Geomatikk IKT er en av landets ledende leverandører av løsninger knyttet til implementering av elektronisk dokumenthåndtering, forvaltning av eiendomsskatteloven, mobile løsninger og geografisk IT.

N G U

Skilleark

Geomatikk IKT

Geomatikk IKT er en av landets ledende leverandører av løsninger knyttet til implementering av elektronisk dokumenthåndtering, forvaltning av eiendomsskatteloven, mobile løsninger og geografisk IT.

Bergvesenet

Postboks 3021, N-7441 Trondheim

Rapportarkivet

Bergvesenet rapport nr	Intern Journal nr	Internt arkiv nr	Rapport lokalisering	Gradering
4619	0279/00			Åpen

Kommer fra ..arkiv	Ekstern rapport nr	Oversendt fra	Fortrolig pga	Fortrolig fra dato:
	GT 00-83-01	Geologiske Tjenester AS		

Tittel

Re-sampling of core and a compilation of adit-, core- and surface sampling program as pr December 1999, Kolsvik Gold Deposit, Bindalen, North Norway

Forfatter	Dato År	Bedrift (Oppdragsgiver og/eller oppdragstaker)
Flood, Boye Johannesen, Ulf	19 jan 2000	Bindal Gruver AS Geologiske Tjenester AS

Kommune	Fylke	Bergdistrikt	1: 50 000 kartblad	1: 250 000 kartblad
Bindal	Nordland		18252	Mosjøen

Fagområde	Dokument type	Forekomster (forekomst, gruvefelt, undersøkelsesfelt)
Geologi Kjemiske analyser		Kolsvik

Råstoffgruppe	Råstofftype
Malm/metall	Gull

Sammendrag, innholdsfortegnelse eller innholdsbeskrivelse

All remaining drillcores from Kolsvik, stored at the NGU core laboratory at Løkken has been re-examinated.
It appears, that high gold values in most cases show corresponding high arsenic values, while arsenic anommalies are not necessarily gold associated.
Harsh topogracic conditions, makes gathering of exploration field data at Kolsvik rather difficult. Partly due to this the excisting field data, in our opinion, are inadequate to support any reliable reserve figures for Kolsvik at this stage.
Significant mineralization within the southern part of the D-zone, revealed in drillhole #25 suggest a following up program along this structure to the north, wich so far has remained untested.

REPORT NO. 00-83-01

BINDAL GRUVER A/S

KOLSVIK GOLD DEPOSIT

BINDAL, NORTH NORWAY

Re sampling of core, and a compilation of adit-, drill core- and surface sampling programs, as per December 1999.

Geologiske Tjenester a.s.

Geologiske tjenester a.s.

Hovfaret 8
N-0275 Oslo
Norway

Telephone: 22 50 65 30
Telefax: 22 50 91 30
E-mail: bflood@online.no

Bankgiro: 7029.05.15765
Company Reg.: 937 746 571

0279/00 Nei

Oslo, 2000-01-27

PR BL

Bergvesenet
Postboks 3021 Lade

7441 TRONDHEIM

BINDALEN GRUVER A/S – RELOGGING/ANALYSER AV KJERNER

På vegne av Bindal Gruver A/S oversender vi herved en kopi av vår rapport GT 00-83-01, Kolsvik Gold Deposit, Bindal, North Norway "Re sampling of core, and a compilation of adit, drill core and surface sampling programs, as per December 1999".

Det rapporterte prosjekt ligger innom Kolsvik mutingsområde i Bindal kommune.

Med vennlig hilsen

Boye Flood

Kopi: Bindal Gruver A/S, v/Henning Fangel

Vedl.

BV 4619

Geologiske Tjenester a.s.

Hovfaret 8
N-0275 Oslo
Norway

Telephone: 22 50 65 30
Telefax: 22 50 91 30
E-mail: bflood@online.no

Bankgiro: 7029.05.15765
Company Reg.: 937 746 571

REPORT NO. 00-83-01

BINDAL GRUVER A/S

KOLSVIK GOLD DEPOSIT

BINDAL, NORTH NORWAY

Re sampling of core, and a compilation of adit-, drill core- and surface sampling programs, as per December 1999.

Boye Flood
Ulf Johannesen

Distribution:

1 original	Bindal Gruver A/S
1 copy	Bindal Gruver A/S
1 "	Bergvesenet, Trondheim
1 "	SND, Bodø
1 "	Geologiske Tjenester a.s., Oslo

Oslo, January 19, 2000

CONTENTS:

LIST OF FIGURES:

APPENDICES:

KOLSVIK GOLD DEPOSIT

BINDAL, NORTH NORWAY

Re sampling of core, and a compilation of adit-, drill core- and surface sampling programs, as per December 1999.

1. INTRODUCTION:

1.1 General:

The reported program has been initiated by Bindal Gruver A/S, which in co-operation with The Norwegian Industrial and Regional Development Fund (SND) has funded additional sampling and assaying of drill cores from the Kolsvik gold deposit.

The actual sampling was carried out at the Løkken core laboratory of the Norwegian Geological survey (NGU) during week 41 last year and included a re examination of all the core stored, resulting in the selection of 101 mainly new samples totalling 150.4 m of core.

Prior to the work being carried out at Løkken it was necessary to examine previous information related to the exploration of the Kolsvik deposit. The objective with this program was to exploit existing data, as drill core, to its maximum extent, to learn if any significant new information could be added at a relatively low cost.

Additional sampling and assaying of drill core was suggested already in 1993 by Peter Ihlen (NGU report 93.003). This was partly followed up by Bill Fleshman of Viking Gold and Prospecting AB (VGP) in 1996, who selected 11 diamond drill holes for sampling or re sampling, see below.

Later examination of selected drill holes by VGP and Boye Flood in 1997, indicated that mineralised core still remained untested, and the current program was suggested.

1.2 Geology and Mineralization:

A short summary on these subjects from the VGP report 1996 is included as Appendix 1. This summary is largely based on Ihlen's report from 1993.

2. PREVIOUS WORK:

The objective with this chapter is not to list all the work and reports from Kolsvik, but to focus on the programs, which have offered new information with respect to sampling and assay results. This includes driving and sampling of adits, trenching, diamond and percussion drilling and surface sampling. Assessment of these programs combined with accurate grid surveys and geological mapping may reveal where adequate information exist and where more data, and what type of data is required for a proper economic evaluation of this project.

Bolidens Gruvaktiebolag: During the 1930ies the Swedish company Boliden drilled three diamond drill holes and was sinking one shaft and driving 9 adits with a total length of around 260 m. These are all marked on Ihlens map Pl. 2, shown as Fig. 5 in this report. The location of drill holes are known, but apparently no logs or assay results are available. Assay results from chip and channel samples collected within the adits are known, but the sample positions are in places uncertain.

The Geological Survey of Norway (NGU): NGU carried out a drill program in 1962. The core from one of the holes is stored, but otherwise no information is recorded.

A/S Sulfidmalm (Falconbridge): During the period 1980-82 Sulfidmalm diamond drilled 36 holes, numbered 1 to 36, including 21 B and 33 B with the numbers 7 and 28 missing, see Fig. 4 and 5. The total length of core for logging and sampling was 3375 m. Hole # 7 was abandoned due to overburden and core from the hole # 28 was lost during helicopter transport.

Sulfidmalm also carried out geological mapping; re sampled the adits and collected a number of surface chip and grab samples from the mineralised zones. Five trenches were dug and sampled in the vicinity of the Seksa shaft and Nordre Skarsstoll. The sample localities of mineralization with width ≥ 1 m and grades ≥ 1ppm Au are shown on Fig.6B-8B. During this period also the first attempts for a reserve calculation was presented and metallurgical tests were carried out.

The samples, both from the surface and drill core, were mainly assayed for gold only, but additional assays for WO_3 and S were done in places.

Most of this work was concentrated around the northern portion of the C-zone and the southern part of the F-zones, see Fig. 3-5.

The work by Sulfidmalm is recorded in a report filed with the Norwegian Commissioner of Mines (Bergvesenet) numbered BV 553.

Terra Mining A/S: During the years 1985-86 Terra Mining drove a new adit in the F-zone. (Nebbastollen), core drilled 4 holes (# 40-43) in the B-zone and 7 holes (# 50-56) in the C and F-zones with a total length of 769 m. In addition, 3 percussion holes (# 101-103) totalling 54 m were drilled in the vicinity of the Boliden adit and Søndre Skarsstoll. Most of the samples were analysed both for gold and arsenic, see below.

The new adit was supposed to be used for bulk sampling of the F-zones. For some reason it is running parallel with the zone, between two of the mineralised sub-zones, and doesn't expose any mineralization at all.

The work by Terra Mining is reported in the following reports filed with the Commissioner of Mines: No. BV 533, 577, 578.

The Geological Survey of Norway (NGU): The Survey carried out a research program in the Bindalen area during the period 1986 to 92. This included detailed geological mapping of the Kolsvik deposit within a new 25x25 m grid. This grid was later fitted into a new topographical map with scale 1: 1,000 based on aerial photography flown in 1992. All drill hole collars, still to be found, and adit fix points were surveyed and their positions plotted on

the new map, see Fig. 5. Concurrent with the mapping program, surface sampling of the mineralised zones was carried out, the results are discussed in Chapter 5.

The Terra Mining percussion drill holes were originally not shown on this figure due to their uncertain positions, but have later been transferred by us from a sketch map in report BV 533.

Finally all the drill holes stored at the NGU core laboratory at Løkken were logged. This included 41 diamond drill holes totalling 3722 m. Previous logging had been cursory or non-existing. All the actual holes were plotted in their respective drill hole sections.

The NGU program was completed by a comprehensive report by P.M. Ihlen, NGU Report No. 93.003 that in addition to critical comments to previous work programs offers detailed information with respect to general geology and mineralization. In addition to a complete set of E-W drill hole profiles for all the diamond drill holes, longitudinal sections are shown for the F-zones, the C-zone and the B-zone, see below.

Ihlen's recommendations, particularly concerning further sampling and assaying of the stored drill core, was followed up by VGP, see below, and is also the general reason for the current work program.

Viking Gold and Prospecting AB: During most of 1996, 1-3 persons worked in the field for (VGP). This is a Swedish subsidiary of Viking Gold Corp., which trades on the Canadian Dealing Network. The work program for Evenlyn Pty, Ltd, Sidney was part of an agreement with Bindal Gruver A/S.

The program constituted compilation of previous work. Surface samples, drill hole data and topography were all entered into a computer database.

Surface sampling: Surface sample results from 104 rock samples were purchased from NGU and the results produced on a separate map. A similar map was also produced showing the results from 133 rock chip samples collected by VGP. These are all grab samples, no sample lengths are indicated. This is in contrast to the Sulfidmalm results, which are also reproduced by VGP, all showing grade/m, see above.

In general the surface samples show the mineralization along the F-zones, the southern part of the C-zone and the northern part of the B-zone, all confirmed by drilling.
It is, however, interesting to observe the surface mineralization also along the western part of the K-zone, the southern part of the B-zone and the northern part of the A1, all which have remained untested, see Chapter 5 and Fig. 3.

Diamond drill core sampling: P. Ihlen in NGU report 93.003 complains about lack of assays from the existing core, as well as the use of sample intervals that varied from 0,25 m to 21 m. VGP biggest effort during their Kolsvik program was the sampling and re sampling of 11 drill holes, all together 580 m of core, see table in Appendix 2. This table says 701 m, but 121 m of core was missing. A consistent 1 m sample interval was used all the way through. All samples were analysed for both gold and arsenic.

The one-meter core samples selected by VGP constitute 389 new samples including 240 samples from the 4 holes (# 5, 6, 32 and 35) not previously assayed. The remaining 191 samples represent re sampling of previously assayed core sections.

The new samples showed only three core sections with gold values ≥ 0.5 ppm:

Hole # 18 (C-zone):	50-51 m	1.8 ppm Au
Hole # 32 (B-zone):	14-17 m	0.5 ppm Au
Hole # 35 (B-zone):	21-22 m	1.2 ppm Au

In addition a few spread samples showed values around 0,1 to 0,3 ppm, generally associated with high arsenic values, see below.

In the discussion of the re sampling results VGP claims a general increase in tonnage and grades from the new results. The whole discussion, however, is meaningless as they add up mineralised core, disregarding barren sections in between. This is done both when assessing old assay result and the re sampling results.

This of course, affects the whole conclusion in the VGP report, which should be red with caution.

3. CURRENT PROGRAM:

During an examination of three drill holes at the NGU core laboratory in 1997 it became apparent that there was still mineralised core from the Kolsvik field, not subjected to sampling and analysis, and the current program was proposed.

Since some holes have been sampled and assayed, using all existing material, it is to day 37 holes left at the core laboratory totalling 2810 m, se list Appendix 3.
Ulf Johannesen and Boye Flood visited the laboratory during the period October 12 to 14. All the cores from Kolsvik was examined, and 101 samples totalling 150.4 m were selected and sent OMAC Laboratories in Ireland for gold assays. Prior to shipment the cores were cut, crushed and split to 100 g samples. NGU at Løkken retains the surplus material.

A list of the selected samples, with the gold assay results, is shown in Appendix 4.

During the selection of samples, we closely studied the detailed core logs and drill hole section produced by Peter Ihlen. No attempts were made by us to re log the core. The criteria for sample selection were fracture zones and/or visible arsenopyrite in the core.
We also looked for other sulphides, and some samples of skarn with abundant iron sulphides were sampled (holes # 21B, 26 and 41), but these only returned traces of gold.

In the sample list, an asterisk behind the sample number shows that the core has been previously assayed. This amounts to 35 samples, mainly being a part of earlier bulk sample.

Gold mineralization is indicated several places in the new material, but mainly with gold values between 0.1 and 0.5 ppm. Significant mineralization were only found in the following holes:

Hole # 34 (B-zone):	54-56 m	8.17 ppm Au
Hole # 25 (D-zone):	106.4-109 m	24.30 ppm Au
" " :	116-116.5 m (EOH)	3.71 ppm Au

DDH 34 then confirms the spread mineralization encountered in this part of the B-zone.

DDH 25 may indicate something new. It shows the easternmost mineralization in this part of central Kolsvik. It is only 5-10 m north of DDH 19, which, according to P. Ihlen, is drilled down dip, converging with the late, unmineralised FOFZ fault. DDH 19 is barren except for half a meter at the very start. Hole 25 is also supposed to converge with FOFZ below 100 m. But here it encounters a significant mineralization, and the hole ends in a breccia rich in arsenopyrite, assaying 3.7 ppm Au. One may then ask if the FOFZ structure after all, also is mineralised, or has the hole reached the younger KRFZ structure or D-zone?

If this is the case, the potential of this structure or zone, extending at least 350 m to the north, should be seriously considered. So far, this area is totally untested both by surface sampling and drilling.

4. GENERAL RESULTS, CONSIDERING ALL DATA:

4.1 The gold/arsenic correlation at Kolsvik:

A strong association between gold and arsenopyrite was noted already in the early pre World War II reports. VGP also, in their report, demonstrate a good correlation between the two minerals based on the surface rock chip samples collected 1996, see Table 1 (VGP's Fig. 2-7) below. In Table 2 we have produced correlation diagrams based on Terra Mining's diamond and percussion drill samples, which show a correlation of medium strength.

Correlation diagrams based on all of VGP's samples from the previous drill programs (581 samples) however show a weak correlation between arsenic and gold, see Table 3. This demonstrate that the correlation factor vary extensively with the selection of a sample population, and VGP's conclusion should be handled, again, with caution:
"Its such a close association that it highlights the importance of assaying arsenic in all drill cores and strengthens the interpretation of Falconbridge who used the occurrence of arsenopyrite in its ore model".

It appears, that high gold values in most cases show corresponding high arsenic values, while arsenic anomalies are not necessarily gold associated.

Table 1: Correlation diagram Au/As
All VGP Surface samples

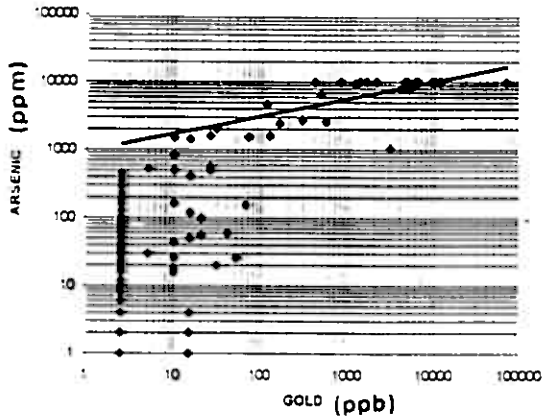


Table 2: Correlation diagram arsenic-gold, Terra Mining. 89 drill hole samples.

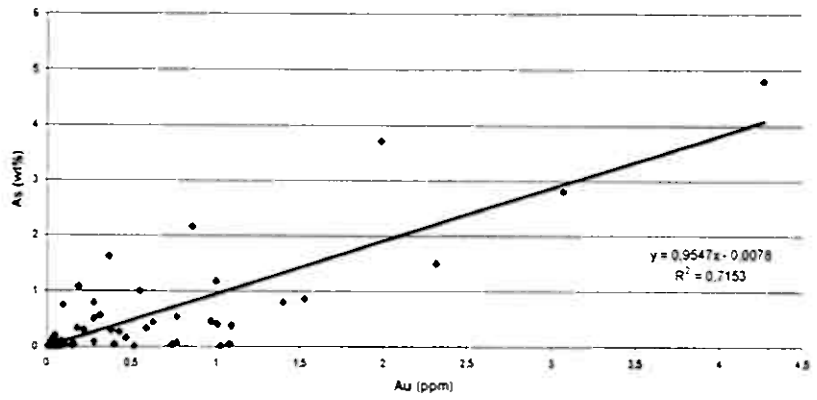
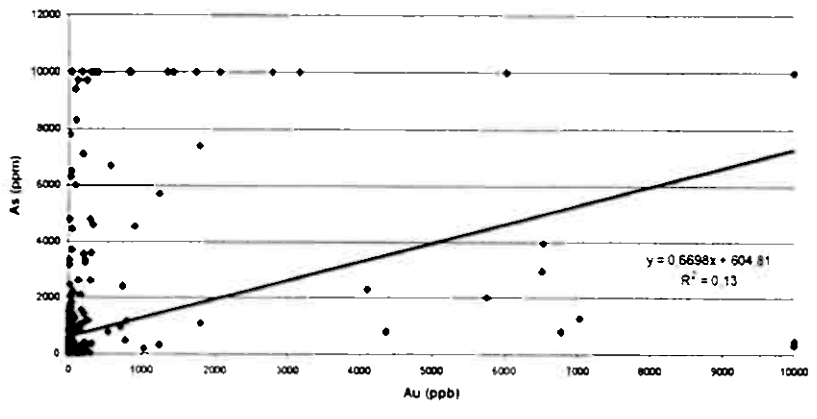


Table 3: Correlation diagram arsenic-gold, 581 core samples.



4.2 Longitudinal sections from the Kolsvik area:

After producing cross sections for all the diamond drill holes, P. Ihlen in NGU report 93.003 also produced longitudinal section for the mineralised zones F, C and B. Different scales and different techniques were used for these sections; and they were viewed from the east or northeast. The longitudinal sections shown as Fig. 6A-8A in this report are mainly digitised from Ihlen's report, but are all drawn in the same scale as the map Fig. 5 (1:1,000) and are viewed from the same side as the map, from the west.

The F-zones were, by Ihlen, all shown in the same "section" (F1-F4), with up to five mineralised intersections for one and the same drill hole, at gradually deeper levels. This reveals the mineralization over the full zone, or corridor, rather than along a single planar section. For the C and B zones, however, a planar section was used.
When redrawing the sections we have used a longitudinal zone or corridor rather than a section, and the outline of these are show on the maps Fig. 6B-8B. The reason is that the C-zone, or any other zone or structure for that matter, is based on a highly subjective interpretation. Hence, any wall rock or adjacent mineralization outside the interpreted zone would not show up in a planar section.
This is best demonstrated by looking at DDH 15 along Ihlen's C-zone section, and the same hole as shown in Fig. 7A. In the former, hole # 15 appears barren, while 16 m of core with 6,9 ppm Au is shown in Fig. 7A.

The F-corridor on Fig. 6 A has a width between 30 and 50 m, while the width of the C and B corridors is around 20 - 25m.

Only gold ≥ 1 ppm along a core length ≥ 1 m are shown on the longitudinal sections. To further demonstrate where the gold occurs in the Kolsvik drill holes we have projected the same mineralised drill hole intersections to the surface and shown them in red on Fig. 6B-8B. In addition we have plotted Sulfidmalm's surface samples with similar grade/length criteria on to the surface maps. Since NGU and VGP, apparently only collected grab samples, they are not plotted here, but commented upon below.

The F-corridor: The figures 6A and 6B show that only the drill holes # 36 and # 11 intersect the corridor deeper than 75 m below surface. From Ihlen's drill hole sections, the mineralization shown in # 11 and also # 10 may belong to the K-zone, rather than to the F5 sub zone?
A general lack of a consistent drill hole pattern is clearly demonstrated. What may look as vertical fans, as for drill holes # 3 and # 4, is mainly the same hole intersecting different sub zones. When also the horizontal distance between the holes reaches up to 80 m, any reserve estimate becomes very speculative.
The southernmost drill hole # 14 is barren, but grab samples collected by NGU 40 m further south, by the end of the F-zone, assay up to 3,6 ppm Au. Both NGU and VGP collected a number of grab samples at the junction between the F-zones and the K-zone. These assayed from 0,025 to 68,09 ppm Au. NGU also collected grab samples between hole # 19 and # 51, several of them returning values ≥ 10,0 ppm Au.

The C-corridor: The figures 7A and 7B demonstrate that the southern part of this corridor has a reasonable drill hole density over a strike length of around one hundred meters, down to a depth of around 75 m. Also here, a number of mineralised intersections for each hole

indicate a number of sub-parallel mineralised zones. The double appearances of the FOFZ indicate the eastern and western border of the corridor.
The two drill fans based on the holes # 15, 16,17 and # 22, 23, 24, 27 are the only ones that give adequate information for delineation of a mineralised body. This body plunges from vertical to around 60° to the east; it converges with and even intersects the interpreted structures as the C-zone and the FOFZ. The host rocks are mainly light grey to pink leucocratic or two-mica granites.
In addition to the surface samples collected by Sulfidmalm and shown on Fig. 7B, a number of grab samples have been collected by NGU and VGP between the drill holes # 30 and # 33. Several of these assay above 10,0 ppm Au, while samples collected around the drill holes # 5 and # 6 are unmineralised.

The B-corridor: The figures 8A and 8B show that only one drill fan occurs within this corridor. Scattered mineralization is revealed, but no economic width and grade, except for a deep mineralization in the vertical hole # 34. This mineralization may continue to the east in hole # 35 at around 85 m below surface, but with < 0.5 ppm Au. Otherwise, also for this part of Kolsvik, little is known below 75 m from the surface.
Surface grab samples, however, collected by NGU and VGP between the holes # 40 and # 43 assay from a few hundreds of ppb up 10,0 ppm.

5. SUMMARY AND CONCLUSION:

All remaining drill core from Kolsvik, stored at the NGU core laboratory at Løkken, has been re examined. Mineralised core from previous bulked, large samples have been re sampled, but most of the samples have been collected from suspicious looking core, which had been left untested.
The samples represent altogether 150.4 m of core in 101 samples. A number of the samples show arsenopyrite, with or without brecciation, and some of these carry gold, but mainly < 0,5 ppm. The current program revealed economic grades in the deeper parts of the two holes, # 25 and # 34 not previously recorded.

To assess the results of this program in a proper context it has been necessary to review previous data and to summarise and visualise their results. This was partly done by P. Ihlen in his NGU report 93.003, but more data has been added since then. The most relevant information has been summarised in this report's Fig. 6A,B – 8A,B. Otherwise, we have referred to the earlier reports, and relevant figures in these.

The gold – arsenic relationship at Kolsvik has been considered and correlation diagrams have been discussed. It appears that gold is generally dependent on the presence of arsenopyrite, while the latter mineralization doesn't necessarily indicate gold.

During the previous programs, see Chapter 2, several hundreds of meters of core have been split and assayed. Based on these results a number of ore reserve figures have been suggested see Table 4.

Source	Tonnes	Grade Au g/t
Sulfidmalm	2,000,000	5-10
NGU	880,000	?
VGP	2,640,000	?

Table 4: Reserve estimates from the Kolsvik gold deposits

Harsh topographic conditions makes gathering of exploration field data at Kolsvik rather difficult. Partly due to this the existing field data, in our opinion, are inadequate to support any reliable reserve figures for Kolsvik at this stage. Particularly the following drawbacks or deficiencies make a proper assessment of Kolsvik difficult:

- Arbitrary positions of the existing drill holes
- Lack of vertical drill fans, except for the southern part of the C-corridor.
- Lack of interrelated work with respect to exact defined surface mineralization versus drill hole mineralization.
- Virtually no information from deeper than 75 m below surface

To rectify these shortcomings, a limited number of vertical drill fans should be selected, based on existing drill holes and surface channel sampling where appropriate. This will provide better and necessary information with regard to mineralization control and configuration.

During perusal of previous reports we have found information about other mineralised structures not yet being pursued. These are shown in Fig. 3 in the northern part of A1, the southern part of B7 and along the western part of the K-zone. The lack of samples from other parts of A1 and B7 must probably be due to overburden. Where accessible, these structures should be trenched and sampled.

Significant mineralization within the southern part of the D-zone, revealed in drill hole # 25 suggest a follow up program along this structure to the north, which so far has remained untested.

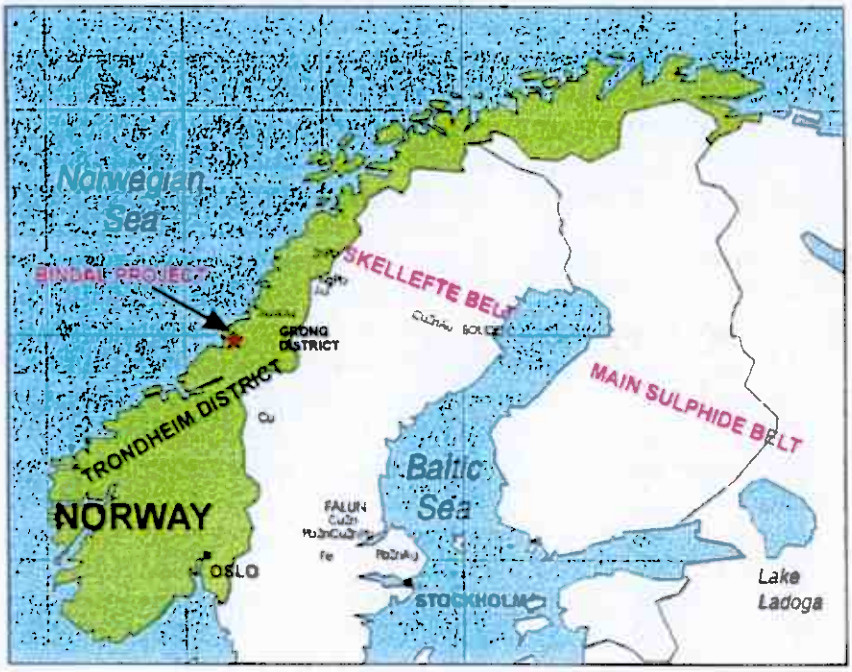


Figure 2-1 Bindal Project Location Map.

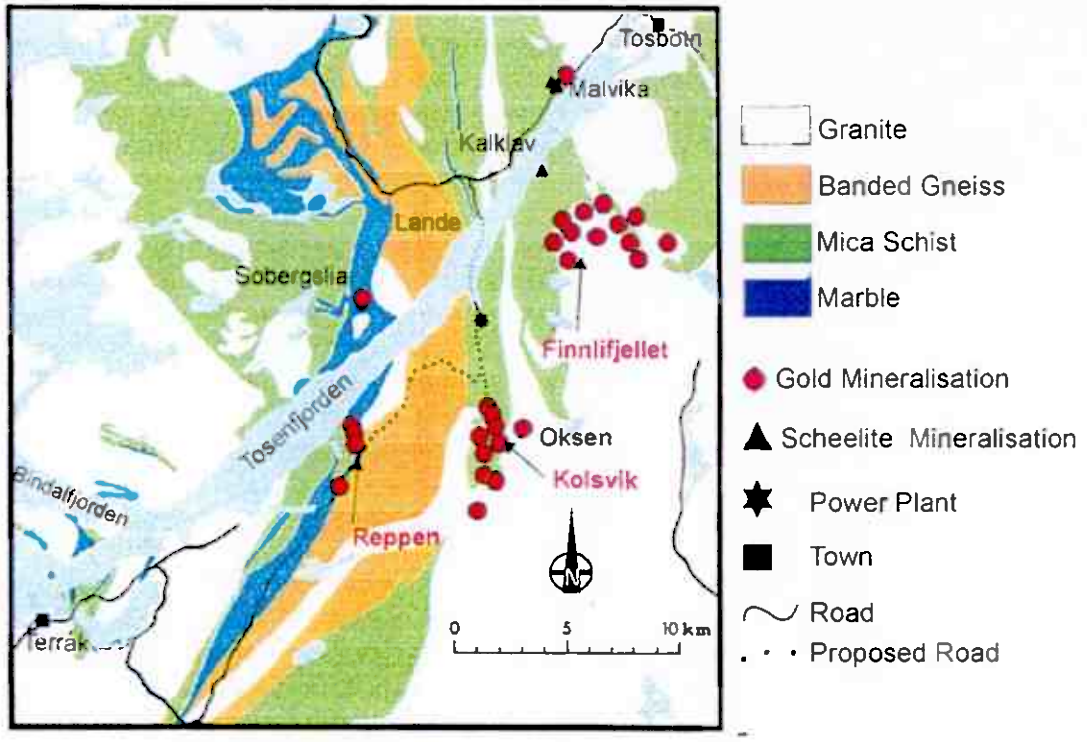


Figure 2-2 Bindal Area Geology and Project Location Map.

From VGP Report,1996

FIG. 1

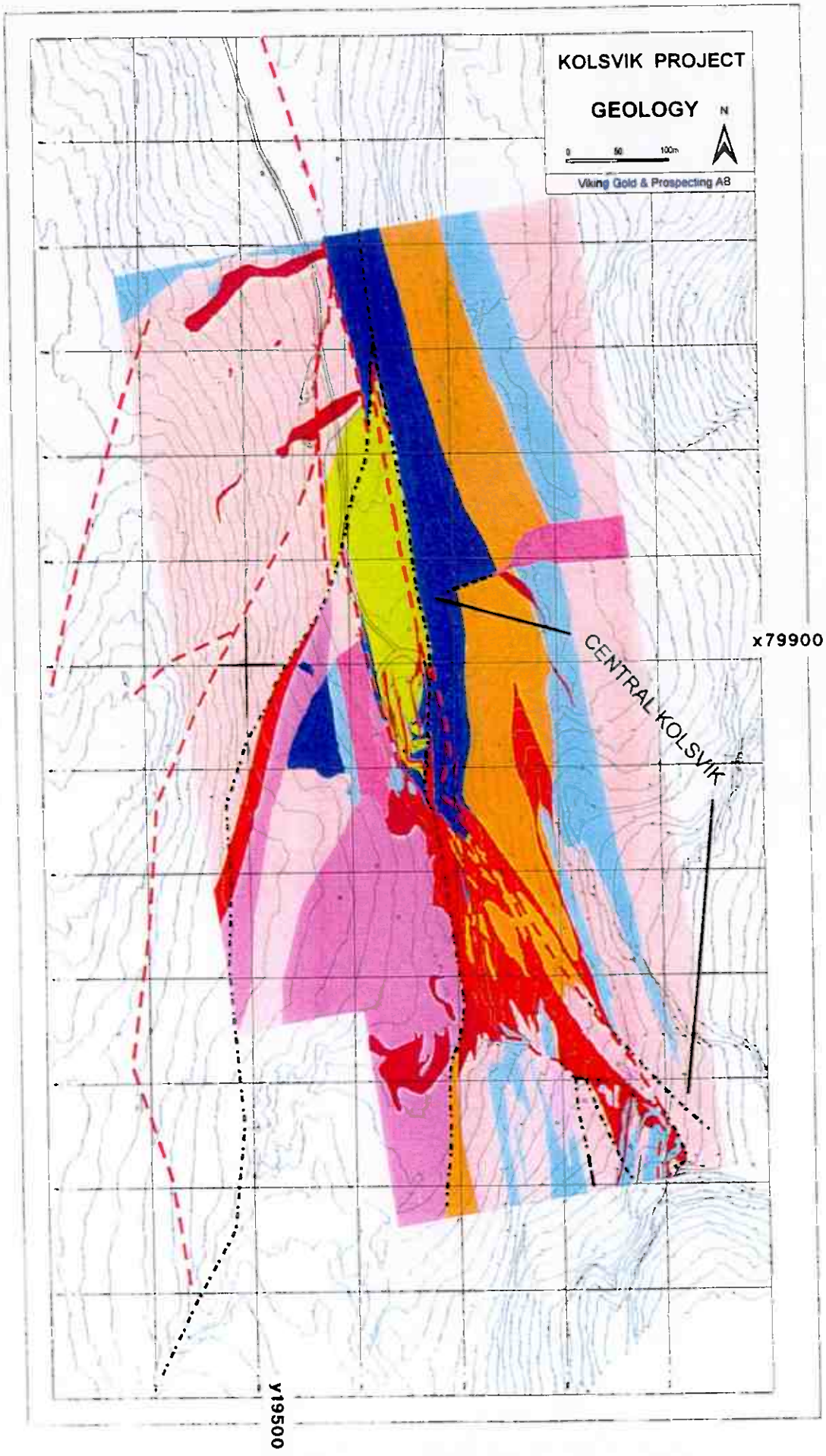

KOLSVIK PROJECT
GEOLOGY
N
0
50
100m
Viking Gold & Prospecting AB
CENTRAL KOLSVIK
x79900
y19500

FIG. 2A

LEGEND

INTRUSIVE ROCKS:

- White to pink medium grained to pem. Leuco granite
- Light grey to pink medium grained two-mica granite
- Grey quartz monzonite
- Dark grey medium grained monzodiortie
- Grey biotite-rich anatectic granite

SUPRACRUSTAL ROCKS:

- Alternating zones of calc-silicate gneiss, amphibolite, biotite gneiss and migmatitic gneiss
- Marble
- Garnet-clinopyroxene skarn
- Alternating zones of amphibolite, amphibole-biotite gneiss, calc-silicate gneiss, granodioritic orthogneiss and locally marble and skarn
- Migmatitic sillimanite-kyanite-biotite gneiss

Strike and dip of foliation and banding

Stilbite breccia

Late high-angle normal fault with dextral strike-slip displacement (FOFZ)

Early high-angle dextral fault (KRFZ) with dip of fault plane/quartz vein.
Ore structures: B1, B2, C, F1-F11, K

Mylonite

Quartz breccia and quartz veined zone

Diamond drill hole number 5 (DDH 5)

- Shaft
- Adits
- Cabin
- Road

From: P. Ihlen 1996

FIG.2B

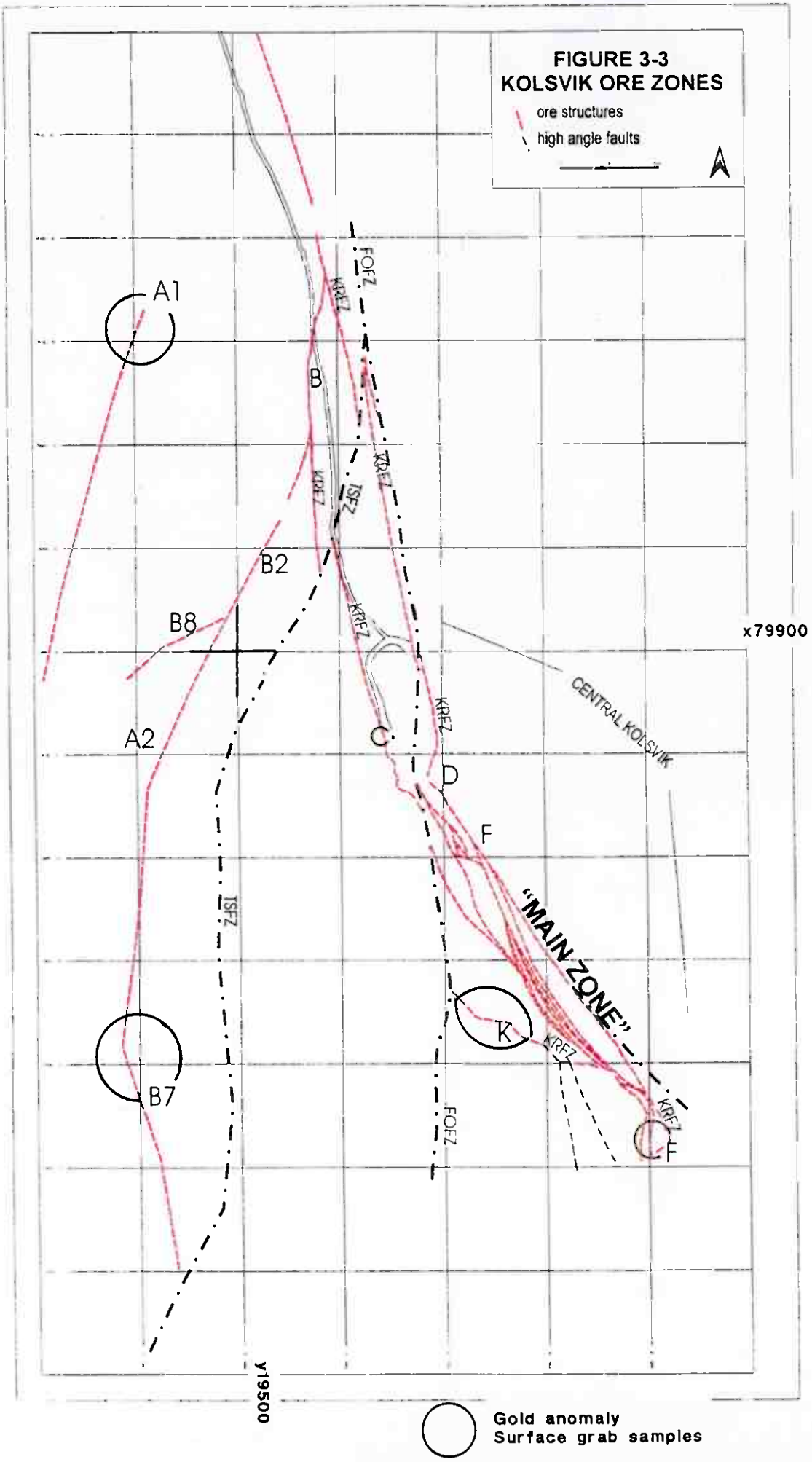


FIGURE 3-3
KOLSVIK ORE ZONES
ore structures
high angle faults
A1
B
B2
B8
A2
B7
C
D
F
K
FOFZ
KRFZ
ISFZ
CENTRAL KOLSVIK
"MAIN ZONE"
x79900
y19500
Gold anomaly
Surface grab samples

FIG.3

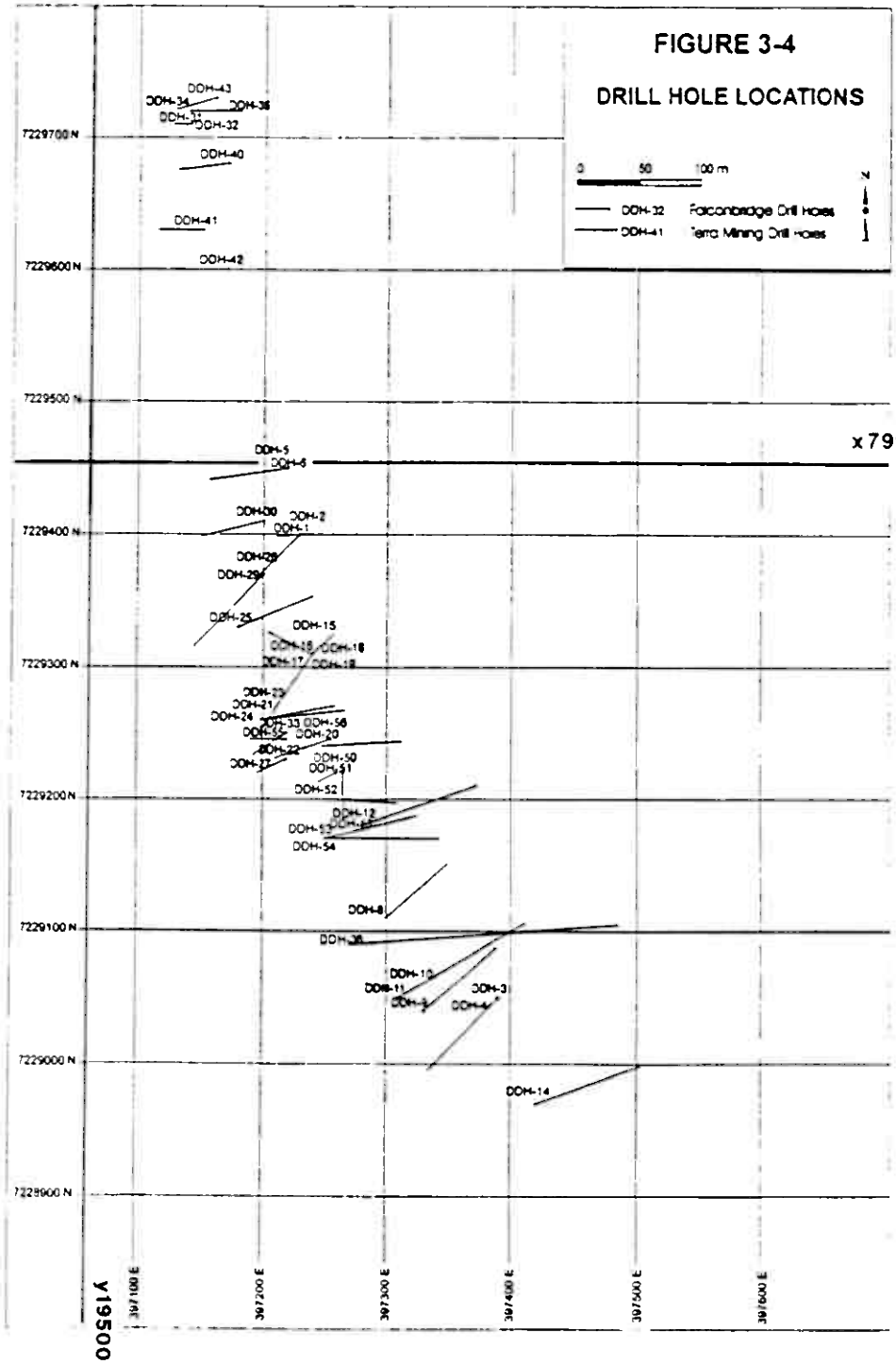
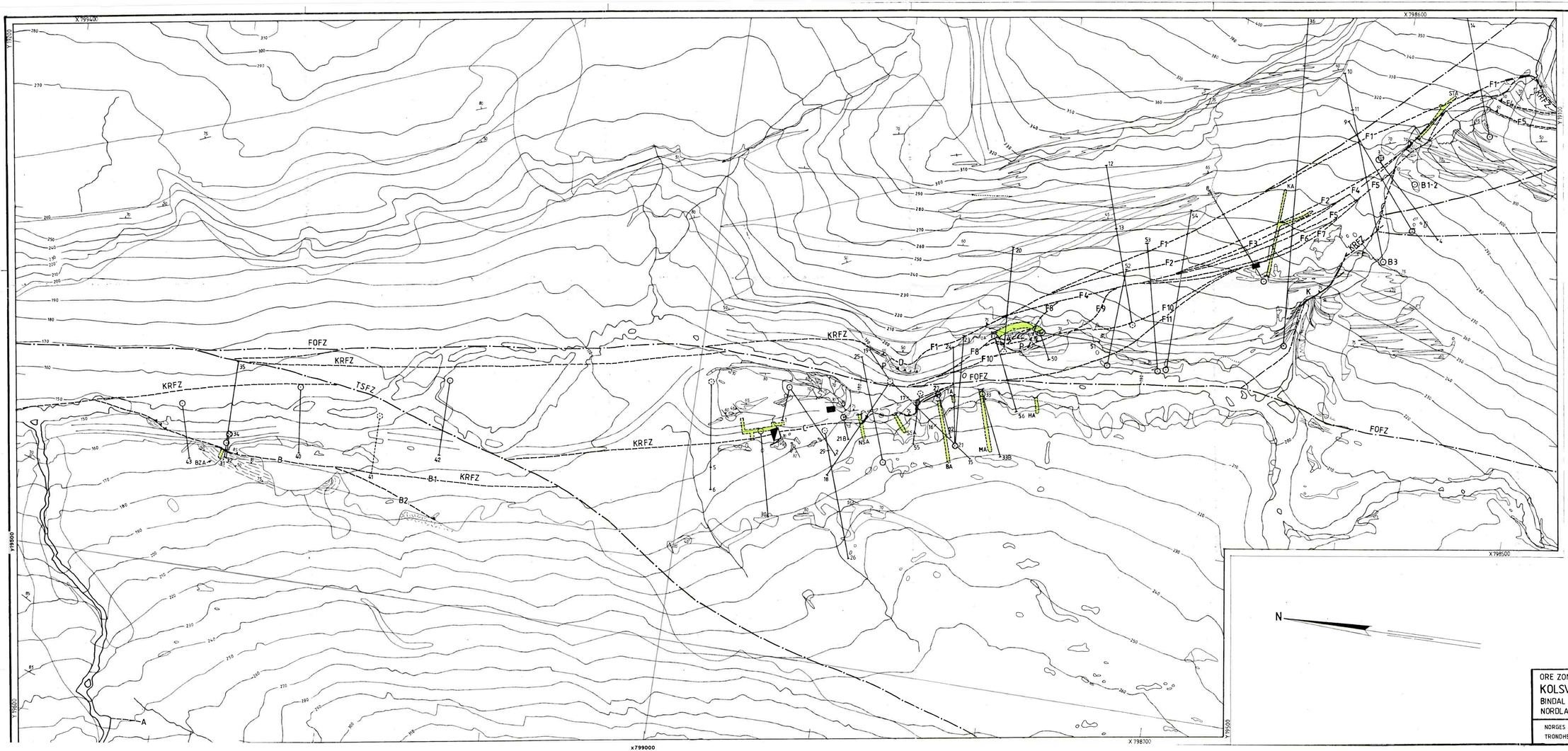


FIGURE 3-4
DRILL HOLE LOCATIONS
0 50 100 m
DDH-32 Falconbridge Drill Holes
DDH-41 Terra Mining Drill Holes
N
x79900
7229700 N
7229600 N
7229500 N
7229400 N
7229300 N
7229200 N
7229100 N
7229000 N
7228900 N
397100 E
397200 E
397300 E
397400 E
397500 E
397600 E
Y19500
DDH-43
DDH-34
DDH-36
DDH-33
DDH-32
DDH-40
DDH-41
DDH-42
DDH-5
DDH-6
DDH-30
DDH-2
DDH-1
DDH-29
DDH-29A
DDH-25
DDH-15
DDH-16
DDH-18
DDH-17
DDH-19
DDH-23
DDH-21
DDH-24
DDH-33
DDH-56
DDH-55
DDH-20
DDH-22
DDH-27
DDH-50
DDH-51
DDH-52
DDH-12
DDH-53
DDH-54
DDH-8
DDH-38
DDH-10
DDH-11
DDH-9
DDH-3
DDH-4
DDH-14

FIG.4



LEGEND

INTRUSIVE ROCKS:

- White to pink and mediumgrained to pegm. leuco-granite
- Light grey to pink mediumgrained two-mica granite and grey quartz monzonite
- Dark grey mediumgrained monzodiorite
- Grey biotite-rich anatectic granite

SUPRACRUSTAL ROCKS:

- Alternating zones of calc-silicate gneiss, amphibolite, biotite gneiss and migmatitic gneiss
- Marble
- Garnet-clinopyroxene skarn
- Alternating zones of amphibolite, amphibole-biotite gneiss, calc-silicate gneiss, granodioritic orthogneiss and locally marble and skarn
- Migmatitic sillimanite-kyanite-biotite gneiss

GEOLOGICAL SYMBOLS:

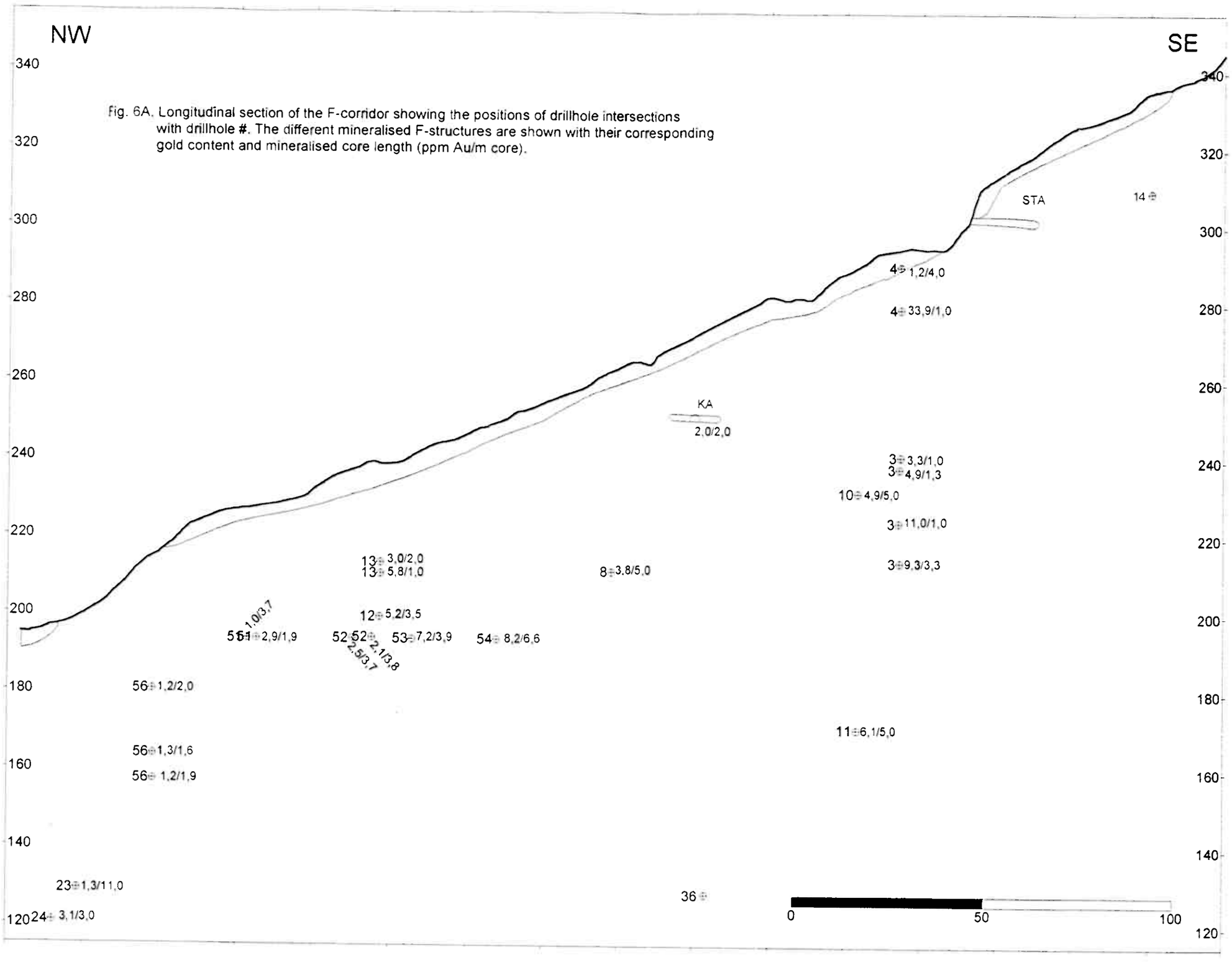
- Strike and dip (60°, 90°) of foliation and banding
- Strike and dip (60°) of shear planes and mylonite banding
- Foldaxes with plunge (30°)
- Stilbite breccia
- Late high-angle normal fault with dextral strike-slip displacement (FOFZ)
- Quartz breccia and quartz veined zone
- Early high-angle dextral fault (KRFZ) with dip of fault plane/quartz vein. Ore structures: B1, B2, C, F1 - F11, K.
- Mylonite
- Shaft/small working (P)
- Adits: BZA = B-zone, NSA = Nordre Skarstoll, SSA = Søndre Skarstoll, BA = Boliden, TA = Tanner, MA = Mannerheim, HA = Hartvig, OA = Oppgangen, KA = Kaffisteinen, STA = Storsteinen
- Diamond drill hole no. 5 (DDH 5) with horizontal projection
- Vertical drillhole, DDH 21
- DDH 20 with uncertain position
- DDH 41 with uncertain position and orientation
- B1 Boliden drillhole
- Cabin

0 50 100 m

FIG. 5

ORE ZONE MAP WITH DRILLHOLE LOCATION KOLSVIK Au - As DEPOSIT BINDAL COMMUNE NORDLAND	MÅLESTOKK 1 : 1000	OBS. P.M.I. TEGN. P.M.I. TRAC. L.F. DES.-93 KFR.	
		PLATE 2	
NORGES GEOLOGISKE UNDERSØKELSE TRONDHEIM	TEGNING NR. 93.003 - 02	KARTBLAD NR. 1825 II	

Fig. 6A. Longitudinal section of the F-corridor showing the positions of drillhole intersections with drillhole #. The different mineralised F-structures are shown with their corresponding gold content and mineralised core length (ppm Au/m core).



KOLSVIK GOLD DEPOSIT
THE F-CORRIDOR

Legend:

Corridor boundary

Drill hole with Au ≥ 1 ppm/ ≥1 m core, projected to surface

Sulfidmalm surface sample, Au≥ 1 ppm/ ≥ 1 m chip sample

See also legend Fig. 5

Scale 1:1000

FIG. 6 B

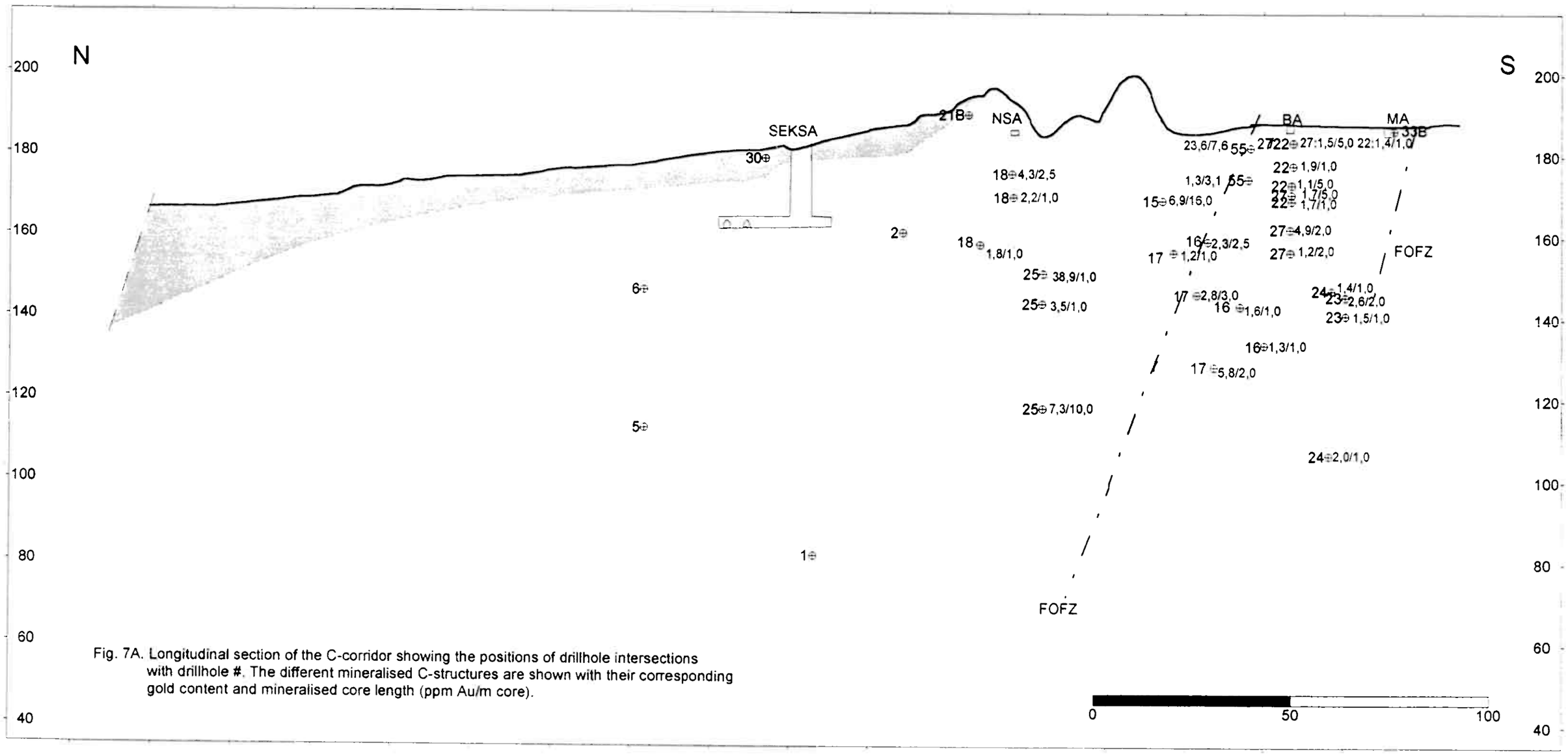


Fig. 7A. Longitudinal section of the C-corridor showing the positions of drillhole intersections with drillhole #. The different mineralised C-structures are shown with their corresponding gold content and mineralised core length (ppm Au/m core).

KOLSVIK GOLD DEPOSIT
THE C-CORRIDOR

Legend:

Corridor boundary

Drill hole with Au ≥ 1 ppm/ ≥1 m core, projected to surface

Sulfidmalm surface sample, Au≥ 1 ppm/ ≥ 1 m chip sample

See also legend Fig. 5

Scale 1:1000

FIG. 7 B

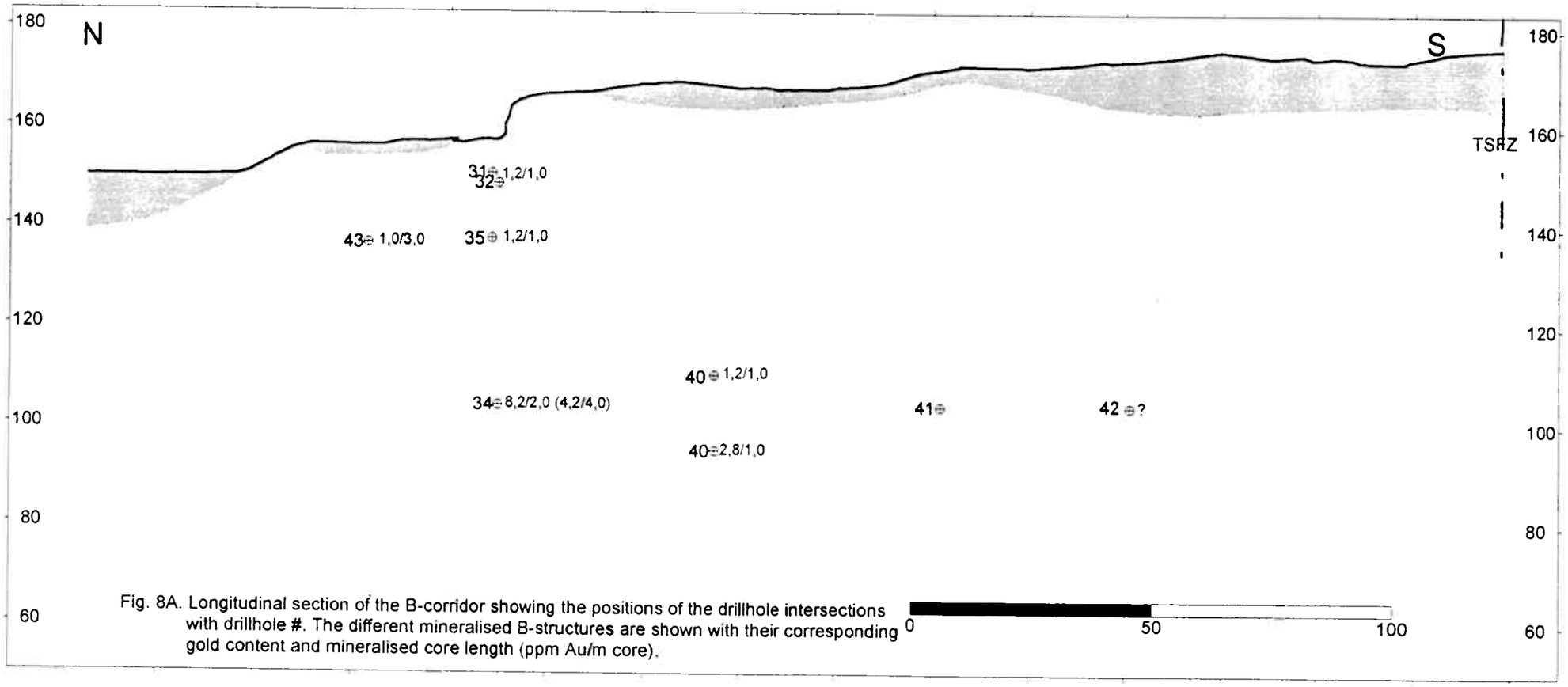
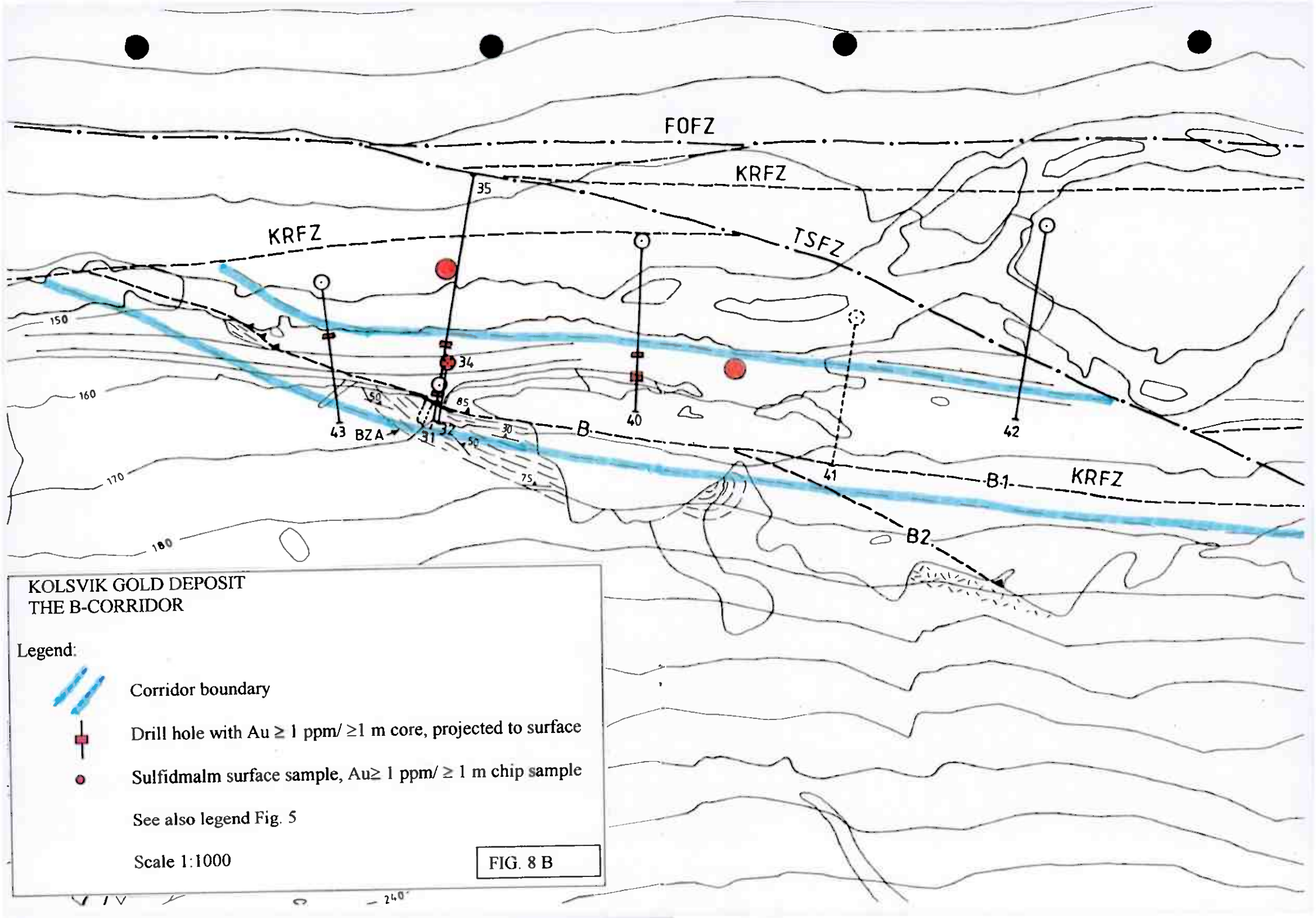


Fig. 8A. Longitudinal section of the B-corridor showing the positions of the drillhole intersections with drillhole #. The different mineralised B-structures are shown with their corresponding gold content and mineralised core length (ppm Au/m core).



KOLSVIK GOLD DEPOSIT
THE B-CORRIDOR

Legend:

Corridor boundary

Drill hole with Au ≥ 1 ppm/ ≥1 m core, projected to surface

Sulfidmalm surface sample, Au≥ 1 ppm/ ≥ 1 m chip sample

See also legend Fig. 5

Scale 1:1000

FIG. 8 B

APPENDIX 1

3. 0 Kolsvik Project

3.1 Geology

The Kolsvik gold deposit is located at the contact-zone of the Early Silurian age Oksdal granite massif with supracrustal rocks (Figures 3-1 and 3-2; and Plate VGP-8). Granite intrusive rocks within the deposit consist of medium to coarse grained grey biotite-bearing quartz monzonite and light grey 2-mica granites, the latter representing the main intrusive phase. The principle host rock, a late phase leucocratic muscovite granite occurs in the central part of the deposit. The granite often shows alteration in the vicinity of the tectonic zones, where carbonate, sericite, muscovite and chlorite are common.

Granitic rocks are intruded into rocks of the Grytendal Complex, the Bogadal Formation and the Tosenfjord group. Main lithologies found in the Kolsvik area are: granite, augen gneiss/banded gneiss, marble and mica schists.

3.2 Alteration

Hydrothermal alteration has affected most rocks that occur at the deposit. Ihlen (1993) describes the alteration as including skarnification of the marbles, silicification of the granites, bleaching of the two-mica granites (dissolution and replacement of biotite by muscovite), muscovitisation of the granites, quartz-sericite alteration of the leucocratic granites, ankerite veining, chloritisation, argilitisation connected with fault gouges and chlorite-calcite-stilbite and epidote veins associated with red colouration of the granites.

3.3 Gold Mineralisation

Gold and arsenopyrite mineralisation is dominantly hosted by granitic rocks near contact zones with gneisses and metasediments. Mineralisation is typically tectonically controlled and related to such structures as:

-quartz vein fillings in fractures, shears and joints.
-quartz segregation in or associated to the above structures.
-quartz/arsenopyrite matrix fill in breccias.
-massive arsenopyrite zones in fractures and shears.

Mineralisation consists of native gold, pyrite, pyrrhotite, arsenopyrite and chalcopyrite and minor scheelite. Native gold is known to occur as visible grains (0.2-1 mm) in sheared and fractured quartz veins, but is most commonly encountered as microscopic grains (1-100μm) intimately intergrown with arsenopyrite. Coarse visible gold is associated with fractured quartz and is known to occur at several locations particularly near the Klondike adit.

Visible grains of native gold have been observed at several places at the deposit. DDH 55 intersected 27.5 g/t over 4.7m including 1.3m at 125 g/t. Visible gold was also noted in hole DDH 15 that locally assayed 777 g/t from a drill intercept containing quartz veins.

3.4 Structural Control

Two systems of fractures appear to be significant in the localisation and distribution of gold and arsenopyrite mineralisation:

a) conjugate system of gentle to moderately inclined shears and joints with an average strike of 160 degrees. These flat shears often contain development of massive arsenopyrite or vein quartz with arsenopyrite and gold.

b) Steep shear-faults and joints with an average SE-NW trend. These fractures exhibit a suite of associated tension gash veins. The major fault zones have steep easterly dips (eg. 70^0+ 15^0).

Surface sampling and mapping have delineated the "main zone" of mineralisation that extends for a minimum of one kilometre in a north south direction. Examples of surface geochemical results from this main zone are shown in Plates: VGP-2 and VGP-10.

Sampling during 1996 also located anomalous gold bearing structures 4 kilometres south of the K-zone at the head of the Bogelva valley.

3.5 Gold Zones

A main zone of ore mineralisation has been formed as a result of the structural control of the Kolsvikbogen-Ringvatn fault zone (KRFZ) (Figure 3-3 and Plate: VGP-8). The richest and most continuous Au-As mineralisation occurs along the KRFZ and associated splays.

The KRFZ also appears to have controlled the emplacement of the leucocratic granites that occur in the central part of the deposit where they constitute an important host-rock for mineralisation. Mineralisation is known to extend for several metres into the granitic wallrocks on both sides of the fault plane.

For descriptive purposes the main zone can be broken down into areas: F to C zone; C to B zone and the B7 zone (Figure 3-3 and Plate VGP-8). Besides the main zone, NGU geologists have also located zones peripheral to the main zone. These additional structural zones include the A1, A2, B8, B7, E and K-zones. To date the recognition of additional structures and potential ore host has largely been limited by available outcrop exposures (ie; scree covers large areas within the valley and on the gentler slopes).

Ore zones along the KRFZ appear offset by the younger Finnlia-Oksdal fault zone (FOFZ) and it's splay, termed the Tverrelva-Skavvassfjell fault zone (TSFZ). Strong chlorite alteration and chlorite and calcite-stilbite in veins are associated with these later faults.

True widths of high grade ore zones vary from 1 to 3 metres with an average taken as 1.5 m. Wider ore zones in the range 5 to 7m (5 to 10 g/t) are known to occur on the surface where high gold assays are accompanied by visible gold. Drill sections through the main ore zone indicate continuity of the high grade gold mineralisation occasionally within a halo of lower grade mineralisation. Because some of the gold is known to occur as coarse or nuggetty gold, some areas of low grade mineralisation may in fact contain higher grade values but were not intersected by drill holes.

APPENDIX 2

3.6.3 Core Re-assay Program

Eleven drill holes were selected to be re-assayed in whole or part during the 1996 exploration program. The purpose of the re-assaying program was: (1) to standardise a portion of the data set using 1m sample intervals (2) determine the significance of potential dilution using 1m sample intervals and (3) to obtain new data from previous un-sampled core. Peter Ihlen's NGU (1993) report recommended that future work at Kolsvik include re-assaying approximately 600m of the core stored at Løkken. VGP geologists reviewed the core logs and drill sections and selected 701m of core to be re-assayed. However, because of missing core intervals, the final amount of core available out of the 701m selected was 580m.

Table 3.3 is a list of the core intervals which VGP requested to have re-analysed. Locations of the "re-assayed" drill holes are shown in Figure 3-6.

Some of the holes selected for re-analysis had intercepted high grade gold intervals. Other holes selected such as 5,6, 32 and 35 had not been assayed at all, but were in areas where ore zones are projected.

Most of the core diameter is 36mm or "B" core, which is small when a potential for coarse or nuggetty gold exists which is the case at Kolsvik. In addition, many of the sample intervals have been split and previously assayed. Therefore, only half of the B-core was available compounding the problem of a small core diameter. In addition some of the core with visible gold had been hand picked for hand specimens or metallurgical tests.

Table 3.3. Core Selected to be Re-Assayed

Drill Hole #	From	To	Total Meters	Remarks
4	14	93	79	
5	6	122	116	Not previously assayed
6	8	60	52	Not previously assayed
8	2	88	86	
10	25	88	63	
11	80	120	40	
15	16	70	54	
16	19	70	51	
18	16	52	36	
32	4	34	30	Not previously assayed
35	1	95	94	Not previously assayed
Total No. of meters			701	

APPENDIX 3

NGU
Geologi for samfunnet siden 1858
Leiv Eirikssons vei 39
Postboks 3006 - Lade
N-7002 Trondheim
Telefon: 73 90 40 11
Telefax: 73 92 16 20

BORKJERNELAGERET PÅ LØKKEN.

Utskriftsdato: 31.10.19

Registrerte borkjerner:

Forekomst: NO0056 KOLSVIK **Type:** AU AS

Reg.nr.	Borhull	År	Lengde	Lengde Lagret	Diameter
725	BH 6	1981	92	30	36
727	BH 9	1981	94	94	36
728	BH 10	1981	144	100	36
729	BH 11	1981	159	119	36
730	BH 12	1981	124	124	36
731	BH 13	1981	63	63	36
732	BH 14	1981	121	121	36
733	BH 15	1981	93	40	33
734	BH 16	1981	90	20	36
735	BH 17	1981	81	71	36
736	BH 18	1981	97	47	36
737	BH 19	1981	56	56	36
738	BH 20	1981	90	90	36
739	BH 28-21	1982	20	20	36
740	BH 21	1982	157	157	36
741	BH 22	1982	38	33	36
742	BH 23	1982	133	123	36
743	BH 24	1982	141	141	36
744	BH 25	1982	116	106	36
745	BH 26	1982	91	91	36
746	BH 27	1982	39	39	36
747	BH 29	1982	45	45	36
748	BH 30	1982	77	77	36
749	BH 31	1982	49	49	36
751	BH 33	1982	46	46	36
752	BH 34	1982	73	73	36
754	BH 36	1982	271	271	36
755	BH 1/80	1980	118	118	45
756	BH 2/80	1980	85	69	45
758	BH 53	1986	77	27	62
759	BH 54	1986	92	21	62
760	BH 55	1986	~~10~~ 40	2	62
979	BH 3/80	1980	94	94	
980	BH 40/81	1985	83	63	36
981	BH 41/81	1985	69	59	36
982	BH 42/81	1985	79	59	36
983	BH 43/81	1985	62	52	36

Antall borehull: 37

Total lengde lagret: 2810 meter

APPENDIX 4

Samples from Kolsvik, Bindalen:

October 1999

Sample no.:			To:
03/	370	*	380
03/	380	*	390
03/	390	*	400
03/	745	*	760
03/	760	*	770
03/	770	*	780
03/	780	*	790
03/	790	*	800
03/	865	*	875
09/	620	*	640
09/	790	*	800
09/	800	*	810
09/	810	*	820
12/	93		100
12/	100		117
12/	830		840
12/	875	*	890
12/	890	*	900
12/	990	*	1000
12/	1000	*	1010

Sample no.:			To:
13/	300	*	320
13/	485	*	500
13/	500		510
13/	510		520
13/	520		530
13/	587		597
13/	597		607
13/	607		617
13/	617		627
17/	360	*	370
17/	370	*	380
17/	380	*	390
17/	390	*	400
17/	400	*	410
17/	410	*	420
17/	420	*	430
17/	430	*	440
17/	440	*	450
19/	150		170
19/	170		190

Sample no.:		To:
19/	190	210
19/	210	230
19/	230	250
19/	250	270
19/	270	290
21/	320	330
21B/	45	60
21B/	60	70
21B/	120	140
23/	1100	1120
23/	1120	1140
23/	1140	1160
23/	1160	1180
23/	1180	1200
23/	1200	1220
23/	1220	1240
23/	1240	1260
23/	1260	1280
23/	1280	1300
23/	1300	1320

Sample no.:			To:
23/	1320		1330
24/	1200	*	1220
24/	1220	*	1240
24/	1240	*	1260
24/	1260	*	1280
24/	1280		1300
24/	1300		1320
24/	1320		1340
24/	1340		1360
24/	1360		1380
24/	1380		1400
24/	1400		1420
25/	180		200
25/	270		290
25/	310		330
25/	330		350
25/	1000		1020
25/	1020		1040
25/	1040		1050
25/	1050		1064

Sample no.:			To:
25/	1064		1078
25/	1078		1090
25/	1090		1100
25/	1100		1114
25/	1114		1125
25/	1125		1145
25/	1145		1160
25/	1160		1165
26/	87		100
26/	100		127
29/	120	*	130
29/	130	*	140
33B/	35	*	50
33B/	50		60
34/	540		560
34/	560		580
34/	580		600
36/	2240		2250
36/	2250		2260
36/	2260		2270
41/	190		200

03/ 370 = Drillhole no. 3, sample starting at 37.0 m.

*** Previously subject to assay**

OMAC Laboratories Ltd.,
Athenry Road, Loughrea, Co. Galway, Ireland.
Telephone: 353-91-841741, 841457
Fax: 353-91-842146
e mail: omac@eircom.net

CERTIFICATE OF ANALYSIS 10/12/99

TO: Geologiske Tjenester A/S.,

INVOICE: Same

ATTN: B. Flood

CODE: 03/370-41/190

Preparation Pulverized

BATCH NO. ET31
NO. SAMPLES 101

Crushed Rock

LAB. NO.	SAMPLE NO.	Au6 Wet Assay Auppm	Repeat Au4 Fire Assay Auppm	Re-Repeat Au5 Wet Assay Auppm	Re-Repeat Au4 Fire Assay Auppm
1	03/370	0.03			
2	03/380	0.62	0.63		
3	03/390	0.14			
4	03/745	0.15			
5	03/760	0.22			
6	03/770	0.31			
7	03/780	0.03			
8	03/790	11.02	4.60	8.85	10.26 *(15.80g)*
9	03/865	0.14			
10	09/620	0.38			
11	09/790	-0.01			
12	09/800	0.20			
13	09/810	-0.01			
14	12/93	-0.01			
15	12/100	-0.01			
16	12/830	0.01			
17	12/875	0.01			
18	12/890	-0.01			
19	12/990	0.06			
20	12/1000	0.03			

ET31

LAB. NO.	SAMPLE NO.	Au6 Wet Assay Auppm	Repeat Au4 Fire Assay Auppm	Re-Repeat Au5 Wet Assay Auppm	Re-Repeat Au4 Fire Assay Auppm
21	13/300	2.97	3.12		
22	13/485	0.03			
23	13/500	-0.01			
24	13/510	0.01			
25	13/520	0.01			
26	13/587	0.07			
27	13/597	0.03			
28	13/607	0.10			
29	13/617	0.03			
30	17/360	0.12			
31	17/370	0.01			
32	17/380	0.03			
33	17/390	0.08			
34	17/400	0.17	0.13		
35	17/410	0.10			
36	17/420	0.01			
37	17/430	0.10			
38	17/440	0.01			
39	19/150	0.02			
40	19/170	-0.01			
41	19/190	-0.01			
42	19/210	0.01			
43	19/230	0.01			
44	19/250	-0.01			
45	19/270	0.02			
46	21/320	0.33	0.28		
47	21B/45	0.02			
48	21B/60	-0.01			
49	21B/120	0.03			
50	23/1100	0.19			
51	23/1120	0.23			
52	23/1140	0.21	0.19		
53	23/1160	0.07			
54	23/1180	0.08			
55	23/1200	0.05			
56	23/1220	0.02			
57	23/1240	-0.01			
58	23/1260	0.02			

LAB. NO.	SAMPLE NO.	Au6 Wet Assay Auppm	Repeat Au4 Fire Assay Auppm	Re-Repeat Au5 Wet Assay Auppm	Re-Repeat Au4 Fire Assay Auppm
59	23/1280	-0.01			
60	23/1300	-0.01			
61	23/1320	-0.01			
62	24/1200	-0.01			
63	24/1220	0.04			
64	24/1240	0.03			
65	24/1260	0.01			
66	24/1280	0.04			
67	24/1300	0.01			
68	24/1320	0.10			
69	24/1340	-0.01			
70	24/1360	-0.01			
71	24/1380	-0.01			
72	24/1400	-0.01			
73	25/180	0.49			
74	25/270	0.53	0.36		
75	25/310	0.37			
76	25/330	0.07			
77	25/1000	0.25	0.04		
78	25/1020	0.12			
79	25/1040	0.39			
80	25/1050	0.39			
81	25/1064	16.86	17.28		
82	25/1078	33.01	36.96		
83	25/1090	0.81			
84	25/1100	0.04			
85	25/1114	0.03			
86	25/1125	0.01			
87	25/1145	0.02			
88	25/1160	3.71	3.80		
89	26/87	0.04			
90	26/100	-0.01			
91	29/120	0.02			
92	29/130	0.01			
93	B33/35	0.09			
94	B33/50	0.69			
95	34/540	8.17	9.00		
96	34/560	0.40			

LAB. NO.	SAMPLE NO.	Au6 Wet Assay Auppm	Repeat Au4 Fire Assay Auppm	Re-Repeat Au5 Wet Assay Auppm	Re-Repeat Au7 Fire Assay Auppm
97	34/580	0.05			
98	36/2240	-0.01			
99	36/2250	0.10			
100	36/2260	-0.01			
101	41/190	-0.01			

Au analysis weight is 50gm except where indicated otherwise in brackets.