table 33. BH No. SPD 33
Location: 400 m NW of top of Cnoc na Cloich-bhuaile, W Grudie district
NGR: 5217 0445 Collar elevation 316 m, vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.57	0.57	A_o - well decomposed black peat.		20	10	50	130			1373
0.84	0.27	A_o - very well decomposed black peat with granite fragments.	5	35	50	9	70	5		1374
1.10	0.20	A_o - decomposed black peat with small granite fragments.	10	45	70	8	40	20		1375
		GRANITE								
1.14	0.04	Boulder or bedrock granite fragments.	5	5	20	1	10		2.8	1376
1.45	0.31	Granite with disseminated pyrite.	0	0	20	7	20		3.5	1377
2.25	0.80		0	5	30	4	20		5.6	1378
2.97	0.72	Granite with disseminated fluorite and pyrite.	5	0	20	6	10		4.8	1379
3.42	0.45	Granite with a little disseminated pyrite.	0	5	30	3	30		6.2	1380
3.89	0.47		0	5	30	10	10		7.2	1381
4.49	0.60	Granite with disseminated pyrite-fluorite- ?chalcopyrite.	5	5	20	8	10		12	1382
5.04	0.55	Granite with disseminated pyrite and a little fluorite	0	5	30	5	20		5.9	1383
5.74	0.70	and occasional black discolorations on fracture surfaces.	5	5	30	3	30		8.6	1384
6.39	0.65	" " "	5	0	30	2	0		12	1385
7.44	1.05	" " "	5	5	30	4	10		8.1	1386
7.94	0.50	" " "	0	0	20	2	10		19	1387
8.44	0.50	Granite with disseminated pyrite and fluorite.	0	0	30	1	20		4.0	1388
9.10	0.66	" "	0	5	20	3	10		5.0	1389
	Total bedrock intersection 8.00		average ppm of bedrock							
			2	3	26	4	15		7.5	

Appendix Table 2: Borehole Records
Table 34 BH No. SPD 34
Location: 200 m SW of Cnoc na Cloich-bhuaile, W Grudie district
NGR: 5220 0400 Collar elevation 328 m, vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.14	0.14	A_o - dark brown peat grading downwards to black peat.	0	10	20	37	20	5	5.0	1390
0.30	0.16	A_o - black, well decomposed peat with eluvial sand.	0	5	10	10	10	0	4.8	1391
0.38	0.08	B_1 - brown sandy soil.	0	15	20	25	20	0	4.0	1392
		TILL								
0.74	0.36	T_1 - yellow-grey, clay-sand till with hematite in psammitic fragments.	10	20	30	15	10	5	5.0	1393
0.90	0.16	T_1 - pale yellow sandy till with psammite and semipelite fragments.	5	10	20	6	10	5	4.4	1394
1.39	0.49	T_1 - grey, clay-sand till with granite and psammite fragments.	5	35	30	6	10	5	4.0	1395
1.85	0.46	T_1 - grey, clay-sand with psammite containing	5	35	30	8	20	5	4.8	1396
2.22	0.37	quartz-feldspar veins; also granite fragments.	5	30	30	6	20	15	4.1	1397
		MOINIAN								
2.88	0.66	Pink granitised schist with quartz-feldspar and hematite in veins.	5	15	10	6	0		1.0	1398
3.91	1.03	Fractured granitised schist with secondary green	5	5	10	2	0		0.8	1399
4.72	0.81	mineral on fracture surfaces.	5	0	0	1	0		0.5	1400
	Total bedrock intersection					average ppm of bedrock				
	2.50		5	6	7	3	0		0.8	-

Appendix Table 2: Borehole Records
Table 35. BH No. SPD 35
Location: 400 m SW of Cnoc na Cloich-bhuaile, W Grudie district
NGR: 5200 0390 Collar elevation 320 m vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CRD
						ppm				
0.00		SOIL								
0.11	0.11	A_o - moderately well decomposed peat with much root material.		10	50	4	40			1401
0.57	0.46	A_o - darker, moderately well decomposed peat.		5	10	0	10			1402
0.99	0.42			5	10	0	10			1403
1.46	0.47			5	10	3	10			1404
2.00	0.54	B_1 - psammite boulders followed by light brown sandy								
2.56	0.56	soil with psammite pebbles (angular).	15	25	20	5	20		2.7	1406
		TILL								
3.88	1.32	T_1 - grey sandy till with weathered Moinian pebbles.	20	40	50	4	20		4.2	1407
4.66	0.78	T_1 - grey-brown clay-sand till with large angular pebbles.	20	50	40	3	10			1408
4.76	0.10	T_2 - clay-sand till with orange patches.	20	45	40	4	10		3.8	1409
		MOINIAN								
5.32	0.56	Fine grained psammite containing quartz-feldspar veins.	10	20	60	3	10		3.4	1410
6.04	0.72	Quartzose psammite with granitic veins.	5	15	10	1	0		1.1	1411
6.37	0.33	6 cm quartz vein with adjacent pink feldspar enrichment	5	5	10	1	0		0.8	1412
6.86	0.49	Fractured and deeply weathered psammite.	10	15	40	1	0		2.0	1413
7.57	0.71	Psammite containing some quartz-feldspar veins.	10	15	30	0	0		2.6	1414
	Total bedrock intersection					average ppm of bedrock				
	2.81		8	15	30	1	2		2.1	-

Appendix 2: Borehole Records
Table 36. BH No. SPD 36
Location: 400 m SE of head of 'Moly' Burn, W. Grudie district
NGR: 5180 0400 Collar elevation about 298 m vertical hole.

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
							ppm				
0.00			SOIL								
0.26	0.26		A_o - brown peat with rootlets.		5	10	2	20			1415
0.36	0.10		A_o - black decomposed peat.		5	0	1	10			1416
			TILL								
0.82	0.46		T_1 - boulder of micaceous schist with minor pyrite.	10	30	0	4	0	10	4.6	1417
1.24	0.42		T_1 - brown clay-rich sand with limonitic bands and	10	30	50	12	20	10	3.4	1418
1.71	0.47		numerous schist fragments.	15	70	80	17	20	15	5.7	1419
2.14	0.43		T_2 - more sandy yellowish-brown till with small	5	100	50	7	20	10	4.3	1420
2.68	0.54		fragments of vein quartz and granitic material.	5	30	50	5	10	10	4.2	1421
3.29	0.61		T_3 - clay-rich till with limonitic patches and fragments of quartz and psammite.	5	40	40	7	20	10	5.4	1422
3.70	0.41		T_4 - buff sandy till with black iron-rich patches and	0	60	40	8	10	10	5.5	1423
3.98	0.28		many psammite fragments.	0	40	40	6	10	15	4.5	1424
4.41	0.43		T_5 - basal clay-rich brown till (poor recovery).	0	25	40	4	20	5	2.4	1425
			MOINIAN								
4.86	0.45		Weathered and broken psammite with small quartz	5	15	10	7	0		1.7	1426
5.60	0.74		veins containing hematite and traces of possible	5	20	30	12	20		2.9	1427
6.61	1.01		molybdenite: foliation dips 30°	5	10	50	4	0		2.4	1428
6.86	0.25		Psammite composed of quartz, microcline and sericitised plagioclase (mica absent) with small								
7.45	0.59	7.30	quartz segregations: hematite fairly common (contains traces of copper and bismuth).	0	20	10	2	10		1.8	1430
	Total bedrock intersection 3.04 -						average ppm of bedrock				
				4	16	28	6	7		2.3	-

Appendix 2: Borehole Records
Table 37 BH No. SPD 37
Location: 250 m SSE of head of 'Moly' Burn, W. Grudie district
NGR: 5160 0400 Collar elevation about 285 m vertical hole.

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
				ppm							
0.00			SOIL								
0.09	0.09		A_o - organic litter.		10	40	3	40			1431
1.08	0.99		A_o - dark brown to black fairly well decomposed peat with wood fragments.		10	10	110	20			1432
			TILL								
1.22	0.14		Schist boulder.	0	40	0	3	0		1.0	1433
1.87	0.65		T_1 - sandy till (low clay content)	10	150	60	8	20	5	7.9	1434
2.00	0.13		with rounded schist	10	140	40	23	20	0	7.3	1435
2.40	0.40		pebbles; locally ferruginous.	15	215	50	25	20	0	7.7	1436
2.57	0.17		T_2 - sandy till, more ferruginous.	10	200	40	35	20	10	11	1437
2.61	0.04		T_3 - basal till with fragments of schist.	5	110	30	35	10	5	7.4	1438
			MOINIAN								
3.38	0.77		Weathered psammite.	5	50	10	4	0		1.8	1439
4.19	0.81		Rather weathered and fractured psammite;	5	65	0	6	20		1.7	1440
5.00	0.81		foliation dips 38°.	5	60	0	4	20		1.5	1441
5.72	0.72		Weathered ferruginous schist.	270	1440	240	40	20		10.9	1442
6.50	0.78	5.75	Pink psammite composed of quartz, microcline and sericitised plagioclase; a green clay mineral occurs in fractures with quartz; quartz veinlets.	5	140	10	3	10		1.8	1443
Total bedrock intersection 3.89				average ppm of bedrock							
				54	330	48	11	14		3.4	-

Appendix 2: Borehole Records
Table 38. BH No. SPD 38
Location: 200 m S of head of 'Moly' Burn, W. Grudie district
NGR 5140 0400 Collar elevation about 286 m vertical hole.

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
							ppm				
0.00			SOIL								
0.48	0.48		A_o - dark brown peat with roots, moderately decomposed.		5	10	2	40			1444
1.00	0.52		A_o - very dark brown well decomposed peat.		5	10	15	40			1445
			TILL								
1.95	0.95		T_1 - dark brown till with pebbles and fragments.	25	45	50	100	20	15	9.1	1446
2.45	0.50		T_1 - cuttings of micaceous schist (poor recovery).	5	40	20	12	0	5	11	1447
3.16	0.71		T_2 - greenish-grey sandy clay.	10	40	20	8	10	5	2.3	1448
3.42	0.26		(partly washed) with schist fragment.	30	75	40	20	10	5	4.4	1449
3.60	0.18			30	125	60	17	10	15	3.5	1450
4.03	0.43		T_3 - basal greenish-grey sandy clay with angular schist and quartz fragments.	30	95	30	10	10	20	3.1	1451
			?LEWISIAN								
4.43	0.40		Very weathered schist at bedrock surface	30	210	50	22	10		2.7	1452
4.75	0.32		becoming fresher in depth; some	15	40	20	8	0		1.5	1453
5.13	0.38		fracturing and dispersed	15	130	30	18	0		1.9	1454
6.24	.11		goethite.	15	100	30	2	10		1.7	1455
6.79	0.55	6.39	Psammite comprising quartz, plagioclase, K-spar biotite, minor pyrite and ilmenite and muscovite replacing sericitised plagioclase; molybdenite in concordant quartz vein; pyrite, ilmenite and trace of covellite present; foliation dip 35°: the fresh brown biotite suggests Lewisian affinities.	35	140	30	45	10		1.8	1456
7.90	1.11		Fractured psammite	15	100	30	10	0		1.5	1457
Total bedrock intersection 3.87							average ppm of bedrock				
				19	115	31	17	7		1.8	-

Appendix 2: Borehole Records
Table 39. BH No. SPD 39
Location: 300 m SW of head of 'Moly' Burn, W Grudie district
NGR: 5120 0400 Collar elevation 305m (approx.) vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.18	0.18	A_o - dark brown decomposed peat with rootlets		5	20	4	30			1458
0.28	0.10	A_1 - sandy soil with organic matter	5	10	20	4	10	5	1.9	1459
		TILL								
1.00	0.72	T_1 - micaceous schist pebbles.	10	10	10	3	0	5	1.1	1460
1.10	0.10	Sandy clay with angular fragments	15	65	50	7	10	5	2.6	1461
1.87	0.77	(partly washed).	15	10	30	6	0	5	1.0	1462
2.74	0.87	Fragments of schist boulders with	5	15	20	4	0	10	1.0	1463
3.40	0.66	traces of pyrite	10	15	20	3	0	10	1.2	1464
4.51	1.11	(Poor recovery)	15	15	30	2	0	5	1.6	1465
		(Bedrock not intersected)								

Appendix 2: Borehole Records
Table 40. BH No. SPD 40
Location: 400 m WSW of head waters of 'Moly' Burn; W Grudie district
NGR: 5100 0415 **Collar elevation 328 m vertical hole.**

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.08	0.08		A_o - vegetation and minor humus.		15	30	10	50			1466
0.38	0.30		A_o - brown to black moderately decomposed wet peat.		56	10	6	40			1467
0.62	0.24		A_o - black, decomposed peat lying above boulders		15	40	15	20			1468
			TILL								
1.27	0.65		T_1 - cored psammite boulders with K-spar veinlets containing pyrite	5	10	30	4	0			1469
1.35	0.08		T_2 - very coarse sandy till.	10	15	20	3	0		1.2	1470
1.89	0.54		T_2 - cored pink psammite boulders with minor pyrite.	5	15	20	1	0		1.7	1471
2.48	0.59		T_2 - coarse sandy leached till with angular psammite pebbles.	20	125	100	9	20		2.7	1472
2.75	0.27		T_2 - cored psammite pebbles.	5	10	10	3	0		0.9	1473
			MOINIAN								
3.55	0.80		Sheared and banded psammite; pink feldspar in bands along foliation planes and in cross-cutting veinlets	5	10	20	6	0		1.2	1474
4.29	0.74		calcite and drusy quartz on vertical joints; pyrite associated with quartz veins and with muscovite-chlorite foliae.	10	25	20	5	0		1.0	1475
5.54	1.25	4.32	Strongly banded pink and grey psammite consisting of quartz-microcline-muscovite-(plagioclase)-(green biotite); cross-cutting feldspar veinlets with minor pyrite and calcite.	5	10	30	7	20		0.8	1476
	Total bedrock intersection 2.79			average ppm of bedrock							
				6	14	24	6	9		1.0	-

Appendix 2: Borehole Records
Table 41. BH No. SPD 41
Location: 400 m W of 'Moly' Burn headwaters, W Grudie district
NGR: 5100 0430 **Collar elevation 320 m vertical hole.**

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.69	0.69		A_o - poorly decomposed, dark brown wet peat.		5	10	0	20			1477
1.15	0.46		A_o - moderately decomposed, dark brown peat.		5	10	1	10			1478
1.42	0.27		A_o - dry black well decomposed peat lying above soil.		10	10	4	10			1479
1.73	0.31		A_1 - brown sandy soil with a few psammite pebbles.	10	15	20	7	10	0	2.7	1480
2.05	0.32		B - dark brown sandy soil.	20	25	30	5	20	5	2.7	1481
			TILL								
2.41	0.36		T_1 - grey-green sandy-clay with Moinian pebbles	35	35	50	3	20	5	2.6	1482
2.67	0.26		cored boulders of semipelite	10	10	20	2	10		1.6	1483
4.66	1.99		and psammite; disseminated pyrite								
5.20	0.54		in most fragments.								
			MOINIAN								
5.98	0.68	5.80	Quartz-muscovite rock with quartz veins containing fine grained molybdenite; disseminated pyrite and chalcopyrite.	5	60	60	7	30		1.1	1484
7.06	1.08	6.20	Sparsely micaceous psammite with pink veins; quartz microcline-plagioclase-(biotite) with interstitial carbonate; quartz veinlets contain minor molybdenite; pyrite is disseminated.	5	75	30	8	20		2.0	1485
8.21	1.15	7.85	Numerous cross-cutting pink veinlets containing pyrite-molybdenite-chalcopyrite on joint surface, also disseminated pyrite; vein at 7.85 m contains. quartz-sericitised feldspar-carbonate-pyrite-ilmenite-hematite-molybdenite-chalcopyrite-covellite.	5	65	20	0	10		1.6	1486
9.07	0.86		Numerous cross-cutting feldspar-pyrite veinlets and minor molybdenite in concordant quartz veinlets.	5	55	0	22	0		1.9	1487
	Total bedrock intersection 3.77			average ppm of bedrock							
				5	64	26	9	14		1.7	-

Appendix 2: Borehole Records
Table 42. BH No. SPD 42
Location: 400 m W of 'Moly' Burn, W Grudie District
NGR: 5100 0450 Collar elevation 290 m, vertical hole.

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.34	0.34		A_o - dark brown peat with roots.		5	20	20	40			1488
0.38	0.04		A_o - medium brown, well decomposed, gleyed peat.		5	10	30	10			1489
0.52	0.14		A_o - black, well decomposed peat.		10	10	150	20			1490
0.74	0.22		A_1 - dark grey sandy soil.	15	20	40	40	20	10		1499
			TILL								
1.89	1.15		T_1 - grey-green clay-sand till containing rounded and subangular Moinian pebbles.	15	40	40	9	20	5		1491
			MOINIAN								
2.21	0.32		? boulders of psammite.	10	40	30	2	0		2.3	1492
2.87	0.66		Siliceous psammite with quartz-feldspar veins containing much pyrite and minor chalcopyrite.	5	35	30	6	0		2.3	1493
3.69	0.82		Molybdenite on some fracture surfaces; pyrite in quartz-feldspar veinlets which cross cut thicker concordant quartz veins.	10	35	10	9	0		1.9	1494
4.19	0.50		Pyrite-chalcopyrite in quartz-feldspar veins in a	15	25	20	4	0		1.8	1495
4.84	0.65		more feldspathic schist.	15	0	30	0	0		1.5	1496
5.44	0.60		" "	15	15	30	3	0		1.8	1497
5.70	0.26	5.65	Quartz-plagioclase-K-spar-carbonate psammite with discordant carbonate veins containing minor baryte and surrounded by reddened altered area.	10	25	30	70	0		2.0	1498
Total bedrock intersection 3.81				average ppm of bedrock							
				11	23	25	18	0		1.9	-

Appendix 2: Borehole Records
Table 43. BH No. SPD 43
Location: 400 m W of headwaters of 'Moly' Burn; W Grudie district
NGR: 5120 0450. Collar elevation 280 m (approx.), vertical hole.

Depth m	Thickness m	Section	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.19	0.19		A_o - black peat with rootlets.		5	20	0	20			1500
0.26	0.07		A^o - black peat with some eluvial sand.		5	10	6	20			1501
0.42	0.16		B^o - light brown soil with rounded pebbles.		0	30	5	20		2.0	1502
			TILL								
0.50	0.08		T_1 - clay rich till with rounded pebbles.	15	15	40	0	30	5	2.2	1503
0.63	0.13		T_1 - boulder.	10	30	10	1	0		1.5	1504
0.82	0.1		T_1 - brown clay-rich sandy till with fragments.	20	35	50	1	30	5	2.8	1505
1.15	0.33		T? 2 - grey till with pebbles and fragments.	20	30	40	0	20	5	2.8	1506
3.35	2.20		T? 2 - pebbles and boulders of metamorphic	10	10	10	3	0		2.7	1507
5.41	2.06		and granitic rocks (poor core recovery).	5	10	10	6	0		1.5	1508
5.79	0.38		T? 3 - greenish-grey clay-rich sand with pebbles.							2.8	1509
5.90			T? 3 - boulder.								
			LEWISIAN								
6.56	0.77		Fresh schist or gneiss with some later feldspar veinlets and minor calcite.	10	35	10	10	16		0.9	1510
8.28	1.72	8.0	Intermediate or silicic gneiss composed of quartz plagioclase, K-spar, muscovite, chlorite (after amphibole) and accessory apatite, epidote, zircon and sulphide including traces of molybdenite in late veinlets; quartz-carbonate veinlets also present.	10	35	10	3	0		1.3	1511
9.08	0.80		Gneiss with tendency to show augen texture; small molybdenite veinlet at 8.50 m.	10	80	10	100	0		1.2	1512
	Total bedrock intersection 3.18						average ppm of bedrock				
				10	47	10	29	4		1.2	-

Appendix 2: Borehole Records
Table 44. BH No. SPD 44
Location: about 400 m W of headwaters of 'Moly W Grudie district
NGR: 5100 0470. Collar elevation 273 m (approx.), vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.25	0.25	A_o - organic litter.		0	30	5	20			1513
0.50	0.25	A_o^o - dark brown peat with much undecomposed		0	10	6	10			1514
0.98	0.48	matter.		5	0	2	40			1515
1.28	0.30	A_o - black well decomposed peat.		15	10	24	30			1516
		TILL								
1.73	0.45	T_1 - greyish-green clay-rich sandy	20	40	60	30	30	10	5.9	1517
2.15	0.42	till with weathered fragments of	20	40	50	50	20	10	4.1	1518
2.96	0.81	micaceous schist or gneiss.	40	70	70	30	20	10	4.1	1519
		MOINIAN								
3.56	0.60	Little weathered micaceous psammite with thick	10	20	0	14	0		1.2	1520
4.29	0.73	barren quartz veins, some hematite and	5	20	0	8	0		1.5	1521
4.84	0.55	oxidised pyrite; no molybdenite observed.	10	25	10	55	0		1.1	1522
Total bedrock intersection										
1.88						average ppm of bedrock				
			8	21	3	24	0		1.3	-

Appendix 2: Borehole Records
Table 45. BH No. SPD 45
Location: west bank of head waters of Allt a'Choire, W Grudie district
NGR 5120 0490. Collar elevation about 253 m, vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00		SOIL								
0.18	0.18	A_1 - a dark brown well decomposed peat		5	30	2	10			1523
0.42	0.24	becoming wetter towards base.		0	0	4	0			1524
0.67	0.25	" "		5	10	6	0			1525
1.39	0.72	" "		25	10	30	10			1526
2.26	0.87	" "		15	10	100	10			1527
		TILL								
2.57	0.31	T_1 - cored boulder.								-
2.74	0.17	T_1 - greyish-green sandy clay with subangular	20	25	30	225	10	10	2.5	1528
3.30	0.56	pebbles of psammitic schist	40	65	60	22	10	15	3.7	1529
3.91	0.61	T_2 - weathered micaceous schist (? bedrock)	70	145	100	22	10	20	4.7	1530
4.32	0.41	fragments in a sandy matrix.	65	170	120	20	20	25	5.3	1531
		MOINIAN								
5.18	0.86	Weathered micaceous psammite with concordant	35	25	30	8	0		2.1	1532
6.10	0.92	quartz-feldspar veins and cross-cutting	25	30	30	7	0		1.6	1533
7.75	1.65	quartz-veinlets; some oxidised pyrite	25	35	30	11	10		1.6	1534
8.60	0.85	" "	30	15	30	3	0		1.5	1535
9.20	0.60	" "	25	25	30	9	0		1.6	1536
9.91	0.71	Fresh psammite with minor pyrite; some quartz	25	25	20	5	10		1.5	1537
10.67	0.76	and feldspar veinlets.	25	25	30	3	0		1.3	1538
	Total bedrock intersection					average ppm of bedrock				
	6.35		27	27	29	7	4		1.6	-

Appendix 2: Borehole Records
Table 46. BH No. SPD 46
Location: 200 m W of head of Allt a'Choire, W Grudie district
NGR: 5100 0490 Collar elevation 258 m (approx.), vertical hole.

Depth m	Thickness m	Section depth m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.42	0.42		A_o - dark brown well decomposed peat with roots.		5	10	10	60			1539
0.96	0.54		A_o - black decomposed peat.		10	10	30	10			1540
1.47	0.51		A_o - Few roots.		15	10	50	10			1541
2.10	0.63		- black, decomposed wet peat (poor recovery).		85	60	200	50			1542
			TILL								
2.55	0.45		T_1 - boulder of probable micaceous psammite with quartz-feldspar-pyrite veinlets.	10	10	20	1	10		1.1	1543
2.97	0.42		T_2 - greenish-grey sandy clay with subangular fragments of micaceous schist.	20	50	60	10	40	5		1544
3.30	0.33		T_2 - micaceous psammite boulder.	15	15	20	6	10	5	1.2	1545
3.57	0.27		T_2 - sandy clay with some fragments.								1546
3.97	0.40		T_2 - greenish-grey sandy till.	60	80	70	9	30	30		1547
4.56	0.59		T_3 - alternating clay-rich and sandy bands with altered biotite in the sand.	60	35	60	6	20	20		1548
4.80	0.24		T_3 - basal sandy clay (contaminated).	70	40	70	9	10	25		1549
			LEWISIAN								
5.34	0.54		Strongly weathered biotite-rich schist or gneiss.	25	10	40	3	0		1.5	1550
6.03	0.69	6.26	Micaceous schist or gneiss with numerous concordant quartz veins.	25	10	30	1	0		1.1	1551
6.63	0.60		Somewhat weathered gneiss composed of quartz, K-spar, plagioclase (partly overgrown by K-spar) chlorite (partly after amphibole) epidote and biotite; concordant quartz-pyrite-molybdenite veinlets; some feldspar veinlets and trace of galena.	30	40	30	70	10		1.9	1552
7.66	1.03		Gneiss	30	25	30	8	0		1.6	1553
	Total bedrock intersection 2.86						average ppm of bedrock				
				28	22	32	18	2		1.7	-

Appendix 2: Borehole Records
Table 47. BH No. SPD 47
Location: 100 m W of headwaters of Allt a'Choire, W Grudie district
NGR: 5120 0510 Collar elevation 245 m (approx.), vertical hole.

Depth m	Thickness m	Section Depth m	Core description	Ni	Cu	Zn	Mo	Pb	Co	U	Sample No. CBD
							ppm				
0.00			SOIL								
0.21	0.21		A_0 - dark brown peat.		15	40	30	50			1554
0.44	0.23		A_1^o - organic-rich soil.	10	15	20	12	0	0	2.7	1555
			TILL								
0.91	0.47		T_1 - leached buff-coloured sandy clay	10	50	40	70	40	10	2.6	1556
1.40	0.49		with boulders of micaceous schist.	30	65	60	60	50	15	2.5	1557
			LEWISIAN								
1.64	0.24		Gneiss or schist with feldspar-pyrite veinlets,	25	35	30	10	40		1.3	1558
2.16	0.52		foliation dips 20°, concordant quartz veins cut	30	25	30	7	10		1.5	1559
2.60	0.44		by fractures with pyrite.	30	5	30	0	0		1.2	1560
3.24	0.64	2.95	Banded gneiss (quartz, plagioclase, biotite, chlorite epidote) with some epidote rimming large allanites; minor pyrite and ilmenite, trace chalcopyrite.	35	25	30	5	0		1.3	1561
3.96	0.72		Gneiss with pyrite and molybdenite in concordant quartz veins.	40	40	40	28	10		1.3	1562
4.76	0.80		Less micaceous gneiss.	25	10	30	8	0		1.2	1563
5.54	0.78	5.40	Banded gneiss similar to that at 2.95 m but plagioclass less sericitised; pyrite and molybdenite in concordant quartz veinlet.	35	25	30	35	0		1.2	1564
Total bedrock intersection 4.14				average ppm of bedrock							
				32	30	32	12	5		1.3	-

Appendix 2: Borehole Records
Table 48. BH No. SPD 48
Location: 300 m NW of head of All a'Choire, W Grudie district
NGR: 5100 0510 Collar elevation 259 m (approx.), vertical hole.

Depth m	Thickness m	Section Depth m	Core description	Ni	Cu	Zn	ppm Mo	Pb	Co	U	Sample No. CBD
0.00			SOIL								
0.14	0.14		A_o - black moderately decomposed peat with grass.		0	20	9	20			1565
0.25	0.11		A_o - black decomposed peat.		5	10	2	20			1566
0.58	0.33		A_1 - dark brown sand-humus mixture with boulders of schist or gneiss containing pyrite.	5	10	10	30	20			1567
			TILL								
1.34	0.76		T_1 - leached pale grey sandy till with rock fragments.	20	45	30	30	20			1568
1.76	0.42		T_2 - grey sandy clay with some limonitic patches	15	40	30	30	20			1569
1.96	0.20		and angular fragments.	20	40	30	30	20			1570
2.34	0.38			20	40	30	30	20			1571
2.51	0.17		T_3 - basal till consisting of grey sandy clay with limonitic patches.	20	45	40	40	20			1572
			LEWISIAN								
3.15	0.64	2.84	Psammite composed of quartz, microcline and lesser plagioclase and chlorite; cut by quartz-pyrite-molybdenite-chalcopyrite veinlets.	5	100	20	150	0		1.3	1573
3.80	0.65		More weathered with some quartz-pyrite veinlets.	10	35	20		0		1.3	1574
4.62	0.82		Psammitic gneiss with weak augen texture composed of quartz, plagioclase, biotite, chlorite, minor epidote and hematite- ilmenite intergrowths; chlorite-coated and slickensided surface cutting quartz-molybdenite veinlet.	10	45	20	60	0		1.4	1575
5.48	0.86	5.13	Fine grained silicic gneiss composed of quartz microcline plagioclase, muscovite, biotite, minor epidote and hematite-ilmenite intergrowth; molybdenite and chalcopyrite occur at edge of quartz vein which has a feldspathic selvage.								1576
Total bedrock intersection											
2.97				9	60	20	74	0		1.3	-
				average ppm of bedrock							

Appendix 2: Borehole Records
Table 49. BH No. SPD 49
Location: 700 m SE of Cnoc na Cloich-bhuaile
NGR: 5300 0370 Collar elevation 286 m, vertical hole.

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No.CBD
0.00		SOIL								
0.30	0.30	A_o - dark brown dry peat.		5	10	18	40			1577
1.30	1.00	A_o - dark brown wet peat.		20	30	40	10			1578
1.80	0.50	A_o - dark brown-black, very wet peat.		10	20	20	30			1579
2.40	0.60	A_1 - grey, clay rich soil with schist pebbles.	45	35	50	22	10	5	8.8	1580
		TILL								
3.15	0.75	T_1 - grey clay sand with angular schist pebbles.	45	35	40	4	0	10	2.8	1581
4.08	0.93		15	50	10	6	0	10	2.9	1582
4.70	0.62	T_2 - grey-green clay rich till with angular schist pebbles.	25	50	40	5	0	10	4.4	1583
5.21	0.51	T_2 - green clay-sand till with anglular schist pebbles.	50	100	120	6	30	20	2.8	1584
		MOINIAN								
5.71	0.50	Quartz-biotite-(chlorite) schist with minor K-spar along foliation planes associated with secondary hematite.	10	15	30	3	10		0.8	1585
6.86	1.15									1586
7.88	1.02	Psammite with quartz-feldspar bands along foliation planes.								1587

Appendix 2: Borehole Records
Table 50. BH No. SPD 50
Location 600 m ESE of Cnoc na Cloich-bhuaile
NGR 5300 0410 Collar elevation 326 m, vertical hole

Depth m	Thickness m	Core description	ppm Ni	Cu	Zn	Mo	Pb	Co	U	Sample No.CBD
0.00		SOIL								
0.35	0.35	A_o - black, poorly decomposed dry peat.		5	30	5	40			1588
0.60	0.25	A_o/A - black peat with some detrital minerals.	5	5	10	2	0	5	2.2	1589
0.70	0.10	B - light brown gleyed sandy soil; numerous angular granitic fragments.	5	5	10	2	0	5	2.7	1590
		TILL								
0.97	0.27	T_1 - light grey sandy till containing numerous	15	10	30	7	10	0	5.0	1591
1.25	0.28	granitic fragments.	5	10	30	6	10	0	6.5	1592
		GRANITE								
2.13	0.88	Granite containing quartz phenocrysts and minor pyrite, both disseminated and in quartz veins.	5	5	30	4	10		7.1	1593
3.10	0.97	Granite containing quartz-pyrite-magnetite veins;	5	5	30	1	10		7.9	1594
4.49	1.39	traces of fluorite associated with pyrite.	0	10	40	3	10		1.9	1595
	Total bedrock intersection 3.24		average ppm of bedrock							
			3	6	34	2	10		5.1	-

Appendix 2: Borehole Records
Table 51 Location 800 m SSE of Cnoc na Cloich-bhuaile
NGR 5280 0340 Collar elevation 255 m vertical hole.

Depth m	Thickness m	Core description	Ni	Cu	Zn	Mo	Pb	Co	U	Sample No.CBD
0.00		SOIL								
0.35	0.35	A_o - dark brown dry peat.		5	10	3	10			1596
0.65	0.30	A_o - dark brown wet peat.		20	10	12	30			1597
1.05	0.40	A_1 - clay-sand soil with schist fragments	5	10	10	12	0	5	3.0	1598
		TILL								
1.90	0.85	T_1 - grey clay-sand till with schist fragments.	50	35	50	12	10	20	6.2	1599
		? MOINIAN								
2.13	0.23	Micaceous psammite with very weathered green banding (possible boulder).								-

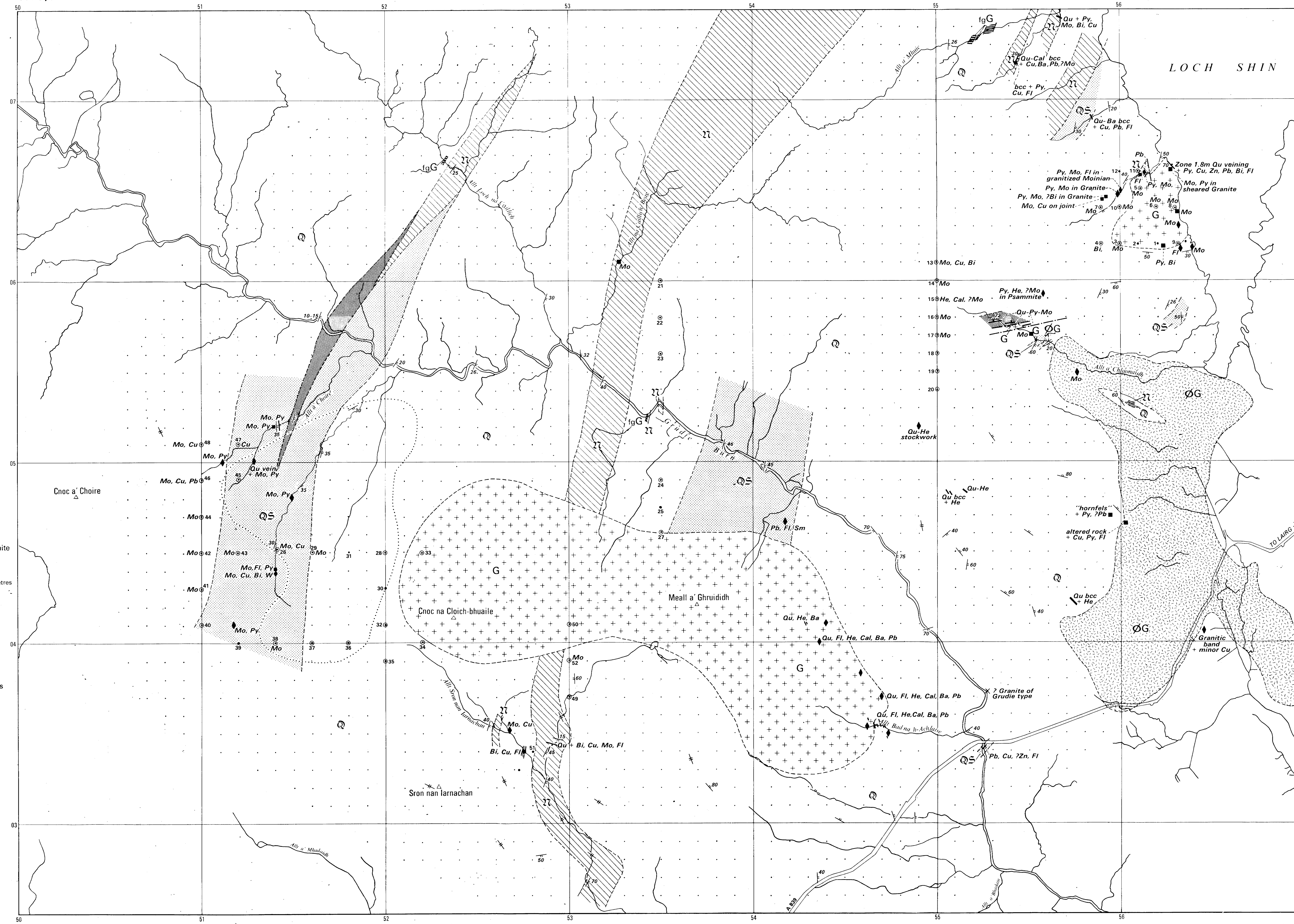
Appendix 2: Borehole Records
Table 52. BH No. SPD 52
Location: 650 m SE of Cnoc na Cloich-bhuaile
NGR: 5300 0390 Collar elevation 305, vertical hole.

Depth m	thickness m	Section depth m	Core description	Ni	Cu	Zn	ppm Mo	Pb	U	Sample No.CBD
0.00			SOIL							
0.24	0.24		A_o - vegetation and a little dark brown peat.		10	30	15	80		1601
0.58	0.34		A_o - black, moist moderately decomposed peat.		5	10	40	50		1602
0.90	0.32		A_o - very moist, well decomposed peat.		15	20	35	10		1603
1.21	0.31		A_1 - grey clay soil with peat and a few semipelite pebbles.	20	40	60	40	20		1604
			TILL							
1.71	0.50		T_1 - drier grey clay rich till with angular semipelite pebbles containing pyrite and fine grained molybdenite (?)	15	25	70	3	30		1605
2.57	0.86		T_2 - wet grey clay till with angular semipelite fragments	10	20	40	6	20		1606
2.81	0.24		T_2 - veined with quartz-feldspar.	10	15	20	9	10		1607
			MOINIAN							
3.45	0.64		Granitised micaceous schist with quartz and feldspar phenocrysts; K-spar developed in foliation plane.	10	5	40	2	10	0.7	1608
4.23	0.78		Chloritised schist containing calcite veinlets and K-spar in foliation planes, the latter with minor molybdenite-pyrite.	30	10	70	50	10	2.0	1609
4.56	0.33		Sheared schist containing large quartz phenocrysts; fluorite and molybdenite in calcite vein.	35	75	50	7	20	1.0	1610
5.45	0.89	5.2	Schist enriched in silica; more intense calcite veining, also molybdenite in concordant quartz veins; psammite composed of quartz-microcline (biotite) and K-spar-sericite-carbonate layers.	10	5	30	16	0	1.3	1611
6.71	1.26		Siliceous schist with calcite veining; foliation 35° dip.	10	5	40	4	0	0.6	1612
7.59	0.88		Much quartz and K-spar introduction; foliation locally destroyed in probable melt zone.	15	5	50	8	5	0.7	1613
	Total bedrock intersection 4.78			average ppm of bedrock						
				16	10	46	18	6	1.0	-

FIG 1: REVISED GEOLOGY OF THE AREA WEST OF LAIRG SHOWING PRINCIPAL EXPOSURES OF MINERALIZATION AND SITES OF SHALLOW BOREHOLES

(Parts of NC 50 NW, NE, SW & SE)

1:10,000



ØG	Foliated diorite and granodiorite
fgG	Granite and microgranite (unclassed) } Late-Caledonian
+G+	Granite of Grudie type } Late-Caledonian
QS	Micaceous psammite interbanded with semipelite (where separable)* } Moine
Q	Psammite, mainly sparsely micaceous } Moine
Ն	Acidic, hornblendic and biotitic gneiss with calc-silicate gneiss } Lewisian
	Platy schist (slide rock and crush rock)
	Fault
	Geological boundary (broken line denotes uncertainty)
	Edge of deeply decomposed rock
50	Strike of lithological banding, dip in degrees
	Strike of lithological banding, dip vertical
*	including some interbanded Lewisian rocks west of the Grudie granite

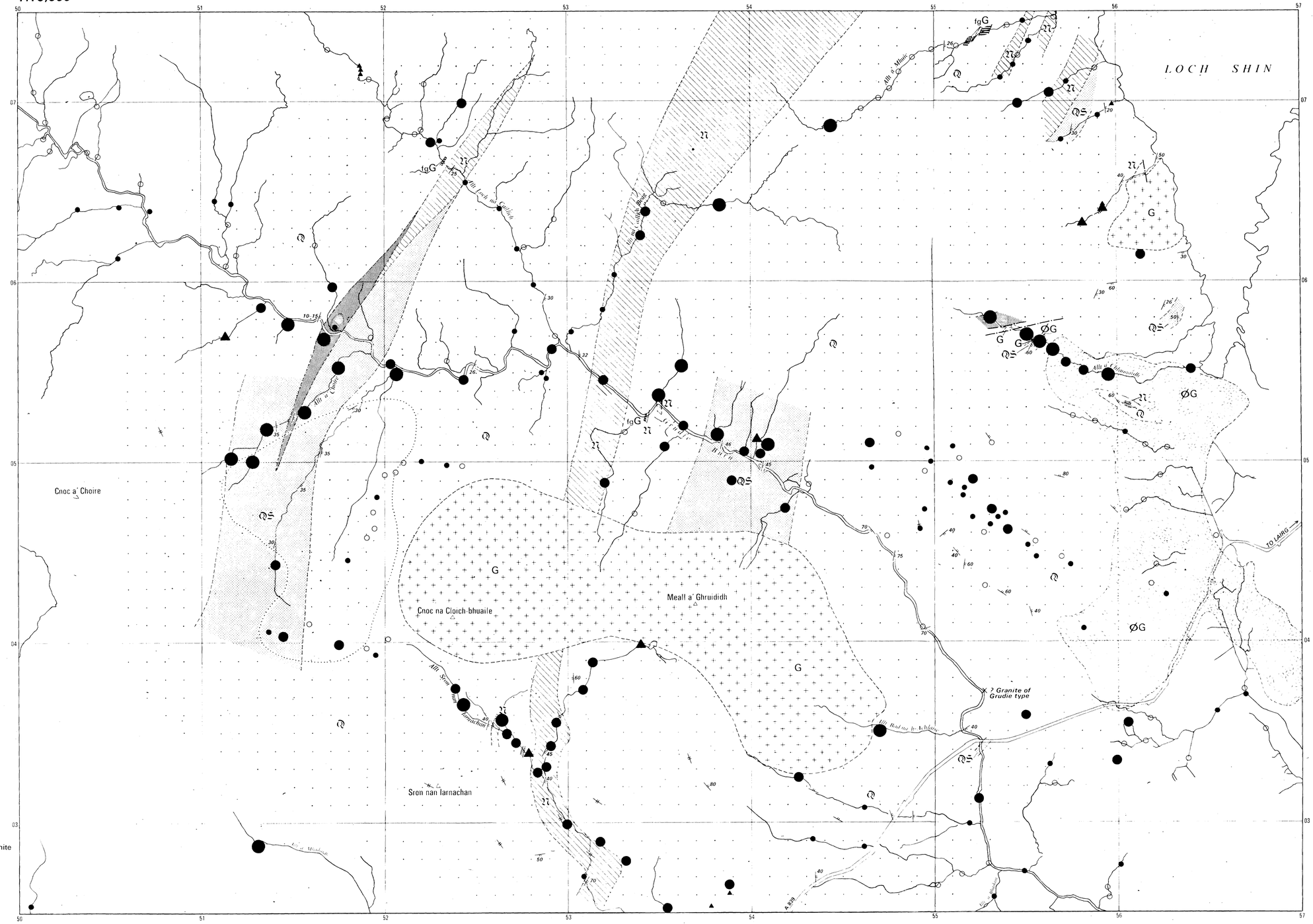
0 500 1000 1500 Metres

◆	Principal mineralized boulders
⊙	Site of shallow borehole; bedrock intersected
•	Site of shallow borehole; bedrock not intersected
■	Exposed mineralization
	Exposed mineral vein or strike of mineralized breccia, dip in degrees
Ba	Baryte
Bi	Bismuth minerals
bcc	Breccia
Cal	Calcite
Cu	Chalcopyrite
Fl	Fluorite
He	Hematite
Mo	Molybdenite
Pb	Galena
Py	Pyrite
Qu	Quartz
Sm	Smithsonite
W	Scheelite
Zn	Sphalerite

FIG 2: MOLYBDENUM DISTRIBUTION IN DRAINAGE OF THE AREA WEST OF LAIRG

(Parts of NC 50 NW, NE, SW & SE)

1:10,000



40 / 10 — ppm Mo in minus 150µ stream sediment

2

60 — ppm Mo in chemical precipitate

- ØG — Foliated diorite and granodiorite
- ØG — Granite and microgranite (unclassed) — Late-Caledonian
- +G+ — Granite of Grudie type — Late-Caledonian
- ØS — Micaceous psammite interbanded with semipelite (where separable)* — Moine
- Q — Psammite, mainly sparsely micaceous — Moine
- Acidic, hornblendic and biotitic gneiss with calc-silicate gneiss — Lewisian
- Platy schist (slide rock and crush rock)
- Fault
- Geological boundary (broken line denotes uncertainty)
- Edge of deeply decomposed rock
- 50 — Strike of lithological banding, dip in degrees
- Strike of lithological banding, dip vertical
- * including some interbanded Lewisian rocks west of the Grudie granite

0 500 1000 Metres