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REPORT NO. 97 - 81 - 01

BLUE EMERALD RESOURCES INC.

EXPLORATION WORK WITHIN THE MANNFJELLET - FONNFJLLET
PROPERTIES, MERÅKEF, NORD-TRØNDELAG, 1996

Geologiske
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EXPLORATION WORK WITHIN THE MANNFJELLET - FONNFJELLET

PROPERTIES, MERÅKER, NORD-TRØNDELAG, 1996

**Boye Flood
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Oslo, May 13, 1997

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EXPLORATION WORK WITHIN THE MANNFJELLET-FONNFJELLET PROPERTIES, MERÅKER, NORD-TRØNDELAG, 1996

1. INTRODUCTION:

1.1 Location and Infrastructure:

The Mannfjellet and Fonnfjellet properties are situated within the Meråker municipality in the eastern part of central Norway, (see Fig. 1). The properties extend southwards from a point less than 1 km Southwest of the Meråker municipality centre, which is located on the main road and railway line between Trondheim and Sweden. The distance by road to Trondheim is 78 km and to the Trondheim airport at Værnes is 47 km. In spite of celebrating its one thousand years anniversary this year, Trondheim is a modern regional centre and University town with some 140,000 inhabitants.

1.2 The legal aspects of the Properties:

The adjoining properties of Mannfjellet and Fonnfjellet consist of 78 individual claims (mutinger), renewed for 1997 and covers an area of 19.5 km² (see Fig. 2). All the claims are «pegged» on copper, zinc and gold.

The blocks were initially applied for by Norway Gold Exploration A/S (NGE) in 1995 and expanded to their current extension last year.

NGE is the formal holder of the claims belonging to the Norwegian Mineral Venture (NMV) which is a Joint Venture agreement between Geologiske Tjenester a.s./NGE and the Canadian company 1052544 Ontario Ltd. In 1996 NMV entered an agreement with Blue Emerald Resources Inc. (BER) of Toronto, Canada permitting BER to earn an interest in the properties

BER has through Geologiske Tjenester a.s. carried out substantial work on the properties during 1996 which is presented in this report.

1.3 Logistics and Personnel:

The claims as shown on Fig. 2 are situated on the eastern and northern slope of Mannfjellet and Fonnfjellet, from between 300 m to 800 m above sea level, the tree line is mainly around 600 m. Vegetation varies from zero in the highest elevations, to mountain birch and scattered spruce at medium elevations which also is heavily covered by peat. Lower elevations are dominated by spruce and some pine, (see Photos 1-2). A dirt road is running north-south along the properties in the valley to the east. Most of the area, however, can be reached by a tractor or a muskeg.

Due to the short distance (5-10 km) the exploration crew lived in Meråker during the program and drove by car into the field and walked up to the properties each day. The field program was carried out in two periods between August 14 to October 5, and October 21 to 24. The field personnel varied between 1 to 4 persons, but 2-3 persons were involved most of the time.

Geologiske Tjenester a.s. supplied the following team for the job:

Boye Flood, geologist, supervisor
Arne Reinsbakken, project geologist
Jannecke Bugge, geology student, field assistance
Ulf Johanessen, geology student, field assistance (until September 10)

2. GEOLOGY AND MINERALIZATION:

The Meråker district constitutes the north-eastern part of the Trondheim region. The Meråker West area which contains the Mannfjellet and Fonnfjellet properties is underlain by the Ordovician Fundsjø Group. This group is in its lower part dominated by basaltic volcanites intruded by tonalitic rocks. Higher up in the sequence, interlayered felsic tuffs and tuffites increase, and in places also graphitic metasediments occur. Particularly this upper part of the sequence hosts a number of massive stratiform sulphide deposits (VMS), (see Fig. 1). The sequence strikes roughly north-south, and dips around 50° to the west. Metamorphic grade is Upper Greenschist to Lower Amphibolite facies.

The regional setting of the Fundsjø Group resembles strongly that of the Stekenjokk metavolcanites further north in the Swedish Caledonides. The Fundsjø-Stekenjokk metavolcanites is one of the most important «Greenstone belts» in the Scandinavian Caledonides in view of the highest abundance of VMS deposits. The largest deposit is the Stekenjokk-Levi orebody which contained originally around 26 mill. mt of copper-zinc ore.

An account of the regional aspect of the Meråker area is given by Grenne et. al., NGU Bull. 427, 1995 which we have included as Appendix 1.

Within the properties Fonnfjell, Løvlibekken and Mannfjell deposits, (see Fig. 2), all typical VMS mineralizations, were mined during late 19th century and up to 1918. Mannfjell is the largest having produced around 100 Kt grading between 1 and 2 % Cu. Zinc does not appear on the old assay list as it was apparently of no interest. Precious metals were not assayed prior to 1990 when new samples were collected from the dumps that indicated significant contents of Zn and Au.

Later selected dump samples have shown the following results:

Mannfjell: 9.7% Zn, 1.6% Cu, 35.4g/t Ag and 0.71g/t Au
Fonnfjell: 4.1% Zn, 0.4% Cu, 1.6g/t Ag and 0.03g/t Au
Løvlib.: 0.4% Zn, 5.3% Cu, 31.5g/t Ag and 1.96g/t Au
Øytrø: 8.9% Zn, 1.1% Cu, 98.0g/t Ag and 1.59g/t Au

Beside base metal sulphides, pyrite is the dominating ore-forming mineral in these deposits, both in the massive bands (Photo 3), and in the footwall mineralized zone (Photo 4). The footwall pyrite occurs both as thin (cm) bands and as dissemination and stringers, all set in a chlorite-rich rock which is generally low in both base metals and gold.

3. PREVIOUS WORK:

Extensive visual prospecting was obviously done in the Meråker area during the late 1800's and early 1900 resulting in a number of discoveries on exposed massive sulphides. Since then, no new deposits have been found. The deposits were mined through small open cuts and by adits started downhill from the surface exposure and driven westwards until they intersected the ore zone. Thereafter they followed the zone along strike by drifting and stoping as long as they were in ore, (see Photo 5).

Virtually no detailed, modern exploration work has been carried out in this part of the Trondheim District.

A stream sediment survey was done by Skorovass gruver in 1966, but only semi quantitative assay methods for Cu, Pb, Zn and Ni were used. Some discrete anomalies occur down stream from the old mines, and one anomaly with unknown source occurs south-west of the Mannfjell mine. No follow up is reported. (NGU Rapport nr. 695 and 763)

The Mannfjell mine was in 1975 subject to a geophysical survey that included VLF and CP. The CP survey clearly outlines the 350 m long extension of this mine. VLF shows a partly strong anomaly which confirms this extension of the mineralization, but is off set around 100 m to the west at its southern end. Thereafter it continues for at least 700 m southwards and out of the surveyed area. There are no records of any follow up of this or parallel anomalies. (NGU Rapport nr. 1350)

No diamond drilling is recorded from this part of Meråker.

The 1:50,000 geological map sheet Flornes that was published by NGU as a preliminary black/white edition in 1984, covers the project area. However, the dominance of granitic and gabbroic rocks indicated for the north-western part of this area is according to our observations wrong. It is also misleading as it places the Øytrø mineralization in a totally different environment to the other deposits found within the properties.

In 1990, H.J.Karlstrøm (BVLI Teknisk Rapport Nr. 77, 1990) analysed Norwegian Caledonian sulphide deposits for precious metals. The few samples collected from Mannfjellet gave the second highest gold average in the entire survey. A later and extended sampling program by NGU indicated high gold values also for the Løvlibekken and Øytrø deposits, (see below). Here gold is also followed by high silver values.

In 1991, NGU flew a helicopter borne geophysical survey over the Meråker area including magnetics, EM, VLF and radiometrics, the coverage is shown on Fig. 3. Maps on a scale of 1:50.000 have been produced from the various methods, (see insets from the EM maps Fig. 4 and 5), but no interpretation has been presented (NGU Rapport 92 153). A number of the soil

sample lines selected for our 1996 survey were based on the position of the EM anomalies. A more extensive use of these geophysical data is planned for the coming season.

The same area that is outlined by helicopter survey was also subject to a regional 1 x 0.5 km soil sampling survey (C-horizon) by NGU in 1991/92. Since the results were only reported on small scale A4 sheets and their assay list did not include gold and arsenic, our work last year included some up grading of this survey, (see below).

4. EXPLORATION PROGRAM, 1996:

The last years program included:

- 1) Compilation and assessment of previous work.
- 2) Initial geological mapping of the properties on a scale of 1:5,000
- 3) Soil sample survey
- 4) Expanded assay program on NGU soil survey samples
- 5) Sampling of mineralization exposed in or close to the old mines and workings.

4.1 Compilation and assessment of previous work:

The interest for this area was aroused by the report by Karlstrøm (1990) showing the anomalously high precious metal contents at Mannfjellet, compared to other Caledonian Norwegian sulphide deposits. A further study of this area resulted only in a limited amount of data that is listed in the previous chapter. Based on this information a program was set up to improve our knowledge on the known mineralizations, and to survey the unexplored ground between the exposed deposits that lies in a large and essentially covered area.

4.2 Geological mapping:

From previous mapping, (see above), the north-western part of the property that includes the Øytrø deposit, should be underlain by Caledonian granitic and gabbroic intrusives. Last years mapping found this area to be dominated by the Fundsjø Group volcanic lithologies.

In the lower and eastern parts there is a dominance of greenstones, for the most part spilitic in nature. Around the Fonnfjellet deposit interlayering of greenstones and more felsic bands are more typical. The latter vary between fine grained meta tuffs, feldspar porphyries (crystal tuffs ?) and partly fragmental horizons, (see Photo 6). A similar sequence is also observed to the south at Mannfjell, where a thin massive sulphide band is observed within a fragmental unit. Westwards and higher up in the Øytrø area, fine-grained felsic bands start to dominate, (see Photo 7) and up to several m thick gabbroic sills ? become more frequent, (see Photo 8).

A preliminary geological map scale 1:50,000 outlining these main units has been drawn, (see Fig. 6 with Legend 6B).

A more detailed map, scale 1:20.000, will be produced after a few more detailed profiles have been controlled in the field. This will be done concurrent with the ground geophysical survey that is planned to be completed before commencement of the drilling program, (see below).

4.3 Soil sample surveys:

4.3.1 Detailed survey, 1996

Due to the extension of the area, 9.5 km long, and limited budget, the soil sampling was carried out along E-W lines that varied between 600 m to 2100 m in length and with a line spacing between 200 m to 600 m. The line positions were selected to test: 1) - Strike extension of the known deposits, 2) - The more prominent EM anomalies, and 3) - The stream sediment anomaly south of Mannfjell.

A grid was established using a hip chain and compass; origin was on 32400 E /29200 N, UTM Zone 32, WGS84. The base line following 32400 E was pegged each 50 m, while the sample lines were pegged only at the end of each line. Samples were collected for each 50 m and the localities were marked with coordinates on a red flagging tape.

As expected, without proper surveying, the grid does not fully correspond to the map grid. However, by tape measure, compass and control points along the route, the sampling grid has been determined in relation to terrain and the map grid.

Altogether 709 samples were collected, mainly at a depth between 15 and 30 cm. Sampling was done with a spade for removal of vegetation and peat, and the actual sample was collected with a hand trowel. Most of the samples come from the B horizon, or C if the B is missing. In places only a thin cover of skeletal material was amenable to sampling and in some of the bogs, varying amounts of organic (O) material got mixed into the sample. Thick bogs were not sampled (NS).

The samples, each with a weight of around 250-300 g, were put into a plastic bag marked with the grid co-ordinate as sample no. Sample sheets are found as Appendix 2. The samples were air freighted from Trondheim, Værnes Airport to XRAL Laboratories in Toronto where they were assayed for:

Cu, Pb, Zn, As and Au

Due to low values and very weak contrast in the assay results for As and Pb, no further assessment of these results have been done. For Cu, Zn and Au, the assay results have been transferred to the Sample sheets in Appendix 2, and a Manual calculation of the 90%ile and 95%ile values for the three elements has been compiled, (see Table 1 below).

%ile	Cu ppm	Zn ppm	Au ppb
95	52-441	64-268	14-95
90	34-51	44-63	8-13

Table 1: Percentile values for Cu, Zn and Au from the Mannfjellet soil sample survey.
N = 704

Only the 90 and 95%ile values have been plotted on the grid maps, scale 1:20.000. These maps are shown as Figs. 7 - 9. Due to the varying and generally large line spacing no attempt has been made to contour the results. A selection of anomalies or anomalous areas has been made by colouring in the more prominent anomalies on the individual maps, before making the final selection with all three maps overlays studied on light table.

The selected anomalies are all indicated on the Zn anomaly map, (Fig. 8), and listed in Table 2 below.

Anomaly no.:	Elements:	Description
1	Cu, Zn	On both sides of Baseline from 32400N/33000N
1A	Au, Cu, Zn	Extension of the no. 1 anomaly north to 33400N/32800E
2	Cu, Au, Zn	East of and along Baseline from 34000N around the Øytrø deposit to 3566N. No Zn in northern part.
2A	Cu	34300N/32200E. Two adjoining samples with max. Values
3	Cu, Zn	West and south of Mannfjellet deposit between 28800N and 29200N
4	Cu, Au	West of Baseline between 28000N and 28400N. Somewhat scattered anomalous samples, but coinciding with old stream sediment survey anomaly. Max. Au-value.
5	Zn, Au, (Cu)	Around Løvlibekken deposit, east of Baseline between 32800N and 33400N.
6	Au	West and north of the Fonnfjellet deposit.
34800N	Cu, Zn	East and downhill from Fonnfjellet deposit. Contamination
29200N	Cu, Zn	East and downhill from Mannfjellet deposit. Contamination

Table 2: The more prominent Cu, Zn and Au anomalies selected from the soil sample survey within the Mannfjellet and Fonnfjellet properties.

4.3.2 NGU's Regional soil survey - expanded program:

This survey, conducted during 1991/92, covered the same area as the helicopter geophysics, (see Fig. 3). The samples were taken from the C-horizon and totalled 1554 samples on a regional 500x1000 m grid. Assay results for 28 elements were shown as symbols on maps

on 1:200.000 scale maps. Coloured maps for the elements Cu, Mo, Ni, Pb and Zn were also produced.

The part of the survey area covered by the Flornes map sheet includes the Mannfjellet - Fonnfjellet properties and is covered by 538 samples. On request from Geologiske Tjenester a.s., NGU has for this area produced raw value maps (scale 1:50.000) for Cu, Pb and Zn, with enhanced 90 and 95 %ile values.

Since no assays were done for Au and As in the earlier survey, it was agreed that NGU would pay for shipping the samples to XRAL Laboratories in Canada, and this project would cover the assay cost. NGU will receive all result after one year. A composite anomaly map including the elements Cu, Zn, Au and As is presented in Fig. 10.

Due to the sample spacing, this survey has only to some extent picked up the known mines and workings within the properties. The anomalies around Løvlibekken-Øytrø, however, are indicated. Otherwise the main trend of the geochemical anomaly is seen from st. Klepptjørna and toward the south-east.

4.4 Sampling of old workings:

4.4.1 Dump sample results received from NGU:

A number of high-grade dump samples have been collected by Tor Grenne from NGU who has kindly given the assay results to us. The numbering for the workings and mineralized outcrops are shown in Figs. 2 and 6-10. The same numbers are used in the enclosed assay list in Appendix 3. Although the mineralization found in the different deposits are generally similar, there are some main distinctions that are possibly related to the stratigraphic position in the dominantly volcanic package. We are in this context not considering mineralization only represented by one sample, as for example localities 2 and 4.

Fonnfjellet (7-10): Lowermost part of the package (tectonically?). Low in precious metals. Generally high in Cu-Zn, but decreasing values to the north (10).

Løvlibekken (5): Within central greenstone unit. A Cu-Au deposit with low Zn and medium Ag.

Mannfjellet (3): Probably on contact between greenstone and upper felsic unit. A typical Cu-Zn deposit with some Au-Ag sweetener.

Øytrø (6): Situated within upper felsic unit. Variable Cu, but rich in Zn and carry also elevated Pb values. Contains the best precious metals value in this region.

Gamle Mannfjellet (1): This deposit is within greenstones, apparently still higher up in the sequence. A deposit with oly Cu is indicated.

4.4.2 1996 Sampling of mineralized zones:

The massive ore zones are in most places no longer accessible and the dump sampling done by NGU gives a good indication on the metal content in the massive ores. Hence last years sampling was concentrated on the footwall mineralization and some other mineralized zones adjacent to the known workings.

Particularly at Fonnfjellet and Løvlibekken, there are several m wide mineralized zones with bands and stringers of pyrite in strongly chloritic schists, characteristic of footwall mineralization. Sampling of these and the less mineralised footwall rocks at Mannfjellet has been the main purpose of this work. Massive ore has also been sampled at the above named localities in addition to three mineralised zones adjacent to Øytrø. Altogether 16 chip samples, each 2-3 kg, were collected and sent to XRAL Laboratories in Toronto for assays. The locality map, sample sheet and sample sections with assay results are shown in Appendix 4.

Last years massive ore sampling confirm the earlier dump sample results. The footwall mineralizations are low in both base and precious metals. The sampled zones near Øytrø do not indicate any similarity to this deposit.

5. SUMMARY AND CONCLUSIONS:

The Mannfjellet and Fonnfjellet properties occur within the Trondheim region of the eastern part of the central Norwegian Caledonides. The properties are underlain by the Ordovician Fundsjø Group which is dominated by basaltic to felsic volcanites and known to host a large number of stratiform VMS massive sulphide deposits. The Stekenjok-Levi deposit, to the north and on the Swedish side of the border, being the largest deposit yet discovered contained some 26 mill. metric tonnes of Cu-Zn ore.

A number of mineralized showings and three small deposits (100 Kt.) that were mined for copper around the turn of the century, occur within the properties. Later sampling (from 1990) has revealed high Zn-values, and, for Scandinavian Caledonian sulphide deposits, exceptionally high gold-silver values for some of the deposits.

During the 1990's the area was subjected to regional geochemical and helicopter geophysical surveys. No modern, detailed exploration has been carried out in the area of the properties or on the known deposits prior to this program reported by Blue Emerald Resources. A limited geophysical survey was done on the Mannfjellet deposit in 1975 and in spite of known VLF anomalies was never subject to any follow up. No diamond drilling has been done.

Current research that revealed the above information led to the selection of soil geochemistry and geological mapping as the best tool for a better assessment of the area and further selection of targets. Ore grade values of base and precious metals appear to be associated with the massive pyrite dominated parts of the deposits. Different metal combinations are indicated for different levels within the volcanic package.

Time and budget did not permit a sufficiently dense sampling pattern to give a complete geochemical assessment of the 9.5 km length of the properties. However, it was still possible to outline at least 6 distinct anomalies, of which some are associated with the known deposits.

It was not the scope of the 1996 program to define drill targets. The objective was to obtain more detailed information on the geology and soil geochemistry in order to assist in the final selection of areas for ground geophysics and infilling soil sampling. This selection will be made when an interpretation of the helicopter geophysics has been completed, see Proposed Program below.

The number of high grade deposits found within the properties is intriguing considering the generally extensive cover in the area and the fact that all mineralizations have been found as the result of exposure. The main objective of the 1997 exploration program is for the first time, in this area, to make use of geophysics, geochemistry and diamond drilling in order to expand reserves on known mineralization and to locate new deposits.

6. PROPOSED PROGRAM:

Geophysical interpretation: A geophysical interpretation map (1:20,000) based on the 1991 helicopter borne survey will be made available. Anomalies of similar character as are seen for the known deposits will be properly located by ground geophysics and the best drill targets will be located with the aid of infill soil sampling, if required.

Ground geophysics: All the helicopter anomalies, with or without geochemical support, and selected for follow up will be subject to ground control. The best, and less expensive tool is VLF controlled with Slingram. As there appears to be an association between some of the deposits and magnetic ridges, ground magnetics will also be carried out. A number of short lines, 200 - 300 m long, will be surveyed having a line spacing of between 50 - 100 m. Altogether around 25 line km will be surveyed.

Infilling soil sampling: Since last year's soil sampling has in places too wide line spacings, infilling sampling will be required in places before the final selection of drill targets can be made. Also here, short lines will be used. Altogether, around 10 line km will be sampled giving a total of some 200 samples.

Diamond drilling: The best targets will be tested by diamond drilling. A program of about 10 short holes totalling 1,000 drill meters will be carried out. Based on the previous VLF and last years soil sampling we have a target south of the Mannfjell deposit. We have also a good EM/geochemical target south of Løvlibekken and north of Øytrø, but the exact drilling location must await the results from the above program.

The estimated cost figures for this program is given below.

BUDGET:

	1,000 Nkr
1. Interpretation of helicopter borne geophysics and production of anomaly maps (scale 1:20.000).	20
2. Magnetic, VLF and Slingram ground surveys, 4 weeks	135
3. Diamond drilling 1,000 m at Nkr. 600.-/m	600
4. Geologist for supervision, logging and reporting, 10 weeks	180
5. Field assistant for soil sampling, slingram survey and core splitting	80
6. Assays of 100 core samples and 200 soil samples	40
7. Accommodation and per diem	40
8. Freight	15
9. Travel and transport	<u>40</u>
Sub Total	1,150
Contingency	<u>100</u>
Total	<u>1,250</u>

The program is planned to be completed during the summer or early autumn of 1997.

Boye Flood

Arne Reinsbakken

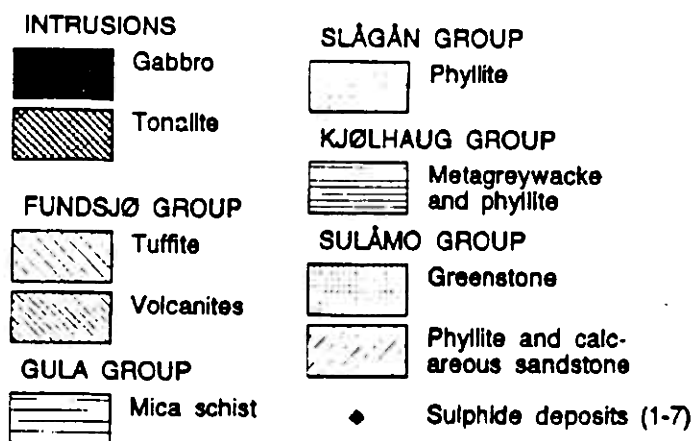
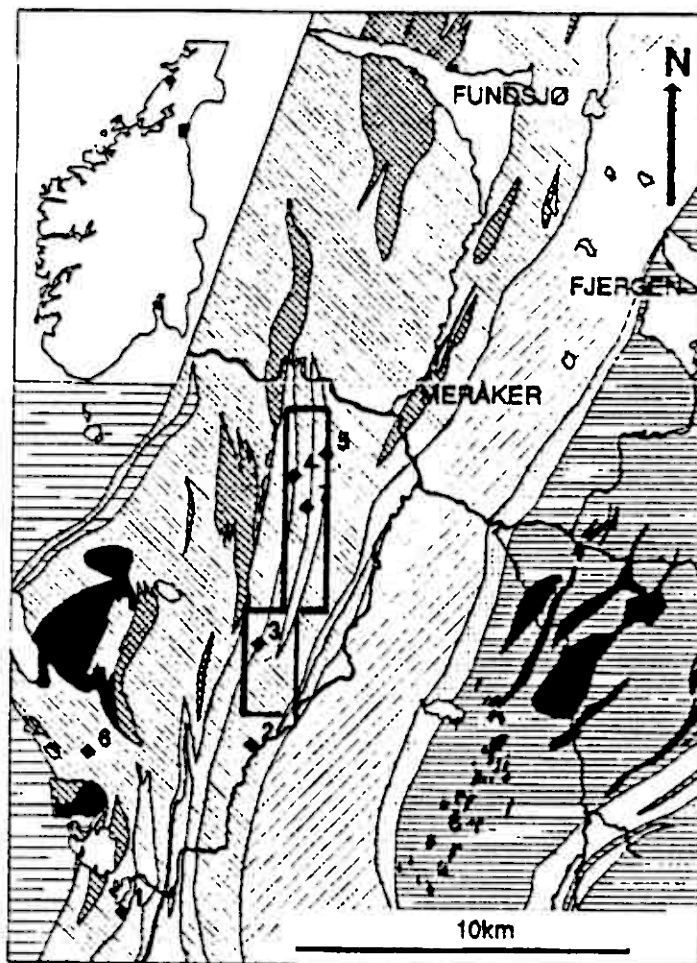
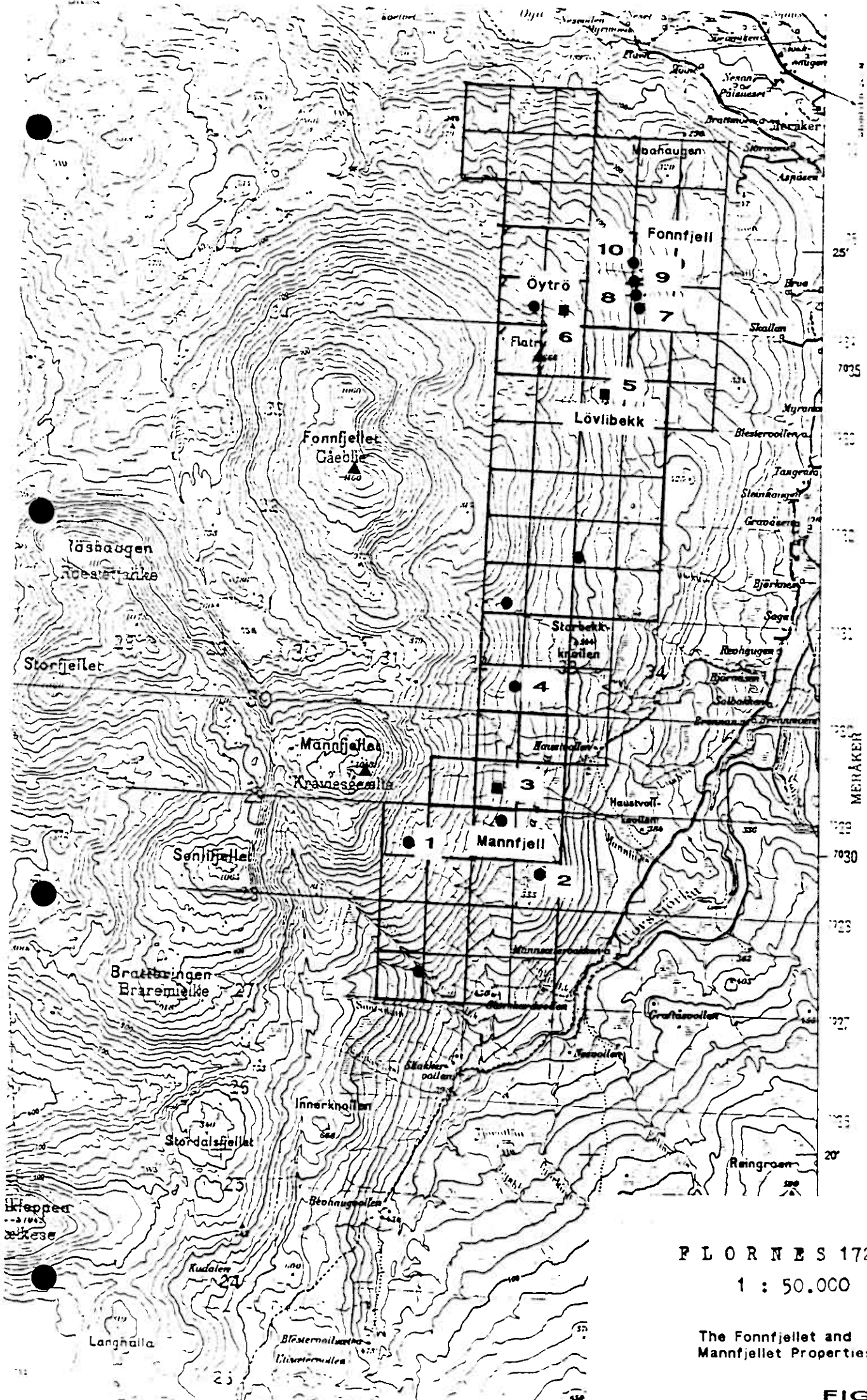


Fig. 1. Simplified geological map of the Meråker area. Volcanogenic sulphide deposits are indicated by numbers: 1: Kongens, 2: Torsbjørk, 3: Mannfjell, 4: Øytrø, 5: Fonnfjell, 6: Skrøydalen, 7: Løvlibekk.

From Grenne et.al., NGU-Bull 427, 1995

 Mannfjellet and Fonnfjellet Properties



FLORNES 1721 IV
1 : 50.000

The Fonnfjellet and Mannfjellet Properties

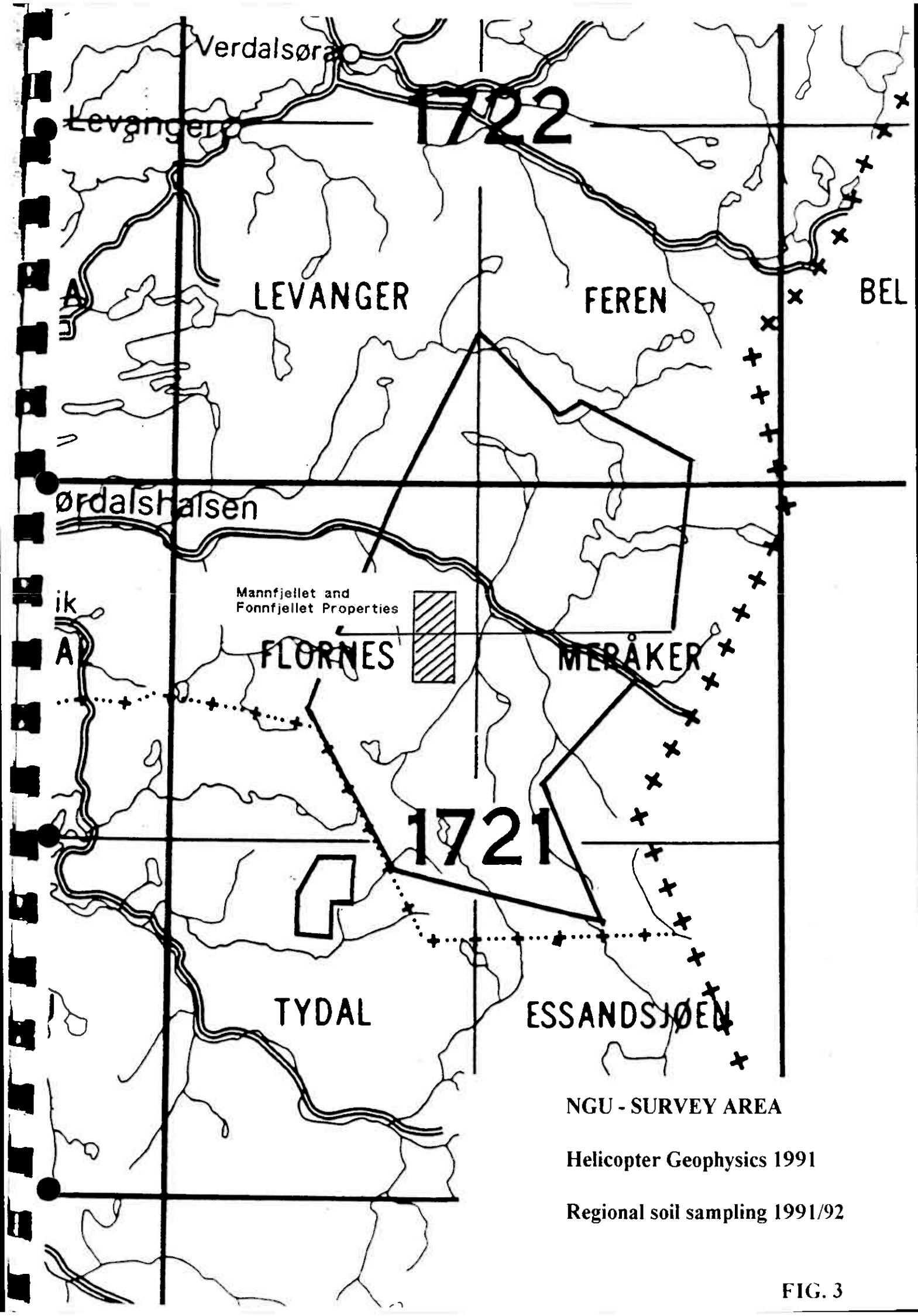


FIG. 3

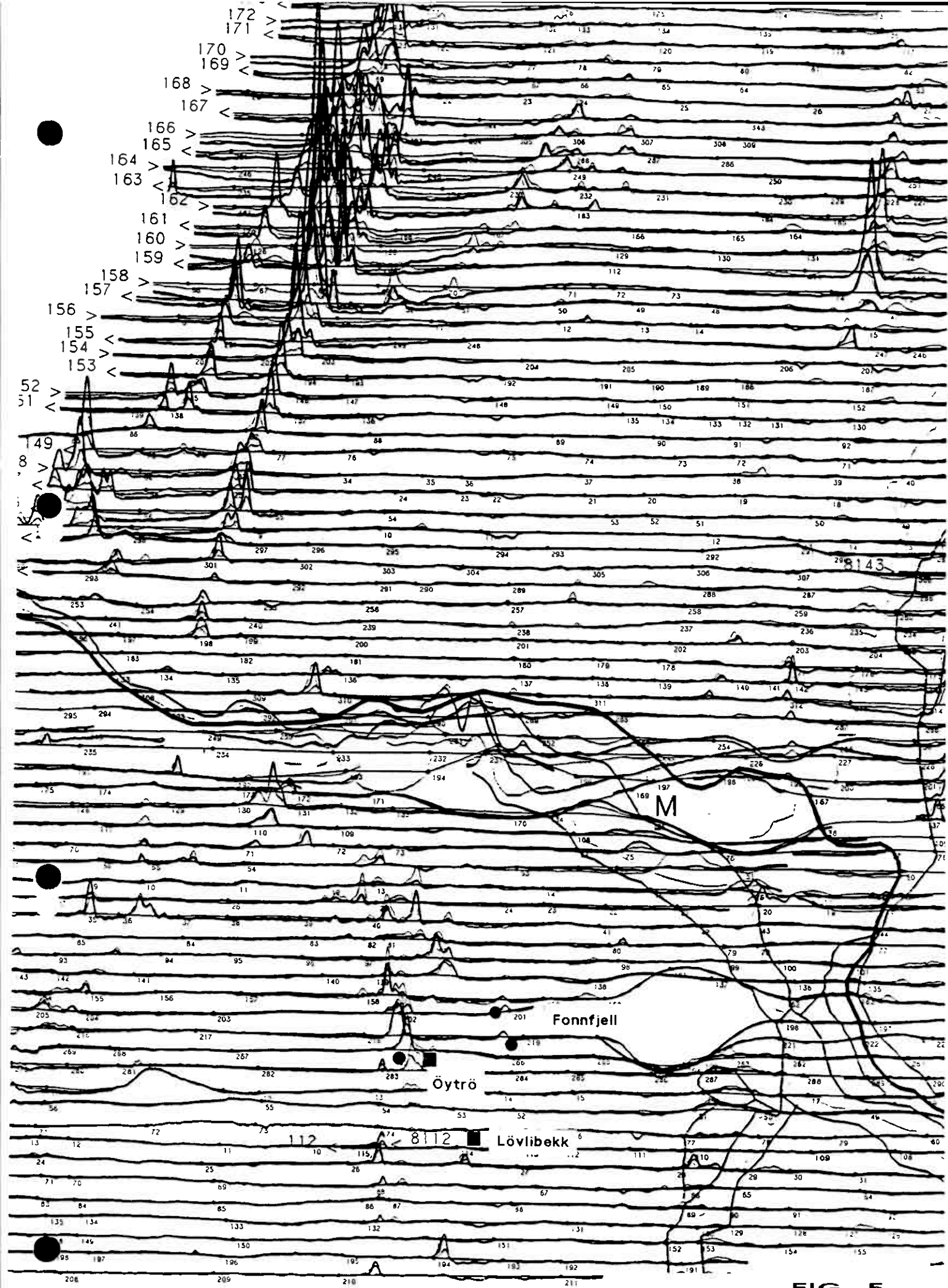
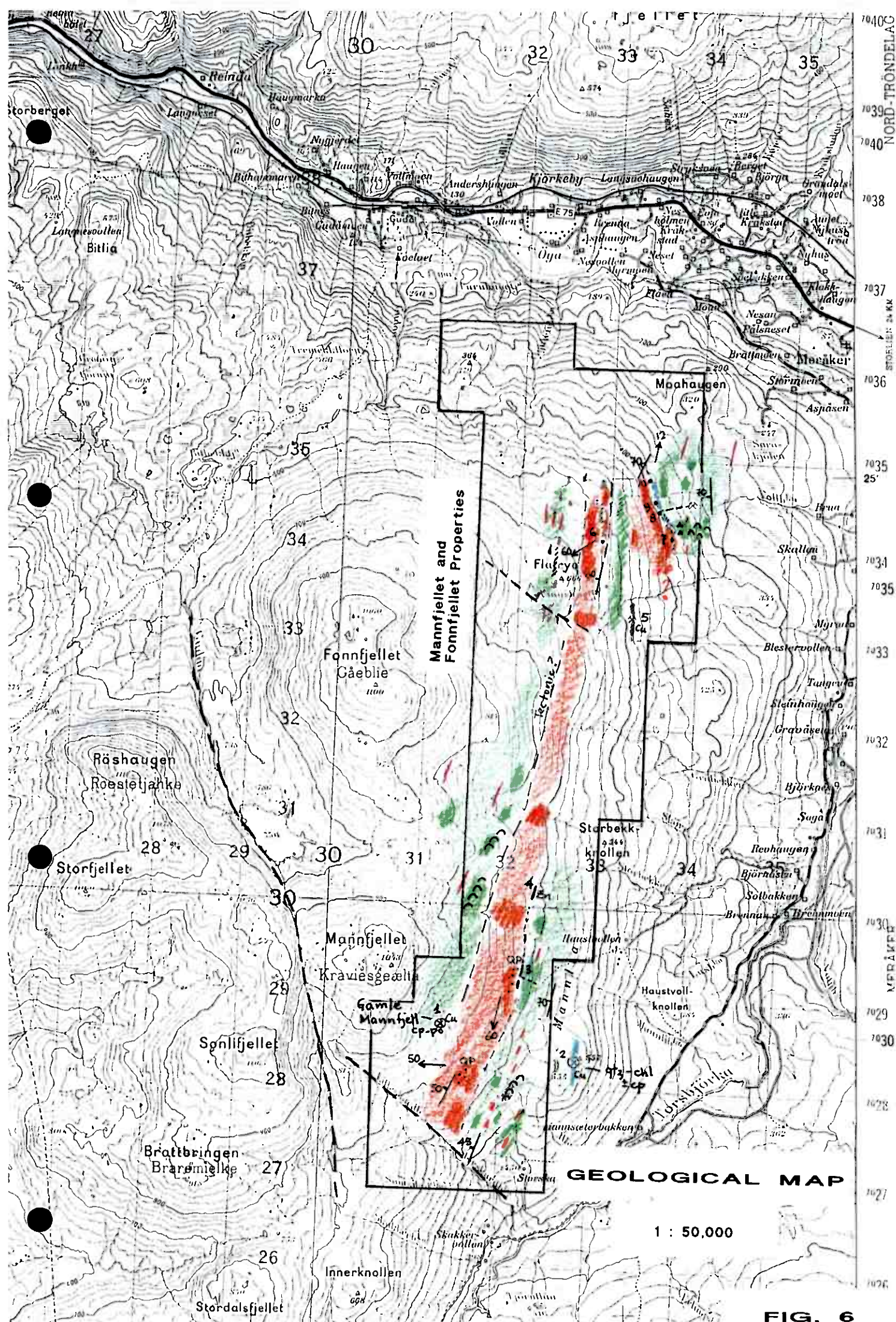


FIG. 5



LEGEND.



- Tonalite/Trondhjemite intrusive/dykes



- Gabbro intrusives/dykes



- Greenstone, mafic metavolcanites (spilitic).



- Dark, chlorite-quartz rich rock, with strong disseminations and veins of sulphides (py-cp)



QP - Keratophyre, felsic metavolcanite

$\therefore$ QP = quartz-phyric



- high level felsic dykes

Symbols



- pillow structures.



- zones of strong sulphide disseminations and veining
"stockwork" - stringer zone mineralization.



- massive sulphide mineralization
showings and old workings.



- sample points in dissem. mineralization outside
of old workings.



- fold axis



- foliation

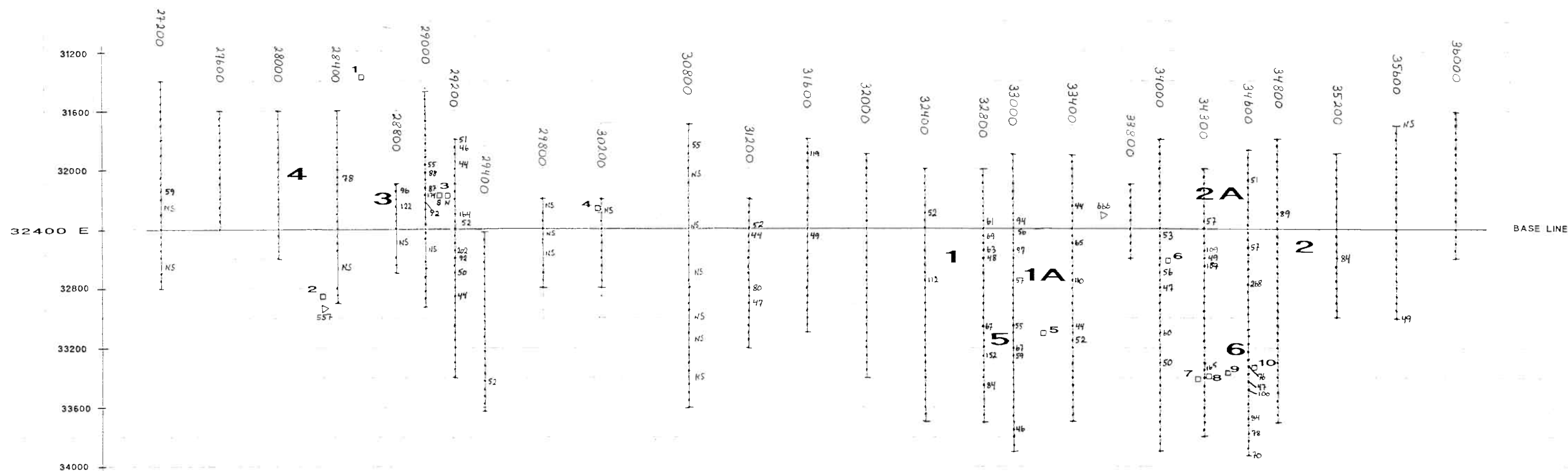
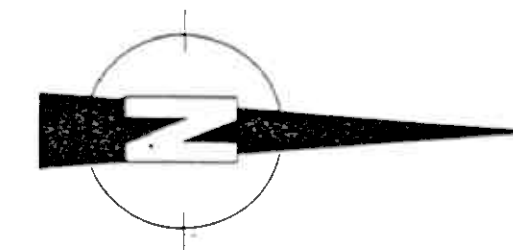


- cleavage



- major fault.

UTM
Grid North



MANNFJELLET-FONNFJELLET

SOIL SAMPLE SURVEY 1996

Zn 95 o/oile > 64 ppm Max 268 ppm
90 o/oile > 44 ppm < 64 ppm

Trig.point

Mine/working no. 9

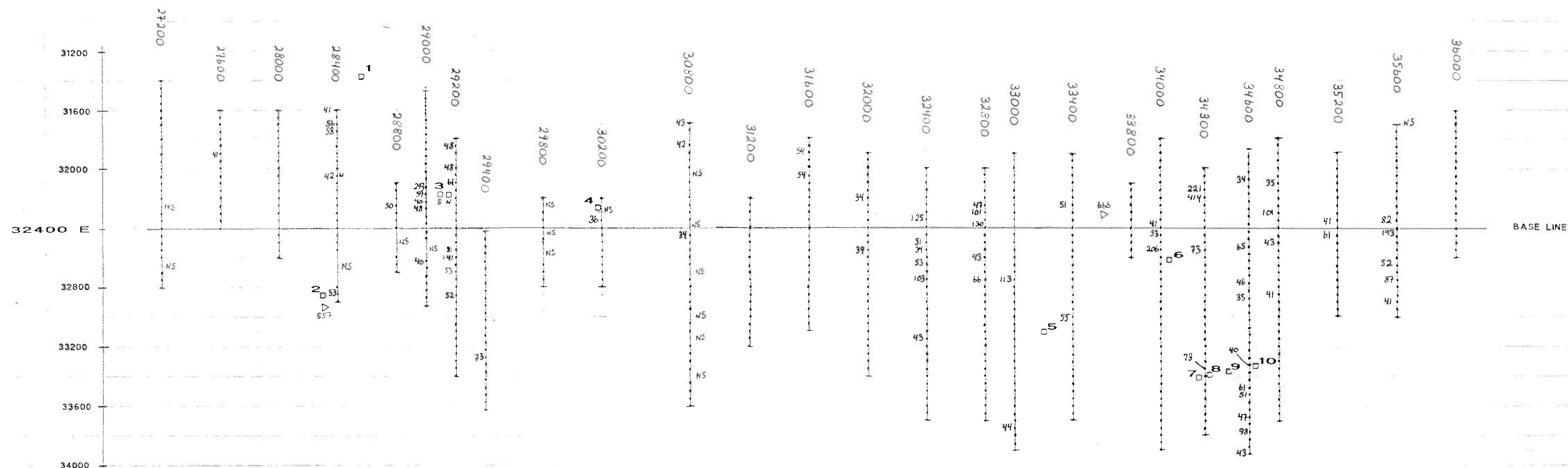
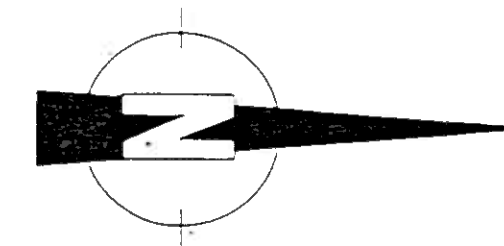
3 Anomaly area for Cu/Zn/Au

Sampled line with sample locality

Scale 1 : 20,000

FIG. 8

UTM
Grid North



MANNFJELLET-FONNFJELLET

SOIL SAMPLE SURVEY 1996

Cu 95 o/oile $\geq$ 52 ppm Max 441 ppm
90 o/oile $\geq$ 34 ppm $<$ 52 ppm

Trig.point

9 Mine/working no. 9

Sampled line with sample locality

Scale 1 : 20,000

FIG. 7

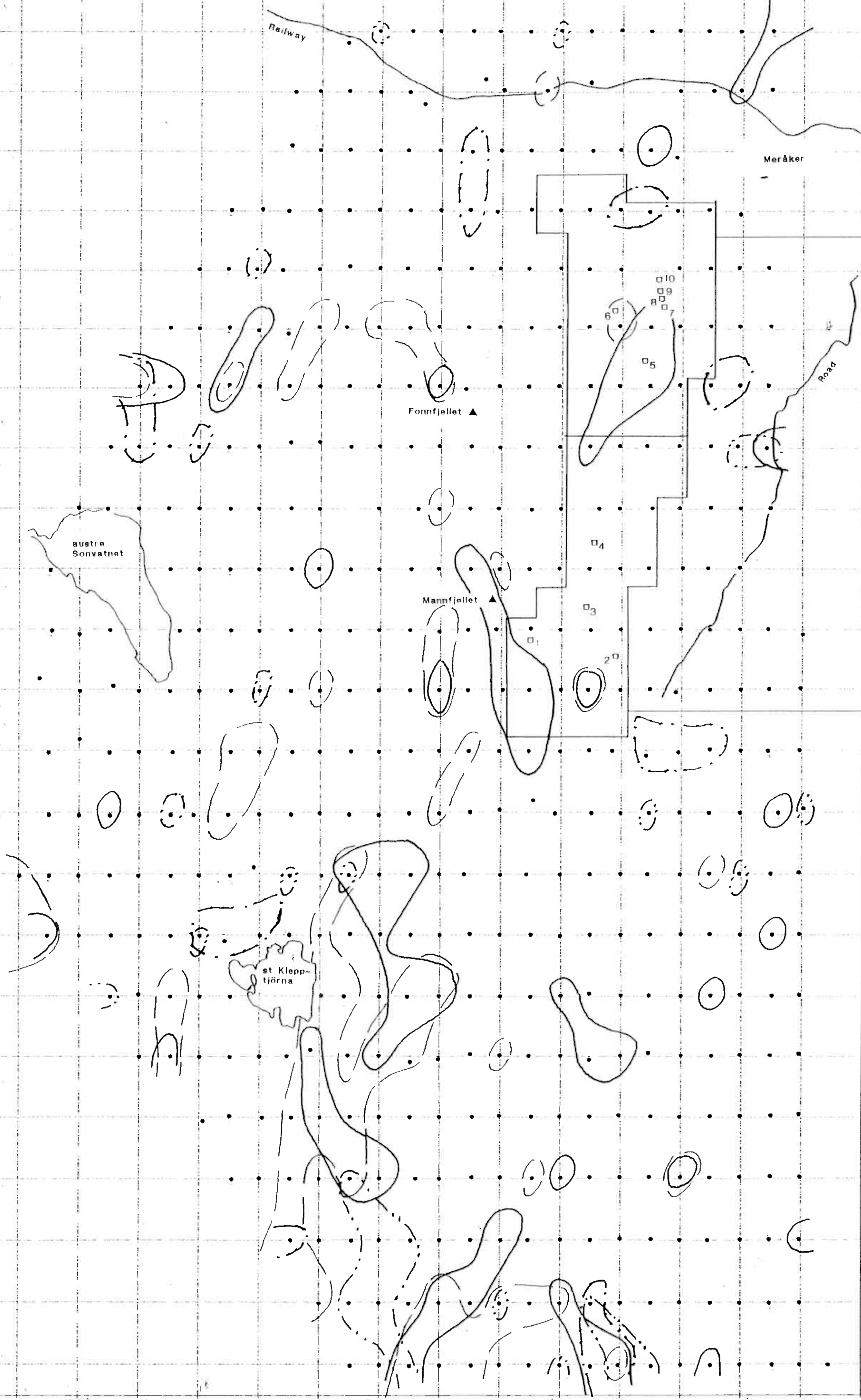
7044
7043
7042
7041
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7023
7022
7021
7020
7019
7018
7017

Flornes 1721 IV

1 : 50.000

MANNFJELLET PROJECT

REGIONAL GEOCHEM



Fonnfjellet
Property

Mannfjellet
Property

Coordinates in km; UTM-zone 32. Datum: ED50



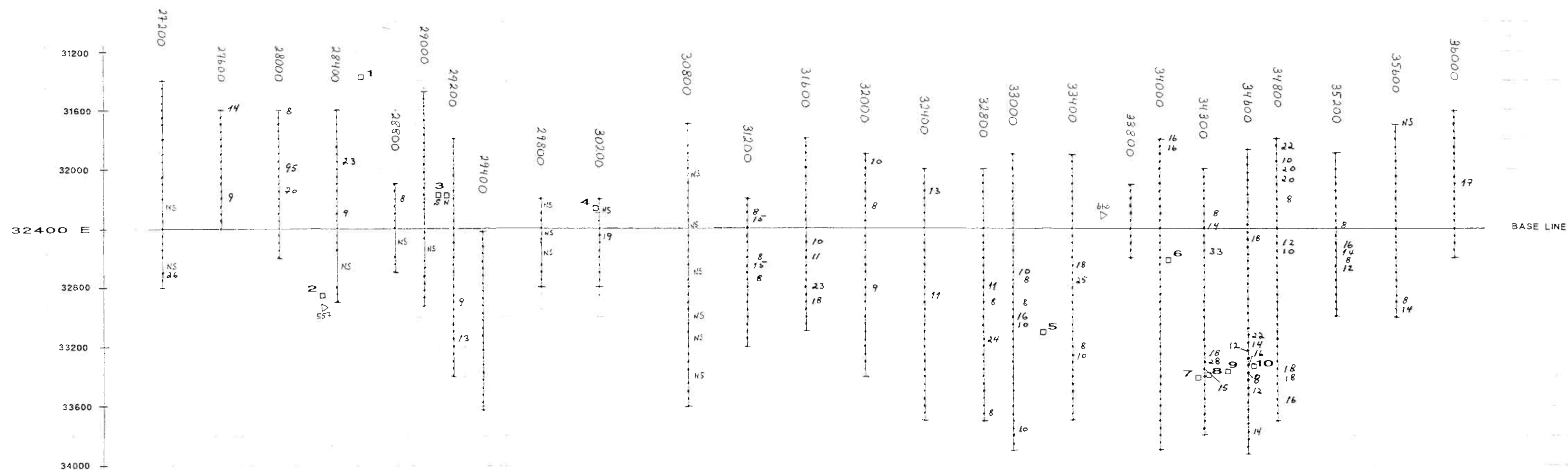
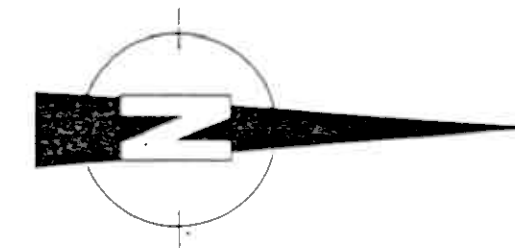
LEGEND:

- NGU Soil sample sites
- Mine/working no.9

- Zn 90 o/o ile anom. 50-237 ppm
- Cu 90 o/o ile anom. 48-142 ppm
- As 95 o/o ile anom. 8-103 ppm
- Au 95 o/o ile anom. 11-65 ppb

FIG. 10

UTM
Grid North



MANNFJELLET-FONNFJELLET

SOIL SAMPLE SURVEY 1996

Au 95 o/oile ≥ 14 ppb Max 95 ppb
90 o/oile ≥ 8 ppb ≤ 14 ppb

Trig.point

9 Mine/working no. 9

Sampled line with sample locality

Scale 1 : 20,000

FIG. 9

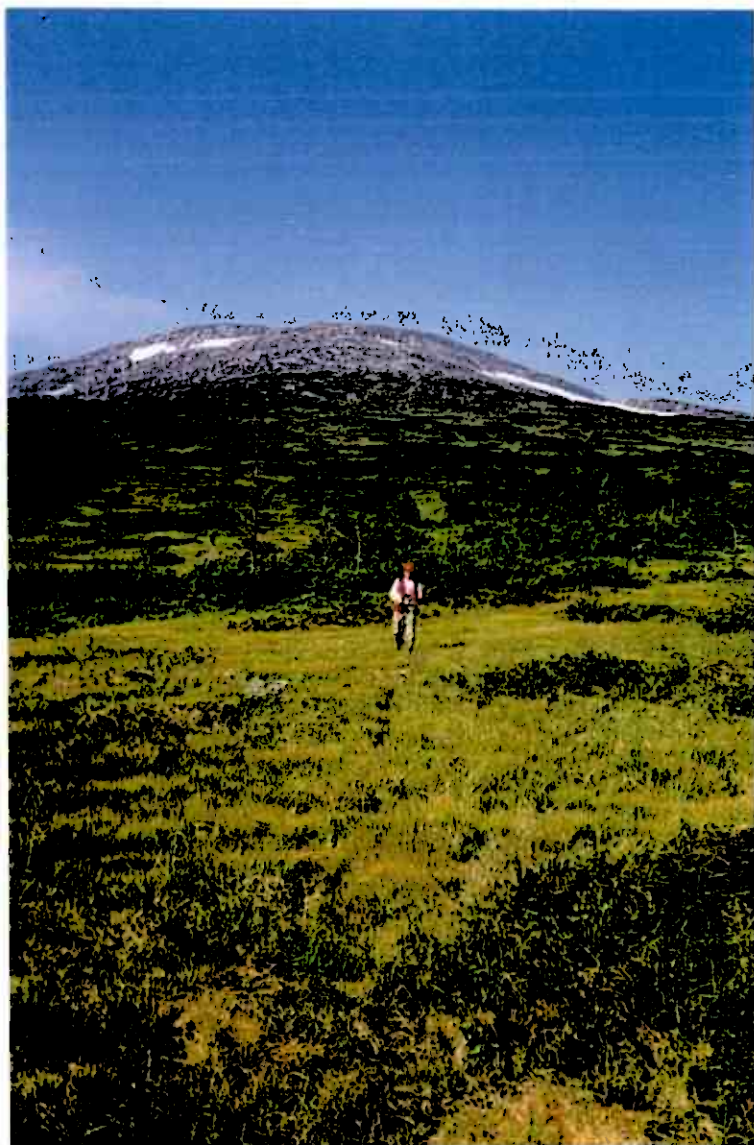


Photo 1: Soil sampling on elevation 550 m, 400 m NE of Mannfjell deposit. Mannfjellet (mountain) in the background. Seen towards W

Photo 2: Same locality as above, seen towards NE





Photo 3: Massive sulphides (Nye Fonnfjell - 10). Seen towards W



Photo 4: Footwall chlorite schist with pyrite as dissemination, stringers and bands. Nye Mannfjell, seen towards SW

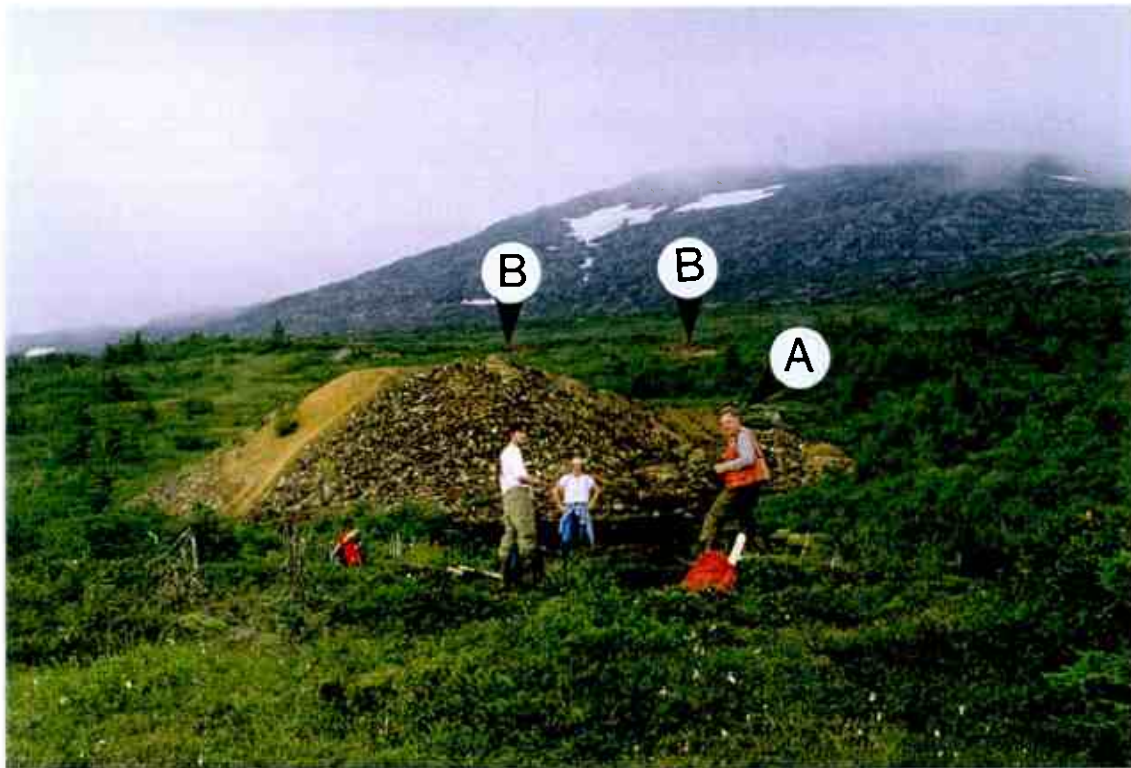


Photo 5: Mannfjell with main dump. Adit entrance (A) with open cut and ore exposures (B) in the background. Seen towards W



Photo 6: Fonnfjell. Banded greenstone (G), felsic tuff (F) and fragmental unit (Fr) below ore horizon. Seen towards W



Photo 7: Øytrø. Hangingwall banded felsic unit. Seen towards W



Photo 8: Øytrø. Folded ore zone north of deposit, intruded by gabbroic dike. Seen towards W

APPENDIX 1



NORGES GEOLOGISKE UNDERSØKELSE

Geological Survey of Norway

Offprint NGU Bulletin 427, 108–111 (Extended abstract)

GRENNE, T., HERTOGEN, J., SOLLI, A., BIRKELAND, A., ERICHSEN, E. & SANDSTAD, J. S.

The sequential development of
magmatic and ore-forming processes in the Fundsjø
Group, Meråker district, Central Norway.

Trondheim 1995

The sequential development of magmatic and ore-forming processes in the Fudnsjø Group, Meråker district, Central Norway

TOR GRENNE, JAN HERTOGEN, ARNE SOLLI, ANNE BIRKELAND, EYOLF ERICHSEN & JAN SVERRE SANDSTAD

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Regional setting

The metavolcanic Fudnsjø Group is situated in the eastern part of the Trondheim Nappe Complex, equivalent to the Kôli part of the Upper Allochthon of the Scandinavian Caledonides (Gee et al. 1985). Although the subduction affinity (Grenne & Lagerblad 1985, Grenne 1987) of the Fudnsjø Group is now generally accepted, various models have been suggested for its exact paleogeographic setting. Stephens & Gee (1989) suggested an oceanic setting on the Laurentian side of Iapetus, whereas a paleogeographic linkage to the Baltoscandian continent has been proposed by, e.g., Roberts et al. (1985).

The regional setting of the Fudnsjø Group resembles strongly that of the Stekenjokk metavolcanites (Stephens 1986) further north in the Swedish Caledonides. The two units are comparable in age (c. 490 Ma) and both are structurally overlain by a sequence dominated by metapelites which are partly graphitic and contain interlayers of quartzite and quartzite conglomerate as well as thin limestones and metabasalts. Furthermore, both are structurally underlain and stratigraphically overlain by calcareous phyllites which contain gabbroic intrusions and local metabasaltic units.

The Fudnsjø–Stekenjokk metavolcanite sequence has a combined strike length of more than 450 km and is one of the most important 'greenstone belts' in the Caledonides in view of the high abundance of massive volcanogenic sulphide (VMS) deposits. The biggest deposit is the Stekenjokk-Levi orebody containing originally c. 26 million metric tons (Mt) of ore.

The Meråker area

The general geology of the Meråker area (Fig. 1) has previously been outlined by Wolff et al. (1967) and Wolff (1973). The present account is based on studies of key profiles and localities combined with airborne geophysical data obtained during a mineral resource reconnaissance programme carried out by NGU.

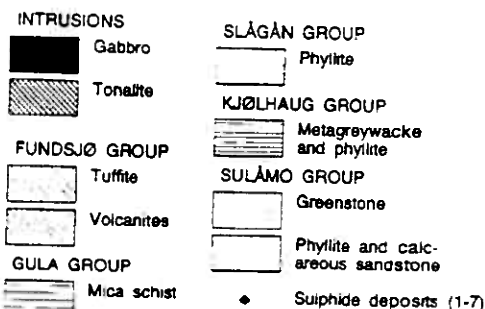
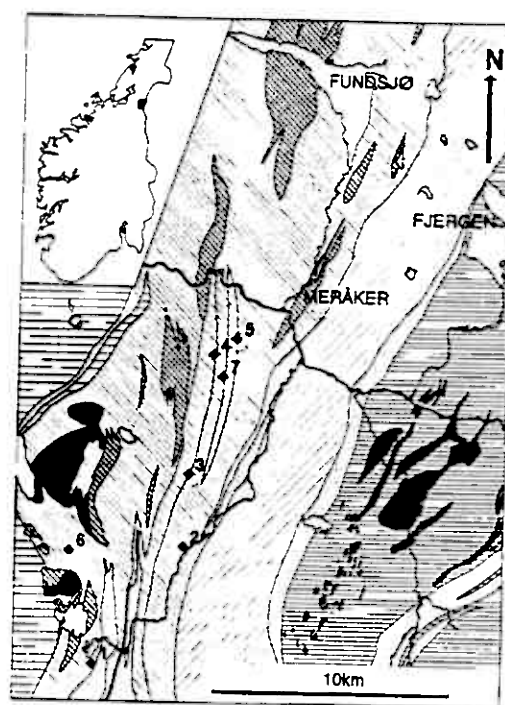


Fig. 1. Simplified geological map of the Meråker area. Volcanogenic sulphide deposits are indicated by numbers: 1. Kongens, 2. Torsbjørk, 3. Mannfjell, 4. Øytrø, 5. Fonnfjell, 6. Skråydalen, 7. Lovibekk.

The 7-9 km thick Fundsjo Group is structurally overlain, with a steep west-dipping contact, by metasediments of the Gula Group. The Fundsjo and Gula Groups were both involved in two phases of early isoclinal folding, which is not seen in the younger sedimentary formations to the east (Lagerblad 1983). This deformation, of Early Ordovician age, effectively masked primary structures of the less competent lithologies such as volcanic and volcanoclastic rocks, except in certain local areas. Metamorphic grade ranges from high amphibolite to greenschist facies.

The Sulåmo Group to the east is lying stratigraphically above the Fundsjo Group, and contains at its base a local conglomerate (Lille Fundsjo Conglomerate; cf. Wolff et al. 1967) composed of detritus from the underlying deformed igneous complex. The conglomerate is followed up sequence by phyllites and calcareous sandstones and a metabasaltic unit. Gabbro bodies associated with swarms of plagioclase-phyric metadolerite dykes occupy large portions of the Fundsjo Group and are also found locally in the Gula and Sulåmo Groups. The intrusions post-date the early isoclinal folding of the Fundsjo and Gula (Grenne & Lagerblad 1985).

Fundsjo Group stratigraphy

The lower part of the Fundsjo Group stratigraphy is a sequence of basaltic volcanites and co-magmatic dykes and subordinate gabbro. Pillow lava, pillow breccia and hyaloclastites are preserved locally and imply a submarine origin. A thin iron-formation comprising alternating layers of magnetite, pyrite and quartz occurs locally within the basaltic pile.

The basaltic sequence is intruded by a suite of coarse-grained tonalitic rocks; these are most extensively developed in the northern part of the area (Fig. 1) where they form bodies up to 3 km across and at least 15 km long. Acidic dykes are numerous above the larger intrusions and in places comprise quartz-feldspar phyric varieties. Overlying the tonalite-intruded basaltic sequence is a level of acidic volcanites which are mineralogically and texturally similar to the acidic dykes. Their effusive origin is revealed by local fine lamination and their conformable nature; however, their precise origin either as tuffs or flows, or both, has not been possible to define due to deformation and metamorphic recrystallisation.

The acidic volcanites are overlain by a variably thick sequence of layered tuffitic sediments with local interlayered pillow lavas and acidic pyroclastic rocks compositionally similar to those below. The tuffites are generally fine grained and display a compositional banding due to varying

Deposit no.	1	2	3	4	5	6	7
Cu %	1.4	3.0	1.1	1.0	2.1	1.3	2.4
Zn %	5.0	0.9	5.0	10.0	6.3	0.2	0.2
Pb ppm	35	80	473	3695	113	8	13
Ag ppm	6	14	36	90	8	4	16
Au ppm	0.1	0.1	0.9	1.9	0.2	0.1	1.1
As ppm	5	41	80	3050	11	14	4

Table 1. Bulk composition of VMS deposits in the Meråker district. Stratiform massive sulphides: no. 1-5, feeder-type deposits: no. 6-7. Deposit numbers refer to Fig. 1.

proportions of acidic and basic detritus; graphitic varieties are quite common and locally pass into graphite schist. Graphite is most abundant to the south where the tuffitic sequence attains its greatest thickness, and disappears towards the north accompanied by a gradual thinning out of the tuffites.

VMS deposits

Massive stratiform sulphides in the Meråker area are generally confined to the acidic volcanite level but also occur within the tuffitic sequence. Most deposits are proximal, being situated directly above hydrothermal feeder conduits in the form of stockwork, stringer or disseminated pyrite-pyrrhotite-chalcopryrite mineralisation with a high Cu/Zn ratio and very low Pb contents. Stockwork mineralisation with no spatial relationship to known stratiform sulphides (Table 1, no. 6-7) is thought to represent feeder conduits to presently unexposed ores.

The actual massive stratiform deposits are generally situated between the acidic effusive rocks and the overlying tuffites. The most important of the known deposits are clustered in the central-southern part of the area. They form sheet-like bodies with thicknesses usually not exceeding 1 metre, and are dominated by pyrite and sphalerite; chalcopryrite, pyrrhotite, galena and arsenopyrite occur in variable proportions. Bulk compositions (Table 1) of massive ore indicate a tendency towards increasing Zn, Pb, Au, Ag and As values from south to north.

Geochemistry

Preliminary interpretations of geochemical data from the Meråker area indicate that the igneous rocks of the Fundsjo Group can be subdivided into well-defined types which are represented by analyses shown in Fig. 2. The oldest basalts recorded have a composition which is indistinguishable from typical mid-ocean ridge basalts (MORB) with the exception of a pronounced negative Ta anomaly. Such anomalies are a distinctive feature of island arc-related magmas (Saunders & Tarney 1984), and lavas compara-

ble to the *MORB-like* basalts from the Fundsjø Group have been found in the Lau Basin (Vallier et al. 1991).

In the upper part of the basaltic sequence, possibly following deposition of the thin iron-formation, the *MORB-like* basalts were succeeded by low-K tholeiitic basalts which have a signature comparable to that of modern island arc tholeiites (IAT), such as low contents of most high field strength elements and a high Th/Ta ratio.

The acidic effusive rocks are geochemically identical to the large tonalitic intrusions and dykes, and represent a consanguineous suite of acidic melts which were erupted subsequent to the IAT-type volcanic period and at intervals during deposition of the tuffitic sequence. The rocks are very low in potassium and other large-ion lithophile elements (LILE), a feature which must be largely primary since the LILE contents are uniformly low in the volcanic as well as in the various intrusive equivalents. They classify as low-K rhyolitic melts, and are very similar to acidic rocks formed in nascent back-arc basins in the Izu-Ogasawara arc (Ikeda & Yuasa 1989). Their low content of incompatible trace elements and distinctive REE pattern (Fig. 2) argue strongly against a derivation from the basaltic magmas by crystal fractionation; an origin by partial melting of basaltic material under hydrous conditions (Helz 1976) is more likely.

A third group of basaltic lavas occurs above the first acidic volcanites and is seemingly contemporaneous with, or succeeded by, low-K rhyolitic magmatism recorded by local tuffs within the volcanoclastic sequence. These basalts are characterised by very strong HFSE-depletion but with an 'arc-type' Th/Ta signature similar to that of the preceding basalt types. The REE pattern (Fig. 2B) of these *depleted IAT-type* basalts is distinctly different from that of the underlying IAT-type basalts, denoting that they represent different parent magmas and are not related by crystal fractionation processes.

Conclusions

Preliminary interpretations of data from the Meråker area indicate the following sequential development of the Fundsjø Group, schematically illustrated in Fig. 3:

1. Accumulation of a thick submarine sequence of *MORB-like* basalts, followed by deposition of ferruginous cherty sediments.
2. Continued basaltic submarine volcanism of IAT-type composition.
3. Introduction of large volumes of low-K rhyolitic melts to the basaltic crust in local intrusive centres, generated by partial melting of hydrated

basic crust at deeper levels.

4. Uplift of oceanic crust related to the acidic intrusions, locally to subaerial levels with exposure of older basaltic material to erosion processes.

5. Eruption of low-K rhyolitic melts and deposition of water-lain tuffs and possibly flows.

6. Convective hydrothermal activity in the crust induced and driven by heat from the acidic intrusions, with precipitation of VMS deposits from

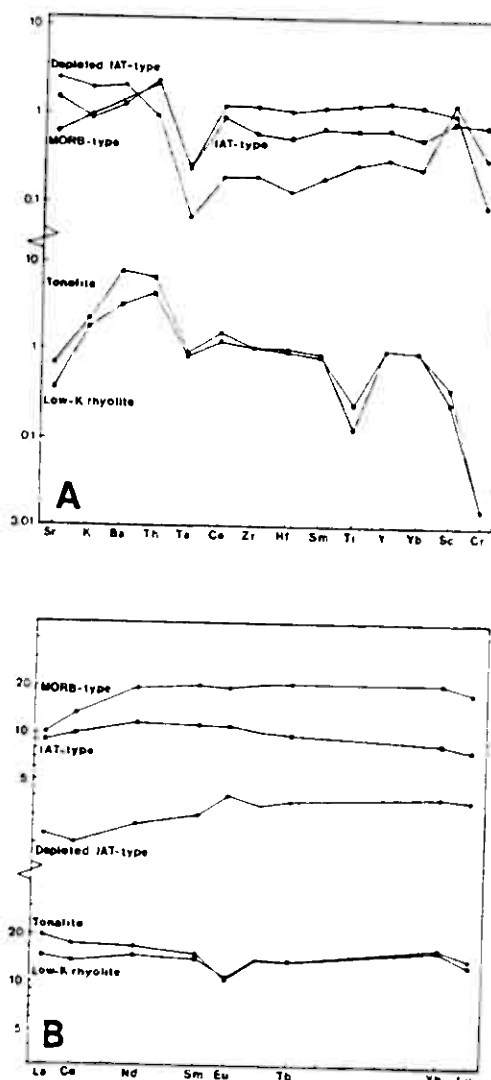


Fig. 2. MORB-normalised spidergrams (A) and chondrite-normalised REE plots (B) of representative samples of different igneous rock-types from the Fundsjø Group referred to in the text. Sr, K, Ba, Zr, Ti and Y analysed by XRF at NGU. REE and Th, Ta, Hf and Sc analysed by Instrumental Neutron Activation at University of Leuven, Belgium.

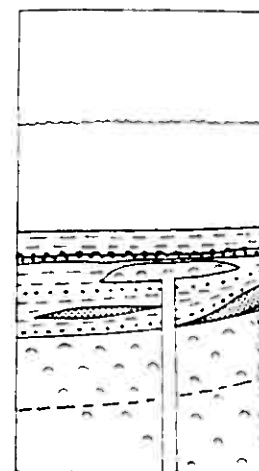


Fig. 3. Schematic model for the development of the Fundsjø Group.

the ascending hydrothermal floor. VMS formation largely confined to subaqueous magmatic centres, leading to the formation of deposits in a sequence of magmatic centres. The Fundsjø Group where the tuffitic sequence is deposited northwards towards a subaerial magmatic centre (see also Fig. 1).

7. Erosion of basic and acidic rocks from subaerial regions with deposition of tuffites in partly euxinic basins.

8. Local eruptions of depleted IAT-type, waning acidic volcanism and continued deposition of tuffites. No sign of the vast, arc magmatism of the Fundsjø Group adjoining Gula Group, indicating a tectonic break exists between the Fundsjø and Gula Groups, probably in Early Ordovician time. Both suffered a similar tectonic break prior to deposition of the tuffites of the Sulåmo Group.

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- Grenne, T. 1987. Marginal basins and related tectonics, eastern Norwegian Caledonides. No. 42.

levels.
crust related to the acidic
subaerial levels with expo-
sured material to erosion proces-

hyolitic melts and depositi-
and possibly flows.
thermal activity in the crust
y heat from the acidic intru-
sion of VMS deposits from

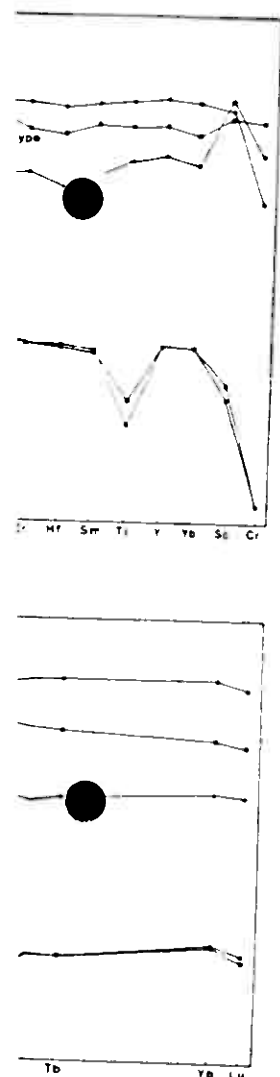


Fig. 3. Schematic model for the igneous and metallogenic development of the Fudnsjø Group in the Meraker area.

the ascending hydrothermal solutions at the sea-floor. VMS formation largely controlled by, and confined to subaqueous regions around acidic magmatic centres, leading to the observed clustering of deposits in a segment of the Fudnsjø Group where the tuffitic sequence wedges out northwards towards a supposed acidic intrusive centre (see also Fig. 1).

7. Erosion of basic and acidic volcanic material from subaerial regions with deposition of mixed tuffites in partly euxinic basins between the acidic centres.

8. Local eruptions of depleted IAT basalts, and waning acidic volcanism and VMS-forming hydrothermal activity, contemporaneous with continued deposition of tuffites.

No sign of the vast, arc- or back-arc type magmatism of the Fudnsjø Group is seen in the adjoining Gula Group, indicating that a major tectonic break exists between the two. It is likely that the Fudnsjø and Gula complexes were amalgamated prior to an early tectonic event, probably in Early Ordovician times, since they both suffered a similar type of isoclinal folding prior to deposition of the overlying sediments of the Sulåmo Group.

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APPENDIX 2

和

Project No: 81

Sample Type: Soil

Project Name: MANNFELLET

Date: 03.09.96

Submitted By: JB

Supervisor:

Geologiske
Institutt
Hovfaret 8
0275 Oslo, Norway

Cu Zn Au

Assay Suggestion

1: _____

2: _____

3: _____

Stream-Sediment Sample Data Sheet

No of Samples on the Sheet 13

No of Samples for Assay

Batch No. _____

Sheet No.				Sample No.							Bedrock		UTM		Map	Sam	Month	Stream Cond.			Assay	Comments						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Sheet	pler		Day	Width	Fl	St	Fe	Sugg.
																		32850	30800	1,3		8,2	-					BR - GR, SANDY SILT, MUCH ROCK FRAG., BOGEDEGE, 7cm C
																		32900		34		9,9	-					OR - YE - BR, SANDY SILT, ROCK FRAG., BOGEDEGE, 15cm B
																		32950		9,3		1,3	-					BR - GR, SILT, 20cm B
																		33000					-					NO SAMPLE, BOG
																		33050		8,5		16,8	-					GREENISH GR., SILT, ROCK FRAG., 25 cm C
																		33100		0,7		20,0	-					OR - RED - BR, SILTY SAND, ROCK FRAG., 20 cm B
																		33150					-					NO SAMPLE, BOG
																		33200		0,9		4,5	-					LIGHT BR., SANDY SILT, ROCK FRAG., 35 cm B
																		33250		-		3,4	-					LIGHT GR., SANDY SILT, ROCK FRAG., 15 cm A
																		33300		1,5		7,5	-					GR - BR., SANDY SILT, ROCK FRAG. & ROOTS, 5cm C
																		33350		13,8		11,8	-					DARK BR., SANDY SILT, MUCH ROOTS, 30 cm B
																		33400					-					NO SAMPLE, BOG
																		33450		-		29,8	-					REDISH BR., SANDY SILT, SOME ROCK FRAG., 25 cm B
																		33500		-		0	-					LIGHT GR., SANDY SILT, SOME ROCK FRAG., 10 cm C
																		33550		-		7	-					GR, SANDY SILT, ROCK FRAG., 30 cm B
																		33600		24		37	-					REDISH BR., SANDY SILT, MUCH ROCK FRAG., 25 cm B

Project No. 81	Project Name: MERAKER	Geologiske Hjester Hovfaret 8 0275 Oslo, Norway	Any Suggestion	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: 11.09.96		1: _____ 2: _____ 3: _____	No of Samples on the Sheet _____ No of Samples for Assay 21 Batch No. _____
	Submitted By: J.B.			
	Supervisor: _____			

Sheet No.				Sample No.								Bedrock				UTM		Map		Month		Stream Cond.		Assay		Comments	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Sheet	Day	Width	Fl. St. No.	Sugg.			
																		32200	31200	22	15	-			(REDISH) BR, SANDY SILT, SOME ROCK FRAG., 30 cm, B		
																		32250		17	29	-			BR., FRAGMENTAL SANDY SILT, MUCH ROOTS, 30cm B		
																		32300		8	26	81			REDISH BR, SANDY SILT, 30 cm B		
																		32350		16	21	10			BR., SANDY SILT, SOME ROCK FRAG., 25 cm B		
																		32400		14	52	-			BR., SANDY SILT, MUCH ROCK FRAG., ROOTS, B/C		
																		32450		5	44	-			LIGHT BR., SANDY SILT, SOME ROCK FRAG., 30 cm B		
																		32500		1	2	-			GR., FINE SANDY, SOME ROCK FRAG., A		
																		32550		7	11	-			BR.-GR, FRAGMENTAL SILTY SAND, B/C		
																		32600		10	18	81			BR.-GR, SANDY SILT, MUCH ROOTS, B/C		
																		32650		28	7	15			DARK BR., SANDY SILT, SOME ROOTS, 20 cm B/C		
																		32700		0	4	-			DARK GR-BR., SANDY SILT, B		
																		32750		2	7	8			BR.-GR, SANDY SILT, MUCH ROCK FRAG., ROOTS, 20 cm C		
																		32800		23	25	7			DARK BR., SANDY SILT, MUCH ROCK FRAG. & ROOTS, 20 cm C		
																		32850		1	8	-			GR. FRAGMENTAL SANDY SILT, MUCH ROOTS, 20 cm C		
																		32900		1	47	5			DARK BR., SANDY SILT, ROOTS, 20 cm B		
																		32950		-	10	-			(REDISH) BR., SANDY SILT, SOME ROCK FRAG., 20 cm B		
																		33000		5	5	-			GR., SANDY SILT, SOME ROCK FRAG., MUCH ROOTS 10 cm C		
																		33050		0	2	-			BR.-GR., SANDY SILT, 10 cm C		
																		33100		3	3	-			GR., SANDY SILT, MUCH ROOTS, 15 cm C		
																		33150		1	9	-			BR.-GR, SANDY SILT, SOME ROOTS, 25 cm C		
																		33200		1	3	-			GR., SANDY SILT, SOME ROOTS, 20 cm C		

R. A. R.

Project No: 81		Project Name: MERAKER		Geologiske Jenseter AS Hovfaret 8 0275 Oslo, Norway		Agency Section		Stream-Sediment Sample Data Sheet	
Sample Type: SOIL		Date: 12.09.96				Submitted By: JB		No of Samples on the Sheet	
Supervisor:				CA 20 A1		1: _____		27	
Batch No. _____						3: _____			

Sheet No.	Sample No. Year Serial Reg	Sc	Bedrock	UTM East North	Map Sheet	Sam pler	Month Day	Stream Width	Cond. Fl. St. Po	Assay Sugg.	Comments
				31800	31600	12	6	-			DARK BR., SILT, 15 cm B/O
				31850		7	27	-			BR., SANDY SILT, MUCH ROCK FRAG., 20 cm B/C
				31900		12	19	-			BR., SANDY SILT, SOME ROCK FRAG., 30 cm B
				31950		12	12	-			BR., SANDY SILT, SOME ROCK FRAG., 20 cm B/C
				32000		18	11	-			DARK BR., SANDY SILT, ROOTS, 15 cm B
				32050		18	7	-			BR., SILT, 20 cm B
				32100		24	24	-			BR., SILT, SOME ROCK FRAG., 20 cm C
				32150		17	17	-			BR., SILT, SOME ROCK FRAG., ROOTS, 20 cm B
				32200		18	24	-			BR., SANDY SILT, SOME ROCK FRAG., 2.5 cm B
				32250		5	15	-			BR., SANDY SILT, ROOTS, 25 cm B
				32300		17	23	-			BR., SANDY SILT, ROCK FRAG., 20 cm B
				32350		24	27	-			RED-YE-BR., SANDY SILT, 30 cm B
				32400		17	27	-			DARK REDISH BR., SANDY SILT, SOME ROCK FRAG. & ROOTS, 25 cm B
				32450		38	49	-			BR., SANDY SILT, MUCH ROCK FRAG., ROOTS, 20 cm B
				32500		7	8	10			DARK BR., SILT, ROOTS, 25 cm B
				32550		10	29	-			BR., SANDY SILT, ROCK FRAG. & ROOTS, 20 cm B
				32600		7	32	11			BR., SANDY SILT, SOME ROOTS, 25 cm B
				32650		16	16	7			REDISH BR., SANDY SILT, MUCH ROCK FRAG., ROOTS, 25 cm B
				32700		-	11	-			REDISH BR., SANDY SILT, ROCK FRAG., SOME ROOTS, 15 cm B
				32750		1	2	7			GR-BR., SANDY SILT, MUCH ROCK FRAG., 25 cm B/C
				32800		6	14	23			(REDISH) BR., SANDY SILT, ROOTS, 25 cm, B
				32850		2	3	6			DARK GR., SILT, 25 cm B/C
				32900		2	7	12			(REDISH) BR., SANDY SILT, ROCK FRAG., 20 cm B
				32950		1	10	7			(RED/GR) BR., SANDY SILT, MUCH ROCK FRAG., 20 cm B
				33000		1	11	5			DARK GR., SILT, SOME ROCK FRAG., 35 cm B
				33050		-	24	-			DARK BR., SANDY SILT, ROCK FRAG., 25 cm B
				33100		-	3	-			GR., FINE SAND, 30 cm A/B

[illegible]

Project C 81	Project Name: <u>HANNETUN</u>	Geologiske Jensen & Hovfaret 8 0275 Oslo, Norway Cu Zn Au	Assay Suggestion	Stream-Sediment Sampling Data Sheet
Sample Type SOIL	Date: <u>040996</u>		1: _____	No of Samples on the Sheet
	Submitted By: <u>UJ</u>		2: _____	No of Samples for Assay 2
	Supervisor: _____		3: _____	Batch No. _____

[illegible]

Project No: <u>81</u>	Project Name: <u>MERÅKER</u>	Geologiske Jensenet AS Hovfaret 8 0275 Oslo, Norway Cu Zn Au	Any Suggestion	Stream-Sediment Sampling Data Sheet
Sample Type: <u>SOIL</u>	Date: <u>16.07.96</u> Submitted By: <u>JB</u> Supervisor: _____		1: _____ 2: _____ 3: _____	No of Samples on the Sheet No of Samples for Assay 9 Batch No. _____

Sheet No.				Sample No.							Bedrock							UTM		Map		Sampler		Month		Stream Cond.		Assay		Comments
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Sheet	Day	Width	Fl	St	Pl	Sugg.				
																		32000	32400	2	2	-						GR. - BR., FINE SAND, 30 cm, SOME ROCK FRAG.	B/C	
																		32050		13	14	-						BR., SANDY SILT, SOME ROCK FRAG., 25 cm	B	
																		32100		18	11	-						BR., SANDY SILT, ROCK FRAG. & ROOTS, 30 cm	B/C	
																		32150		8	10	13						BR., SANDY SILT, SOME ROCK FRAG., 20 cm	B	
																		32200		27	5	-						DARK GR-BR., SILT, ROCK FRAG. & ROOTS, 30 cm	B/C	
																		32250		15	10	6						BR., SANDY SILT, ROCK FRAG. & ROOTS, 30 cm	B/C	
																		32300		26	52	-						BR.-GR., SANDY SILT, MUCH ROCK FRAG., 15 cm	B/C	
																		32350		26	14	-						BR., SANDY SILT, MUCH ROCK FRAG., 15 cm	B/C	
																		32400		4	4	-						GR.-BR., SANDY SILT, SOME ROCK FRAG. & SOME ROOTS, 20 cm	B	

Project No: 81	Project Name: MERAKER	Geologiske Jensen & Co. Hovfaret 8 0275 Oslo, Norway Cu Zn Au	Assay Selection	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: 17.09.96 Submitted By: JB Supervisor: _____		1: _____ 2: _____ 3: _____	No of Samples on the Sheet: No of Samples for Assay: 26 Batch No.: _____

Sheet No.				Sample No.							Bedrock							UTM		Map Sheet		Sampler	Month	Day	Stream Cond			Assay Sugg.	Comments																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Scale																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														

Project No: 81	Project Name: MELAKER	Geologiske Jensenst. 22 Hovfaret 8 0275 Oslo, Norway	Assay Section	Stream-Sediment Sampling Data Sheet
Sample Type: SOIL	Date: 16.09.96 Submitted By: JB Supervisor: _____		1: _____ 2: _____ 3: _____	No of Samples on the Sheet No of Samples for Assay 9 Batch No. _____

Sheet No.	Sample No.						Bedrock							UTM		Map Sheet	Sampler	Month / Day	Stream Width	m	Cond.	Assay Sugg.	Comments
1 2 3 4	5 6 7 8 9 10	11	12	13	14	15	16	17	18	East	North												
										32000	32800					SS		4/1	-				DARK BR., SILT, 25 cm. B
										32050						23		18	-				BR., SILT, SOME ROCK FRAG., 20 cm B/C
										32100						11		12	-				DARK BR., (SANDY) SILT, 30 cm B
										32150						11		9	5				BR., SANDY SILT, ROCK FRAG., 25 cm B/C
										32200						5		20	-				BR., SANDY SILT, SOME ROCK FRAG., 25 cm. B
										32250						47		6	-				DARK BR., SILT, ROOTS, 30 cm B
										32300						101		12	-				BR., SANDY SILT, ROOTS & MUCH ROCK FRAG., 20 cm B/C
										32350						1		12	-				BR., SANDY SILT, ROOTS, 10 cm. B/C
										32400						7138		18	-				BR., SANDY SILT, SOME ROCK FRAG., 25 cm B

Project No. 81	Project Name: MERÅKER	Geologiske Institutt Hovlandt 8 0275 Oslo, Norway	May Suggestion	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: 18.09.96		1: _____ 2: _____ 3: _____	No of Samples on the Sheet: No of Samples for Assay: 26 Batch No. _____
Submitted By: JB		C4 20 A4		
Supervisor: _____				

Sheet No.				Sample No.							Bedrock							UTM		Map	Sampler	Month	Stream Cond.			Assay	Comments		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Sheet		Day	Width	Fl.	St.	Pool		Sugg.	
																		32450	32800	7		169	-					BR., SANDY SILT, SOME ROOTS, 25 cm	B
																		32500		1		1	-					DARK BR., SANDY SILT, SOME ROOTS, 25 cm	B
																		32550		25		169	-					BR., SANDY SILT, MUCH ROOTS, MUCH ROCK FRAG.	B/C
																		32600		43		48	-					(REDISH) BR., SANDY SILT, ROCK FRAG. & ROOTS, 25 cm	B/C
																		32650		16		31	-					BR., SANDY SILT, ROCK FRAG. & ROOTS, 20 cm	B/C
																		32700		21		28	-					REDISH BR., SANDY SILT, ROCK FRAG. & ROOTS, 20 cm	B
																		32750		21		37	-					REDISH BR., SANDY SILT, MUCH ROCK FRAG., 20 cm	B
																		32800		26		19	11					" "	B
																		32850		-		2	-					LIGHT GR., FINE SAND, ROCK FRAG. & ROOTS, 15 cm	A
																		32900		-		10	8					LIGHT GR., SILTY SAND, ROCK FRAG., 15 cm	A
																		32950		10		34	-					BR., SANDY SILT, MUCH ROCK FRAG., ROOTS, 20 cm	B
																		33000		1		4	-					DARK GR., SANDY SILT, 15 cm	A
																		33050		9		169	-					(REDISH) BR., SANDY SILT, MUCH ROCK FRAG. & ROOTS, 20 cm	B/C
																		33100		2		3	-					DARK GR., SANDY SILT, ROCK FRAG., 20 cm	B
																		33150		-		1	124					LIGHT BR.-GR., FINE SAND, 15 cm	A
																		33200		-		1	-					DARK BR.-GR., SANDY SILT, 20 cm	B
																		33250		1		152	6					LIGHT BR.-GR., FINE SAND, 20 cm	B
																		33300		-		16	-					RED-PINK-BR., SANDY SILT, MUCH ROCK FRAG., 20 cm	B
																		33350		2		-	-					BR.-GR., FINE SAND, 15 cm	B
																		33400		-		11	-					GR., FINE SAND, SOME ROCK FRAG., 15 cm	B
																		33450		5		189	-					GR.-BR., SANDY SILT, SOME ROCK FRAG., 25 cm	B
																		33500		-		3	-					BR.-GR., FINE SAND, SOME ROCK FRAG., 20 cm	B
																		33550		13		8	7					DARK BR., TALUS! BOG.	O
																		33600		1		41	-					GR., FRAGMENTAL SAND, 20 cm	B/C
																		33650		2		5	8					DARK BR., MUCH ROOTS, 30 cm.	O
																		33700		-		-	-					LIGHT GR., FINE SAND, 20 cm	C

Project No. 81	Project Name: MERÅKER	Geologiske Jenseter AS Hovlaret B 0275 Oslo, Norway	Assay Section	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: 19.09.96		1: _____	No of Samples on the Sheet
Submitted By: JB	Supervisor: _____		2: _____	No of Samples for Assay 30
		CL 2n A4	3: _____	Batch No. _____

Sheet No.				Sample No.							Sc	Bedrock							UTM		Map Sheet	Sampler	Month Day	Stream Cond.			Assay Sugg.	Comments	
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	East	North				W	FI	St			
																			32450	33000	33		8.7	-				BR., SANDY SILT, SOME ROOTS, 40 cm.	B
																			32500		12		26	-				BR., SANDY SILT, SOME ROCKS , 30 cm	B
																			32550		17		27	-				BR., SANDY SILT, MUCH ROCK FRAG., 25 cm	B
																			32600		1		35	-				BR.-GR., SANDY SILT, SOME ROCK FRAG., 25 cm	B
																			32650		7		5	-				(REDISH) BR., SANDY SILT, MUCH ROCK FRAG., 20 cm	B
																			32700		16		28	10				BR., SANDY SILT, ROCK FRAG., 25 cm	B
																			32750		113		57	8				REDISH GR., SANDY SILT, 30 cm	B
																			32800		4		3	-				RED-YE-BR., SANDY SILT, ROCK FRAG., 20 cm	B
																			32850		25		13	-				"	B
																			32900		17		15	3				BR., SANDY SILT, SOME ROCK FRAG., 20 cm	B/C
																			32950		6		22	-				BR.-GR., SANDY SILT, ROCK FRAG., 20 cm	B
																			33000		24		24	10				DARK BR., SANDY SILT, SOME ROCK FRAG., 25 cm	B
																			33050		9		55	10				(REDISH) BR., SANDY SILT, 25 cm	B
																			33100		2		2	-				BR.-GR., SILT, 15 cm	B
																			33150		9		19	-				GR.-BR., SANDY SILT, 15 cm	B
																			33200		24		17	-				LIGHT BR.-GR., SANDY SILT, 25 cm	B
																			33250		3		57	-				LIGHT BR.-GR., FINE SAND, ROCK FRAG., 25 cm	B/C
																			33300		4		17	-				YE-(RED)-BR., SILT, 30 cm	B
																			33350		-		6	-				LIGHT GR., FINE SAND, 40 cm	A
																			33400		-		-	-				" 30 cm	A
																			33450		-		-	-				DARK GR.-BR., SANDY SILT, SOME ROCK FRAG., 30 cm	B
																			33500		2		4	-				DARK GR., SANDY SILT, 10 cm	B
																			33550		13		22	-				DARK GR., SILT, 20 cm	B
																			33600		-		10	-				LIGHT GR., FINE SAND, 15 cm	A
																			33650		-		2	-				DARK GR., FINE SAND, 30 cm	B/C
																			33700		5		27	-				REDISH BR.-GR., SANDY SILT, ROCK FRAG., 20 cm	B/C
																			33750		44		46	10				BR., SANDY SILT, SOME ROCK FRAG., 25 cm	B
																			33800		-		2	-				GR./BR., FINE SAND/SILT, ROCK FRAG.,	B
																			33850		19		27	-				DARK REDISH BR., SANDY SILT, ROCK FRAG., 30 cm	B
																			33900		11		17	-				BR., SANDY SILT, SOME ROCK FRAG., 20 cm	B

Project No: **81** Project Name: **MERAKER** Date: **20.09.96** Submitted By: **JB** Supervisor: _____

Geologiske
Jensen & Co.
Hovfaret 8
0275 Oslo, Norway

Assay Suggestion
1: _____
2: _____
3: _____

Stream-Sediment Sample Data Sheet
No of Samples on the Sheet _____
No of Samples for Assay **11**
Batch No. _____

Sample Type: **SOIL**

Sheet No.				Sample No.							Sc	Bedrock							UTM		Moist Soil	Sam- pler	Month Day	Stream Cond.			Assay Sugg.	Comments	
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	East	North				Width	Fl	St			
																		31900	33000	1,3		4,8	-					DARK BR., SANDY SILT, 25 cm	B
																		31950		22,0		11,5	7					" "	B
																		32000		12,6		8,1	-					DARK BR., SILT, SOME ROOTS, 20 cm	B
																		32050		1,5		-	-					DARK BR., SILT, 25 cm	B
																		32100		3,2		3,3	-					DARK BR., SILT, SOME ROOTS, 25 cm	B
																		32150		13,0		0,6	-					" "	B
																		32200		-		4,5	-					GR.-BR., SANDY SILT, ROCK FRAG. & ROOTS, 20 cm.	B
																		32250		-		0,7	-					GR.-BR., SANDY SILT, ROCK FRAG. & SOME ROOTS, 25 cm	B
																		32300		19,3		12,2	-					BR., SANDY SILT, 25 cm	B
																		32350		32,4		34,0	-					GR.-BR., SANDY SILT, MUCH ROCK FRAG. & ROOTS, 25 cm	B/C
																		32400		10,2		56,6	-					(REDISH) BR., SANDY SILT, ROCK FRAG., 25 cm	B

Project No: 81

Sample Type: SOIL

Project Name: MERAKER

Date: 20.09.96

Submitted By: JB

Supervisor: _____

Geologiske
Fenestler 22
Hovfaret 8
0275 Oslo, Norway

Cu Zn Au

Assay Suggestion

1: _____
2: _____
3: _____

Stream-Sediment Sample Data Sheet

No of Samples on the Sheet

No of Samples for Assay 11

Batch No. _____

Sheet No.				Sample No.							Sc	Bedrock							UTM		Map Sheet	Sampler	Month		Stream Cond.			Assay Sugg.	Comments	
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	East	North			Year	Day	Width	Fl	St			Pos
↓																		31900	33400			4,2	16,6	-					BR., SANDY SILT, SOME ROCK FRAG., 25 cm,	B
																		31950				10,9	11,8	-					BR., SANDY SILT, MUCH ROCK FRAG., 20 cm	C
																		32020				16,8	26,1	-					BR., SANDY SILT, ROCK FRAG., 15 cm	B
																		32050				10,6	14,0	-					BR., SANDY SILT, MUCH ROCK FRAG., 25 cm	B/C
																		32100				20,9	15,8	-					BR., SANDY SILT, 30 cm	B
																		32150				6,3	5,9	-					DARK BR., TALUS, 20 cm	(B)/o
																		32200				12,7	23,3	-					DARK BR., SILT, MUCH ROOTS, 10 cm	B
																		32250				12,7	49,2	-					BR., SANDY SILT, MUCH ROCK FRAG., 10 cm	B/C
																		32300				3,1	5,4	-					(REDISH) BR., SANDY SILT, ROCK FRAG., 15 cm	B
																		32350				10,7	23,7	-					BR., SANDY SILT, ROCK FRAG., 20 cm	B/C
																	32400				9,2	12,2	-					BR., SANDY SILT, 15 cm	B	

Project No: 81	Project Name: MERAKER	Geologiske Henseter Hovfaret 8 0275 Oslo, Norway	Assay Suggestion	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: 24.09.96		1: _____	No of Samples on the Sheet
Submitted By: JB	Supervisor: _____		2: _____	No of Samples for Assay 26
		24 20 A4	3: _____	Batch No. _____

Sheet No.				Sample No.							Bedrock	UTM		Map Sheet	Sampler	Month	Stream Width	Cond.			Assay Sugg.	Comments
1	2	3	4	5	6	7	8	9	10	11		East	North					Fl	St	Pos		
												32450	33400	4		42	-					BR., SANDY SILT, SOME ROOTS, 20 cm B
												32500		32		42	-					BR.-GR., SANDY SILT, ROCK FRAG., ROOTS, 25 cm B
												32550		-		3	-					GR.-BR., SANDY SILT, ROCK FRAG., SOME ROOTS, 20 cm B
												32600		3		26	-					BR., SANDY SILT, ROOTS, 20 cm B
												32650		3		18						DARK BR., SILT, 15 cm, ROOTS, B
												32700		5		43	-					BR.-GR., SANDY SILT, 25 cm B
												32750		16		43						BR., SANDY SILT, ROCK FRAG., 20 cm B/C
												32800		1		13	-					BR., SANDY SILT, SOME ROCK FRAG., 20 cm B/C
												32850		28		21	-					REDISH BR., SANDY SILT, MUCH ROCK FRAG., 30 cm B
												32900		-		6	-					LIGHT REDISH BR., SANDY SILT, SOME ROCK FRAG., 30 cm B
												32950		-		23	-					GR., SANDY SILT, 30 cm B/C
												33000		58		28	5					(REDISH) BR., SANDY SILT, ROCK FRAG., 25 cm B
												33050		31		44	-					RED-YE-BR., (SANDY) SILT, 35 cm B
												33100		5		16	-					BR.-GR., SANDY SILT, 15 cm B/C
												33150		22		52	-					BR., SANDY SILT, 30 cm B
												33200		1		5	8					GR.-BR., SILT, ROOTS, 30 cm B/O
												33250		5		3	10					GR.-BR., SILT, MUCH ROOTS, 25 cm B/O
												33300		-		10	-					LIGHT GR., MUCH ROCK FRAG., 15 cm A/C
												33350		-		9	-					GR.-BR., (SANDY) SILT, 25 cm B/C
												33400		2		8	-					BR., SILT, 30 cm B/O
												33450		-		3	-					BR.-GR., SANDY SILT, 10 cm B
												33500		-		6	-					BR., TALUS, 10 cm O
												33550		5		-	-					LIGHT GR., SANDY SILT, 15 cm A
												33600		11		1	-					BR., SILT, MUCH ROOTS, 30 cm B
												33650		2		11	-					GR.-BR., SILT, 20 cm B/O?
												33700		-		14	-					BR.-GR., SANDY SILT, SOME ROCK FRAG., 25 cm B

Project No: <u>81</u>	Project Name: <u>MERAKER</u>	Geologiske Institutt Hovfaret 8 0275 Oslo, Norway	Assay Suggestion	Stream-Sediment Sample Data Sheet
Sample Type: <u>SOIL</u>	Date: <u>23.09.96</u>		1: _____ 2: _____ 3: _____	No of Samples on the Sheet <u> </u> No of Samples for Assay <u>11</u> Batch No. _____
	Submitted By: <u>J.B</u>			
	Supervisor: _____			

Sheet No.	Sample No.				Sc	Bedrock	UTM		Map Sheet	Sampler	Month	Day	Stream Cond.			Assay Sugg.	Comments												
	Year	Serial	Reg				East	North					Width	Fl.	St. Per														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18												
																		32100	33800	21,5		10,2	-					BR., SANDY SILT, ROCK FRAG., 15 cm	B
																		32150		1,5		6,2	-					BR., (SANDY) SILT, 25 cm	B
																		32200		16,1		10,3	-					BR., SILT, 20 cm	B
																		32250		20,0		23,1	-					(REDISH) BR., SILT, 20 cm	B
																		32300		13,0		12,2	-					BR., SANDY SILT, SOME ROCK FRAG., 25 cm	B
																		32350		2,1		18,1	-					REDISH GR.-BR., SANDY SILT, ROCK FRAG., 20 cm	B
																		32400		31,2		29,0	-					GR.-BR., SANDY SILT, 15 cm	B
																		32450		23,8		13,1	-					YE-RED-BR., SANDY SILT, 30 cm	B
																		32500		13,7		27,1	-					BR., SILT, SOME ROOTS, 25 cm	B
																		32550		9,6		3,3	-					DARK (REDISH) BR., TALUS, 30 cm	O
																		32600		29,1		16,0	-					BR., SILT, 25 cm	B

R. A. S.

Project No: 81	Project Name: MERAKER	Geologiske Jensen & Co. Hovfaret 8 0275 Oslo, Norway C4 27 A4	Any Suggestion	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: 13.09.96		1: _____	No of Samples on the Sheet
	Submitted By: J.B		2: _____	No of Samples for Assay 10
	Supervisor: _____		3: _____	Batch No. 13

Sheet No.				Sample No.							Bedrock		UTM		Map	Sam	Month	Stream	Cond	Assay	Comments							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Sheet		pler	Day	Width	Fl.	St.	Pol.	Sugg.
																					</							

Project Code:

81

Project Name: JIANNI 3217

Date:

210896

Submitted By:

U. F.

Supervisor:

Geologiske
Jenseter as.
Hovtunet 8
0275 Oslo, Norway

C4 2n A4

Assay Suggestion

1: _____

2: _____

3: _____

Stream-Sediment Sample Data Sheet

No of Samples on the Sheet

No of Samples for Assay

28

Batch No. _____

Sheet No.	Sample No.				Map	Bedrock	UTM		Map	Sam	Month	Sk	Con	Assay	Comments														
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16	17	18	East	North	Sheet	pler	Day	Width	Fl	St	Sugg.		
																			32100	31000N	41		22	-				BR, SANDY SILT, 10cm	B
																			32150		53		53	-				"	B
																			32500		12		15	-				" " " " 60cm	B
																			32550		288		20	-				" " " " 40cm	B
																			32600		9		25	-				REDISH BR FINE SAND, 30cm	B/C
																			32650		-		8	-				BR, SANDY SILT, 15cm	B
																			32700		15		56	-				LIGHT REDISH BR, SANDY SILT, 10cm	B
																			32750		7		21	-				REDISH BR, " " " " 15cm	B
																			32800		5		47	-				" " " " SILT, 15cm	B
																			32850		2		15	-				GR, SILT, 10cm	C
																			32900		15		41	-				YE-RED-BR, SILT, 30cm	B
																			32950		8		15	-				RUSTY REDISH-BR, SILT, 20cm	B
																			33000		12		23	-				BR-GR, SANDY SILT, 15cm	C
																			33050		14		25	5				REDISH BR, SANDY SILT, 20cm, ROCK FRAG	B
																			33100		18		26	-				BR, SANDY SILT, 15cm	B
																			33150		4		34	-				GR-BR, SILT, 7cm	C
																			33200		3		2	-				LIGHT GR, SANDY SILT, 15cm	C
																			33250		-		2	5				" " " " FINE SAND, 10cm	C
																			33300		10		50	-				GR-BR, SANDY SILT, 10cm	C
																			33350		-		10	-				BR-GR, FINE SAND, 15cm	C
																			33400		-		3	5				GR-BR, " " " " 10cm	C
																			33450		-		26	-				GREEN-GR, FINE SAND, 10cm, MULKY ROCK FRAG	C
																			33500		-		4	-				GREEN-BR-GR, FRAGMENTAL RESSOIL, 10cm	C
																			33550		7		-	-				GR-BR, FINE SAND, 10cm	C
																			33585		8	X	-	-				BR-GR, " " " " 15cm	C
																			33650		-		-	-				GR-BR, " " " " 15cm, ROOTS	C
																			33700		4		5	-				BR-GR, " " " " 7cm, SOME ROCK FRAG	C
																			33750		3		6	-				BR-GR, FINE SAND, 15cm, SOME ROOTS	C

Project Code: 81 Project Name: 14017 37211 Assay Suggestion
 Sample Type: SOIL Date: 210876 Geologiske Hovfaret 8 0275 Oslo, Norway
 Submitted By: 117 Supervisor: Cy 2n 4y
 Stream-Sediment Sample Data Sheet
 No. of Samples on the Sheet
 No. of Samples for Assay
 Batch No.

Sheet No.	Sample No.										Sc	Bedrock	UTM		Map Sheet	Sampler	Month	Stream	Cond.			Assay Sugg.	Comments
	1	2	3	4	5	6	7	8	9	10			East	North					W	FI	SI		
													33800	34000	-	-	-	-					BR-G-R, FINE SAND, 15cm, SOME ROOTS
													33820	7	7	18	-	-					CR-BR, SILT, 15cm
													33900	7	11	7	-	-					OR-PED-BR, SILT, 25cm

Project Code: 81		Project Name: HANNEFELT		Geologiske Hensler AS Hovfaret 8 0275 Oslo, Norway		Assay Suggestion 1: _____ 2: _____ 3: _____		Stream-Sediment Sample Data Sheet No of Samples on the Sheet: No of Samples for Assay: 286 Batch No.: _____	
Sample Type: SOIL		Submitted By: Uf		Supervisor: _____		C4 20 A4			

Sheet No.				Sample No.				Bedrock				UTM		Map		Sampler		Month		Stream Cond.		Assay		Comments				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Map	Sheet	Sampler	Day	Width	Fl. St. No.	Sugg.		
																		31400	27200	14			13	-			BR, SILT, 10cm	B
																		31450		4			17	-			BR, SANDY SILT, 10cm, SOME ROCK FRAG, ROOTS	B/C
																		31500		9			36	5			GREEN, FRAGMENTAL RESSOIL, 20cm	C
																		31550									BR-GR, SANDY SILT, 10cm, SOME ROOTS	C
																		31600		3			9	-			GR-BR, FINE SAND, 30cm, SOME ROCK FRAG, BOGSLOPE	C
																		31650		15			21	-			OR-RED-BR, SANDY SILT, 10cm, — " —, SLOPE	B
																		31700		11			20	-			GR-BR, SANDY SILT, 15cm, SOME ROCK FRAG, NO A,	B/C
																		31750		23			16	-			OR-RED-BR, SILT, 15cm	B
																		31800		11			17	-			REDISH BR, SANDY SILT, 15cm	B
																		31850		2			8	-			GR, — " —, 30cm, NO A, BOGSLOPE	C
																		31900		10			18	-			GR-BR, FINE SAND, 30cm, NO A, SOME ROCK FRAG	B/C
																		31950		9			14	-			BR-GR, — " —, 25cm, SOME ROCK FRAG, BOGSLOPE	C
																		32000		8			14	-			BR-GR, — " —, 30cm, MUCH — " —	C
																		32050		12			28	-			OR-RED-BR, SANDY SILT, 25cm	B
																		32100		—			8	-			— " —, SILT, 15cm	B
																		32150		21			27	-			— " —, SANDY SILT, 10cm	B
																		32200		27			35	-			BR-RED-VE-GR, SANDY SILT, 25cm, BOG AREA	B
																		32250									NO SAMPLE, BOG	
																		32300		10			32	-			GR-BR, SANDY SILT, 30cm	B
																		32350		11			22	-			DARK BR, SILT, 15cm, SOME ROCK FRAG	B
																		32400		36			41	-			(RED-VE) BR, SANDY SILT, 10cm	B
																		32450		—			12	-			GR, FINE SAND, 25cm, ROCK FRAG	C
																		32500		21			28	-			GR-RED-BR, SANDY SILT, 30cm, MUCH ROCK FRAG, BOGEDE	B
																		32550		9			19	-			BR-GR, FINE SAND, 40cm, ROOTS AND SOME ROCK FRAG	C
																		32600		9			13	-			GR-RED-BR, SANDY SILT, 20cm, — " —, BOGEDE	B
																		32650									NO SAMPLE, BOG	
																		32700		32			32	-			BR-GR, FRAGMENTAL SANDY SILT, 20cm, BOGEDE	(B)/C
																		32750		7			21	-			BR, SANDY SILT, 15cm, SOME ROCK FRAG, NO A	B
																		32800		19			26	-			VE-RED BR, SANDY SILT, 15cm, SOME ROCK FRAG	B

31

SOIL

Project Name: MTMV F7 EL

Date: 270896

Submitted By: Ush

Supervisor: _____

**Geologiske
Tjenester a.s.**
Hovfaret 8
0275 Oslo, Norway

Cy Zn Au

Essay Suggestion

1. _____

2: _____

3: _____

Stream-Sediment Sample Data Sheet

No. of Samples on the Sheet

No. of Samples for Assay

Batch No.

Sheet No.	Sample No.										Bedrock								UTM		Map Sheet	Sampler	Month	Day	Shed m	Cond.	Assay	Comments	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	X									
																		31600	27600	3		9	-						BR, SANDY SILT, ROCK FRAG, 25cm, B
																		31650		19		16	-						DARK BR, SANDY SILT, ROCK FRAG, 20cm, C
																		31700		31		40	-						REDISH BR, SILTY SAND, MUCH ROOTS, 20cm, B
																		31750		10		11	-						BR, SANDY SILT, SOME ROCK FRAG, 20cm, B
																		31800		2		9	-						(DARK) BR-GK, SANDY SILT, SOME ROCK FRAG, 20cm, B/C
																		31850		2		5	-						OR-RED, SILT, SOME ROCK FRAG, 30cm, B
																		31900		41		25	-						BR, SANDY SILT, " " " AND SOME ROOTS, NOA, B/C
																		31950		9		12	-						DARK GR-BR, SANDY SILT, SOME ROCK FRAG, 7cm, C
																		32000		-		3	-						GR, FINE SAND, ROCK FRAG, 25cm, B/C
																		32050		1		3	-						BR-GK, SANDY SILT, SOME ROCK FRAG, 20cm, B/C
																		32100		2		7	-						GR, FINE SAND, MUCH ROCK FRAG, NOB, 30cm, C
																		32150		2		12	-						LIGHT GR-BR, SANDY SILT, SOME ROCK FRAG, 30cm, C
																		32200		9		20	-						" " BR, " " " AND ROOTS, 25cm, B
																		32250		14		22	-						REDISH BR, " " " , 20cm, B
																		32300		0		9	7						" " " , 25cm, B
																		32350		5		9	-						" " " , SILT, 15cm A, 35cm, B
																		32400		2		5	-						DARK BR, FRAGMENTAL SANDY SILT, 30cm, B

[illegible]

RECEIVED ALL RESULTS

Project No: 81		Project Name: MANNFELT		Geologiske Hensler & Hovfaret B 0275 Oslo, Norway		Assay Suggestion		Stream-Sediment Sample Data Sheet	
Sample Type: SOIL		Date: 260896		Submitted By: 117		1: _____ 2: _____ 3: _____		No of Samples on the Sheet: _____ No of Samples for Assay: 23 Batch No: _____	
Supervisor: _____		C4 2n Au							

Sheet No.				Sample No.				Bedrock				UTM				Map		Month		Stream Cond.		Assay		Comments				
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Scale	Sampler	Day	Width	Fl. St. No.	Sugg.			
																		32900	28400	16		9	6				DARK BR, SILT, 7cm, ROOTS,	C
																		32850				18	-				GR-BR, SANDY SILT, 15cm, MUCH ROCK FRAG	C
																		32800				21	-				BR, -" -", 30cm, SOME -" -	B
																		32750									NO SAMPLE, BOG	
																		32700									-" -"	
																		32650									-" -"	
																		32600									-" -"	
																		32550				-	-	-			GR, FINE SAND, 20cm, ROCK FRAG, BOGE	A
																		32500				9	19	-			DARK BR, SANDY SILT, 30cm, ROCK FRAG,	B
																		32450				8	13	-			BR, SANDY SILT, 40cm, -" -",	(B)/C
																		32400				12	15	-			REDISH BR, SANDY SILT, 20cm	B
																		32350				6	24	-			BR-GR, -" -", 30cm, SOME ROCK FRAG,	C
																		32300				8	12	991			GR-BR, -" -", 15cm, ROOTS	B/C
																		32250				-	-	-			BR-GR, -" -", 15cm	C
																		32200				6	14	-			GR-BR, -" -", 35cm,	C
																		32150				16	24	-			BR-GR, -" -", 30cm, SOME ROCK FRAG,	C
																		32100				16	33	-			BR-GR, FINE SAND, 40cm, ROCK FRAG, BOG,	C
																		32050				42	28	-			GR, -" -", 40cm, MUCH ROCK FRAG, BOG,	C
																		32000				21	30	-			GR, SAND, 40cm, -" -", BOG,	C
																		31950				5	-	923			DARK BR-GR, SANDY SILT, 20cm, MUCH ROOTS	B/C
																		31900				-	6	-			GR-BR, SANDY SILT, 40cm, BOG,	C
																		31850				3	8	-			LIGHT REDISH-BR, SANDY SILT, 25cm, ROCK FRAG	B
																		31800				15	13	-			REDISH BR, SANDY SILT, 40cm, ROCK FRAG,	B
																		31750				38	-				BR, SANDY SILT, 25cm, SOME ROCK FRAG, SLOPE	C
																		31700				52	-				REDISH BR, SANDY SILT, -" -", 20cm	B
																		31650				26	56	-			BR, -" -", 15cm, ROCK FRAG,	B/C
																		31600				41	48	-			BR-GR, SANDY SILT, 30cm, SOME ROCK FRAG,	C

[illegible]

[illegible]

Project Code: 81	Project Name: <u>MAINF3215</u>	Geologiske Jensenst. aa. Hovfaret 8 0275 Oslo, Norway Cu Zn Au	Assay Suggestion	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: <u>190896</u> Submitted By: <u>U. J.</u> Supervisor: _____		1: _____ 2: _____ 3: _____	No. of Samples on the Sheet No. of Samples for Assay 267 Batch No. _____

[illegible]

RECEIVED ALBUQUERQUE

Project Code: 81

Sample Type: SOIL

Project Name: HANNEFJELLET

Date: 190876

Submitted By: LK

Supervisor:

Geologiske
jenester as
Hovfaret 8
0275 Oslo, Norway

CU 20 AU

Assay Suggestion

1: _____

2: _____

3: _____

Stream-Sediment Sample Data Sheet

No. of Samples on the Sheet

No. of Samples for Assay

6

Batch No. _____

Sheet No.		Sample No.										Bedrock		UTM		Map Sheet	Sampler	Month	Day	Stream Cond.		Assay Sugg.	Comments
1	2	Year	Serial	Reg	11	12	13	14	15	16	17	18	East	North	Width					Fl. S. W.			
													33150	29200	5		12	13				BR-GR, SANDY SILT, SOME ROCK FRAGMENTS	A/B
													33200		8		23	-				REDISH BR, -" -"	B
													33250		4		20	-				DARK BR, -" -", -" -", IN SLOPE	(B)/C
													33300	29215	4	X	7	-				GR, SILT, ROOTS AND -" -"	C
													33350	29200	3		9	-				GR, SANDY SILT, -" -"	C
													33400	1	7		13	6				GR-BR, SANDY SILT, SOME -" -"	C

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Project Code: 81	Project Name: <u>MANNFELDT</u>	Geologiske jernster Hovfaret 8 0275 Oslo, Norway 24 20 44	Assay Suggestion	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: <u>2008/6</u> Submitted By: <u>UF</u> Supervisor: _____		1: _____ 2: _____ 3: _____	No of Samples on the Sheet No. of Samples for Assay 25 Batch No. _____

[illegible]

R. A. R.

Project No: 81	Project Name: MERAKER	Geologiske tjenester Hovfaret 8 0275 Oslo, Norway G. Zn Au	Assay Suggestion	Stream-Sediment Sample Data Sheet
Date: 10.09.96	Submitted By: J.B.		1: _____	No of Samples on the Sheet
Sample Type: SOIL	Supervisor: _____		2: _____	No of Samples for Assay 9
			3: _____	Batch No. _____

Sheet No.				Sample No.								Bedrock	UTM		Mag Sheet	Sam- pler	Month Day	Stream Cond.				Assay Sugg.	Comments
1	2	3	4	5	6	7	8	9	10	11	12		East	North				Width	Fl	St	Pol		
													32200	29800	13		16	-					GR, SANDY SILT, ROCK FRAG., 25 cm C
													32250										BOG! NO SAMPLE
													32300		31		26	-					REDISH BR., SANDY SILT, MUCH ROCK FRAG., 30 cm B
													32350		14		13	-					BR., SANDY SILT, MUCH ROCK FRAG., 25 cm B/C
													32400		6		4	-					GR-BR, SILT, 10 cm C
													32450										BOG! NO SAMPLE
													32475		10		13	-					GR-BR, FRAGMENTAL SANDY SILT, 25 cm C
													32550										BOG! NO SAMPLE
													32600										"
													32650		9		2	-					LIGHT BR-GR, FINE SAND, 25 cm B(?)
													32700		10		16	-					GR, SANDY SILT, MUCH ROCK FRAG., 40 cm B/C
													32750		-		21	-					BR., SANDY SILT, SOME ROCK FRAG., 15 cm B/O
													32800		10		14	-					LIGHT BR., SANDY SILT, ROCK FRAG., 25 cm B/C

Project No: 81	Project Name: HERAKER	Geological Jensen & Co. Hovfaret 8 0275 Oslo, Norway Cu Zn Au	Assay Suggestion	Stream-Sediment Sampling Data Sheet
Sample Type: SOIL	Date: 10.07.96 Submitted By: JB Supervisor: _____		1: _____ 2: _____ 3: _____	No of Samples on the Sheet No of Samples for Assay 11 Batch No. _____

Sheet No.				Sample No.							Sc		Bedrock							UTM		Map		Sam		Month		Stream Cond.			Assay		Comments	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Sheet	pler	Day	width	Fl.	St.	Per	Sugg.							
																		32200	30200	6		15	-						REDISH BR., FRAGMENTAL SANDY SILT, 25 cm	B/C				
																		32250											BOG, NO SAMPLE					
																		32300											"					
																		32350		36		26	-						RED-YE-BR., SANDY SILT, MUCH ROCK FRAGMENTS, 30 cm	B				
																		32400		5		10	-						REDISH BR., SANDY SILT, ROCK FRAG., 15 cm	B				
																		32450		-		9	FF						REDISH BR., SANDY SILT, SOME ROCK FRAG., 25 cm	B				
																		32500		29		41	-						REDISH BR., SANDY SILT, ROCK FRAG & ROOTS, 20 cm	B				
																		32550		15		27	-						LIGHT (YE) BR., SANDY SILT, ROCK FRAG., 30 cm	B				
																		32600		2		4	-						BR., SANDY SILT, ROCK FRAG., 25 cm	B				
																		32650		2		10	-						GR-BR., SANDY SILT, ROCK FRAG., 25 cm	B/C				
																		32700		1		2	-						GR-BR., SILTY SAND, 30 cm	B/C				
																		32750		6		13	-						BR., SANDY SILT, SOME ROCK FRAG., SOME ROOTS, 20 cm	B				
																		32800		28		10	-						(REDISH) BR., SANDY SILT, SOME ROCK FRAG., 15 cm	B				

Project Code: 81				Project Name: MANNEFELLET				Geologiske tjenester AS Hovfaret 8 0275 Oslo, Norway Cu Zn Au				Assessment: _____				Stream-Sediment Sampling Data Sheet			
Sample Type: SOIL				Date: 03.09.96								Submitted By: JB				No of Samples on the Sheet: 19			
Supervisor: _____				Assay Suggestion: 1: _____ 2: _____ 3: _____				No of Samples for Assay: _____				Batch No.: _____							

Sheet No.	Sample No.	Sc	Bedrock	UTM	Mag	Sam	Month	Stream	Cond.	Assay	Comments																																						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
				East	North	Sheet	pler	Day	width	Fl	St	Pol																																					
				31700	30800	43,3		32,1	-				LIGHT BR., SANDY SILT, MUCH ROCK FRAG., 30cm B/C																																				
				31750		7,9		14,5	-				BR., SANDY SILT, MUCH ROCK FRAG., 40cm B																																				
				✓ 31800									NO SAMPLE, BOG																																				
				31850		42,9		55,6	-				GR., SILT, ROCK FRAGMENTS, 35cm C																																				
				31900		30,1		22,6	-				BR., SANDY SILT, MUCH ROCK FRAG., 30cm B/C																																				
				31950		10,8		28,7	-				BR., SANDY SILT, ROCK FRAG., 35cm C																																				
				32000		2,8		10,4	-				BR-GR, SANDY SILT, ROCK FRAG., 20cm C																																				
				✓ 32050									NO SAMPLE, BOG																																				
				32100		11,5		24,7	-				BR-GR, SANDY SILT, ROCK FRAG., 40cm B/C																																				
				32150		9,3		15,5	-				BR-GR, SANDY SILT, SOME ROCK FRAG., 40cm C																																				
				32200		26,2		40,1	-				(RED)-BR, SANDY SILT, MUCH ROCK FRAG., 30cm B																																				
				32250		6,1		44,5	-				GR., SANDY SILT, MUCH ROOTS, 25cm C																																				
				32300		7,7		19,3	-				GR., SANDY SILT, SOME ROOTS, MUCH ROCK FRAG., 15cm C																																				
				32350		5,0		17,8	-				LIGHT BR., SANDY SILT, ROCK FRAG., 20cm B																																				
				✓ 32400									NO SAMPLE, BOG																																				
				32450		34,5		43,4	-				REDISH BR., SANDY SILT, MUCH ROCK FRAG. & ROOTS, 15cm B																																				
				32500		4,3		20,4	-				LIGHT BR., SANDY SILT, ROCK FRAG. & SOME ROOTS, 15cm B																																				
				32550		7,0		15,4	-				REDISH BR., SANDY SILT, ROCK FRAG. & ROOTS, 15cm B																																				
				32600		31,8		20,8	-				DARK BR., SANDY SILT, SOME ROCK FRAG. & SOME ROOTS, 15cm B																																				
				32650		11,9		23,9	-				OR-RED-BR, SANDY SILT, SOME ROCK FRAG., 20cm B																																				
				✓ 32700									NO SAMPLE, BOG																																				
				32750		11,5		39,1	-				(REDISH) BR., SANDY SILT, ROCK FRAG., 15cm B																																				
				32800		21,8		33,0	-				BR., SANDY SILT, SOME ROCK FRAG. & SOME ROOTS, 25cm B																																				

Project No: **81** Project Name: **MERAKER** Assay Section _____ Stream-Sediment Sample Data Sheet

Date: **23.09.96** Geologiske Hovfaret 8 0275 Oslo, Norway No of Samples on the Sheet _____

Sample Type: **SOIL** Submitted By: **JB** No of Samples for Assay **9**

Supervisor: _____ Batch No. _____

Sheet No	Sample No.										Bedrock	UTM		Map Sheet	Sampler	Month	Day	Stream Width	Cond.	Assay Sugg.	Comments																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
	Year	Season	Reg	1	2	3	4	5	6	7		8	9										10	11	12	13	14	15	16	17	18	East	North																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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Project: 81		Project Name: MERAKER		Geologiske Høyskole Hovlandt 8 0275 Oslo, Norway		Assay Section			Stream-Sediment Sample Data Sheet		
Sample Type: SOIL		Date: 25.09.96				1: _____			No of Samples on the Sheet 		
		Submitted By: J.B				2: _____			No of Samples for Assay 28		
		Supervisor: _____		3: _____			Batch No. _____				

Sheet No.		Sample No.		Bedrock		UTM		Map	Sam	Month	Stream	Cond.	Assay	Comments
2	3	5	6	12	13	East	North	Sheet	pler	Day	Width	Fl. Si. Ph.	Sugg.	
						32450	34300	5,6		37,2	—			BR.-GR., SANDY SILT, 20 cm B
						32500		—		0,9	—			GR.-BR., (SILTY) SAND, 20 cm B
						32550		23,4		16,7	—			BR., SANDY SILT, 15 cm, ROCK FRAG. B
						32600		—		49,1	—			BR., SANDY SILT, SOME ROCK FRAG., 20 cm B
						32650		9,7		5,7	—			BR., SILTY SAND, ROCK FRAG., 20 cm B
						32700		13,6		9,7	—			DARK BR., SILT, 30 cm B/O
						32750		1,0		4,2	—			— " — B/O
						32800		—		6,8	—			LIGHT (YE)-BR., SANDY SILT, 25 cm, SOME ROOTS B
						32850		10,6		5,8	—			DARK BR., SILT, 20 cm B
						32900		—		0,6	—			BR.-GR., FINE SAND, 20 cm A/B
						32950		13,3		23,2	—			BR.-GR., SANDY SILT, 25 cm B
						33000		8,3		8,3	—			BR., TALUS, 35 cm O
						33050		—		4,4	—			BR.-GR., SANDY SILT, 15 cm B
						33100		—		14,6	—			LIGHT GR., SANDY SILT, 20 cm A/B
						33150		1,1		5,0	—			GR., FINE SAND, 10 cm A/B
						33200		—		0,6	—			BR.-GR., SANDY SILT, 20 cm B
						33250		1,6		7,7	—			BR.-GR., SILT, 30 cm B
						33300		—		—	—			LIGHT GR., FINE SAND, 25 cm A
						33350		17,3		16,7	—			BR.-GR., SANDY SILT, 30 cm B
						33400		1,5		16,2	—			GR., SILTY SAND, SOME ROCK FRAG., 20 cm A
						33450		4,6		7,4	—			BR.-GR., SANDY SILT, 20 cm B
						33500		23,3		23,5	—			GR.-BR., SANDY SILT, 15 cm B
						33550		5,0		0,5	—			GR.-BR., SANDY SILT, 20 cm B
						33600		5,4		8,0	—			— " — B
						33650		1,1		8,2	—			— " — B
						33700		0,8		5,1	—			GR., FINE SAND, 30 cm A
						33750		2,4		4,3	—			GR., SANDY SILT, SOME ROOTS, 15 cm A/B
						33800		2,1		30,5	—			GR., SANDY SILT, 30 cm B

Project No: 81	Project Name: <u>MERAKER</u>	Geologiske Jensenst. 11 Hovfaret 8 0275 Oslo, Norway Cu Zn Ag	Assay Section	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: <u>26.09.96</u> Submitted By: <u>JB</u> Supervisor: _____		1: _____ 2: _____ 3: _____	No of Samples on the Sheet No of Samples for Assay 26 Batch No. _____

Sheet No.				Sample No.								Sc		Bedrock		UTM		Map		Sampler		Month		Stream Cond.		Assay		Comments	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Sheet	Day	Width	Fl	St	Fe	Sugg.			
																		32425	34600	6	5	6						DARK BR., SILT, 15cm	B
																		32475		4	20	18						BR., SANDY SILT, ROOTS, 15cm	B
																		32525		13	15							(REDISH) BR., SANDY SILT, MUCH ROCK FRAG., 20cm	B
																		32575		17	22							GR.-BR., SANDY SILT, ROCK FRAG., 15cm	B/C
																		32625		28	9							DARK BR., SILT, 30cm	B
																		32675		3	9							DARK BR., SILT/TALUS, 30cm	B/O
																		32725			3							GR.-BR., SANDY SILT, 20cm	B
																		32775		46								REDISH BR., SANDY SILT, ROCK FRAG., 30cm	B
																		32825		1	4	6						LIGHT BR.-GR., FINE SAND, 15cm	A/B
																		32875		35	12							(GR.)-BR., SILT, 25cm	B
																		32925		7	16							BR.-GR., SILT, 15cm	A/B
																		32975		8	26							REDISH BR., SANDY SILT, 25cm	B
																		33025		12	35	6						(GR.)-BR., SANDY SILT, ROOTS, 15cm	B
																		33075		14	18	6						DARK BR., SILT, SOME ROOTS, 15cm	B
																		33125		4	6	12						BR.-GR., SANDY SILT, 20cm	B
																		33175		10	8	17						BR.-GR., SANDY SILT, ROCK FRAG., 20cm	B/C
																		33225		13	12	12						BR., SILT, 20cm	B
																		33275		17	34							DARK BR., SILT, 20cm	B/O
																		33325		40	12	16						YE.-BR., SANDY SILT, SOME ROCK FRAG., 20cm	B
																		33375		16	21	8						GR., SANDY SILT, 30cm	B/C
																		33425		8	47							RED-YE.-BR., SANDY SILT, 30cm	B
																		33475		61	100	12						REDISH BR., SILT, 30cm	B
																		33525		51	32							REDISH BR., (SANDY) SILT, 30cm	B
																		33575		1	9							GR., SANDY SILT, 35cm	B/C
																		33625		2		6						LIGHT BR.-GR., FINE SAND, 35cm	B/C
																		33675		47	184							REDISH BR., SANDY SILT, 30cm	B

Project No: 81	Project Name: MERAKER	Geologiske Institutt Hovfaret 8 0275 Oslo, Norway	Assay Suggestion	Stream-Sediment Sampling Data Sheet
Sample Type: SOIL	Date: 27.09.96		1: _____ 2: _____ 3: _____	No of Samples on the Sheet No of Samples for Assay 16 Batch No. _____
	Submitted By: J.B.	C4 22 A4		
	Supervisor: _____			

Sheet No.				Sample No.								Bedrock								UTM		Map		Month		Sheet		Cond.		Assay		Comments	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Sheet	Map	Day	Month	Width	FI	St	Pl	Sugg.					
															</																		

Project No:
81

Sample Type:
SOIL

Project Name: **MERAKER**

Date: **27.09.96**

Submitted By: **JB**

Supervisor:

**Geologiske
Jensen &
Hovfaret 8
0275 Oslo, Norway**

C4 2n A4

Assay Suggestion

1: _____
2: _____
3: _____

Stream-Sediment Sample Data Sheet

No of Samples on the Sheet:

No of Samples for Assay: **12**

Batch No. _____

Sheet No.				Sample No.														Bedrock		UTM		Map	Sam	Month	Stream Cond.			Assay	Comments																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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RECEIVED ALL RESULTS

Project No: 81	Project Name: <u>MERAKER</u>	Geologiske Jenseter AS Hovfaret 8 0275 Oslo, Norway	Assay Suggestion	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: <u>30.09.96</u>		1: _____ 2: _____ 3: _____	No of Samples on the Sheet No of Samples for Assay 24 Batch No. _____
	Submitted By: <u>J.B</u>			
	Supervisor: _____			

Sheet No.				Sample No.							Sc	Bedrock							UTM		Map Scale	Sampler	Month	Day	Stream Cond.	Assay Sugg.	Comments	
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	East	North								
																		32400	34800	-		1	-				DARK BR-GR., SANDY SILT, 15 cm	B
																		32450		8	5	-					" " " " , 10 cm	B
																		32500		43	19	12					(REDISH) BR., SANDY SILT, SOME ROCK FRAG., 35 cm	B
																		32550		29	23	10					BR., SILT, ROOTS & ROCK FRAG., 25 cm	B
																		32600		-	2	-					LIGHT BR.-GR., FINE SAND, ROOTS, 25 cm	B
																		32650		-	1	-					BR.-GR., SANDY SILT, 25 cm	B
																		32700		-	5	-					LIGHT BR-GR., SANDY SILT, 15 cm	B
																		32750		21	20	-					DARK BR., SANDY SILT, ROCK FRAG., 20 cm	B
																		32800		7	1	6					BR.-GR., SANDY SILT, 15 cm	B
																		32850		41	32	-					BR., SILT, 25 cm	B
																		32900		-	5	-					BR.-GR., SANDY SILT, 15 cm	B
																		32950		2	22	-					BR., SANDY SILT, ROCK FRAG., 20 cm	B
																		33000		1	9	-					YE-GR., SANDY SILT, ROCK FRAG., 25 cm	B
																		33050		-	-	-					LIGHT BR-GR., FINE SAND, 30 cm	A/B
																		33100		-	1	6					BR.-GR., FINE SAND, 10 cm	B
																		33150		23	15	-					BR., SILT, 20 cm	B/O
																		33200		3	10	6					YE-BR., SANDY SILT, ROCK FRAG., 25 cm	B
																		33250		-	1	-					BR.-GR., SANDY SILT, 20 cm	B
																		33300		8	30	-					DARK GR.-BR., SILT, ROOTS, 20 cm	B
																		33350		1	5	1/8					BR.-GR., SANDY SILT, 15 cm	B
																		33400		-	11	1/8					BR.-GR., SANDY SILT, 20 cm	B/C
																		33450		1	18	5					RED-YE.-BR., SANDY SILT, ROOTS, 30 cm	B
																		33500		4	1	-					BR.-GR., FINE SAND, 20 cm	B/C
																		33550		4	8	1/6					DARK BR., SILT, 20 cm	B/O
																		33600		-	-	-					(BR.)-GR., SANDY SILT, 10 cm	B/C
																		33650		3	1	-					(BR.)-GR., SANDY SILT, 10 cm	B/C
																		33700		11	2	-					" " " " " "	B/C

Project No.: 81				Project Name: MERAKER				Geologiske Jensen & Søn Hovfaret 8 0275 Oslo, Norway				Assay Suggestion				Stream-Sediment Sample Data Sheet			
Sample Type: SOIL				Date: 02.10.96								Submitted By: JB				No of Samples on the Sheet 			
Supervisor: C4 20 A4				No of Samples for Assay 23								Batch No. 							

Sheet No.				Sample No.				Sc		Bedrock		UTM		Map		Sam		Month		Stream Cond.		Assay		Comments						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	East	North	Sheet	Plot	Year	Day	Wch	Fl	St	Pol	Sugg.		
																		31900	35200	-		2	-						GR., SANDY SILT, 20 cm	B/C
																		31950		1		1	-						BR.-GR., SANDY SILT, 20 cm	B/C
																		32000		31		5	-						DARK BR., TALUS /SILT, ROOTS, 25 cm	B/O
																		32050		6		11	-						"	B/O
																		32100		5		2	-						DARK BR., SILT, 30 cm	B/O
																		32150		2		3	-						GR.-BR., FINE SAND, 20 cm	B/C
																		32200		5		9	-						GR.-BR., SILT, 20 cm	B/C
																		32250		14		39	-						BR.-GR., SANDY SILT, ROCK FRAG., 20 cm	B/C
																		32300		22		27	-						DARK BR., TALUS /SILT, 30 cm	B/O
																		32350		41		14	-						"	B/O
																		32400		1		6	8						GR.-BR., SILT, 20 cm	B/C
																		32450		ET		38	-						REDISH BR., SILT, ROCK FRAG., 25 cm	B
																		32500		14		8	F/6						GR.-BR., SANDY SILT, 20 cm	B
																		32550		18		11	94						(REDISH) BR., SANDY SILT, ROCK FRAG., 30 cm	B
																		32600		21		84	8						REDISH BR., SILT, SOME ROCK FRAG., 35 cm	B
																		32650		8		28	12						BR., SANDY SILT, SOME ROOTS, 30 cm	B
																		32700		14		26	6						REDISH BR., SILT, SOME ROCK FRAG., 30 cm	B
																		32750		23		21	-						(REDISH) BR., SANDY SILT, SOME ROCK FRAG., 30 cm	B
																		32800		1		3	-						BR.-GR., SANDY SILT, 30 cm	B/C
																		32850		6		15	-						BR.-YE-GR., SANDY SILT, 30 cm	B/C
																		32900		-		2	6						BR.-GR., SANDY SILT, 25 cm	B/C
																		32950		2		8	-						GR.-BR., SILT, 20 cm	B/C
																		33000		-		4	-						"	B/C

RECEIVED ALL RESULTS

Project C 81	Project Name: MERAKER	Geologiske Jenseler as Hovfaret 8 0275 Oslo, Norway	Assay Suggestion	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: 01/02.10.96		1: _____	No of Samples on the Sheet
	Submitted By: J.B		2: _____	No of Samples for Assay 26
	Supervisor: _____		3: _____	Batch No. _____

Sheet No.				Sample No.							Sc	Bedrock							UTM		Map Sheet	Sampler	Month Day	Stream Width	Cond. Fl. Sl. Po	Assay Sugg.	Comments				
1	2	3	4	5	6	7	8	9	10	11		12	13	14	15	16	17	18	East	North											
																			31700	35600									NO OVERBURDEN => NO SAMPLE		
																			31750				1,3	-					BR-GR., SANDY SILT, 30 cm,	B/C	
																			31800				19,5	6,0	-				DARK BR., SILT, 30 cm	B/O	
																			31850				2,3	-	-				BR-GR., SANDY SILT, SOME ROCK FRAG., 40 cm	B/C	
																			31900				5,5	11,5	-				BR., SANDY SILT, ROCK FRAG., 30 cm	B/C	
																			31950				0,7	4,0	-				BR., SANDY SILT, SOME ROCK FRAG., 25 cm.	B/C	
																			32000				18,0	3,8	-				DARK BR., SILT, ROOTS, 25 cm	B	
																			32050				6,6	0,8	-				GR.-BR., SILT, 25 cm	B/C	
																			32100				19,1	11,7	-				BR.-GR., SANDY SILT, 30 cm	B/C	
																			32150				7,5	20,1	-				DARK BR., SILT / TALUS, 35 cm	B/O	
																			32200				16,4	4,9	-				GR.-BR., SILT, 30 cm.	B	
																			32250				11,0	4,6	-				BR.-GR., SANDY SILT, 15 cm	B/C	
																			32300				27,8	25,8	-				REDISH BR., SANDY SILT, ROCK FRAG., 20 cm	B	
																			32350				32,0	5,8	-				BR., SILT, 30 cm	B/O	
																			32400				27,1	7,3	-				BR., SILT / (TALUS),	B/O	
																			32450				4,4	1,6	-				BR., TALUS, 35 cm	O	
																			32500				1,3	6,3	-				BR.-GR., SANDY SILT, ROOTS, 15 cm	B/O	
																			32550				6,6	16,4	-				DARK BR., TALUS, ROOTS!, 40 cm	O	
																			32600				9,8	15,5	-				REDISH GR.-BR., FRAGMENTAL SANDY SILT, 25 cm	B/C	
																			32650				32,7	16,4	-				REDISH BR., SANDY SILT, SOME ROCK FRAG, 30 cm	B	
																			32700				12,0	16,3	-				REDISH BR., " " "	B	
																			32750				32,1	41,2	-				DARK BR., TALUS, 35 cm	O	
																			32800				10,9	22,9	-				RED, VE-BR., SILT, 30 cm	B	
																			32850				19,0	12,1	-				BR., SANDY SILT, ROCK FRAG., 30 cm	B	
																			32900				41,1	32,0	8,				REDISH BR., SANDY SILT, ROCK FRAG & ROOTS, 30 cm	B	
																			32950				13,9	40,7					REDISH BR., " " "	B	
																			33000				-	49,1	-					GR., FRAGMENTAL SANDY SILT, 30 cm	C

Project No.: 81	Project Name: MERÅKER	Geologiske Jenseter AS Hovfaret B 0275 Oslo, Norway	Assay Question	Stream-Sediment Sample Data Sheet
Sample Type: SOIL	Date: 01.10.96		1: _____	No of Samples on the Sheet
Submitted By: JB	Supervisor: _____		2: _____	No of Samples for Assay 21
		Cu Zn Au	3: _____	Batch No. _____

Sheet No.	Sample No.										Bedrock	UTM		Map Sheet	Sampler	Month	Day	Stream Cond.			Assay Sugg.	Comments																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
	Year	Series	Reg	1	2	3	4	5	6	7		8	9					10	11	12				13	14	15	16	17	18	East	North	Width	Fl.	St. Pos.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
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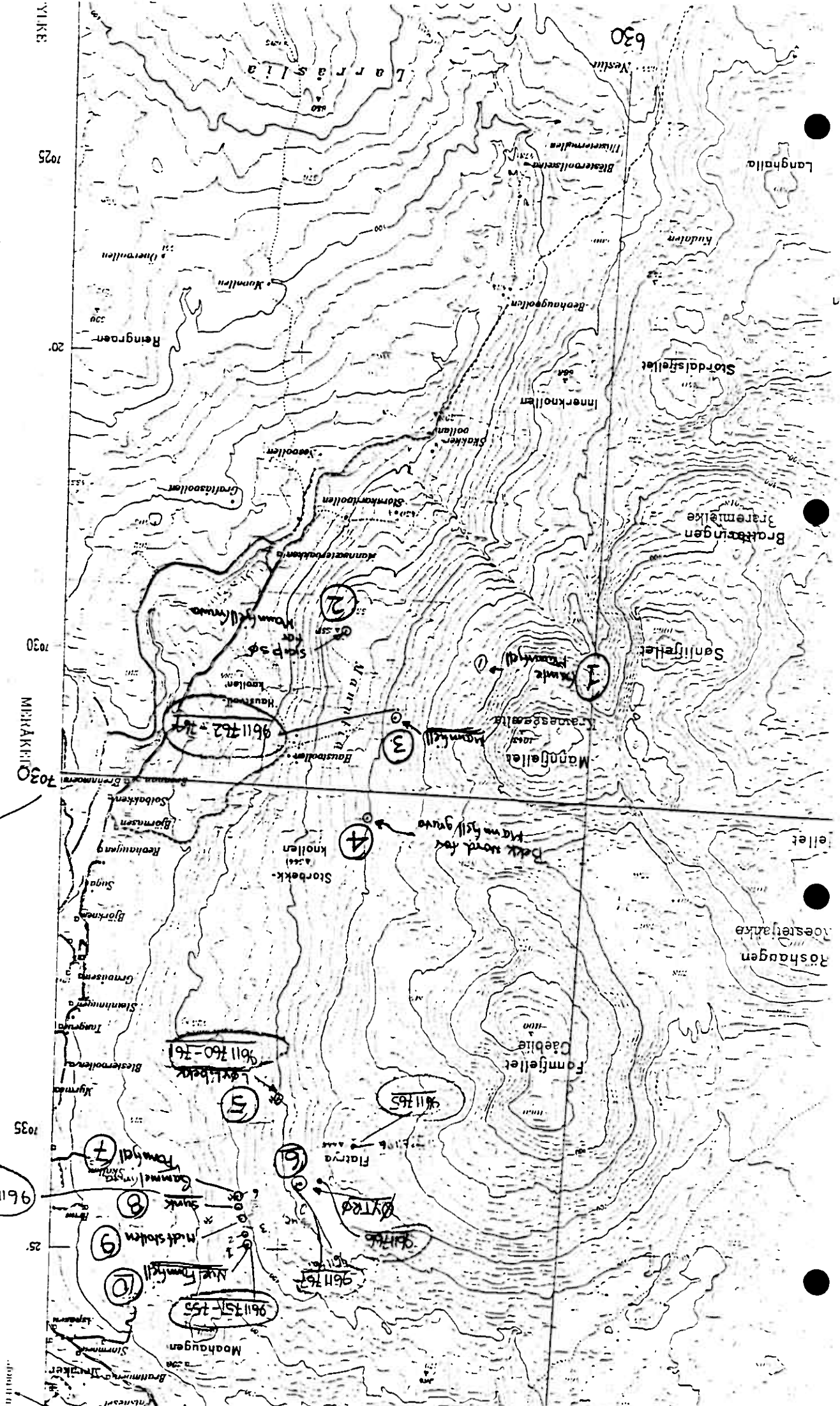
APPENDIX 3

			Pr.nr.	Cu	Zn	Pb	Ag	Au	Co	As	Cd	S
	KONGENS	massivmalm	89010	342	>10000	876	4.0	0.024	84	35	198	34.55
	KONGENS	omv. grst.	89011	808	613	10	0.1	0.002	11	2	1	1.29
	KONGENS	omv. grst.	89012	1243	696	7	0.3	0.003	7	2	1	2.64
	KONGENS	massivmalm	89013	25109	1019	8	8.2	0.033	72	5	4	26.42
	KONGENS	lys omv. b. a.	89014	605	57	2	0.2	0.002	44	7	1	4.34
	KONGENS	massivmalm	89015	7585	13792	20	2.3	0.045	26	5	30	21.11
	KONGENS	sampleprøve massivmalm	93019	14172	50355	35	5.6	0.080	70	5	169	
	KONGENS	massivmalm	9302	12575	869	5	4.8	0.011	88	2	2	
	KONGENS	massivmalm	93021	20185	>10000	91	10.8	0.112	32	12	587	
	KONGENS	massivmalm	93022	1151	>10000	526	4.8	0.093	24	2	687	
	GML. MANNFJELL	massivmalm	1022	40075	1724	76	20.9	0.316	221	14	1	36.64
	GML. MANNFJELL	massivmalm	1023	9346	3094	58	9.2	0.087	121	6	6	36.92
1	GML. MANNFJELL	massivmalm	89007	12771	1763	61	8.8	0.145	25	27	4	25.95
	GML. MANNFJELL	lys omv. b. a.	89008	976	5139	2	0.2	0.006	19	2	15	3.18
2	GML. MANNFJELL	qtz-sulfid	89009	356	82	4	0.2	0.003	14	2	1	0.60
	SKJERP SØ FOR MANNFJELLGRUVA	omv. grst. med dissem.	9301	5619	3846	5	1.8	0.038	267	17	11	
	MANNFJELL	omv. grst.	89001	46	66	2	0.1	0.002	12	2	1	0.49
	MANNFJELL	qtz-ser-py	89002	184	4000	134	0.6	0.012	3	47	10	4.98
	MANNFJELL	massivmalm	89003	3619	82819	425	26.8	2.657	20	121	305	32.15
	MANNFJELL	massivmalm	89004	10156	83273	1674	25.8	0.482	12	82	236	25.55
	MANNFJELL	grovk. qtz-sulfid	89005	15689	1742	47	10.6	0.133	11	30	6	7.73
3	MANNFJELL	massivmalm	89006	1949	9183	307	11.8	0.230	22	123	24	29.40
	MANNFJELL	massivmalm	93058	6610	>10000	1227	18.5	0.380	26	98	1133	
	MANNFJELL	massivmalm	93059	6479	19218	842	11.7	0.292	16	75	71	
	MANNFJELL	massivmalm	9306	15182	>10000	116	14.6	0.215	14	153	695	
	MANNFJELL	massivmalm	93061	17408	24009	65	20.3	0.323	13	103	69	
	MANNFJELL	massivmalm	93062	6062	3192	82	8.6	0.203	29	51	14	
	MANNFJELL	qtz-sulfid, "knadd" malm	93063	33425	16024	300	66.3	1.083	2	5	50	
4	MANNFJELL	qtz-sulfid, "knadd" malm	93064	16468	97892	76	35.4	0.714	38	48	307	
	BEKK NORD FOR MANNFJELLGRUVA	5-10cm massivmalm	93008	3164	10930	88	157.2	3.745	7	24	43	
	LØVLIBEKK	sulfidårer	89039	26399	1802	32	17.1	1.304	25	2	19	26.70
5	LØVLIBEKK	sulfidholdig keratofyr	89040	10786	670	5	6.8	0.399	6	5	7	4.93
	LØVLIBEKK	grovk. qtz-sulfid	89041	8884	578	14	4.4	0.873	4	2	5	1.18
	LØVLIBEKK	sulfidårer	93003	53254	4506	2	31.5	1.960	22	2	59	
	LØVLIBEKK	sulfidårer	93004	19827	1882	10	22.1	0.854	23	7	22	
	LØVLIBEKK	omv. grst.	93017	99	180	33	1.7	0.047	25	24	1	
6	ØYTRØ	massivmalm	89029	11719	89532	3943	98.0	1.591	11	2436	239	34.35
	ØYTRØ	sulfid-qtz b. a.	89031	497	37521	2253	18.5	0.503	15	4305	82	15.05
	ØYTRØ	båndet qtz-cc-sulfid	89032	317	64610	309	40.3	1.321	6	2868	175	6.22
	ØYTRØ	sampleprøve massivmalm	93036	9826	>10000	3695	89.5	1.868	13	3051	296	

		Pr.nr.	Cu	Zn	Pb	Ag	Au	Co	As	Cd	S
6	ØYTRØ	massivmalm	9304	17437	96579	25	27.2	0.203	15	11.	226
	ØYTRØ	massivmalm	93041	3441	>10000	593	37.6	1.901	6	4204	608
	ØYTRØ	massivmalm	93042	10489	>10000	3057	59.1	0.954	16	826	299
	ØYTRØ	massivmalm	93043	15319	94564	3237	117.0	2.135	11	1635	236
	TORSBJØRK	massivmalm	89016	13904	564	36	6.5	0.016	74	4	3 31.05
	TORSBJØRK	massivmalm	89017	65997	6120	21	30.9	0.242	292	21	32 34.42
	TORSBJØRK	omv. grst.	89018	136	341	7	0.1	0.001	18	4	1 1.06
	TORSBJØRK	grovk. qtz	89019	377	3107	5	0.2	0.001	3	4	13 0.34
	TORSBJØRK	cc-sulfidårer	89020	682	1137	38	0.5	0.002	19	21	4 5.05
	TORSBJØRK	båndet malm	89021	18170	2861	24	7.5	0.030	58	98	13 14.75
	TORSBJØRK	massivmalm	89022	20612	25846	238	9.1	0.025	46	40	108 35.71
	GML. FONNFJELL	massivmalm	89035	30643	39285	148	13.6	0.230	8	8	115 30.75
	GML. FONNFJELL	massivmalm	89036	973	>10000	90	0.2	0.048	4	14	1012 30.45
	GML. FONNFJELL	cc-sulfid	89037	4523	17650	47	1.7	0.033	1	7	53 2.52
7	GML. FONNFJELL	grønnskifer	89038	4533	40997	15	1.6	0.039	17	7	132 10.10
	GML. FONNFJELL	massivmalm	93051	15655	8949	123	6.6	0.193	2	15	31
	GML. FONNFJELL	massivmalm	93052	2997	>10000	486	5.0	0.075	9	6	1220
	GML. FONNFJELL	massivmalm	93053	24064	>10000	11	11.7	0.393	17	10	680
8	FONNFJELL (SYNKEN)	grønnskifer	89042	72	29	4	0.1	0.010	5	2	1 1.49
	FONNFJELL (SYNKEN)	lys omv. b.a.	89043	143	300	6	0.1	0.278	25	5	1 2.66
	FONNFJELL (MIDTSTOLLEN)	tett diss.	89053	30243	>10000	5	7.7	0.235	8	20	785 36.60
9	FONNFJELL (MIDTSTOLLEN)	massivmalm	89054	55707	13970	22	15.5	0.205	7	4	45 30.75
	FONNFJELL (MIDTSTOLLEN)	lys omv. b.a.	89055	119	1440	5	0.1	0.011	4	5	6 1.04
	FONNFJELL (MIDTSTOLLEN)	grovk. qtz-cc-sulfid	89056	13966	7804	14	5.1	0.579	1	2	48 2.93
	NYE FONNFJELL	massivmalm	89023	314	391	33	0.7	0.046	80	4	1 27.10
10	NYE FONNFJELL	omv. grønnskifer, liggen	89024	72	271	8	0.1	0.005	21	6	1 3.50
	NYE FONNFJELL	tuffitt(?) hengen	89025	38	120	2	0.1	0.003	5	3	1 0.74
	NYE FONNFJELL	grovk. qtz	89026	51	69	2	0.1	0.002	2	3	1 0.11
	SKRØYDALEN	sulfidårer	89050	11080	344	6	1.6	0.054	141	10	2 29.30
	SKRØYDALEN	sulfidårer	89051	16385	3131	17	6.1	0.483	435	25	8 24.60
	SKRØYDALEN	lys omv. b.a.	89052	90	22	2	0.1	0.012	13	4	1 3.96
	SKRØYDALEN	samleprøve sulfidårer/dissemin.	93029	13120	1461	8	4.0	0.067	289	14	2
	SKRØYDALEN	omv. grst. med tett dissemin.	9303	19318	2120	14	7.5	0.346	385	12	7
	SKRØYDALEN	sulfidårer	93031	10914	1298	4	5.2	0.032	287	12	6
	KROGSTADÅA	sulfidholdig cc-klorittskifer	90128	397	838	4	0.4	0.003	41	5	2 2.00
	KROGSTADÅA	båndet malm/klorittskifer	90129	13118	>10000	746	17.4	0.336	31	25	498 6.40
	KROGSTADÅA	sulfidholdig cc-klorittskifer	90130	50103	>10000	78	57.0	0.090	23	5	755 20.10
	KROGSTADÅA	samleprøve	90131	22550	87024	184	24.3	0.098	30	21	386 16.80

APPENDIX 4

Nyge UTM
KÖÖRDINÄT
UTM
WGS 84



Project C: <u>81</u>				Project Name: <u>Meraker</u>										Date: <u>21.10.96</u>										Submitted By: <u>AR</u>										Supervisor: _____										Assay Su. <u>on</u>										Rock Sample Data Sh.																			
Sample Type: <u>Rock</u>				Geologiske Jenseter AS Hovfaret 8 0275 Oslo, Norway										1: <u>Cu, Zn, Pb, Ag, As, Au.</u>										2: _____										3: _____										No of Samples on the Sheet										No of Samples for Assay										Batch No. _____									

Sheet No	Sample No										Sample Type	UTM 70										Rock Type	Su	Occ. No.	Map Sheet	Sampler	Thin Sec.	Assay Sugg.	Locality	Sample Description (use more lines if necessary)					
	1	2	3	4	5	6	7	8	9	10		11	12	13	14	15	16	17	18	19	20										21	22	23	24	25
Nye Fonnfjell	96	11	75	1							12	13	14	15	16	17	18	19	20	21	22	23	24												massive pyritic ore. med. - c. gr. granular, chlorite schist + Q-py veins
																																			massive pyrite.
																																			chlorite schist with minor py. dissem.
																																			chlorite schist with minor py. dissem.
																																			chlorite schist with strong py. dissem.
Synken	96	11	75	6							12	13	14	15	16	17	18	19	20	21	22	23	24												chlorite schist with strong py. dissem.
																																			" " " " " "
																																			" " " " " "
Løkkelid	96	11	76	0							12	13	14	15	16	17	18	19	20	21	22	23	24												chlorite schist with strong py. dissem.
																																			composite of 2 massive pyritic layers.
Hammfjell #1	96	11	76	2							12	13	14	15	16	17	18	19	20	21	22	23	24												- massive pyritic ore horizon ± cpy-scl?
																																			chlorite rich felsic rock with thicker py veins
Hammfjell #2	96	11	76	4							12	13	14	15	16	17	18	19	20	21	22	23	24												pale. Q-ser. schists + sheared Q-pyrite veins
Øytrø W	96	11	76	5							12	13	14	15	16	17	18	19	20	21	22	23	24												10-15 m wide gusy zone, silicified felsic rock: with fine dissem. py
																																			2-3 m wide zones (4 zones close). thick Q-py veins + fine py. & dark
Øytrø E	96	11	76	7							12	13	14	15	16	17	18	19	20	21	22	23	24												- Qy-ser. zone + Q-py veins and dissem - Stringer zone.

GEOLOGISKE
TJENESTER A/S

Mannfell
Main Workings

Direction 200°

Trench no. #1

Started 22.10.96

Completed

Coord.

TRENCH Record

METRIC Scale 1 : 100 50

Notes By AR

Sheet 1 of 1

m	Struc.	Sample no.	Rock Type and Alteration	ASSAYS					
				Section	Cu	Pb	Zn	As	Au
0			of steeply dipping synk: pale greyish felsic volcanites Strongly foliated/layered. homog./massive volc. S = 200°/70°W						
1			chlorite rich sheared contact zone.						
2			massive pyrite ore — somewhat layered ± cpy-Sl rich zones. (1.0-1.2M) + qtz rich matrix.						
3			(2) (30cm) thicker pyrite veins in felsic rock. somewhat chloritic.						
4			Strongly foliated bluish — to pale greenish-grey felsic volcanites massive feldspar-phyrlic? v. minor pyrite dissem.						
5			Samples ① = 9611762		1.24%	302	2.39	282	15.9 216
6			② = 9611763		2200	29	1.17	138	2.7 60
7			(Samples taken represent whole width.)						
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

W

South End wall.

E

E

GEOLOGISKE
TJENESTER A/S

Mannifell

Direction 270°

Trench no. Northernmost Trench.

Started 22.10.96

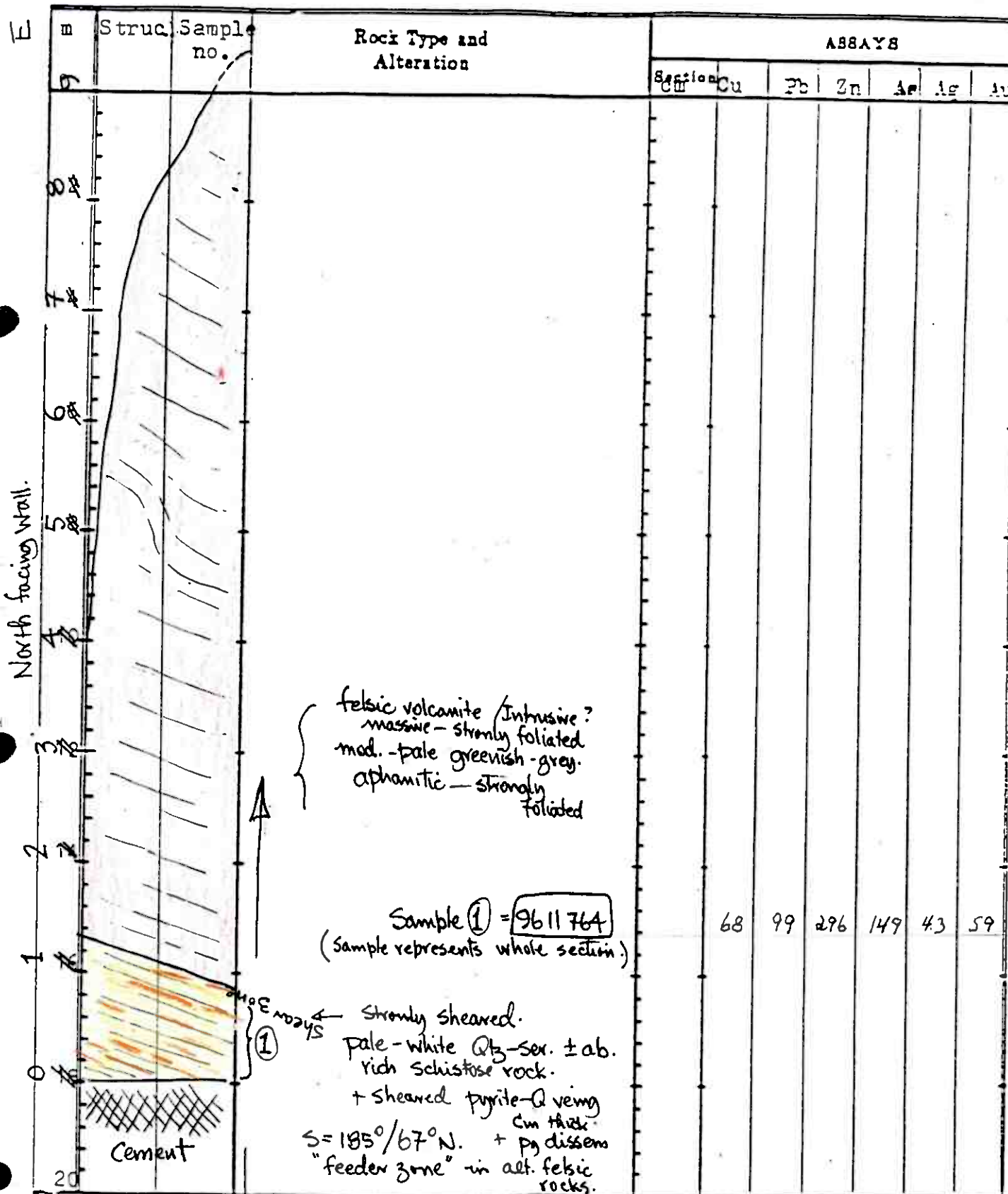
Completed 22.11.96

Coord. _____

TRENCH Record
METRIC Scale 1 : ~~100~~ 50

Notes By AR.

Sheet 1 of 1



GEOLOGISKE
TJENESTER A/S

Direction 290°

Trench no. Lövlibekken

Started 21.10.96

Completed

Coord.

TRENCH

Record

METRIC Scale

1 : 100 50

Notes By AR

Sheet 1 of 1

m	Struc.	Sample no.	Rock Type and Alteration	ASSAYS					
				Section	Cu	Pb	Zn	As	Au

South facing wall

Sampling South wall

Syncline

Roof

Sample ②

massive pyrite
med.-c.gr layers
Irregular.

50 cm massive pyrite
ore layer.

Irregular py veining
cm thick

schistose, chlorite rich
Schists + pyrite veins

Sample ①

Irregular pyrite veins +
layers
strong py dissem.
in chlorite rich schists

c.gr. pyrite dissemination
py cubes idiomorph crystals
∴ c.gr. metamorphosed
Porphyroblasts.

dyke

Section	Cu	Pb	Zn	As	Au
② = 9611761	1.3%		1190	-	17.8 304
① = 9611760	1940	38	538	3	3.1 30

between 12-13 m.
Chlorite rich schistose rock.
with minor py. dissem.

GEOLOGISKE
TJENESTER A/S

Fonnfjell
Synken

Direction 260°

Trench no. Skjerp #5

Started 21.10.96

Completed _____

Coord. _____

Notes By _____

Sheet _____ of _____

Continues ~ 10m

TRENCH

Record

METRIC Scale

1 : ~~100~~ 50

W
13
12
11
10
9
8
7
6
5
4
3
2
1
0
E

m	Struc.	Sample no.	Rock Type and Alteration	ASSAYS					
				Ag	Cu	Pb	Zn	As	Se
13			Sampling S facing side of Stollen - past synken						
12			Whole zone is strong chlorite rich						
11			- Schistose						
10			- S2 cleavage + crenulations						
9			- Stringer zone						
8			cm. thick Q-py veins + strong py dissemin.						
7			chloritic schists zone with strong pyrite impreg.						
6			S = 185/60° S m-c. grained						
5			massive homog. foliated, lenticular dyke?						
4			felsic?						
3									
2									
1									
0									

synk.

Sample ③

(from 9-13m)

Sample ②

(from 5-7m)

Sample ①

(from 0-2m)

③ = 9611758

② = 9611757

① = 9611756

110	3	137	3	0.7	-
138	3	168	6	0.3	9
2	4	138	-	-	-