Reg. i ARKIV

FALCONBRIDGE LIMITED

REPORT OF 1991 EXPLORATION ACTIVITIES

WEST GREENLAND TERTIARY BASALT PROVINCE

FOR
PROSPECTING LICENCE # 156
AND
EXPLORATION CONCESSION # 165

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FALCONBRIDGE LIMITED
MARCH, 1992

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INTRODUCTION

In 1991, Falconbridge Exploration Limited and Platinova Resources Ltd. jointly held prospecting licence # 156 and exploration concession # 165 within the West Greenland Tertiary basalt province. The concession was replaced in December 1991 by three exclusive exploration licences. The 1991 expedition's purpose was to prospect and explore for a Noril'sk type nickel, copper and platinum metals deposit. The geological model for the formation of such a deposit requires major continental rifting with a hot spot in the mantle that gave rise to vast volumes of high MgO flood basalts. Major faults that penetrated to the mantle served as conduits for the volcanic eruptions and magma intrusions. These faults were activated and reactivated during rifting. High MgO magmas melted and assimilated country rock resulting in crustal contamination of some magmas. Nickel depletion in contaminated magmas occurred through sulphide segregation rather than simply through differentiation. Magma with inherited segregated sulphides enriched in chalcophile elements intruded at high crustal levels that are within reach of present day mining capabilities. Most accessible targets are in the deeply incised areas of the flat lying plateau flood basalts where underlying intrusions are exposed. The model recognizes the most efficient segregation of sulphides from one batch of magma to another would have occurred within a vertically oriented magma chamber as opposed to a horizontal chamber. Another essential ingredient is a complex history for the mineralized intrusions, including multiple intrusion with injection of early less-mafic magmas followed by a more mafic magma (eg.: the taxitic gabbro-dolerite at Noril'sk).

Exploration efforts focused on investigating the dolerite sills associated with the Boundary Fault on Nuussuaq and Svartenhuk Peninsulas. The sills were selected as key exploration targets based on their excellent exposure at a favourable stratigraphic position, the association with a major fault system and the general lack of previous work and lithogeochemical information. All remaining sills in the four geographical regions were sampled along with the mineralized showings in the subvolcanic intrusions and lavas. Stratigraphic profile sections were established to determine the chemical variation of the lavas and aid in the correlation of the subvolcanic intrusions with the volcanic stratigraphy.

During the field program, a new native iron cumulate was discovered, thirty stratigraphic profile sections were constructed and a total of 770 whole rock samples and 33 assay samples were collected for geochemical analysis.

The 1991 field crew consisted of four Canadians and one Danish geologist supported by a boat and helicopter, both chartered in Greenland. The field work was conducted between July 01st and August 15th, 1991.

CONCLUSIONS

Continental rifting of the North America plate resulted in the formation of the Tertiary flood basalt province of West Greenland. The province hosts a large volume of ultramafic and mafic volcanics (picrites and olivine basalts). A large quantity of the basaltic magmas were contaminated by reaction with sulphur-rich carbonaceous sediments that precipitated sulphide liquid and metallic iron containing nickel and platinum. The contaminated basalts are present throughout the province with the largest accumulations occurring on Nuussuaq Peninsula and Disko Island. The basalts are recognizable in the field by their orange-tan colour and they commonly host geodes of considerable size. Chemically they are usually depleted of siderophile and chalcophile elements. The 1991 analytical results indicate some picritic lavas from the Nuussuaq Peninsula are nickel depleted.

The majority of contaminated lavas were extruded during the first volcanic eruption cycle of the ultramafic Vaigat Formation (Naujánguit Member). The Asuk Member represents one contaminated basalt phase of this first cycle and may be the largest and most extensive eruption event of contaminated lava in the entire flood basalt province. Sills on Nuussuaq that correlate with this initial stage of volcanism are the Sarqaq olivine-bearing dolerites, the Serfat quartz-dolerite and the south coast picritic sills. On Disko Island, intrusions associated with lower Vaigat volcanism are the Igdlukunguaq dyke and Qutdligassat sill. Samples collected from the Igdlukunguaq nickel sulphide-bearing dyke assayed up to 6.86% Ni, 0.55% Co, 3.71% Cu and 2.0g/t combined Pt and Pd. The Qutdligassat sill contains anomalous Ni and Cu values of 1,280 ppm and 638 ppm respectively.

Picritic sills from the Svartenhuk Peninsula and at Serfat and Kangila on the Nuussuaq Peninsula correlate to the second Vaigat eruption cycle represented by the Ordlingassoq Member. Titanium-rich dolerite sills from the Svartenhuk Peninsula and in the Sarqaq Valley on the Nuussuaq Peninsula represent subvolcanic phases of Maligat Formation volcanism. Associated with this period of volcanic activity are the Hammersdal, Kitlik and Stordal iron-nickel bearing dykes located on Disko Island. Linking the Sarqaq dolerite sills with the same volcanic event responsible for the mineralized dykes on Disko Island makes the sills attractive exploration targets.

A new native iron cumulate was discovered at Qaqarssuit on the northern Nuussuaq Peninsula. Electron microprobe analyses indicate the cumulate contains up to 1.32% Ni, 0.37% Co and 0.38% Cu. Higher values of 3.47% Ni, 1.28% Co and 0.31% Cu were obtained from the Saviargat native iron cumulate along with significant grades from the other sampled iron showings. Electron microprobe analyses revealed the iron cumulates are composed mainly of iron, troilite (FeS), cohenite (Fe_3C) and greenalite ($Fe_6Si_4O1_44H_2O$). The phase relationship of the natural formation of native iron Ni-sulphides is still poorly understood.

The 1991 program has provided tremendous insight into the tectonic and geological evolution of the West Greenland flood basalt province. The key processes interpreted to be responsible for the high grade nickel copper and platinum metal deposits at Noril'sk are also present in West Greenland. The removal of large quantities of siderophile and chalcophile elements from the lavas and sills suggests large concentrations of Ni, Cu, Co, and PGE mineralization remain undiscovered in the basalt province. This paradox surrounding the undetected mineralization will only be resolved through consistent and systematical technical and chemical evaluation of the basalt province.

RECOMMENDATIONS AND PLANS

It is recommended the 1992 program continue to evaluate the Ni and PGE potential of the West Greenland basalt province by means of geological mapping, lithogeochemistry, stream sediment geochemistry, prospecting and airborne geophysics. Field work should concentrate on Nuussuaq Peninsula and Disko Island which have been identified as the two regions containing the highest potential for discovering an economic Noril'sk-type Ni-PGE deposit. A limited segment of the 1992 program must be allotted for further evaluation of the subvolcanic intrusions on Ubekendt Island and Svartenhuk Peninsula.

A combined EM and Mag airborne survey totalling of 2,300 line kilometres should be flown during May, 1992. The survey would be conducted with a fixed-wing aircraft based at the Jakobshavn airstrip. The survey would cover eleven areas on Disko Island and Nuussuaq Peninsula. Rugged topography largely restricts flight line orientation to being parallel topographic contours. Line spacing overall will be at 500 m with more detailed flying at 250 m spacing for specific areas.

A field crew composed of four geologists, a cook/camp manager and helicopter crew will be required to complete geological investigations of airborne anomalies and geological prospects. Activities would include mapping, prospecting and lithogeochemical/stream sediment sampling. The crew will operate out of a tent camp which will be moved twice during the program.

Prospecting is still a viable exploration method in the basalt province. Prospecting will focus on locating mineralization, sills and volcanic eruption centres.

A stream sediment survey analyzing the heavy mineral fraction is recommended for the Disko East Coast subarea and the Sarqaq and Tunorssuaq subareas on Nuussuaq. Hyaloclastite breccias along the Itivdle Fault should be prospected for unmapped sills. The dyke swarm intruding the breccias are to be investigated to determine composition and association with sulphide-bearing magmas. The detection of mineralized dykes will help focus exploration into areas that potentially host near surface, unexposed, mineralized intrusions.

Microprobe analyses of olivine from the Ni-depleted picrites from the Nuussuaq Peninsula are recommended to ensure the Ni loss is not simply due to olivine fractionation.

A structural interpretation of SPOT imagery over the flood basalt province should be completed prior to the summer's program. It is recommended that further structural information and interpretations be obtained through the petroleum department of the GGU in Denmark.

LOCATION, ACCESS AND TOPOGRAPHY

The 1991 exploration concession composed of 3 subblocks is situated 90 to 270 km northwest of Jakobshavn, on the west coast of Greenland. The sub-blocks were located between latitude 70°00'N to 72°00'N and longitude 52°00'E to 54°00'E. The 1991 prospecting licence encompassed the 1991 concession and is located from latitude 68°30'N to 72°00'N and longitude 51°00'E to 56°00'E (figure 1).

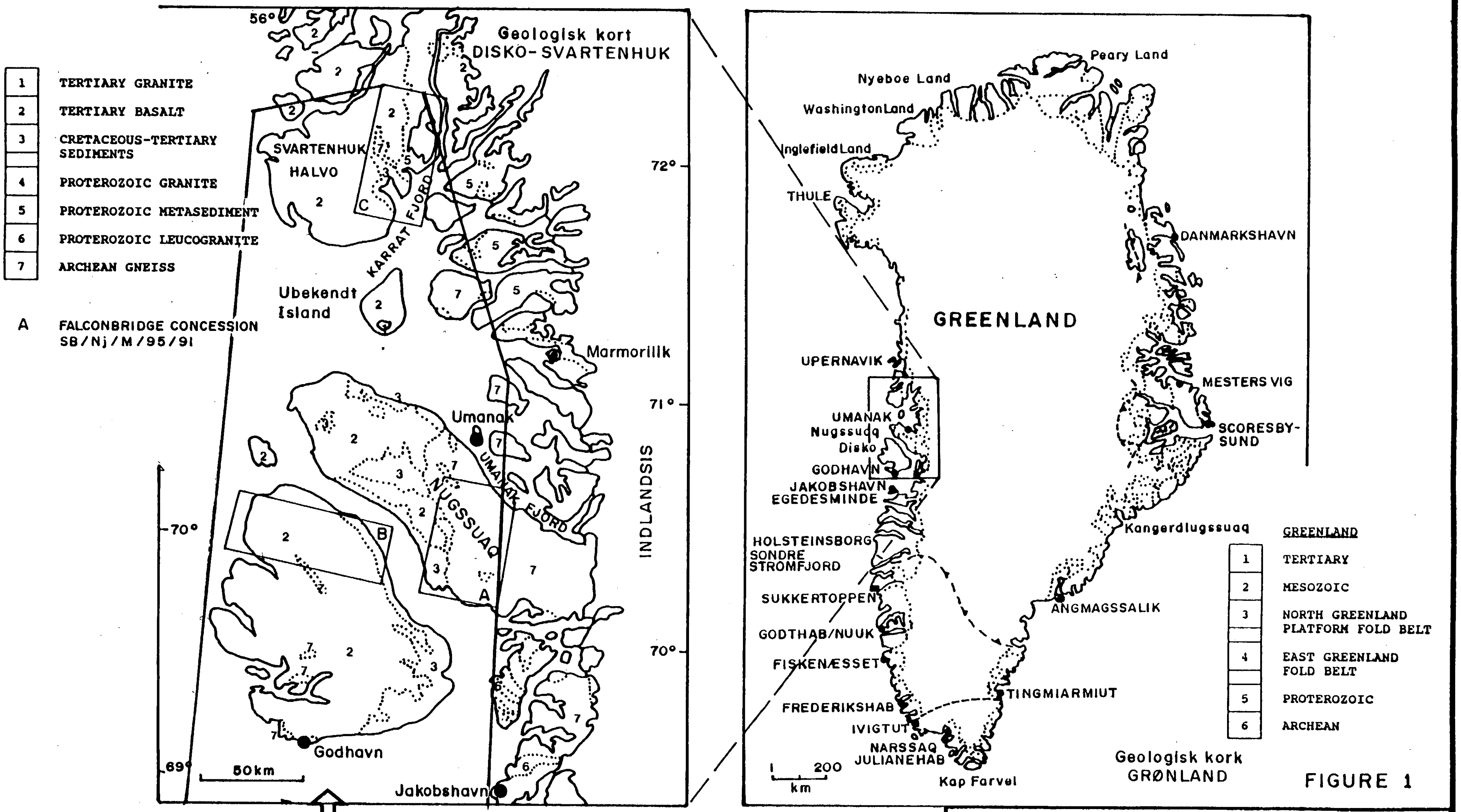
The project area is on tidewater with a 6 to 12 month shipping season (figure 2). It can be reached by helicopter or boat from the communities of Jakobshavn and Umanak. The two towns serve as main supply centres for the region. Jakobshavn has Dash 7 service four times per week to Nuuk from where there is daily jet service to Copenhagen and bi-weekly connections to Iqalluit, Baffin Island, Canada.

The alpine topography is very rugged with elevations commonly exceeding 1,500m. Mountain peaks in excess of 1,500m are usually glacier and snow covered year round. Glacial valleys have deeply incised the flood basalt province locally exposing the underlying sediment. The valley floors are commonly covered by thick accumulations of glacial moraine and fluvial material. High arctic flora and fauna are generally restricted to valley floors.

PROPERTY OWNERSHIP

In 1991, Platinova Resources held one exploration concession #165 from the Greenland Government covering 7,000 square kilometres. They still retain non-exclusive prospecting licence #156 covering approximately 60,000 square kilometres. Concession #165 was subdivided into three sub-blocks located on Disko Island, Nuussauq and Svartenhuk Peninsula's (figure 3). Falconbridge Limited jointly held the concession (51%) with Platinova (49%) through the terms of a Joint Venture agreement.

On December 15th, 1991, exploration concession #165 was annulled under the new Mineral Resource Act. Prior to the expiry date, Falconbridge Limited applied and has since received three exclusive exploration licences covering an area of 1,940 sq km (figure 3). Each licence contains two subareas which are subject to annual exploration expenses and fees based on their areas. Falconbridge elected to not carry forward the 1991 expenditures which would have resulted in the new licences entering year two status.



Prospecting Licence

FIGURE 1

FALCONBRIDGE LIMITED

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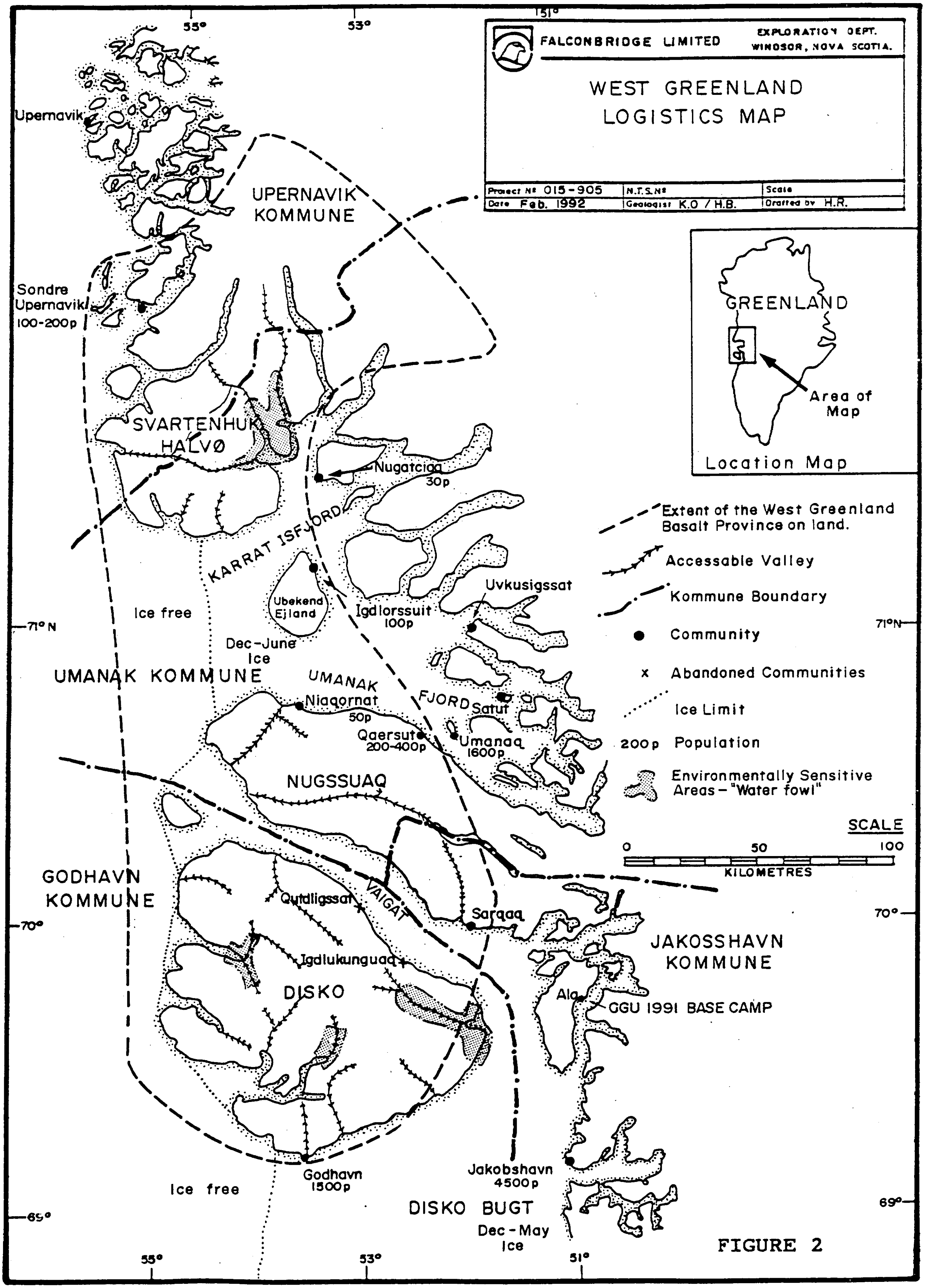
WINDSOR, NOVA SCOTIA.

WEST GREENLAND

CONCESSION LOCATION MAP AND GENERAL GEOLOGY

Sept. 1991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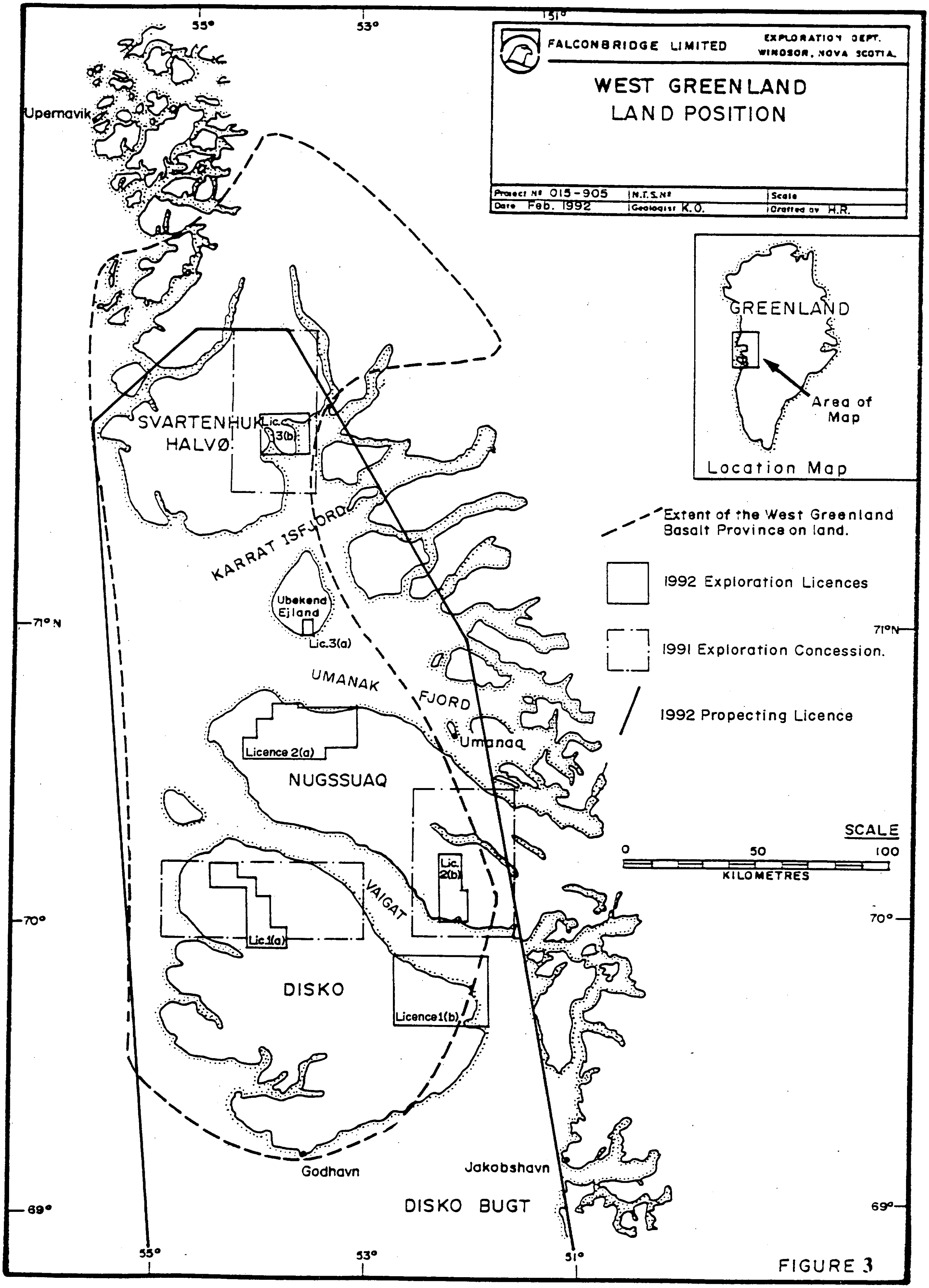
EXPLORATION DEPT. WINDSOR, NOVA SCOTIA.
WEST GREENLAND LOGISTICS MAP
Project Nº 015-905
N.T.S.Nº
Scale
Date Feb. 1992
Geologist K.O / H.B.
Drafted by H.R.
GREENLAND
Area of Map
Location Map
Extent of the West Greenland Basalt Province on land.
Accessable Valley
Kommune Boundary
Community
Abandoned Communities
Ice Limit
200p Population
Environmentally Sensitive Areas - "Water fowl"
SCALE
0 50 100
KILOMETRES
55°
53°
51°
71° N
70°
69°
Upernavik
UPERNAVIK KOMMUNE
Sondre Upernavik 100-200p
SVARTENHUK HALVØ
Nugatciaq 30p
KARRAT ISFJORD
Ubekend Ejland
Igdlorssuit 100p
Uvkusigssat
Ice free
Dec-June Ice
UMANAK KOMMUNE
UMANAK FJORD
Niaqornat 50p
Qaersut 200-400p
Satut
Umanaq 1600p
NUGSSUAQ
GODHAVN KOMMUNE
VAIGAT
Qutdligssat
Sarqaq
JAKOSSHAVN KOMMUNE
Igdlukunguaq
DISKO
Ata
GGU 1991 BASE CAMP
Godhavn 1500p
Jakobshavn 4500p
Ice free
DISKO BUGT
Dec-May Ice

FIGURE 2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EXPLORATION DEPT. WINDSOR, NOVA SCOTIA
WEST GREENLAND
LAND POSITION
Project Nº 015-905
N.T.S.Nº
Scale
Date Feb. 1992
Geologist K.O.
Drafted by H.R.
GREENLAND
Area of Map
Location Map
Extent of the West Greenland Basalt Province on land.
1992 Exploration Licences
1991 Exploration Concession.
1992 Propecting Licence
SCALE
0
50
100
KILOMETRES
Upernavik
SVARTENHUK HALVØ
Lic. 3(b)
KARRAT ISFJORD
Ubekend Ejland
Lic.3(a)
UMANAK FJORD
Umanaq
Licence 2(a)
NUGSSUAQ
Lic. 2(b)
VAIGAT
Lic.1(a)
DISKO
Licence1(b)
Godhavn
Jakobshavn
DISKO BUGT
55°
53°
51°
71° N
70°
69°

FIGURE 3

SENSITIVITIES

The area is accessible and politically stable. The Greenland Government is anxious to develop new mines to replace the gap left by the closing of the Black Angel Mine. A new agreement between Denmark and Greenland gives Greenlanders and Greenland based companies much more financial incentive for new developments. Recommendations from a 1991 white paper proposed a straight corporate tax rate of 33% and straight line depreciation over eight years.

Sensitive areas for wildlife preservation occur in the 1992 Itsako subarea, Svartenhuk Peninsula and in the southern portions of the Stordal and East Coast subareas on Disko Island (figure 2). Exploration is not prohibited, however, regulatory guidelines must be met depending on the character and magnitude of the activity.

PREVIOUS WORK

Native iron occurrences and one nickel sulphide showing had been known and documented in the flood basalt province as early as the 1870's by explorers A.E. Nordenskiöld and K.J.V. Steenstrup. In the 1930's, prospectors extracted approximately 28 tons of massive nickel sulphide from the Igdlukunguaq dyke located on northeast Disko Island. The dyke drew further attention between 1965 to 1968, when Niels Aegidius Andersen, New Quebec Mining and Exploration Company, drilled a limited number of shallow holes into the dyke. The company also completed a combined magnetometer and EM airborne survey in the Igdlukunguaq area and over a portion of Sarqaq Valley on Nuussuaq Peninsula (Prior, 1968).

Since the 1950's, detailed studies have been published on several of the metal occurrences by O.B.Bøggild (1953), H.Pauly (1958, 1969), J.M.Bird & C.A.Goodrich (1981), C.A.Goodrich (1984) J.M.Bird & M.S. Weathers (1977) W.Klock, H.Palme, H.Tobschall (1986) A.K.Pedersen (1975, 1977,1979) and F.Ulff-Møller (1975, 1977, 1985, 1989, 1990). The latter two authors are renowned for their extensive works in the basalt province and are credited for the discovery of several native iron occurrences.

Approximately 80% of the basalt province has been mapped at 1:100,000 scale by government funded mappers. Five out of six map sheets are complete with the sixth sheet (Svartenhuk) being in press.

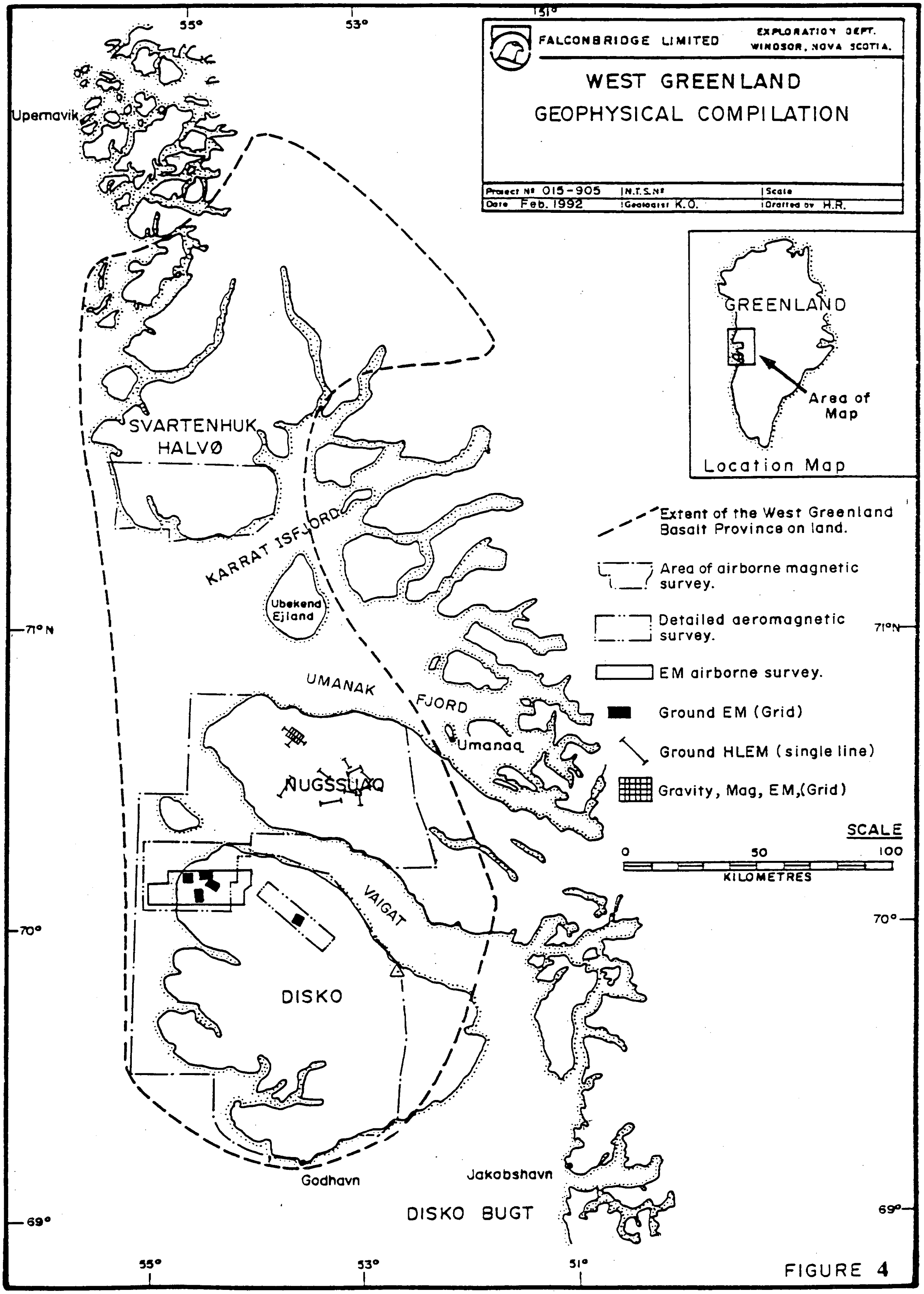
Inco conducted an evaluation of the nickel in the iron cumulates, however the only serious nickel exploration began in 1985 by Greenex for Cominco. The work by Greenex consisted of an unreliable aeromagnetic survey, reconnaissance-type ground VLF-EM, HLEM, UTEM and gravity surveys, prospecting, rock analysis, soil geochemistry and analysis of the light fractions of stream sediment samples (figure 4). Several ground EM anomalies were detected, two native-iron showings were discovered and numerous sediment contaminated flows were outlined.

TECTONIC AND REGIONAL GEOLOGY

Continental rifting in the early Tertiary resulted in the formation of the 63,000 sq. km Tertiary flood basalt province of West Greenland. The province is part of the North Atlantic basalt province that extends from the British Isles, through Iceland, Greenland and terminating in Baffin Island. Subsidence within the North American craton between present day North America and Greenland started as early as 600 million years ago (Fahrig *et. al.*, 1971). This suggests the gradual accumulation of Palaeozoic and Mesozoic sediments up until continental rupture and seafloor spreading in the early Tertiary (Clark and Pedersen, 1976). White and McKenzie (1989), support a mantle plume model as the driving force behind the break-up of the North Atlantic. The centre of the plume was positioned under East Greenland and had a diameter of 1,200 km. Volcanism began at the peripheral of the plume with the eruption of the West Greenland flood basalts province.

The eruption time span for the West Greenland basalts is estimated between four to six million years with the picrite phase lasting as long as three million years (Piasecki *et. al.*, in print). By comparison, the entire East Greenland Tertiary basalt province was erupted within three million years.

In West Greenland the lavas extruded onto a rugged paleosurface composed of fault scarps, basement ridges and deeply eroded channels through the underlying sediments (Clark and Pedersen, 1976). Large tectonic basins were present over Svartenhuk Peninsula, northern Disko Island and western to central Nuussuaq Peninsula. Early volcanism was dominated by the development of picritic pillow and hyaloclastite breccias as lavas flowed and intruded the basins. Water depths reached 700m on Nuussuaq (Piasecki *et. al.*, in print) and up to 1000m on Svartenhuk (Clark and Pedersen, 1976). Several cycles of volcanism and basin development occurred throughout the formation of the basalt province. The initial picritic volcanism was eventually followed by tholeiitic volcanism (figure 5).


FALCONBRIDGE LIMITED
EXPLORATION DEPT.
WINDSOR, NOVA SCOTIA.
WEST GREENLAND
GEOPHYSICAL COMPILATION
Project Nº 015-905
N.T.S.Nº
Scale
Date Feb. 1992
Geologist K.O.
Drafted by H.R.
GREENLAND
Area of Map
Location Map
Extent of the West Greenland Basalt Province on land.
Area of airborne magnetic survey.
Detailed aeromagnetic survey.
EM airborne survey.
Ground EM (Grid)
Ground HLEM (single line)
Gravity, Mag, EM,(Grid)
SCALE
0
50
100
KILOMETRES
55°
53°
51°
71° N
70°
69°
Upernavik
SVARTENHUK
HALVØ
KARRAT ISFJORD
Ubekend
Ejland
UMANAK
FJORD
Umanaq
NUGSSUAQ
VAIGAT
DISKO
Godhavn
Jakobshavn
DISKO BUGT
FIGURE 4

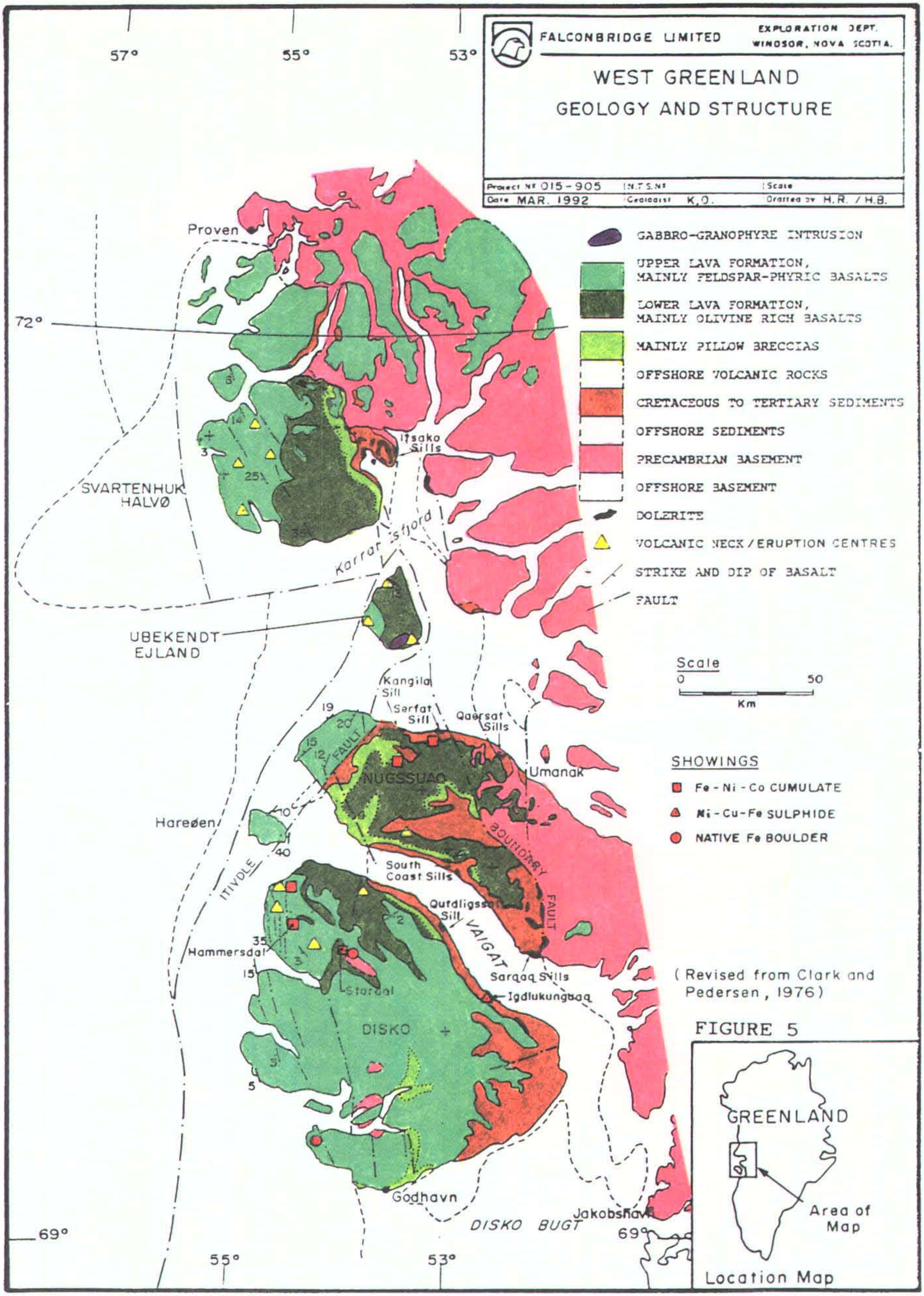

FALCONBRIDGE LIMITED
EXPLORATION DEPT. WINDSOR, NOVA SCOTIA.
WEST GREENLAND
GEOLOGY AND STRUCTURE
Project Nº 015-905
Date MAR. 1992
Geologist K.O.
Drafted by H.R. / H.B.
GABBRO-GRANOPHYRE INTRUSION
UPPER LAVA FORMATION, MAINLY FELDSPAR-PHYRIC BASALTS
LOWER LAVA FORMATION, MAINLY OLIVINE RICH BASALTS
MAINLY PILLOW BRECCIAS
OFFSHORE VOLCANIC ROCKS
CRETACEOUS TO TERTIARY SEDIMENTS
OFFSHORE SEDIMENTS
PRECAMBRIAN BASEMENT
OFFSHORE BASEMENT
DOLERITE
VOLCANIC NECK / ERUPTION CENTRES
STRIKE AND DIP OF BASALT
FAULT
Scale
0
50
Km
SHOWINGS
Fe-Ni-Co CUMULATE
Ni-Cu-Fe SULPHIDE
NATIVE Fe BOULDER
57°
55°
53°
72°
69°
Proven
SVARTENHUK HALVØ
Itsako Sills
Karrat Isfjord
UBEKENDT EJLAND
Kangila Sill
Serfat Sill
Qaersat Sills
Umanak
NUGSSUAQ
FAULT
BOUNDARY FAULT
Hareøen
ITIVDLE
South Coast Sills
Qutdligssat Sill
VAIGAT
Hammersdal
Stordal
Sarqaq Sills
Igdlukunguaq
DISKO
Godhavn
DISKO BUGT
Jakobshavn
GREENLAND
Area of Map
Location Map
(Revised from Clark and Pedersen, 1976)

FIGURE 5

The volcanic stratigraphy of the basalt province has been subdivided into three lithostratigraphical units known as the Vaigat, Maligat and Hareøen Formations (Hald and Pedersen, 1975). The Vaigat Formation consists of picrites to olivine basalts and extends over most of the basalt province. Pedersen (1985), subdivided the formation into the Naujánguit, Asuk, Kûgánguaq, Qordlortorssuaq, Ordlingassoq and Manîtdlat members that define two volcanic eruption cycles. The Asuk and Kûgánguaq members consist of sediment contaminated lavas that are prominent on Disko Island and Nuussuaq Peninsula. On Svartenhuk Peninsula, Larsen (1981) has subdivided the stratigraphy into the Lower, Middle and Upper Formations in which he correlates the Lower Formation with the Vaigat Formation.

The Maligat Formation overlies the Vaigat Formation and is composed of thicker, massive, feldspar-phyric, tholeiitic basalts. The formation occurs throughout central and western Disko Island and west of the Itivdle Fault on Nuussuaq Peninsula. On Disko Island the formation has been subdivided into the Rinks Dal, Nordfjord and Niaqussat members (Pedersen, 1975). On the Nuussuaq Peninsula, Hald (1977), subdivided the Maligat Formation into the Nûluk, Ifsorisok and Kanísut members.

The Hareøen Formation is only present on Hareøen and consists of olivine porphyritic transitional basalts. the Formation is subdivided into the Aumarûtigssâ and Talerua members (Hald, 1977).

Structurally the Boundary Fault marks the eastern extent of the Cretaceous and Tertiary sediments and locally served as a controlling structure for the flood basalts. The fault cuts through eastern Nuussuaq Peninsula and may join with a major fault that cuts through Svartenhuk Peninsula at Itsako. The Itivdle Fault cuts across western Nuussuaq causing major down faulting of the western block. The fault extends south to eastern Hareøen and may intersect the Boundary Fault to the north. On Disko Island a north-south oriented gneiss ridge runs through the centre of the island (figure 5). The gneiss acted as a barrier for some of the erupting lavas. The volcanic stratigraphy west of the ridge is cut by numerous faults that parallel the ridge and has resulted the repetition of the volcanics.

1991 EXPLORATION PROGRAM

The exploration program was conducted from June 28th to August 20th, 1991. The field crew arrived in Greenland on June 28th and completed field operations between July 02nd and August 16th (figure 6). The storage of field gear along with packing and arranging shipments of rock samples was carried out from August 17th to 19th. The crew departed Greenland on August 20th, 1991. The field crew consisted of the following personnel:

NAME	POSITION	COMPANY	RESIDENCE
Kevin Olshefsky	Project Geologist	Falconbridge	N.S., Canada
Harold Bent	Contract Geologist	Falconbridge	N.S.,Canada
Kurt Christensen	Consultant Geologist	Falconbridge/Boliden	Denmark
Alger St. Jean	Senior Assistant	Falconbridge	N.S., Canada
Travis Pink	Senior Assistant	Falconbridge	N.S., Canada

The main objectives of the 1991 field program were to:

-sample the subvolcanic intrusions (sills) associated with the Boundary Fault on Nuussuaq and Svartenhuk Peninsulas,

-prospect for mineralization and unmapped intrusions,

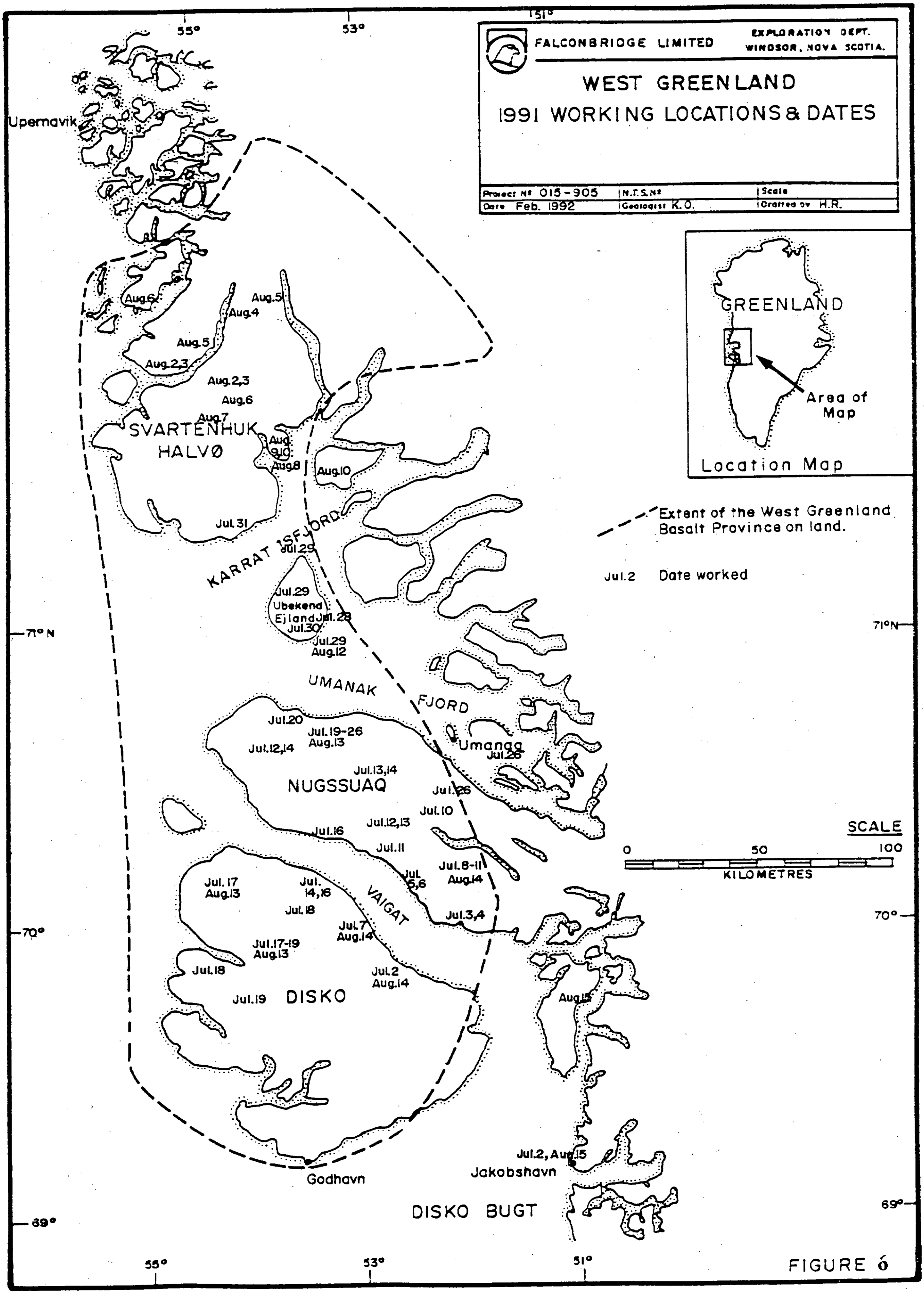
-sample stratigraphic profile sections to identify Ni depleted and enriched lavas,

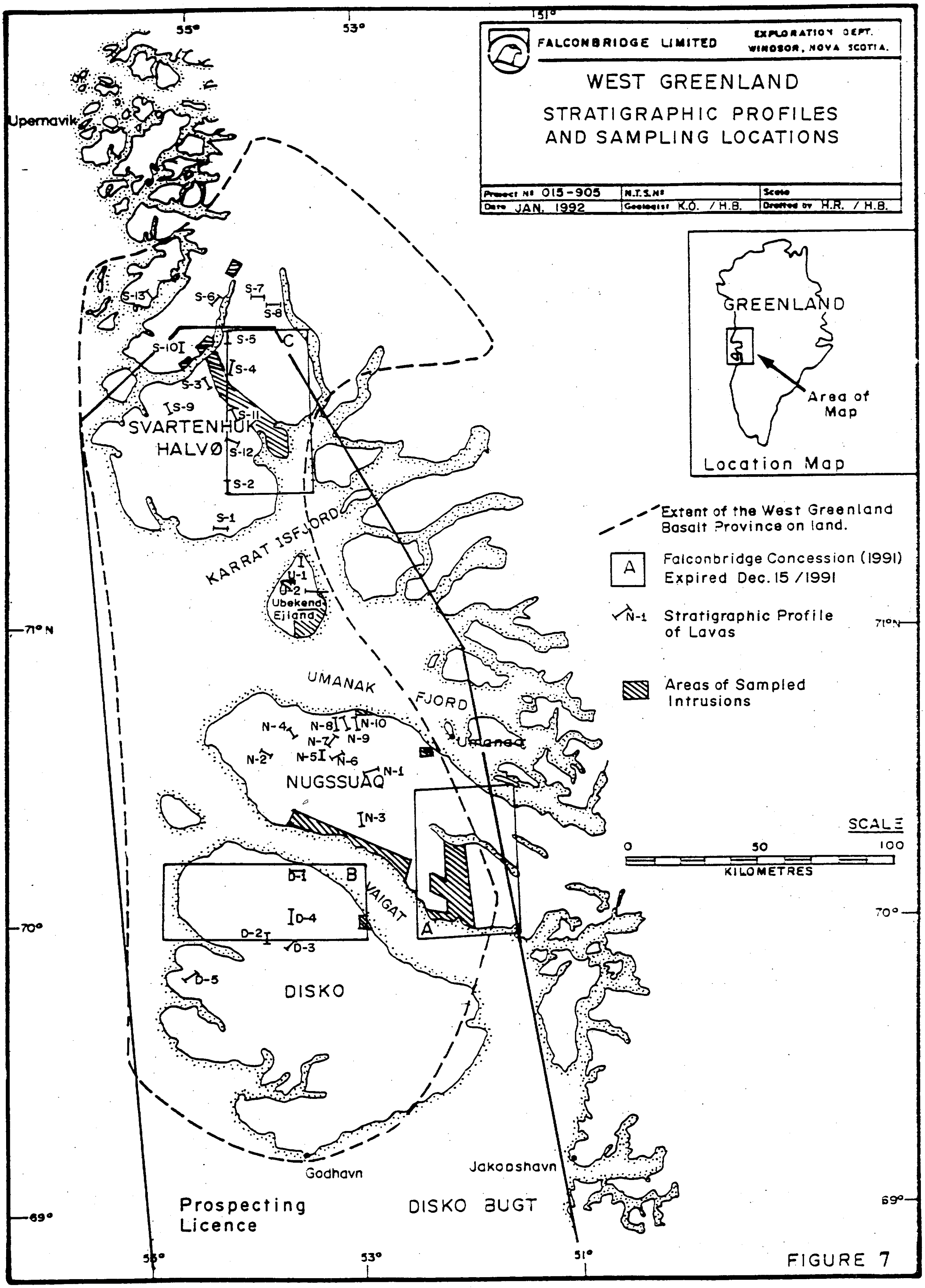
-sample mineralized showings and correlate the subvolcanic intrusions with the volcanic stratigraphy.

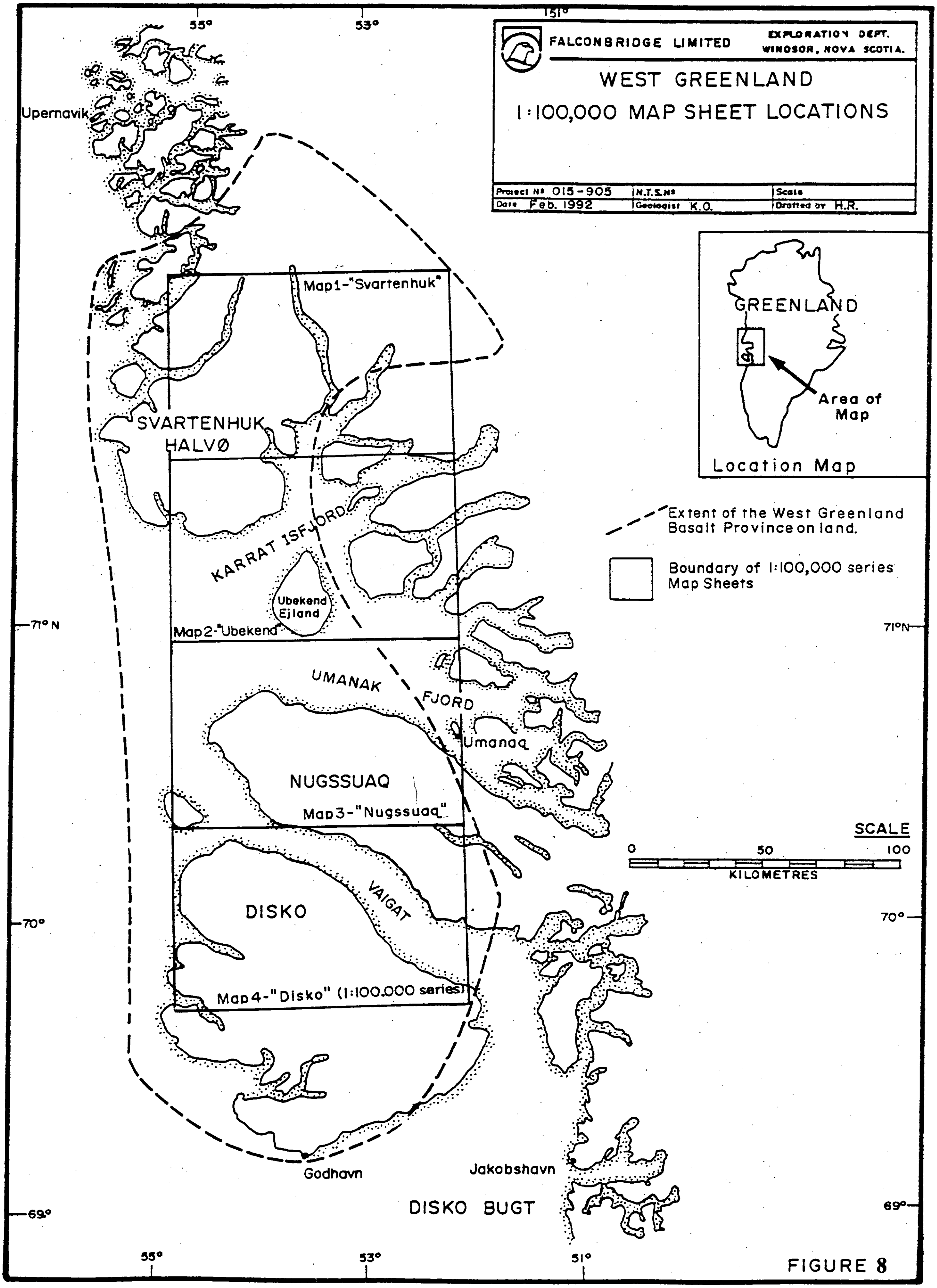
Prospecting was conducted on scree slopes and along steep rock faces with helicopter support.

Stratigraphic profile sections were constructed at 1:1,000 for 30 localities (figure 7). Whole rock sampling of the profiles varied from 30m and 60m intervals through the picrite lavas with more detailed sampling of the individual sediment contaminated flows. Sample locations are plotted on 1:100,000 scale base maps (maps 1 to 4; key maps: figure 8).

Seven hundred and seventy (770) whole rock samples were collected from subvolcanic intrusions and lavas. A fresh, unaltered grab sample, weighing approximately 0.75kg, was taken at each sample location. Accompanying the whole rock samples were thirty-eight (38) reference controls, composed of analytical standards and sample splits. The reference control samples are identified on the analytical documents as samples ending in 08, 28, 48, 68 and 88. Thirty-three (33) geochem samples were collected as either grab, channel or chip samples. All samples were shipped by air cargo to X-Ray Assay Laboratories in Don Mills, Ontario, Canada.


FALCONBRIDGE LIMITED
EXPLORATION DEPT. WINDSOR, NOVA SCOTIA.
WEST GREENLAND
1991 WORKING LOCATIONS & DATES
Project No 015-905
N.T.S.No
Scale
Date Feb. 1992
Geologist K.O.
Drafted by H.R.
GREENLAND
Area of Map
Location Map
Extent of the West Greenland Basalt Province on land.
Jul.2 Date worked
SCALE
0 50 100
KILOMETRES
Upernavik
SVARTENHUK HALVØ
KARRAT ISFJORD
Ubekend Ejland
UMANAK FJORD
Umanaq
NUGSSUAQ
VAIGAT
DISKO
Godhavn
Jakobshavn
DISKO BUGT
Aug.6
Aug.5
Aug.4
Aug.5
Aug.2,3
Aug.2,3
Aug.6
Aug.7
Aug. 9,10
Aug.8
Aug.10
Jul.31
Jul.29
Jul.29
Jul.28
Jul.30
Jul.29
Aug.12
Jul.20
Jul.19-26
Aug.13
Jul.12,14
Jul.13,14
Jul.26
Jul.26
Jul.10
Jul.12,13
Jul.16
Jul.11
Jul.8-11
Aug.14
Jul. 5,6
Jul.17
Aug.13
Jul. 14,16
Jul.18
Jul.7
Aug.14
Jul.3,4
Jul.17-19
Aug.13
Jul.18
Jul.2
Aug.14
Jul.19
Aug.15
Jul.2, Aug.15
55°
53°
51°
71° N
70°
69°
FIGURE 6


FALCONBRIDGE LIMITED
EXPLORATION DEPT. WINDSOR, NOVA SCOTIA.
WEST GREENLAND
STRATIGRAPHIC PROFILES AND SAMPLING LOCATIONS
Project No 015-905
Date JAN. 1992
N.T.S. No
Geologist K.O. / H.B.
Scale
Drafted by H.R. / H.B.
GREENLAND
Area of Map
Location Map
Extent of the West Greenland Basalt Province on land.
Falconbridge Concession (1991) Expired Dec. 15 /1991
Stratigraphic Profile of Lavas
Areas of Sampled Intrusions
SCALE
0
50
100
KILOMETRES
Upernavik
SVARTENHUK HALVØ
KARRAT ISFJORD
Ubekendt Ejland
UMANAK FJORD
Umanaq
NUGSSUAQ
VAIGAT
DISKO
Godhavn
Jakobshavn
DISKO BUGT
Prospecting Licence
55°
53°
51°
71° N
70°
69°
FIGURE 7



FALCONBRIDGE LIMITED
EXPLORATION DEPT.
WINDSOR, NOVA SCOTIA.
WEST GREENLAND
1:100,000 MAP SHEET LOCATIONS
Project Nº 015-905
N.T.S.Nº
Scale
Date Feb. 1992
Geologist K.O.
Drafted by H.R.
GREENLAND
Area of Map
Location Map
Extent of the West Greenland Basalt Province on land.
Boundary of 1:100,000 series Map Sheets
SCALE
0
50
100
KILOMETRES
Upernavik
55°
53°
51°
Map1-"Svartenhuk"
SVARTENHUK HALVØ
KARRAT ISFJORD
Ubekend Ejland
Map2-"Ubekend"
71° N
UMANAK FJORD
Umanaq
NUGSSUAQ
Map3-"Nugssuaq"
DISKO
VAIGAT
70°
Map4-"Disko" (1:100.000 series)
Godhavn
Jakobshavn
DISKO BUGT
69°

FIGURE 8

LITHOGEOCHEMISTRY

Lavas

Introduction

Whole rock analyses by XRAY Assay Laboratories includes the 11 major oxides, trace elements Rb, Sr, Y, Zr, Ba, Nb plus LOI, Cu, Zn, Ni, Co, and S by the Xray fluorescence method (XRF). The 1991 whole rock data has been recalculated to anhydrous condition (the 11 major oxides) for plotting. The term "Mg number" as used in this report was determined using the formula: Mg Number = (wt% MgO/40.32)/((wt% MgO/40.32) + 0.85 (wt% FeO total/71.85)). A statistical review of thirty-eight reference controls indicate the analytical precision for Rb, Nb, Y and Zr is poor and therefore any conclusions based on these elements should not be considered conclusive.

Discussion of Results

Stratigraphic correlation between profile sections and geographical regions was based upon field observations, stratigraphic profile sections and trace element spidergrams. The spidergrams used elements Ba, Rb, K, Nb, Sr, Zr, P, Ti and Y which were first normalized against Nanjánguit Member basalt sample AF07735, then normalized against Zr and multiplied by 10 for plotting.

On Disko Island, stratigraphic profile sections D-91-01 to 05 have been correlated with the Vaigat type section (Pedersen, 1985). A stratigraphic type section for Nuussuaq was derived from profile sections N-91-08, N-91-09 and N-91-10 utilizing a nomenclature of picrite and basalt. The remaining seven profile sections were tied into the new type section. The Nuussuaq type section was employed in subdividing lavas on Ubekendt Island. On Svartenhuk Peninsula, the subdivision of the stratigraphy by Larsen (1981), was simplified by combining the Middle and Upper Formations and assigning the name Svartenhuk Formation. The Lower Formation correlates with the Vaigat Formation and has been subdivided into picrite and basalt flows. The lack of chemical variation in the Lower Formation lavas has hindered correlation with the Nuussuaq type section and the separation of the Naujánguit and Ordlingassoq volcanic cycles.

The Ni/MgO versus Mg Number plot (figure 9), clearly depicts Disko Island and Nuussuaq Peninsula as the two areas hosting the most Ni-depleted and enriched lavas in the basalt province. Only one area on Svartenhuk Peninsula contains Ni-depleted lavas. The

Ni/MgO versus Mg number plot (figure 10) for the entire West Greenland Basalt province indicates Ni-depletion in lavas falls within depleted levels defined for Noril'sk lavas (Naldrett, 1991). The Cu versus Ni plot illustrates Cu depletion in the basalt province is closely associated with Ni-depletion (figure 11).

Disko Island

The stratigraphic members subdivision is shown on the TiO_2 versus MgO plot (figure 12). The Cu versus Ni plot indicate lavas within the Asuk and Kûgánguaq Members are depleted in both elements (figure 13). Asger Ken Pedersen (1985), considers sulphide segregation rather than olivine fractionation was responsible for the loss of nickel in the Kûgánguaq Member. Two Ni-enriched samples on the Ni versus MgO plot (figure 14) represent lavas of the Asuk Member exposed in the Kûgánguaq Valley. Samples AF07738 and AF07739 were collected at the base of profile D-91-04 located 900m south of Cominco's 1985 EM airborne anomaly D-18. The high sulphur content in the samples (1.7% S) must be due to disseminated sulphide mineralization.

Nuussuaq Peninsula

The TiO_2 versus MgO plot is very useful in the separating basalt #1 from basalts #2 and basalt #3 (figure 15). Negligible geochemical distinction exists between basalt #2 & basalt #3, but they are stratigraphically separated in the field by picrite #3. Both basalt #2 & basalt #3 plot within or near the field for the Asuk Member on Disko Island. The Cu versus Ni plot (figure 16) illustrates Cu and Ni depletion occurred in basalts #1, 2 & 3 and less commonly in picrites #3 & 4. The Cu and Ni versus MgO plots show Cu-depletion is more restricted to the basalts (figure 17) whereas the loss and enrichment of Ni is clearly evident in both basalts and high MgO picrites (figure 18). The discovery of Ni-depleted picrites is significant in cases where it can be proved that removal of Ni was through sulphide segregation. The availability of Ni in a high MgO magma would increase the Ni to S ratio and theoretically result in higher grade Ni deposit. Nickel depleted picritic lavas are poorly represented on the Ni versus MgO plot due to the 30m sampling interval used during the summer program. Microprobe analyses planned for later in 1992 could ensure the Ni loss was not solely due to olivine fractionation.

Ubekendt Island

The lavas in northern Ubekendt Island are best correlated with the Nuussuaq picrite #2 series of flows (figure 19). No depletion of the siderophile or chalcophile elements was detected in the lavas sampled (figure 20).

Svartenhuk Peninsula

Nickel and copper depleted flows were only recognized near Uligsivik, immediately west of Itsako Peninsula. The lavas occur in the Lower Formation (Vaigat) at an elevation of 410m and appear to have a limited lateral extent. The lavas plot off the normal differentiation trends on the Cu versus MgO diagram (figure 21). The Ni and Cu depleted lavas plot in the Asuk field on the TiO_2 versus MgO diagram (figure 22).

Stratigraphic Correlation

A preliminary correlation between the Nuussuaq Peninsula type section and the Disko Island Vaigat type section correlates units below Nuussuaq picrite #4 with the Naujánguit Member. Nuussuaq picrite #4 and it's overlying lavas correlate with the Ordlingassoq Member (figure 23). Contaminated Nuussuaq basalt #2 series is tentatively correlated with the Asuk Member on Disko Island and linked to the contaminated lavas on Svartenhuk Peninsula. This correlations would indicate the Asuk event may represent the largest and most extensive eruption of contaminated lava in the West Greenland flood basalt province.

Limited sampling of the lavas on the northern tip of Ubekendt Island best correlate with Nuussuaq picrite #2. Contaminated volcanics and intrusions appear to be absent on Ubekendt Island.

The Svartenhuk Formation on Svartenhuk Peninsula is correlated with the Maligat Formation exposed in the southern portion of the basalt province. If the correlation is correct, the lavas directly underlying the Svartenhuk Formation in central and northern Svartenhuk would represent the Ordlingassoq Member (Nuussuaq picrite #4 to #6). Lavas sampled in southern Svartenhuk are therefore Naujánguit Member equivalents. However, no positive identification of the volcanic cycle can be made.

Stratigraphic Conclusions

Figure 24 is a profile sketch that summarizes the stratigraphic correlations across the four geographical regions.

Nickel depleted, contaminated lavas in the picritic Vaigat Formation are more abundant in the Naujánguit Member which represents the first volcanic eruption cycle in the Tertiary flood basalt province. The Naujánguit Member (lower Vaigat Formation) has been identified on Disko Island, Nuussuaq Peninsula, Ubekendt Island and potentially in southern Svàrtenhuk. The upper Vaigat volcanic cycle (Ordlingassoq Member) composed of tholeiitic picritic lava and hyaloclastite is slightly more extensive but contains only minor contaminated flows. The upper volcanic cycle can be traced from Disko Island through to northern Svartenhuk were it is faulted against the Svartenhuk Formation.

Nuussuaq Peninsula and Disko Island have been identified as the two regions hosting the highest percentage of sediment contaminated lavas in the basalt province. The depletion of Ni and Cu in these lavas is clearly evident in the 1991 whole rock data and in previously published work. The plot of Ni versus 100 x $Mg/(Mg+Fe^{2+})$ clearly illustrates that Ni loss in both West Greenland lavas and Noril'sk lavas and intrusions is not the result of olivine fractionation (figure 25). The West Greenland olivines contain less Ni then the sampled Noril'sk olivines. The removal of Ni through sulphide segregation versus olivine fractionation strengthens the analogy with the Noril'sk model. On Nuussuaq Peninsula alone, it is estimated that over 10 million tons of Ni containing PGE has been removed from contaminated lavas outlined by Greenex in 1987 (Ulff-Møller, 1991). The recent discovery of Ni depletion in picrite lavas could significantly add to this Ni inventory.

Contaminated lavas on Nuussuaq Peninsula and Disko Island merely reflect the magmatic processes that occurred at depth. The key exploration targets are Ni mineralized, subvolcanic intrusions that may or may not be associated with eruption centres for the contaminated lavas. Therefore, exploration effort must concentrate on identifying all major eruption sites and investigating any associated intrusive body.

WEST GREENLAND FLOOD BASALT FLOWS

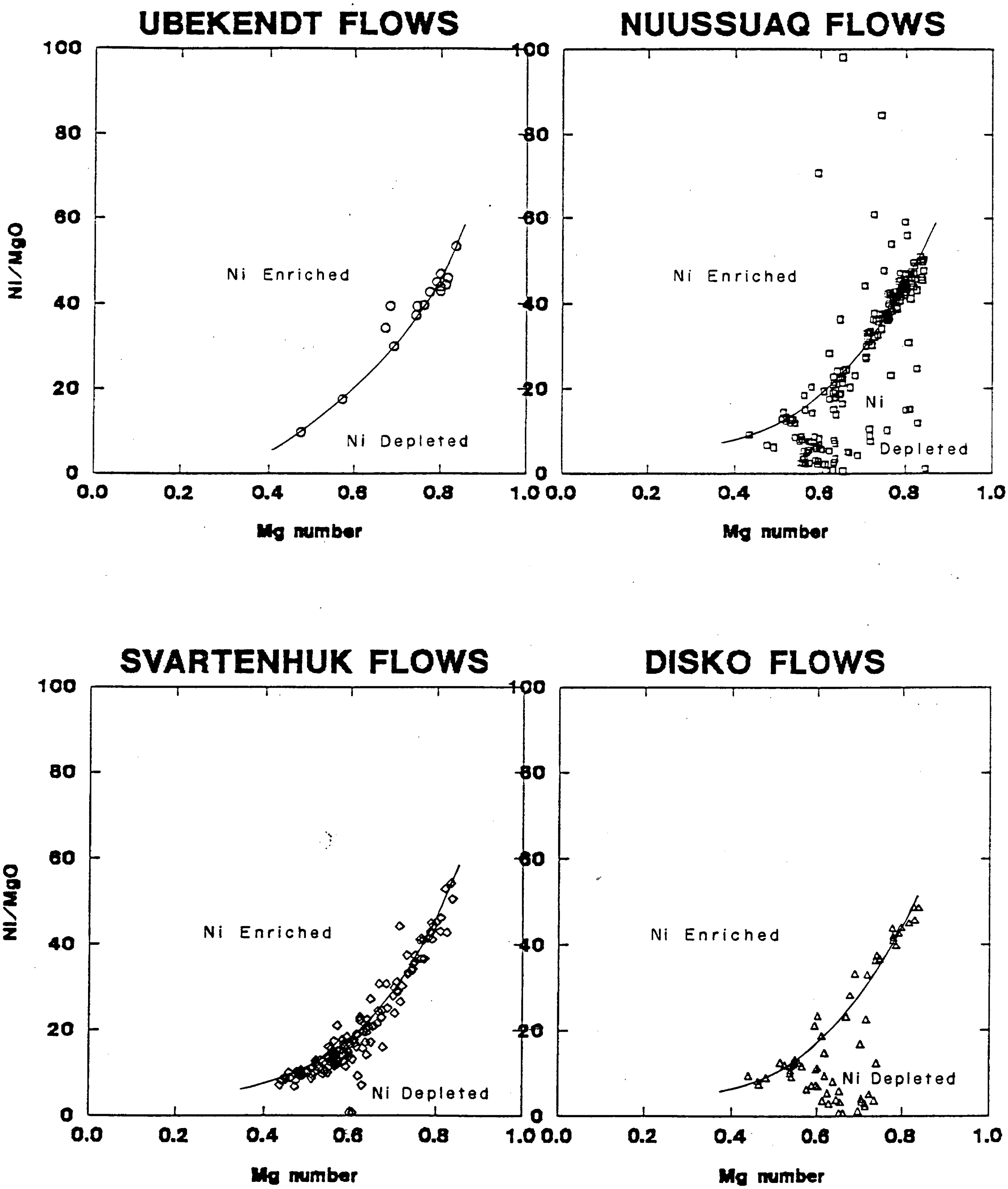
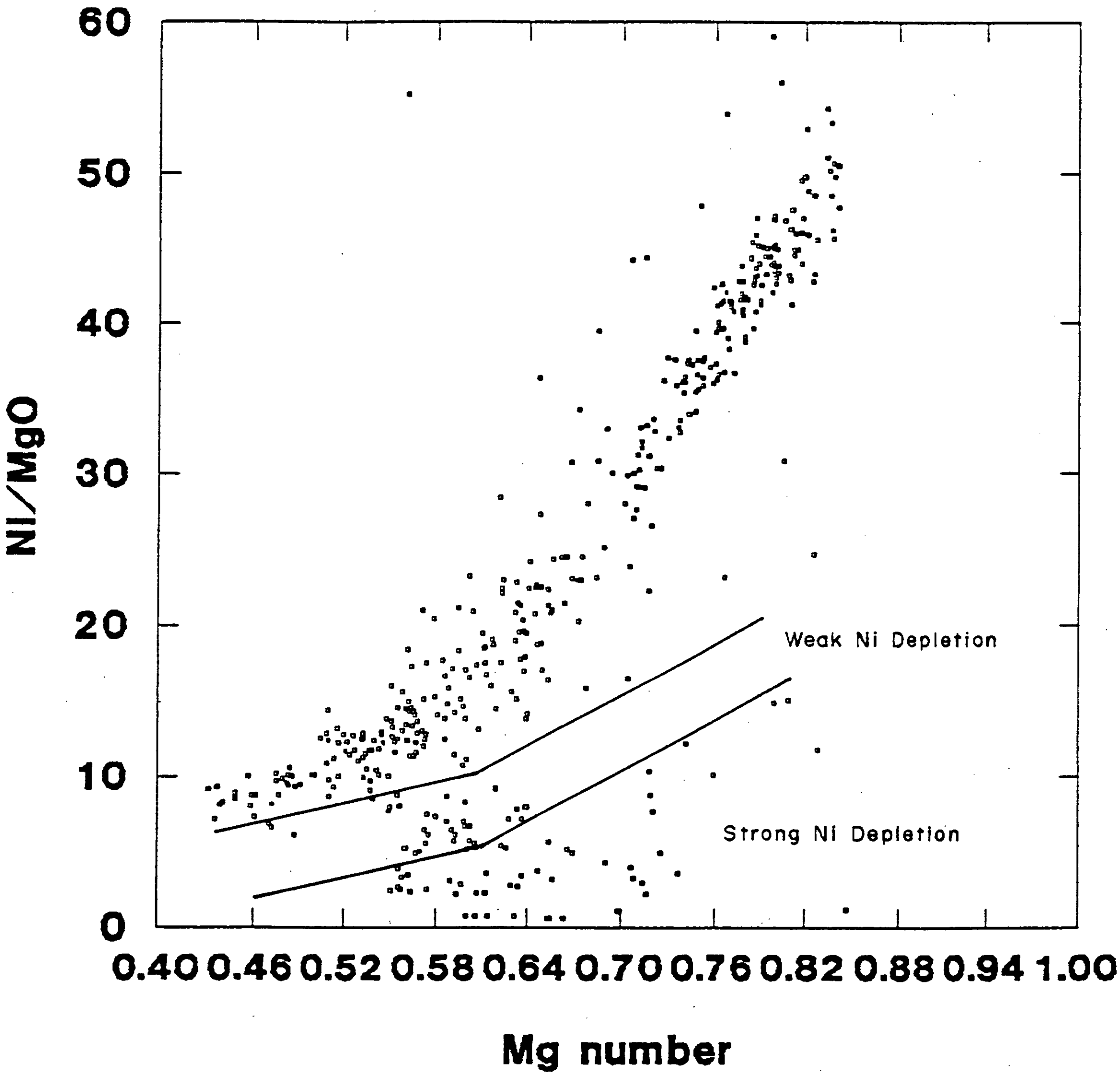


FIGURE 9

WEST GREENLAND FLOWS



FALCONBRIDGE LIMITED

WEST GREENLAND

NORILS'K TYPE Ni DEPLETION
IN GREENLAND FLOWS

SCALE:

DATE OF WORK:		CLAIMS:	Figure Nº
ORIGINAL BY: K. O.	Date: Jan 92	PROJECT NUMBER: 015-905	10
REVISED BY:	Date:		
DRAWN BY:	Date:	N.T.S. Nº:	
APPROVED BY:	Date:	MAP Nº:	

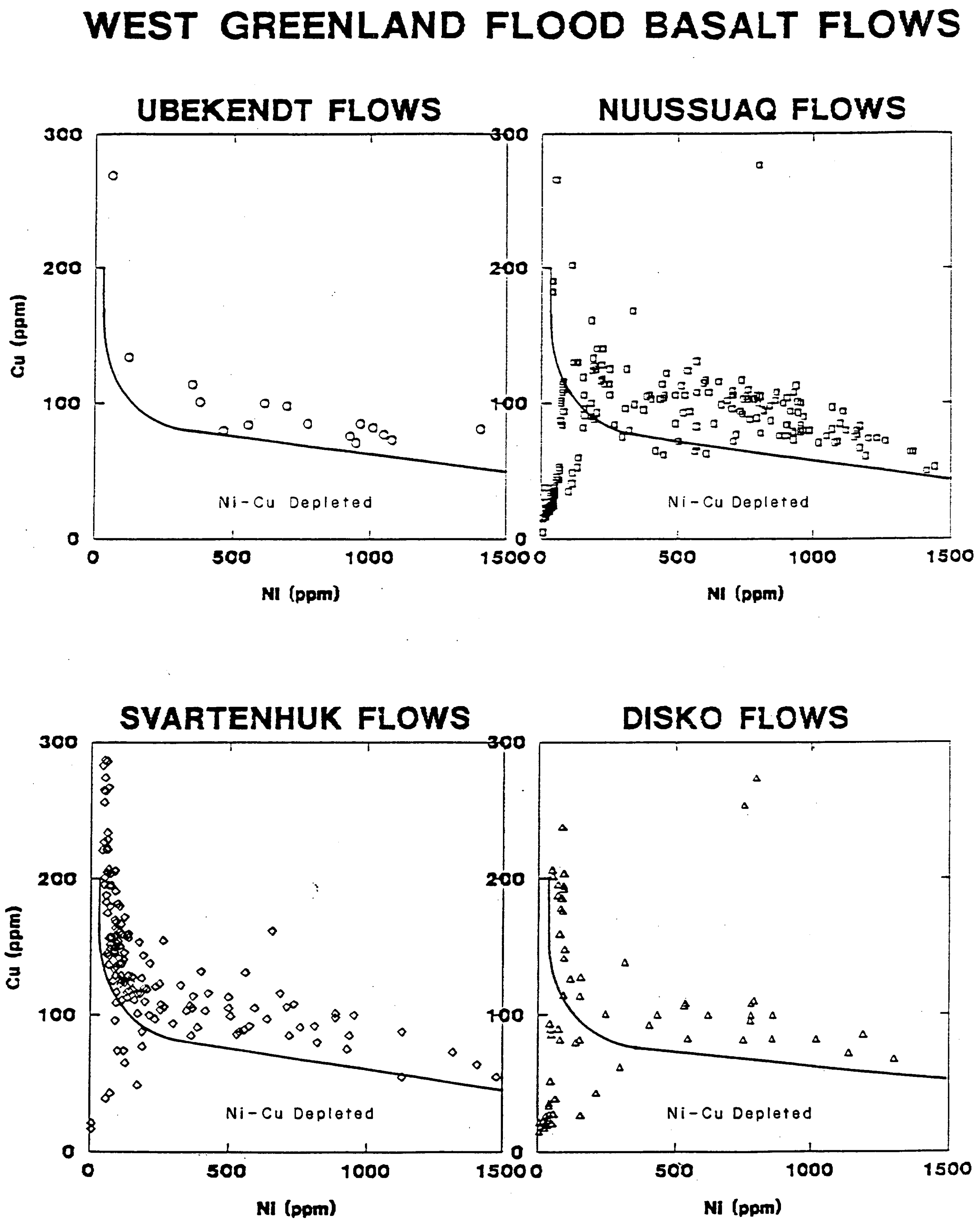
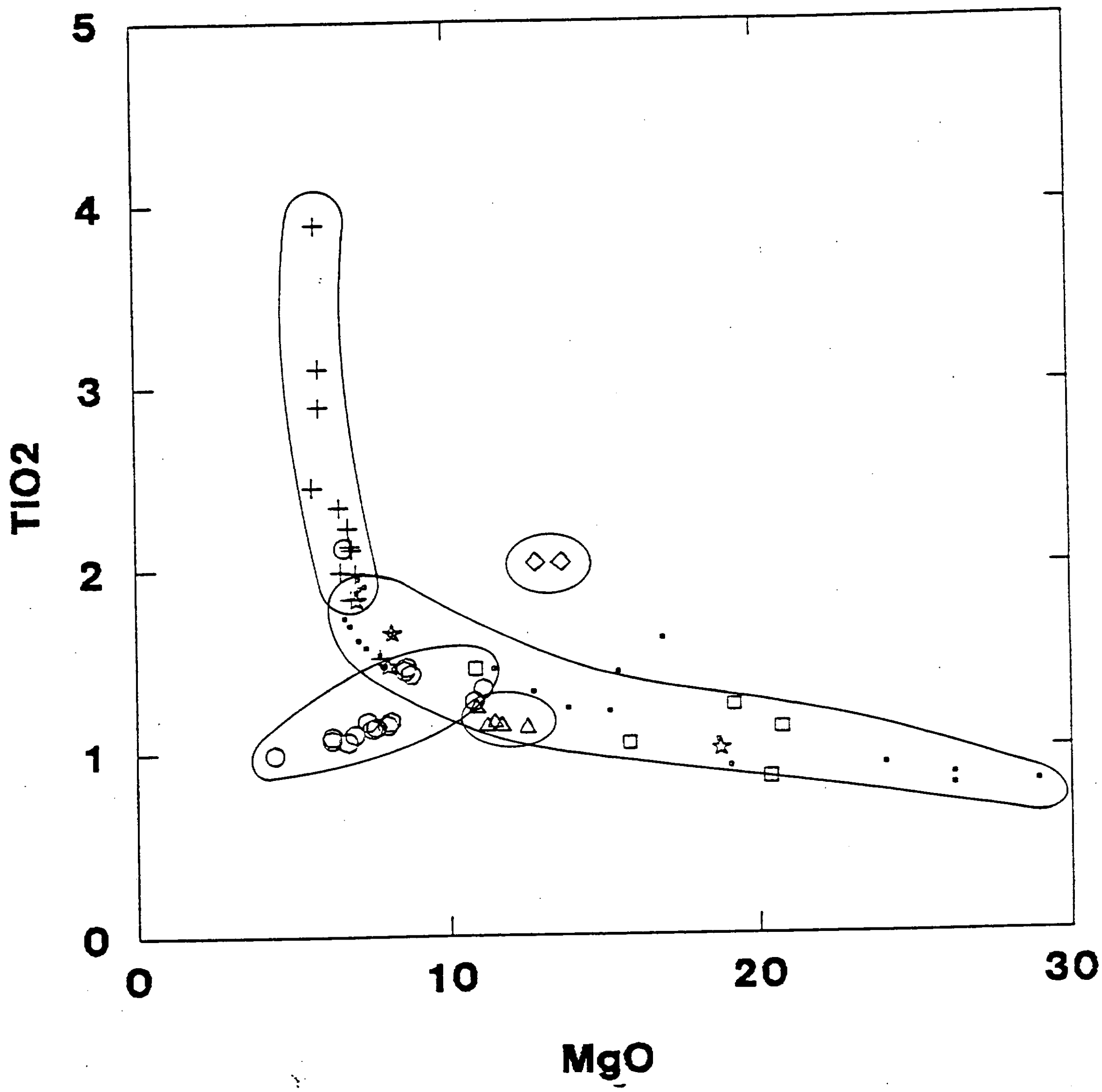

WEST GREENLAND FLOOD BASALT FLOWS
UBEKENDT FLOWS
NUUSSUAQ FLOWS
SVARTENHUK FLOWS
DISKO FLOWS
Cu (ppm)
Ni (ppm)
Ni-Cu Depleted
0
100
200
300
500
1000
1500

FIGURE II

DISKO FLOWS



LEGEND

MALIGAT FORMATION

- \+ NIAQUSSAT
- RINKS DAL

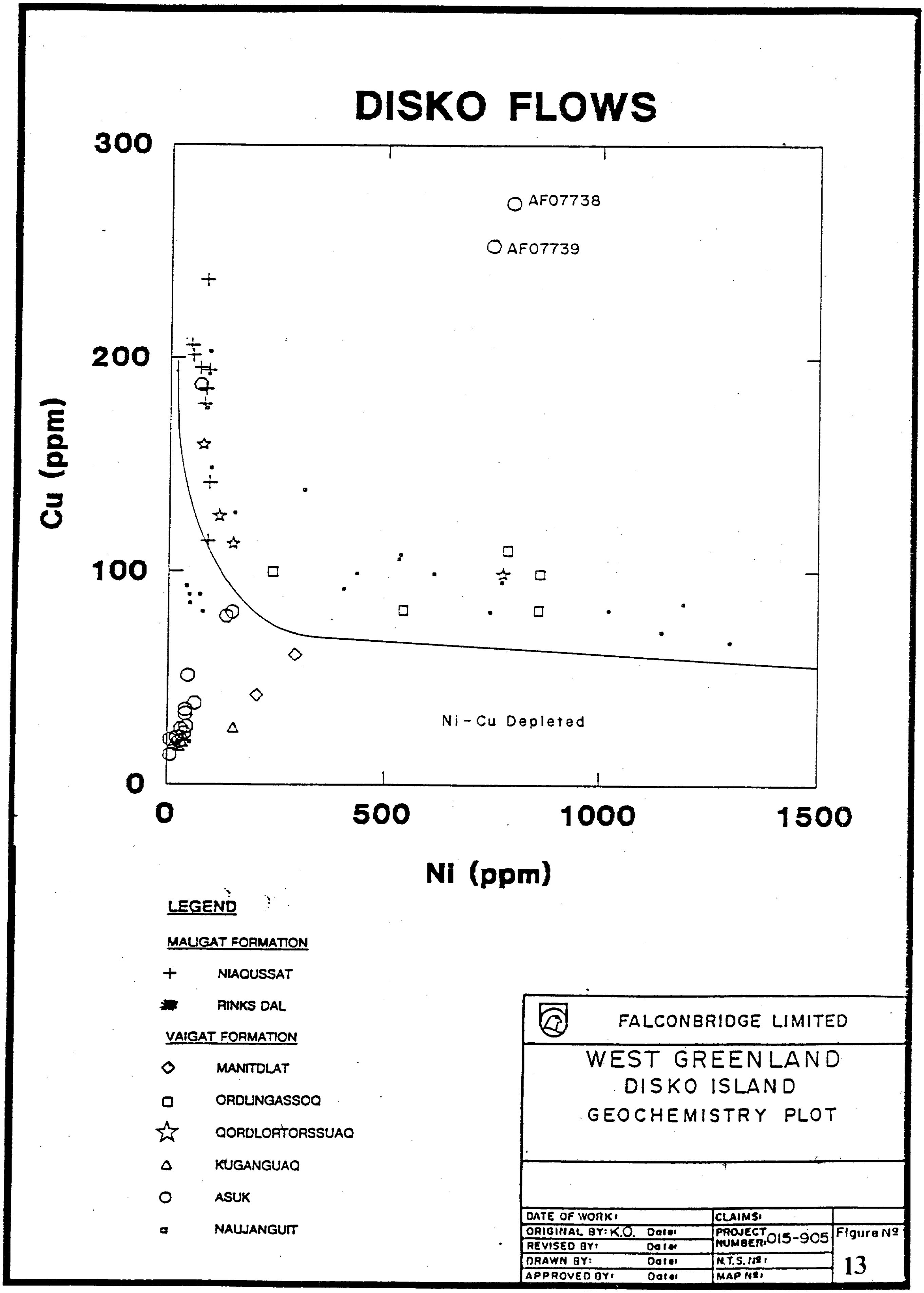
VAIGAT FORMATION

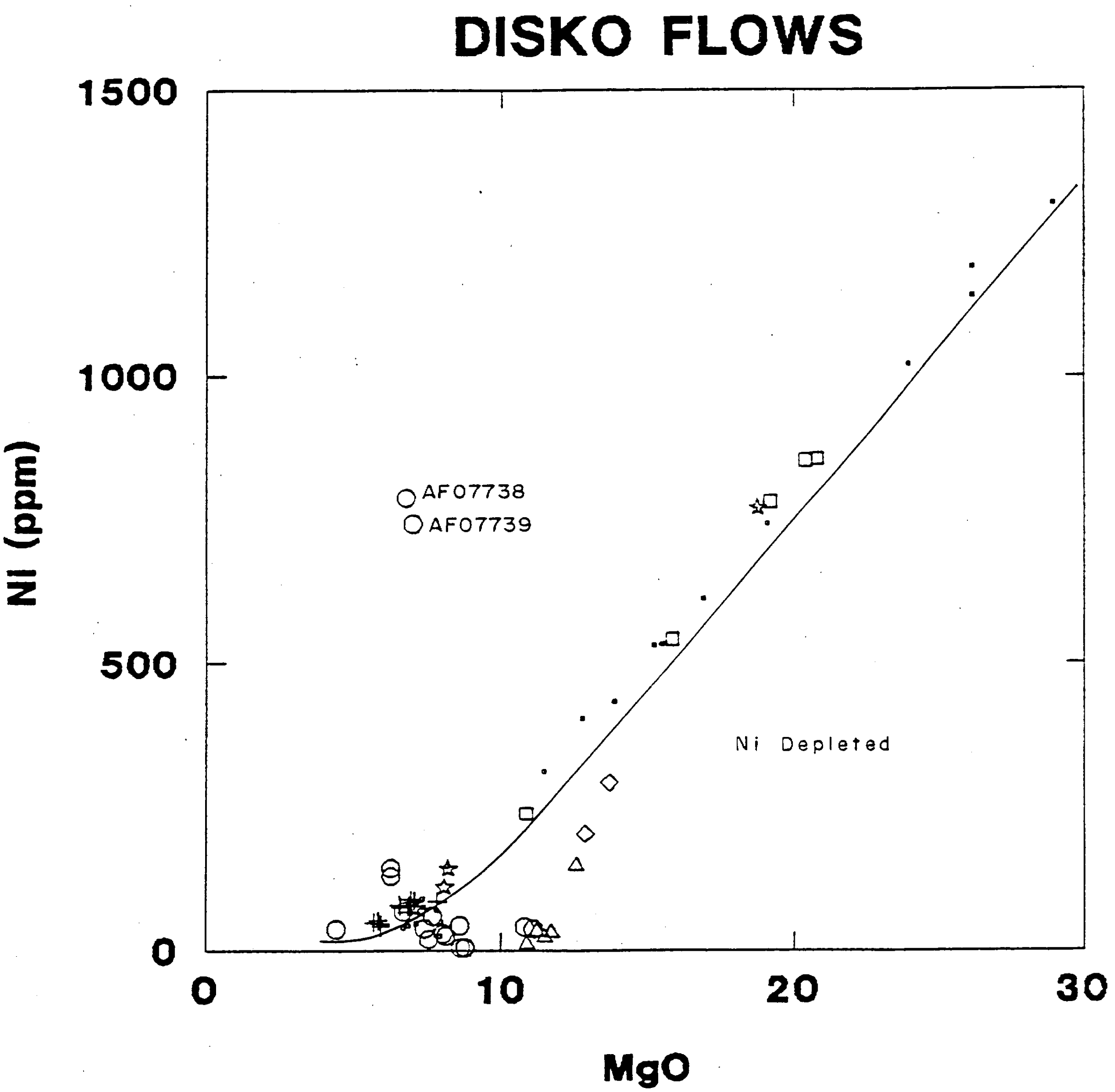
- ◇ MANITDLAT
- □ ORDLINGASSOQ
- ☆ QORDLORTORSSUAQ
- △ KUGANGUAQ
- ○ ASUK
- ▫ NAUJANGUIT

FALCONBRIDGE LIMITED

WEST GREENLAND
DISKO ISLAND
GEOCHEMISTRY PLOT

DATE OF WORK:		CLAIMS:	
ORIGINAL BY: K.O.	Date:	PROJECT NUMBER: 015-905	Figure Nº 12
REVISED BY:	Date:	N.T.S. Nº:	
DRAWN BY:	Date:	MAP Nº:	
APPROVED BY:	Date:		


DISKO FLOWS
300
200
100
0
Cu (ppm)
AF07738
AF07739
Ni-Cu Depleted
0
500
1000
1500
Ni (ppm)
LEGEND
MALIGAT FORMATION
NIAQUSSAT
RINKS DAL
VAIGAT FORMATION
MANITDLAT
ORDLINGASSOQ
QORDLORTORSSUAQ
KUGANGUAQ
ASUK
NAUJANGUIT
FALCONBRIDGE LIMITED
WEST GREENLAND
DISKO ISLAND
GEOCHEMISTRY PLOT
DATE OF WORK:
CLAIMS:
ORIGINAL BY: K.O. Date:
PROJECT NUMBER: 015-905
Figure Nº
REVISED BY: Date:
DRAWN BY: Date:
N.T.S. Nº:
APPROVED BY: Date:
MAP Nº:
13



LEGEND

MALIGAT FORMATION

- + NIAQUSSAT
- RINKS DAL

VAIGAT FORMATION

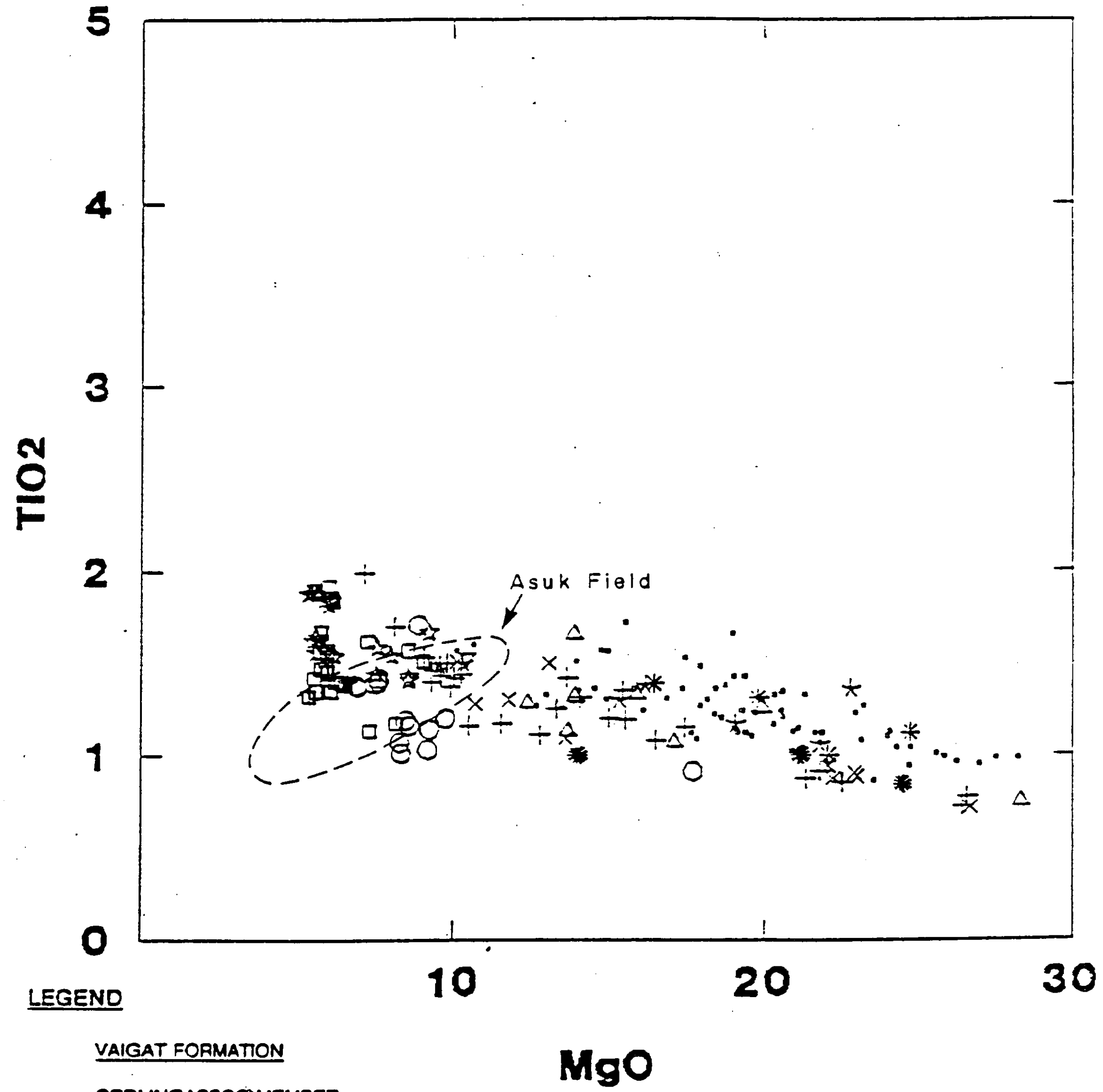
- ◇ MANITDLAT
- □ ORDLINGASSOQ
- ☆ QORDLORTORSSUAQ
- △ KUGANGUAQ
- ○ ASUK
- ▫ NAUJANGUIT

FALCONBRIDGE LIMITED

WEST GREENLAND
DISKO ISLAND
GEOCHEMISTRY PLOT

DATE OF WORK:	CLAIMS:	
ORIGINAL BY: K.O. Date:	PROJECT NUMBER: 015-905	Figure Nº
REVISED BY: Date:		14
DRAWN BY: Date:	N.T.S. Nº:	
APPROVED BY: Date:	MAP Nº:	

NUUSSUAQ FLOWS



LEGEND

VAIGAT FORMATION

ORDLINGASSOQ MEMBER

- ▽ PICRITE 6
- ✸ PICRITE 5
- ★ BASALT 4
- ▫ PICRITE 4

NAUJANGUIT MEMBER

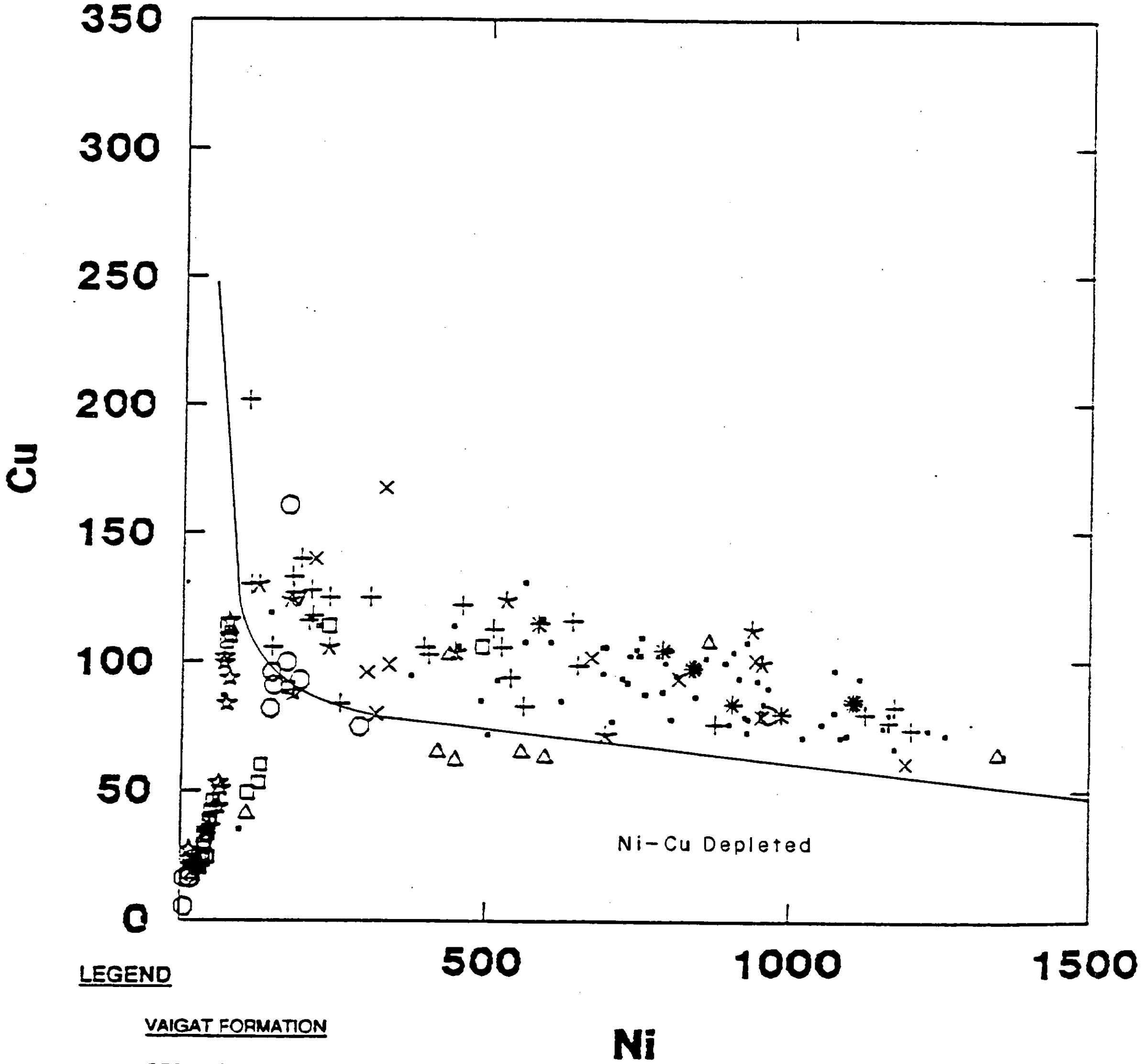
- ☆ BASALT 3
- △ PICRITE 3
- □ BASALT 2
- + PICRITE 2
- ○ BASALT 1
- × PICRITE 1
- ✳ HYALOCLASTIC BRECCIA

FALCONBRIDGE LIMITED

WEST GREENLAND
NUUSSUAQ PENINSULA
GEOCHEMISTRY PLOT

DATE OF WORK:		CLAIMS:	Figure Nº
ORIGINAL BY: K.O.	Date:	PROJECT NUMBER: 015-905	15
REVISED BY:	Date:		
DRAWN BY:	Date:	N.T.S. Nº:	
APPROVED BY:	Date:	MAP Nº:	

NUUSSUAQ FLOWS



LEGEND

VAIGAT FORMATION

ORDLINGASSOQ MEMBER

▽ PICRITE 6

✸ PICRITE 5

★ BASALT 4

▪ PICRITE 4

NAUJANGUIT MEMBER

☆ BASALT 3

△ PICRITE 3

□ BASALT 2

+ PICRITE 2

○ BASALT 1

X PICRITE 1

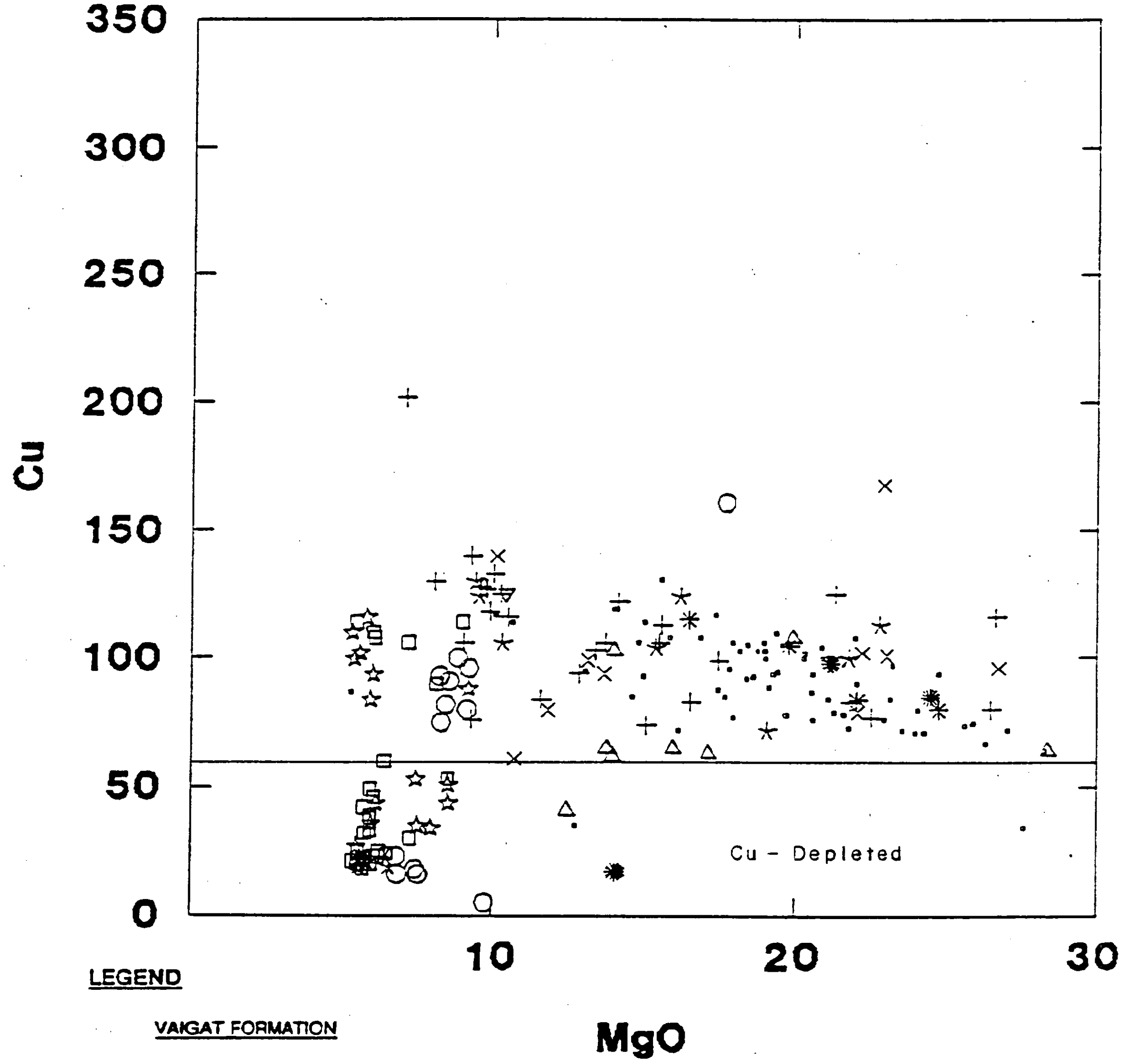
✳ HYALOCLASTIC BRECCIA

FALCONBRIDGE LIMITED

WEST GREENLAND
NUUSSUAQ PENINSULA
GEOCHEMISTRY PLOT

DATE OF WORK:		CLAIMS:	Figure Nº
ORIGINAL BY: K.O.	Date:	PROJECT NUMBER: 015-905	16
REVISED BY:	Date:		
DRAWN BY:	Date:	N.T.S. Nº:	
APPROVED BY:	Date:	MAP Nº:	

NUUSSUAQ FLOWS



LEGEND

VAIGAT FORMATION

ORDLINGASSOQ MEMBER

▽ PICRITE 6

✸ PICRITE 5

* BASALT 4

▫ PICRITE 4

NAUJANGUIT MEMBER

☆ BASALT 3

△ PICRITE 3

□ BASALT 2

+ PICRITE 2

○ BASALT 1

X PICRITE 1

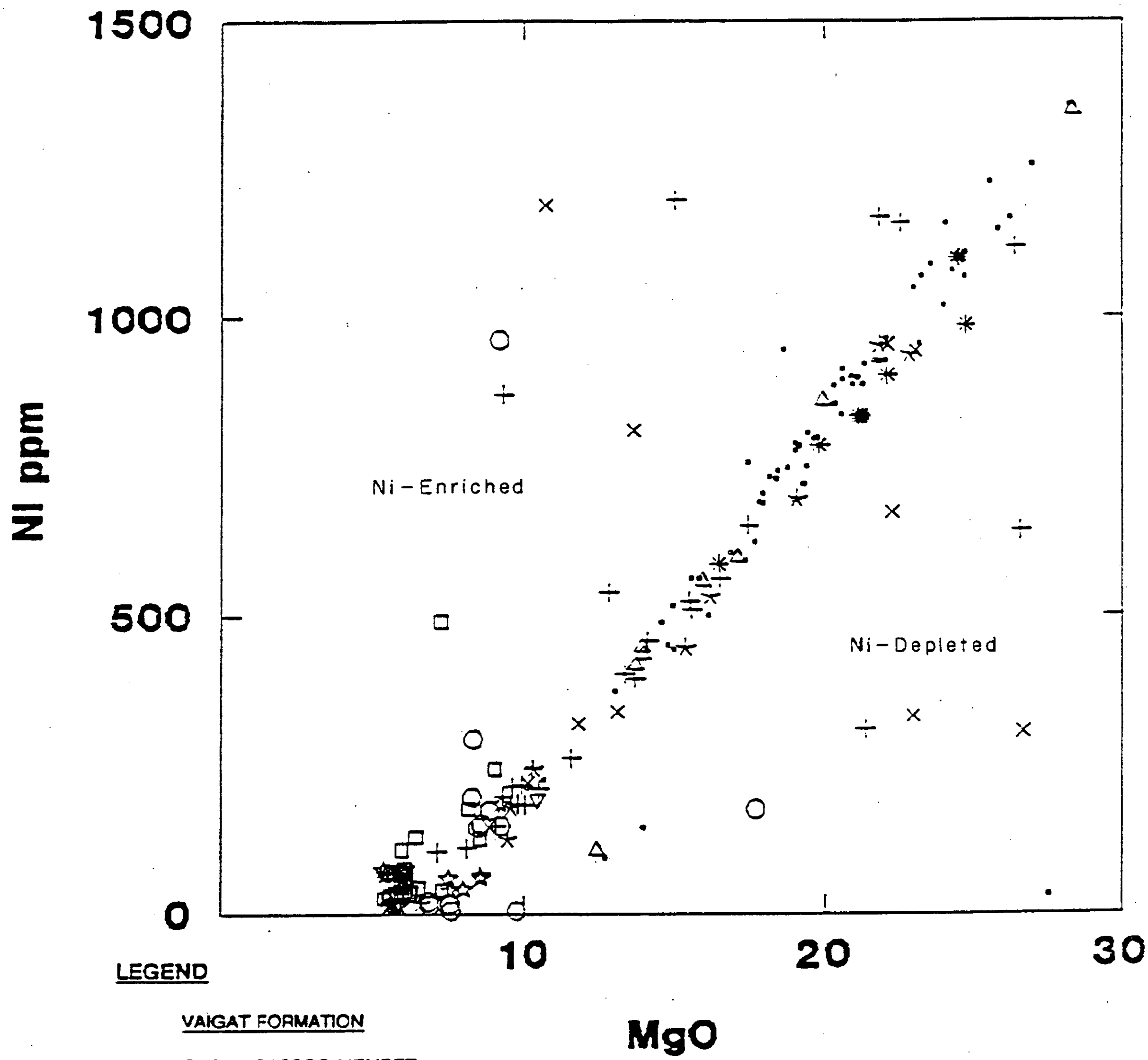
✱ HYALOCLASTIC BRECCIA

FALCONBRIDGE LIMITED

WEST GREENLAND
NUUSSUAQ PENINSULA
GEOCHEMISTRY PLOT

DATE OF WORK:		CLAIMS:	
ORIGINAL BY: K.O.	Date:	PROJECT NUMBER: 015-905	Figure Nº 17
REVISED BY:	Date:		
DRAWN BY:	Date:	N.T.S. Nº:	
APPROVED BY:	Date:	MAP Nº:	

NUUSSUAQ FLOWS



LEGEND

VAIGAT FORMATION

ORDLINGASSOQ MEMBER

- ▽ PICRITE 6
- ✹ PICRITE 5
- ★ BASALT 4
- ▫ PICRITE 4

NAUJANGUIT MEMBER

- ☆ BASALT 3
- △ PICRITE 3
- □ BASALT 2
- + PICRITE 2
- ○ BASALT 1
- X PICRITE 1
- ✱ HYALOCLASTIC BRECCIA

FALCONBRIDGE LIMITED

WEST GREENLAND
NUUSSUAQ PENINSULA
GEOCHEMISTRY PLOT

DATE OF WORK:		CLAIMS:	Figure №
ORIGINAL BY: K.O.	Date:	PROJECT NUMBER: 015-905	18
REVISED BY:	Date:		
DRAWN BY:	Date:	N.T.S. №:	
APPROVED BY:	Date:	MAP №:	

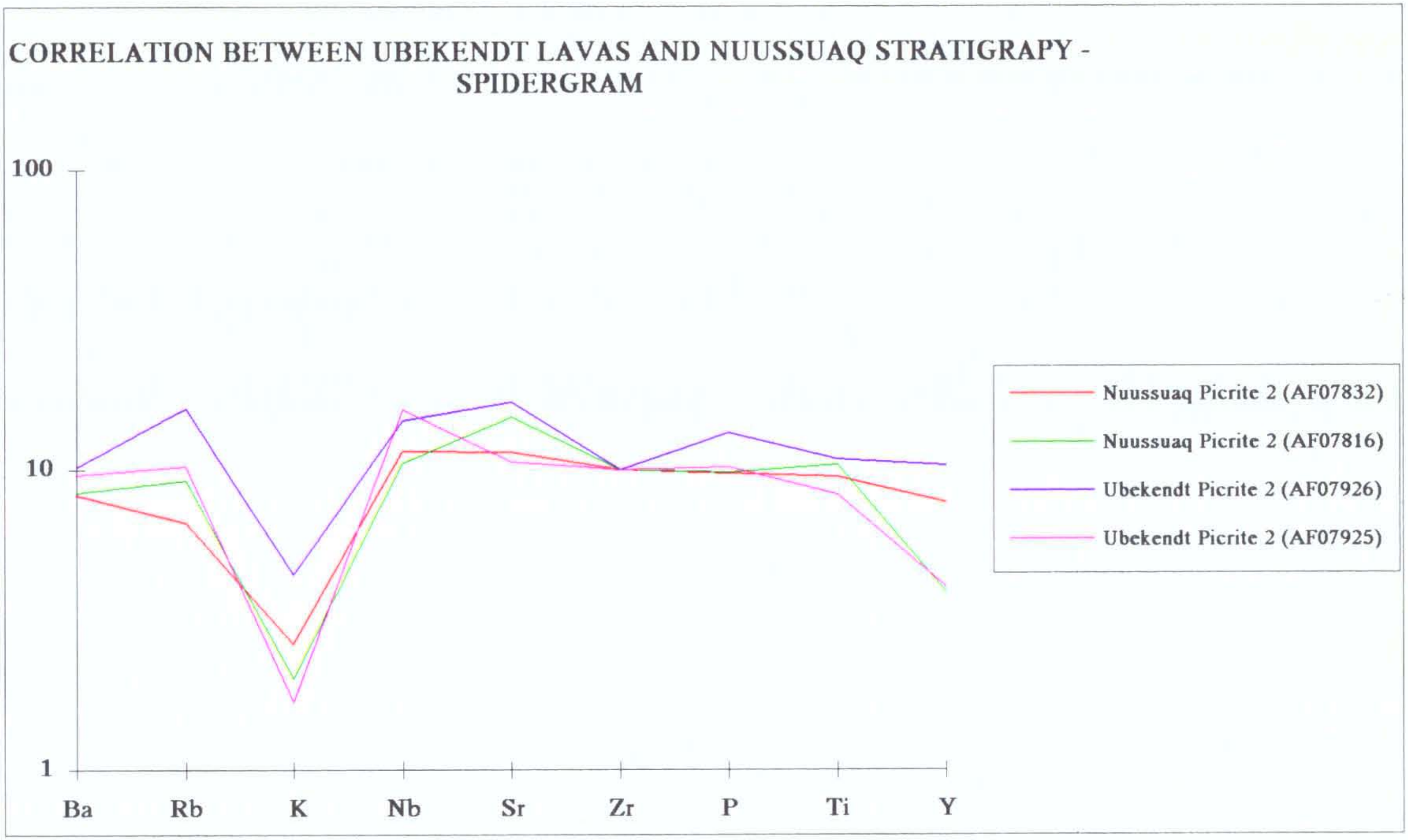
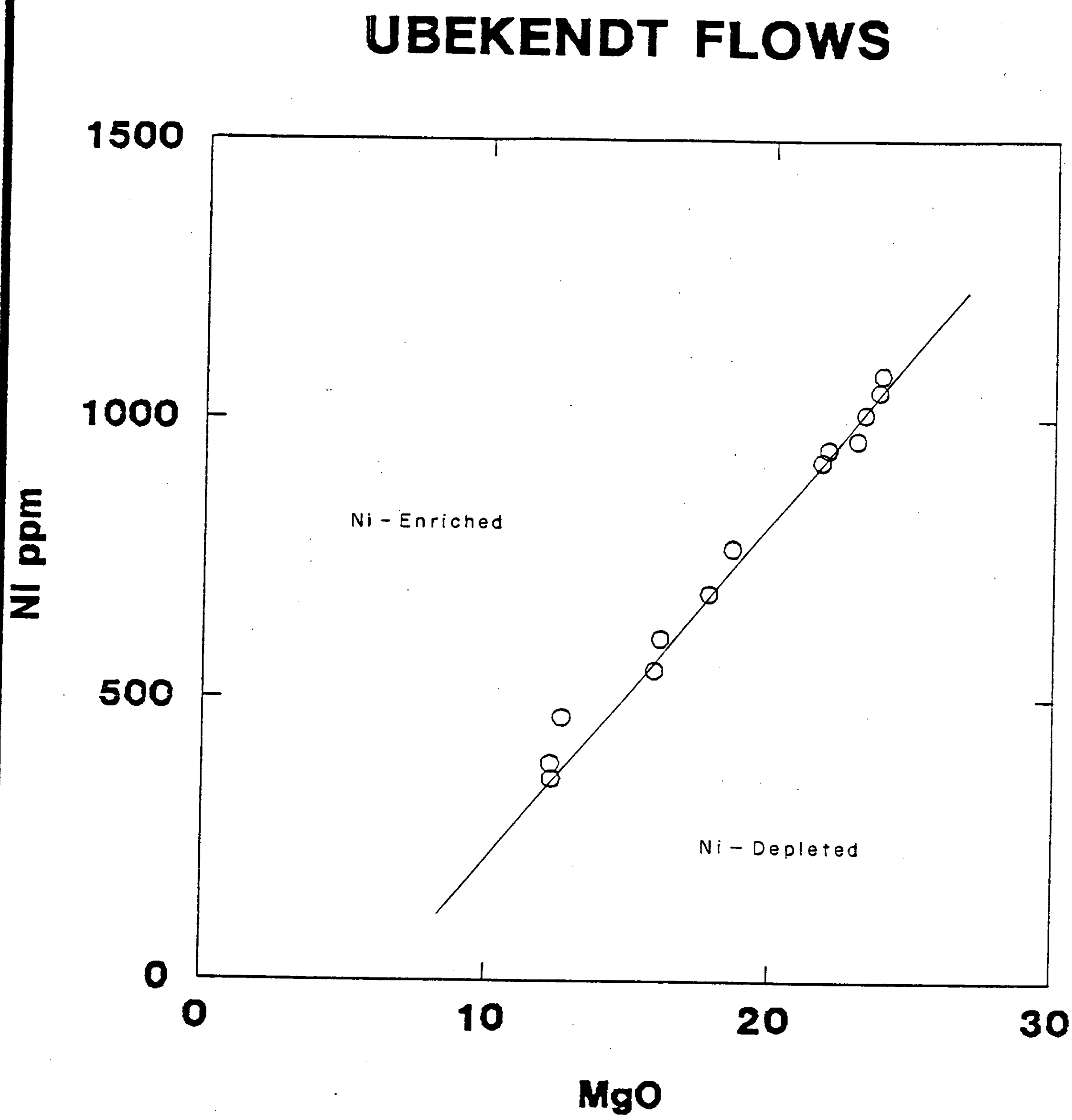

CORRELATION BETWEEN UBEKENDT LAVAS AND NUUSSUAQ STRATIGRAPY -
SPIDERGRAM
100
10
1
Ba
Rb
K
Nb
Sr
Zr
P
Ti
Y
Nuussuaq Picrite 2 (AF07832)
Nuussuaq Picrite 2 (AF07816)
Ubekendt Picrite 2 (AF07926)
Ubekendt Picrite 2 (AF07925)

FIGURE 19



LEGEND

NAUJANGUIT

○ PICRITE 2 (NUUSSUAQ)

FALCONBRIDGE LIMITED

WEST GREENLAND
UBEKENDT ISLAND
GEOCHEMISTRY PLOT

SCALE:

DATE OF WORK:		CLAIMS:	Figure Nº 20
ORIGINAL BY: K.Q.	Date:	PROJECT NUMBER: 015-905	
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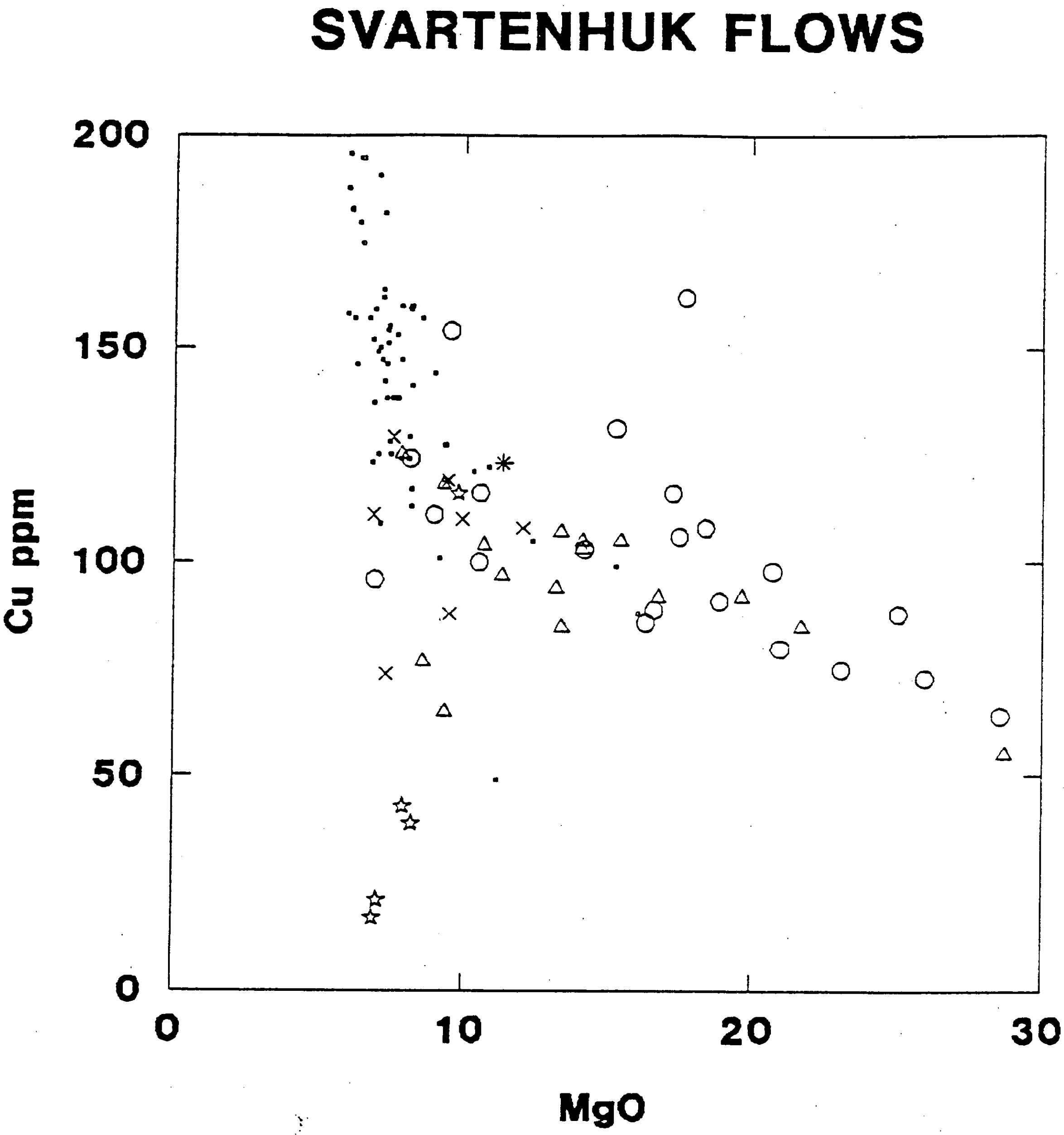

LEGEND

MIDDLE-UPPER FORMATION (MALIGAT)

▫ SVARTENHUK FORMATION

LOWER FORMATION (VAIGAT)

○ PICRITE II

× BASALT (BASALT 4 NUUSSUAQ?)

△ PICRITE I

☆ CONTAMINATED BASALT (BASALT 2 NUUSSAUQ?)

✱ HYALOCLASTITE BRECCIA

FALCONBRIDGE LIMITED

WEST GREENLAND
SVARTENHUK PENINSULA
GEOCHEMISTRY PLOT

SCALE:

DATE OF WORK:		CLAIMS:	Figure Nº 21
ORIGINAL BY: K.O.	Date:	PROJECT NUMBER: 015-905	
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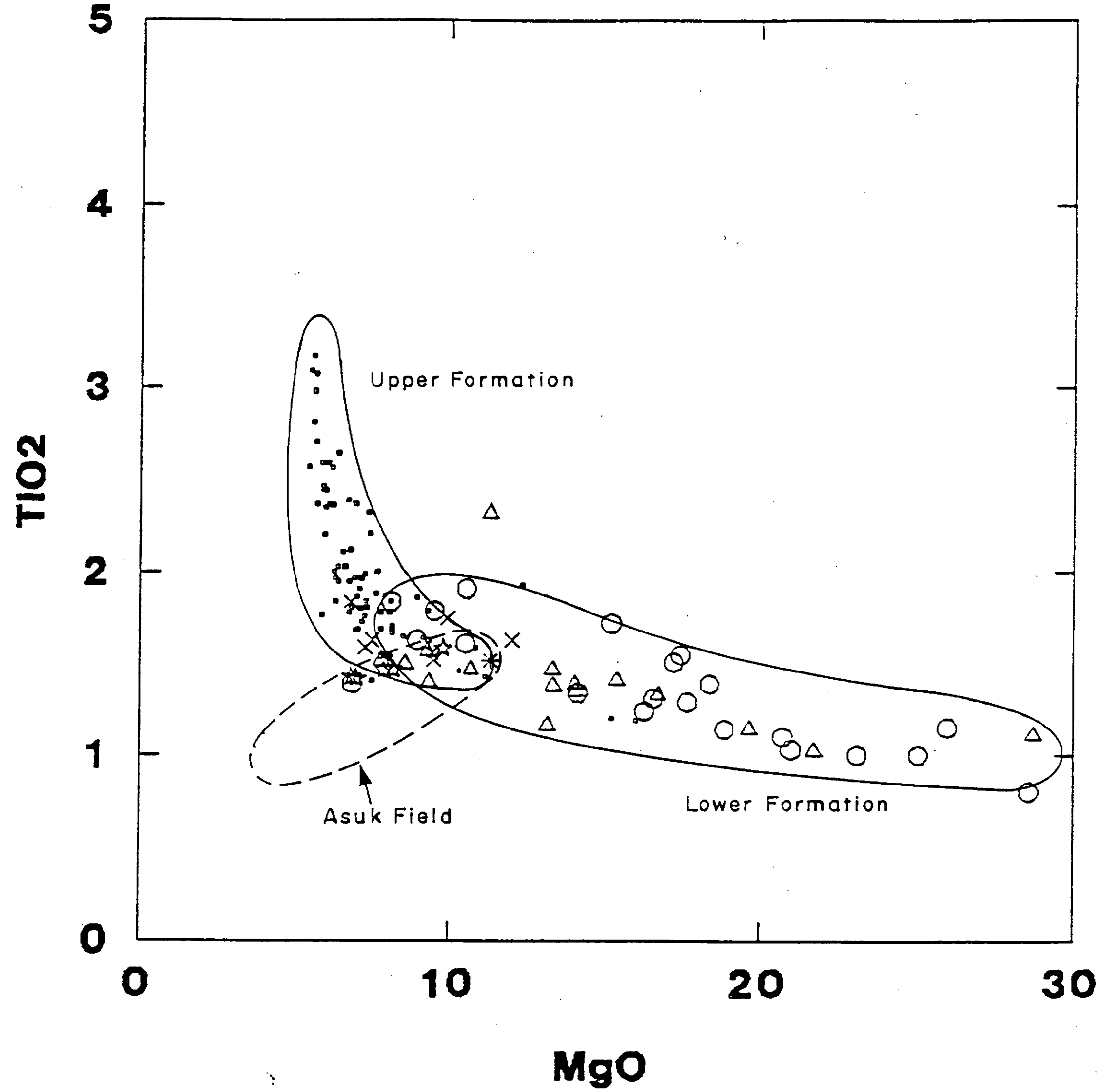
DRAWN BY:	Date:	N.T.S. Nº:	
APPROVED BY:	Date:	MAP Nº:	

SVARTENHUK FLOWS



LEGEND

MIDDLE-UPPER FORMATION (MALIGAT)

▫ SVARTENHUK FORMATION

LOWER FORMATION (VAIGAT)

O PICRITE II

X BASALT (BASALT 4 NUUSSUAQ?)

Δ PICRITE I

☆ CONTAMINATED BASALT (BASALT 2 NUUSSUAQ?)

✱ HYALOCLASTITE BRECCIA

FALCONBRIDGE LIMITED

WEST GREENLAND
SVARTENHUK PENINSULA
GEOCHEMISTRY PLOT

SCALE:

DATE OF WORK:		CLAIMS:	Figure Nº
ORIGINAL BY: K.O.	Date:	PROJECT NUMBER: 015-905	22
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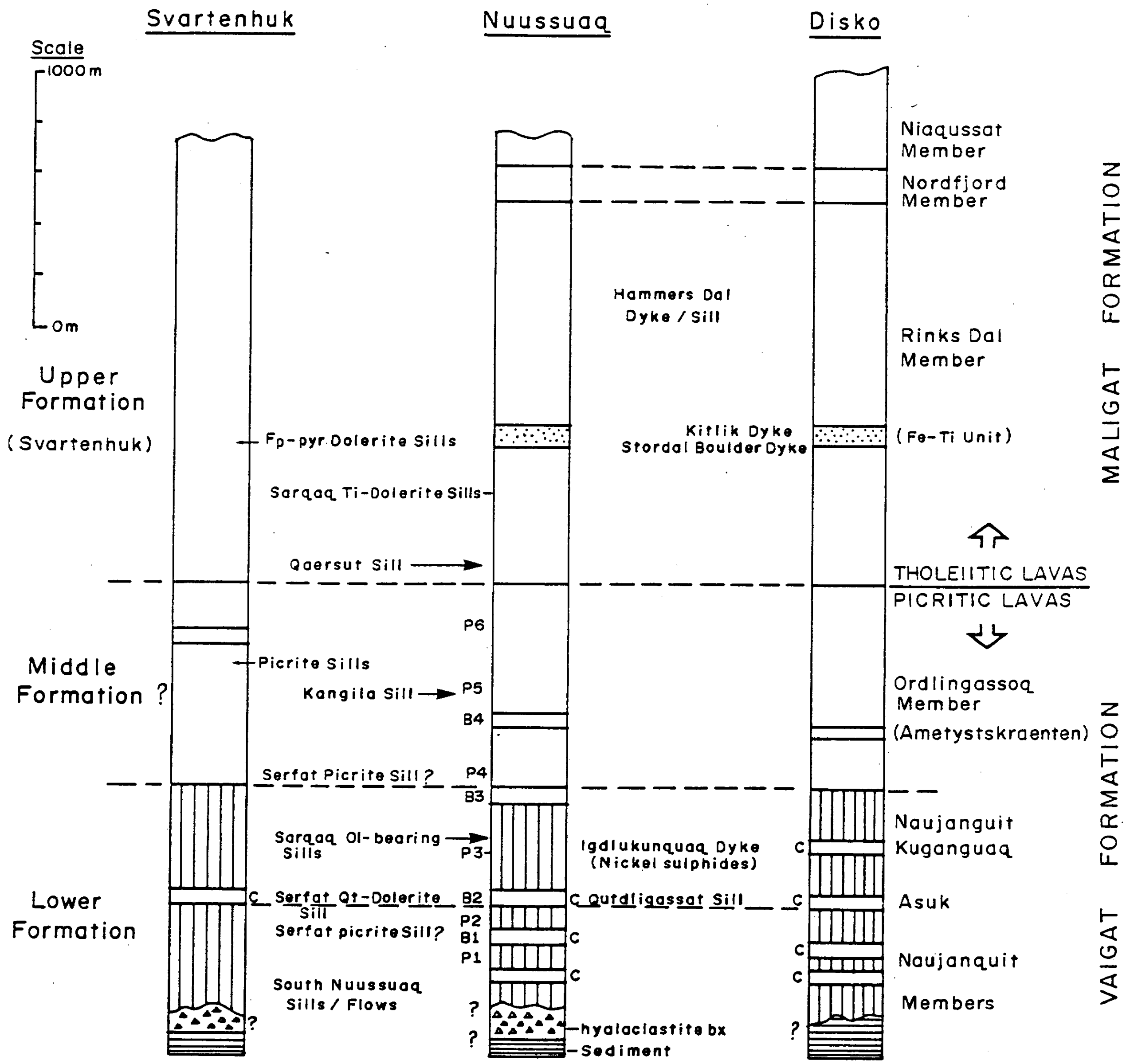


LEGEND

P1 Nuussuaq Stratigraphic Member (P = picrites, B = basalt)

C Contaminated Lavas

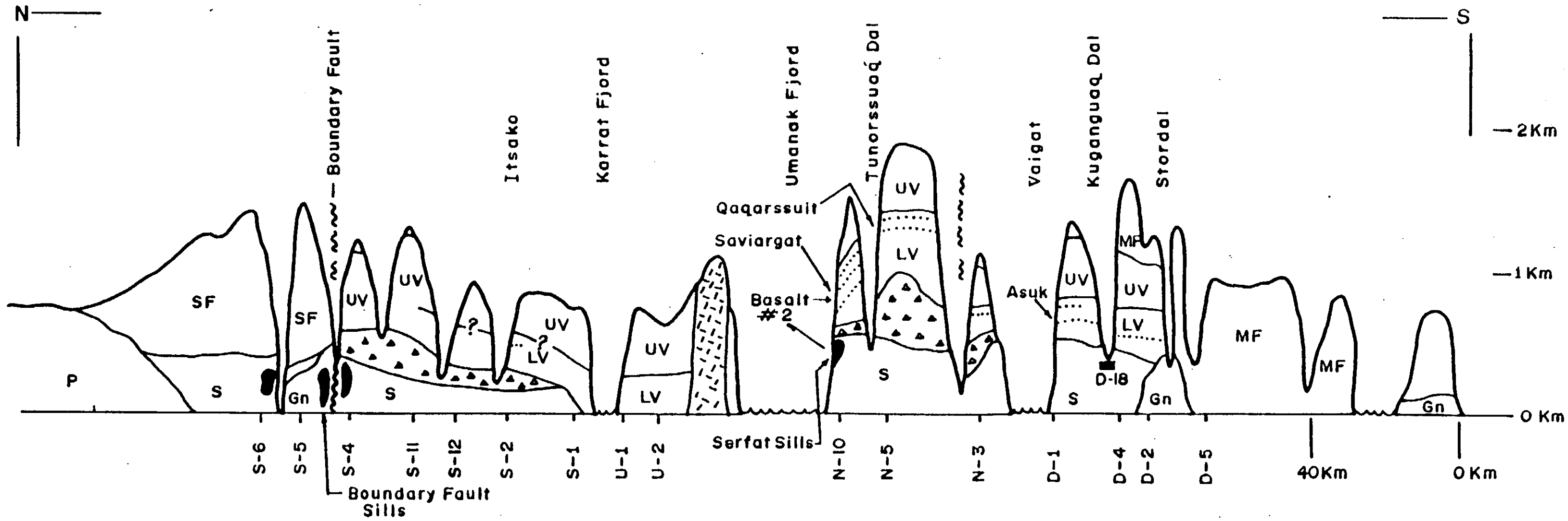
Stratigraphic data revised from Larsen (1981) and UIFF-MØLLER (1991)

FALCONBRIDGE LIMITED

WEST GREENLAND
CORRELATION BETWEEN
INTRUSIONS & VOLCANIC MEMBERS

SCALE:

DATE OF WORK:		CLAIMS:	Figure Nº 23
ORIGINAL BY: K.O.	Date: Feb.92	PROJECT NUMBER: 015-905	
REVISED BY:	Date:		
DRAWN BY: H.R.	Date: Feb.92	N.T.S. Nº:	
APPROVED BY:	Date:	MAP Nº:	



LEGEND

TERTIARY

- DOLERITE SILLS
- GABBRO-GRANITE LAYERED INTRUSIVE
- MF/SF - MALIGAT-SVARTENHUK FORMATION (MF-SF)
- UV - UPPER VAIGAT FORMATION
- LV - LOWER VAIGAT FORMATION
- VOLCANIC PILLOW BRECCIA
- S - CRETACEOUS-TERTIARY SEDIMENTS

PROTEROZOIC

- P - META SEDIMENTS

ARCHEAN

- Gn - GNEISS

SYMBOLS

- GEOLOGICAL CONTACT
- CONTAMINATED LAVA
- N-9 - STRATIGRAPHIC PROFILE SECTION
- D-18 - EM ANOMALY

FALCONBRIDGE LIMITED

WEST GREENLAND

N-S LONGITUDINAL SECTION OF THE TERTIARY BASALT PROVINCE (LOOKING EAST)

Vertical to Horizontal = 1:40

SCALE: 1:40

DATE OF WORK:		CLAIMS:	Figure Nº 24
ORIGINAL BY: K.O	Date: Feb92	PROJECT NUMBER: 015-905	
REVISED BY:	Date:		
DRAWN BY: H.R.	Date: Feb92	N.T.S. Nº:	
APPROVED BY:	Date:	MAP Nº:	

Subvolcanic Intrusions

Disko Island

The majority of the subvolcanic intrusions on Disko Island occur as dykes. Five intrusions were studied in 1991; the Igdlukunguaq dyke, Hammersdal complex, Stordal iron-bearing dyke, Kitlik dyke and Qutligssat sill. The Igdlukunguaq dyke's composition is similar to the Vaigat Formation related olivine-bearing dolerite sills in the Sarqaq Valley. The Hammersdal dyke complex is basaltic in composition and is a well documented feeder for upper Maligat Formation flows. The native iron boulder dyke and Kitlit dyke in the Stordal area plot as high titanium basalts on the TiO_2 versus MgO plot (figure 26). These dykes correspond well with the Fe-Ti lavas from the Maligat Formation's Rinks Dal Member described by Larsen and Pedersen, 1990.

A sill-like body located 1 km east of the abandoned Qutdligssat coal operation has a basaltic composition and plots within the Asuk Formation field on the TiO_2 versus MgO diagram. Contrary to the normal loss of siderophile elements characteristic to the Asuk Formation lavas, this unit is strongly enriched in Ni and Cu (eg. sample AF07984: 1,280 ppm Ni, 638 ppm Cu). Minor disseminated pyrite was observed in the sill.

Nuussuaq Peninsula

The intrusions investigated on Nuussuaq Peninsula occur as dykes and sills in the Sarqaq Valley and along the south and north coast of Nuussuaq Peninsula. The majority of the sills intrude Cretaceous sediments and Pre-Cambrian gneiss along the Boundary Fault that cuts through the Sarqaq Valley (figure 5). The dominant sill type in the valley is a brownish weathered Ti-rich dolerite that contains > 2.0% TiO_2 and < 6.0% MgO (Figure 27). These sills are considered related to the Maligat Formation volcanism. The second sill type is an olivine-bearing dolerite, distinguishable in the field by an olive-green, highly weathered surface. They contain <2.0% TiO_2 and >6.0% MgO. The increase in MgO and less TiO_2 composition suggests they are related to Vaigat Formation volcanism. A crosscutting relationship of the two sill types exposed at a waterfall, 3 km up the Sarqaq Valley on the west wall, clearly indicated the Ti-rich dolerite are younger in age.

Nickel and copper depletion (figures 28 & 29) in the Sarqaq Valley sills were only detected at two locations. The first locality is 1 km north of the waterfall exposure and consists of two dolerite sills in direct contact with each other. The upper sill is depleted in both Ni and Cu (AF07567) while the underlying sill (50m thick) is Ni-enriched near the base (AF07570). The second Ni and Cu depleted sample (AF07582) is from an olivine- bearing dolerite sill located 15 km up the Sarqaq Valley, on the east wall.

Several sills identified by Lotte Larsen in 1987 on the south coast of Nuussuaq Peninsula were examined. The sills are more picritic in composition then the Sarqaq sills, ranging from 11% to 18% MgO (figure 27). Two of the high MgO rich sills are Ni-depleted while two less MgO rich sills are Ni-enriched. Only one sill is depleted in both Cu and Ni (AF07572). It has been suggested that these sills were Vaigat Formation flows that intruded unconsolidated sediments.

On the north coast of Nuussuaq, sills located near Qaersut, Kangila and Serfat were sampled. The Qaersut and Kangila sills are mapped as picrite/peridotite on Agatdal map sheet 70V 1N. The TiO_2 versus MgO plot illustrates the Qaersut sills as being basaltic in composition. The sills plot in the lower end of the high TiO_2 Sarqaq dolerite field, suggesting an origin related to the Maligat Formation volcanism. Noticeably, all samples of the Qaersut sills (AF08003-5) were depleted in Ni and Cu. The Kangila sill samples are picritic and contain normal levels of Ni and Cu (figure 28). On the TiO_2 versus MgO plot, the Kangila sill samples plot just below the south coast Nuussuaq sills suggesting it is an intrusive equivalent to the Vaigat Formation Naugánguit Member.

At Serfat, a 33m exposed section of a quartz-dolerite sill is intruded by a 15m thick picritic sill. The quartz-dolerite sill has been studied in considerable detail by Sole Munck in 1938-39. Based on the coarse grained texture and considerable contact metamorphism associated with the quartz-dolerite, it must have solidified at a deeper level then the Sarqaq dolerite sills (Munck, 1945). The TiO_2 versus MgO plot indicates the Serfat quartz-dolerite samples plot in a field of their own. The Serfat sill has a lower MgO composition then the Sarqaq olivine-bearing dolerite and contains less titanium than the Sarqaq Ti-rich dolerites. The most significant geochemical indicator in the Serfat dolerite is it is completely barren of Ni and Cu (below detection limits) and contains up to 8,100 ppm sulphur. The Serfat dolerite and picrite sills possibly correlate with basalt #2 and picrite #2 of the Nuussuaq stratigraphy, respectively (figure 30).

Ubekendt Island

The gabbro-diorite-granite layered intrusion on the south coast and numerous dykes exposed on the east coast were sampled. Five types of dykes were observed: 1) picritic-olivine porphyritic, 2) fine grained, mafic, aphyric and moderately magnetic, 3) fine grained, mafic, feldspar porphyritic and strongly magnetic 4) carbonate-rich and 5) fine grained felsic dykes. Two picritic intrusions in the northern portion of the island range from 4.87% to 28.6% MgO in composition and host normal levels of Ni and Cu.

Svartenhuk Peninsula

Two sill types have been identified on Svartenhuk Peninsula. The most dominant is a brownish weathered feldspar-pyroxene dolerite. The dolerites on Itsako Peninsula locally exhibit a taxitic texture common to the mineralized Noril'sk sills. Magmatic layering of feldspar and pyroxene indicate differentiation and crystallization processes occurred which may explain the slight subdivision of the sills at 2.3% and 2.8% TiO_2 on the TiO_2 versus MgO plot (figure 31). Sills containing greater then 2.3% TiO_2 only occur on Itsako Peninsula. The second sill type is picritic in composition (> 20% MgO) and contains olivine phenocrysts. Only two occurrences were detected during the sampling program. The first exposure is on profile section S-91-02 at an elevation of 770m. Cumulate feldspar-rich layers were noted in the sill. The second picrite sill outcrop is on Itsako Peninsula at sample location AF08278. No descriptive remarks were made of the sill during sampling. Based on TiO_2 content, the feldspar-pyroxene dolerite sills are correlated with Svartenhuk Formation lavas. The picrite sills are linked with Vaigat Formation volcanism.

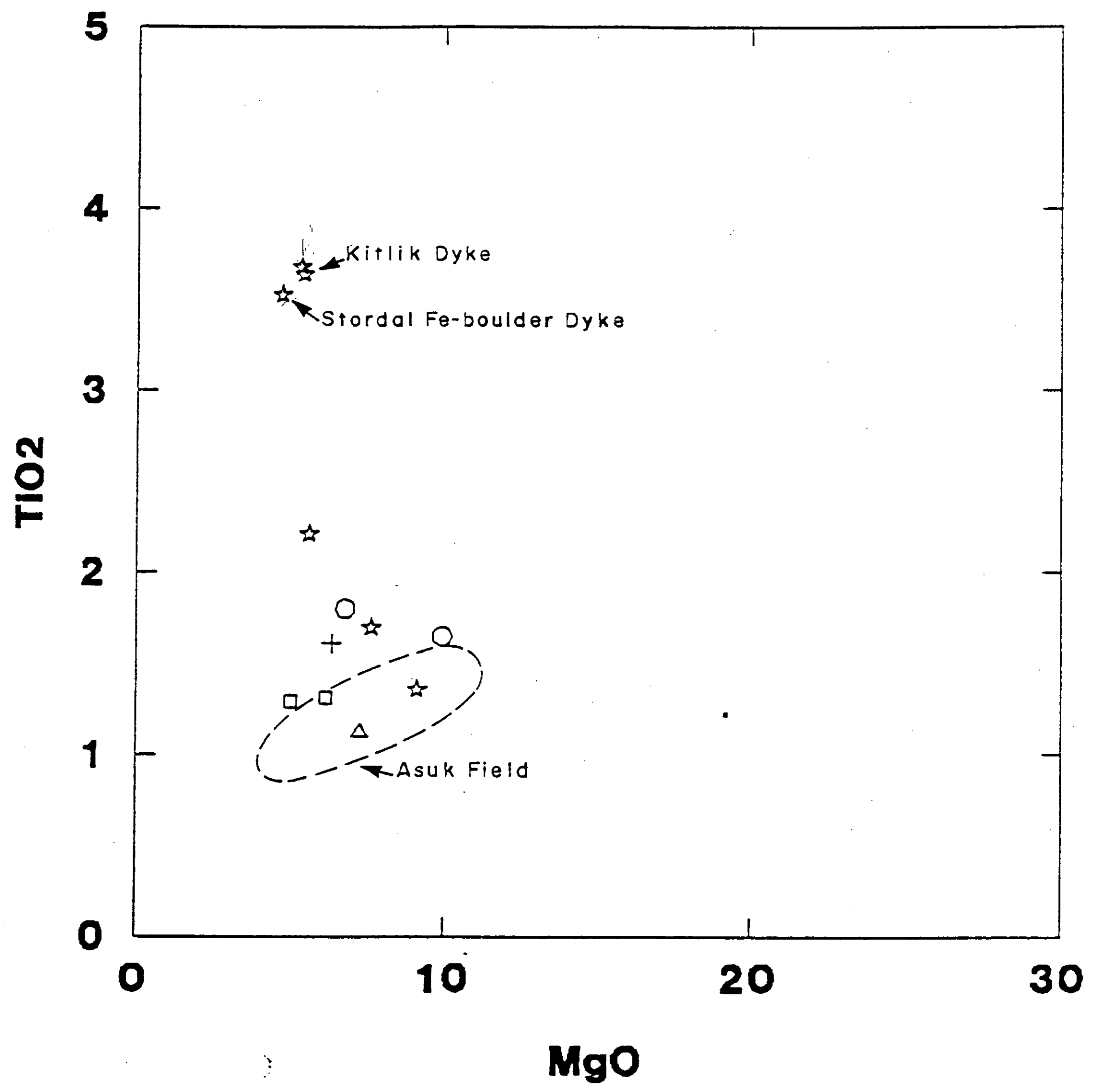
Discussion

Intrusions of different ages and compositions have been identified in the flood basalt province. Figure 23 summarizes the correlation of the intrusions with the volcanic stratigraphy. The depletion of siderophile and chalcophile elements in some sills suggest magmatic processes other than normal differentiation has occurred. In comparison with the Noril'sk intrusions, the West Greenland Ni and Cu depleted sills could represent the Lower Talnakh and Lower Noril'sk type sills. Chemically, the Noril'sk and Talnakh mineralized sills contain slightly to moderately Ni-enriched olivines and elevated Cr in comparison with the unmineralized lower intrusions (Naldrett, 1991). These two chemical variations do not readily distinguish the sills from normal, non-mineralized sills. Strong differentiation and taxitic texture are important textural characteristics of the mineralized Noril'sk sills. These two features were observed in both the Sarqaq Valley and Itsako Peninsula sills.

The fact that the Sarqaq and Itsako Peninsula Ti-rich dolerite sills are correlated to the Maligat Formation expands on our exploration model to include both lower Vaigat Formation and intrusions related to contaminated Maligat Formation lavas. The Hammersdal Fe-Ni bearing dykes located on Disko Island are feeders to a large volume of sediment contaminated Maligat lavas. The presence of Fe-Ni mineralization in the Hammersdal dykes confirms metal segregation processes were occurring during the Maligat volcanism. Therefor the Sarqaq Ti-rich sills on Nuussuaq are legitimate exploration targets.

Further lithogeochemical sampling and geophysical evaluation is required to determine the full economic potential of the sills

DISKO INTRUSIONS



LEGEND

- ☆ STORDAL DYKE
- □ HAMMERSDAL DYKE
- △ QUTDLIGSSAT SILL
- ○ IGDLUKUNGUAQ DYKE
- \+ VARIOUS DYKES
- ▫ KUGANGUAQ

FALCONBRIDGE LIMITED

WEST GREENLAND
DISKO ISLAND
GEOCHEMISTRY PLOT

DATE OF WORK:		CLAIMS:	Figure № 26
ORIGINAL BY: K.O.	Date:	PROJECT NUMBER: 015-905	
REVISED BY:	Date:		
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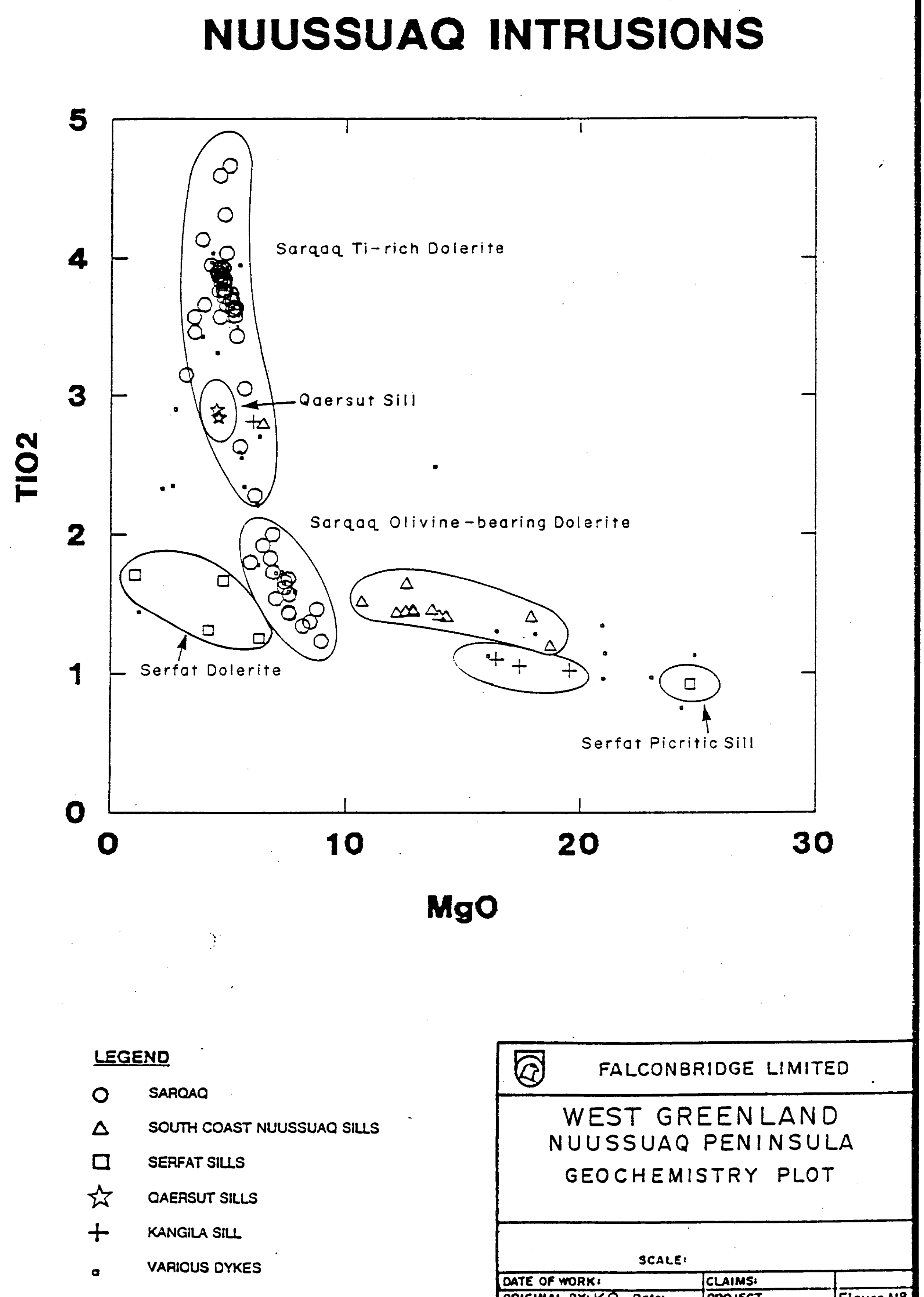


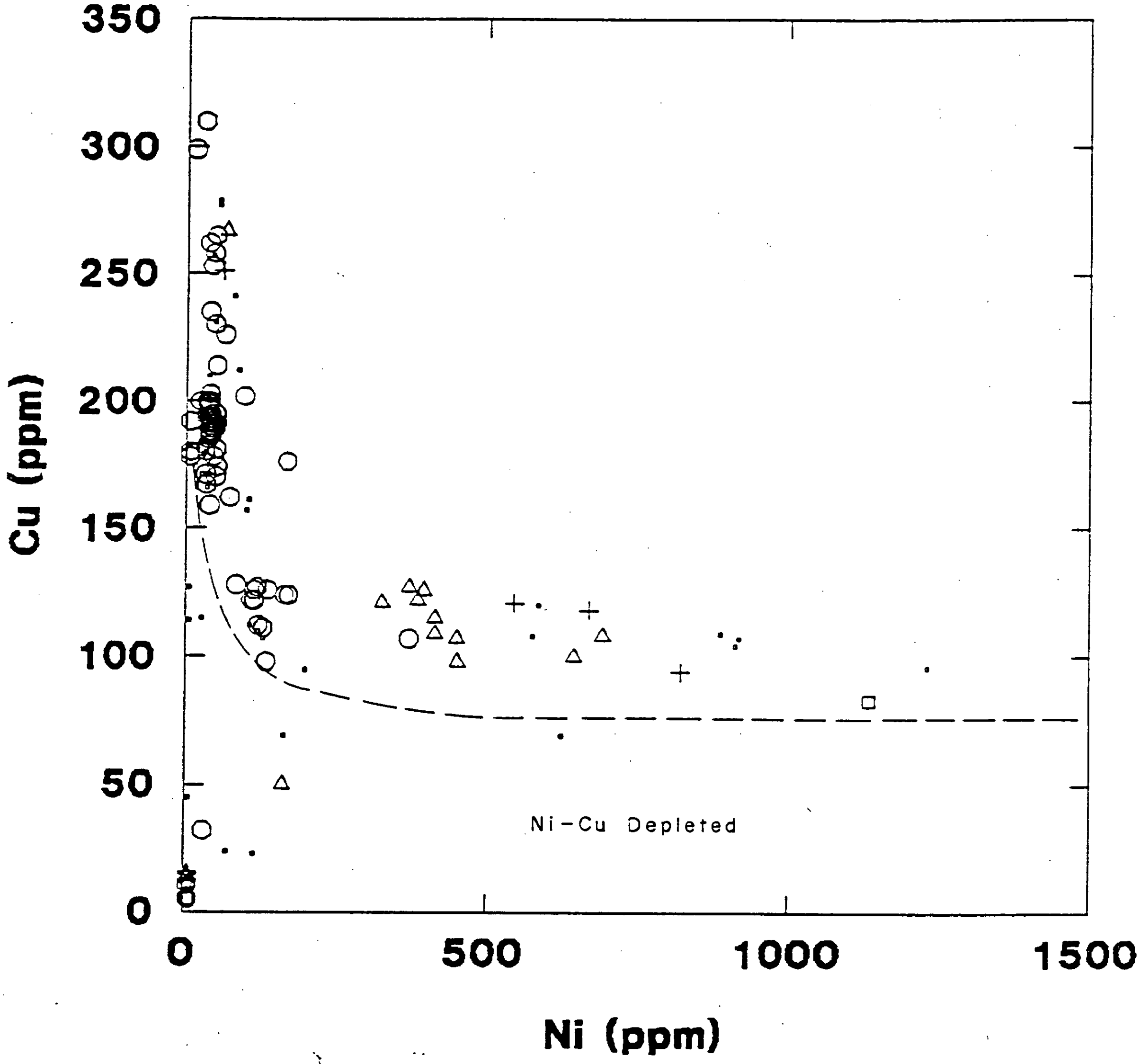
FALCONBRIDGE LIMITED

WEST GREENLAND
NUUSSUAQ PENINSULA
GEOCHEMISTRY PLOT

SCALE:

DATE OF WORK:		CLAIMS:	
ORIGINAL BY: K.O.	Date:	PROJECT NUMBER: 015-905	Figure Nº 27
REVISED BY:	Date:		
DRAWN BY:	Date:	N.T.S. Nº:	
APPROVED BY:	Date:	MAP Nº:	

NUUSSUAQ INTRUSIONS

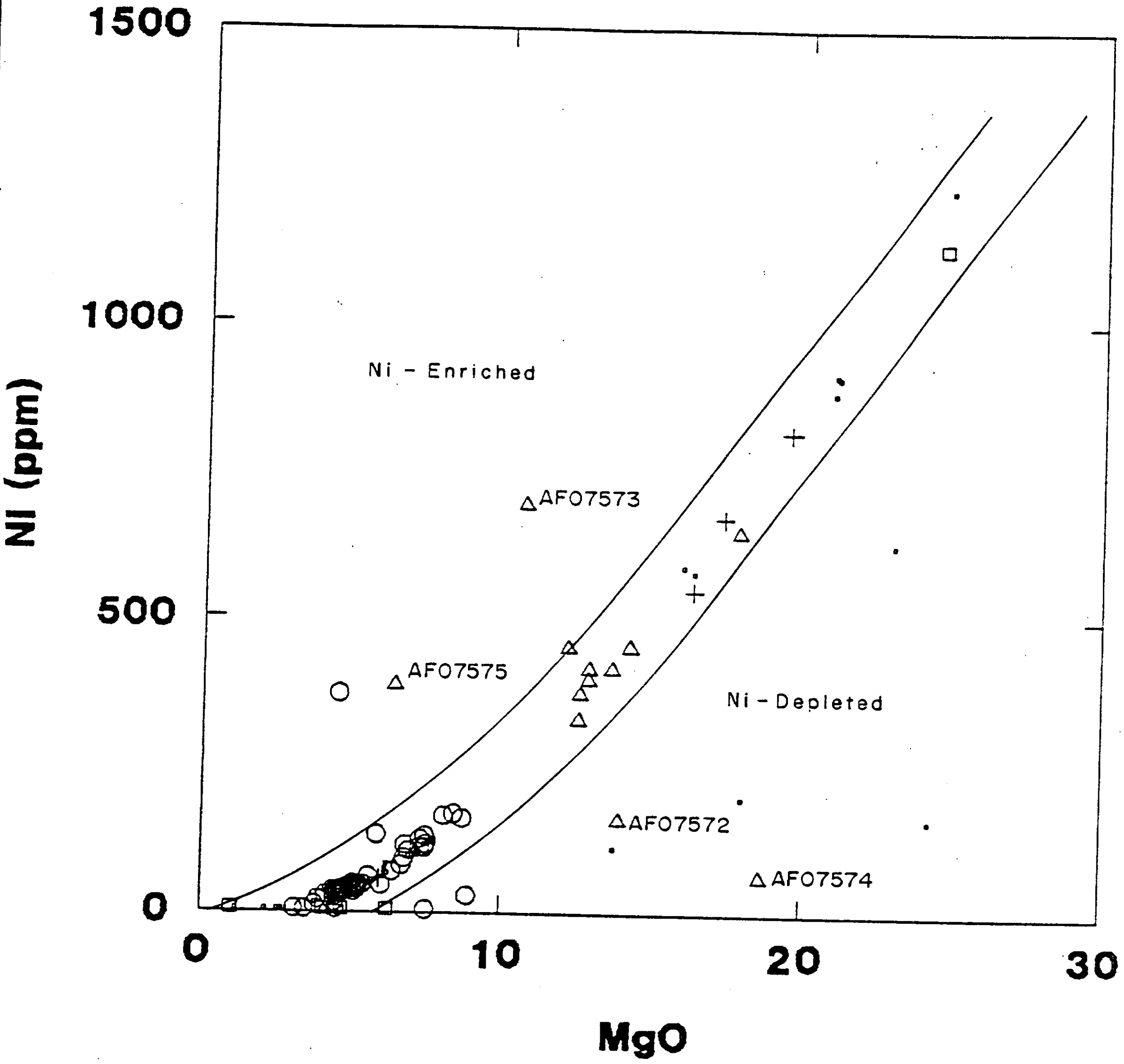


LEGEND

- O SARQAQ
- △ SOUTH COAST NUUSSUAQ SILLS
- □ SERFAT SILLS
- ☆ QAERSUT SILLS
- \+ KANGILA SILL
- ▫ VARIOUS DYKES

FALCONBRIDGE LIMITED		
WEST GREENLAND NUUSSUAQ PENINSULA GEOCHEMISTRY PLOT		
SCALE:		
DATE OF WORK:	CLAIMS:	Figure Nº 28
ORIGINAL BY: K.O. Date:	PROJECT NUMBER: 015-905	
REVISED BY: Date:		
DRAWN BY: Date:	N.T.S. Nº:	
APPROVED BY: Date:	MAP Nº:	

NUUSSUAQ INTRUSIONS



LEGEND

- ○ SARQAQ
- △ SOUTH COAST NUUSSUAQ SILLS
- □ SERFAT SILLS
- ☆ QAERSUT SILLS
- \+ KANGILA SILL
- ▫ VARIOUS DYKES

FALCONBRIDGE LIMITED		
WEST GREENLAND NUUSSUAQ PENINSULA GEOCHEMISTRY PLOT		
SCALE:		
DATE OF WORK:	CLAIMS:	Figure Nº 29
ORIGINAL BY: K.O. Date:	PROJECT NUMBER: 015-905	
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APPROVED BY: Date:	MAP Nº:	

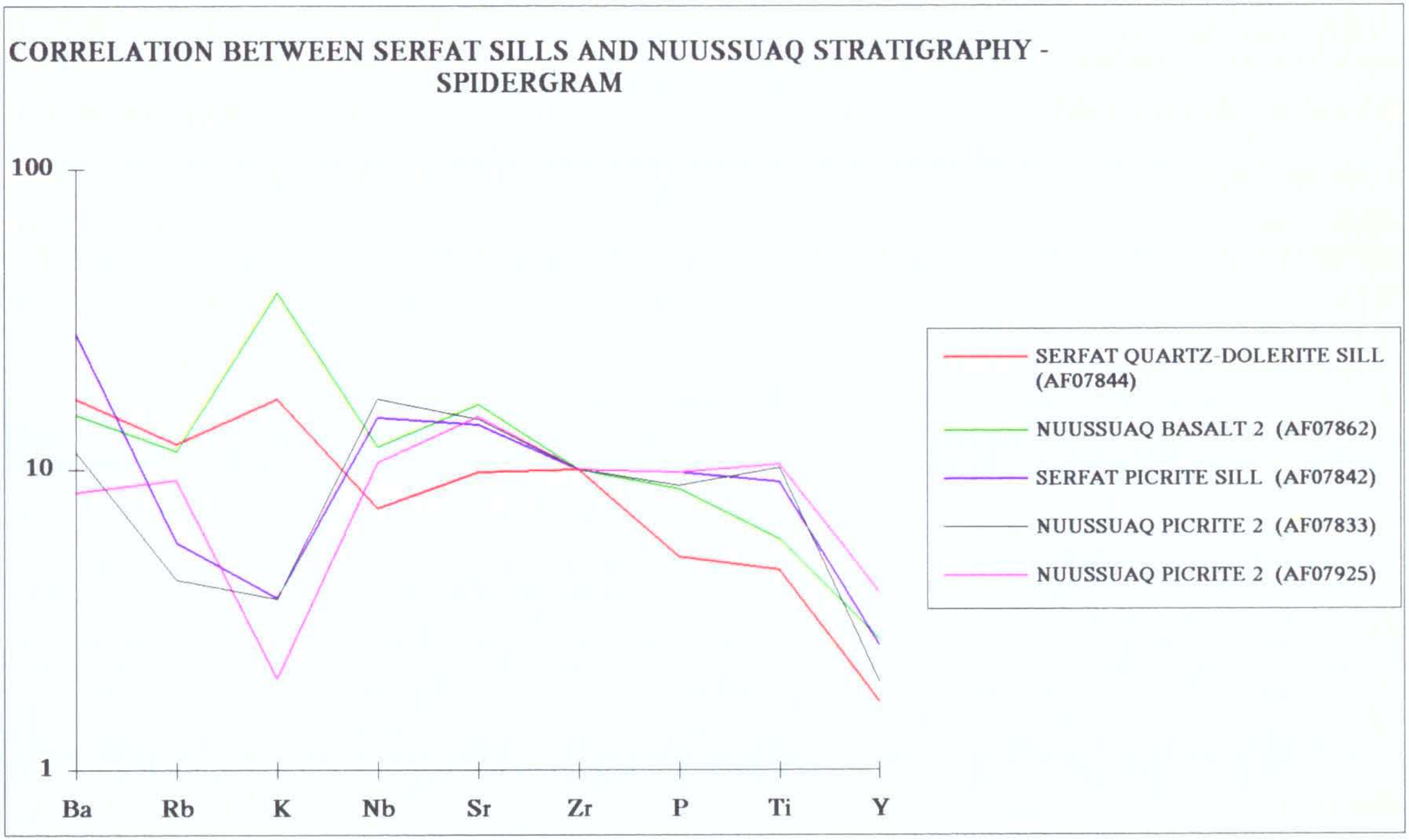
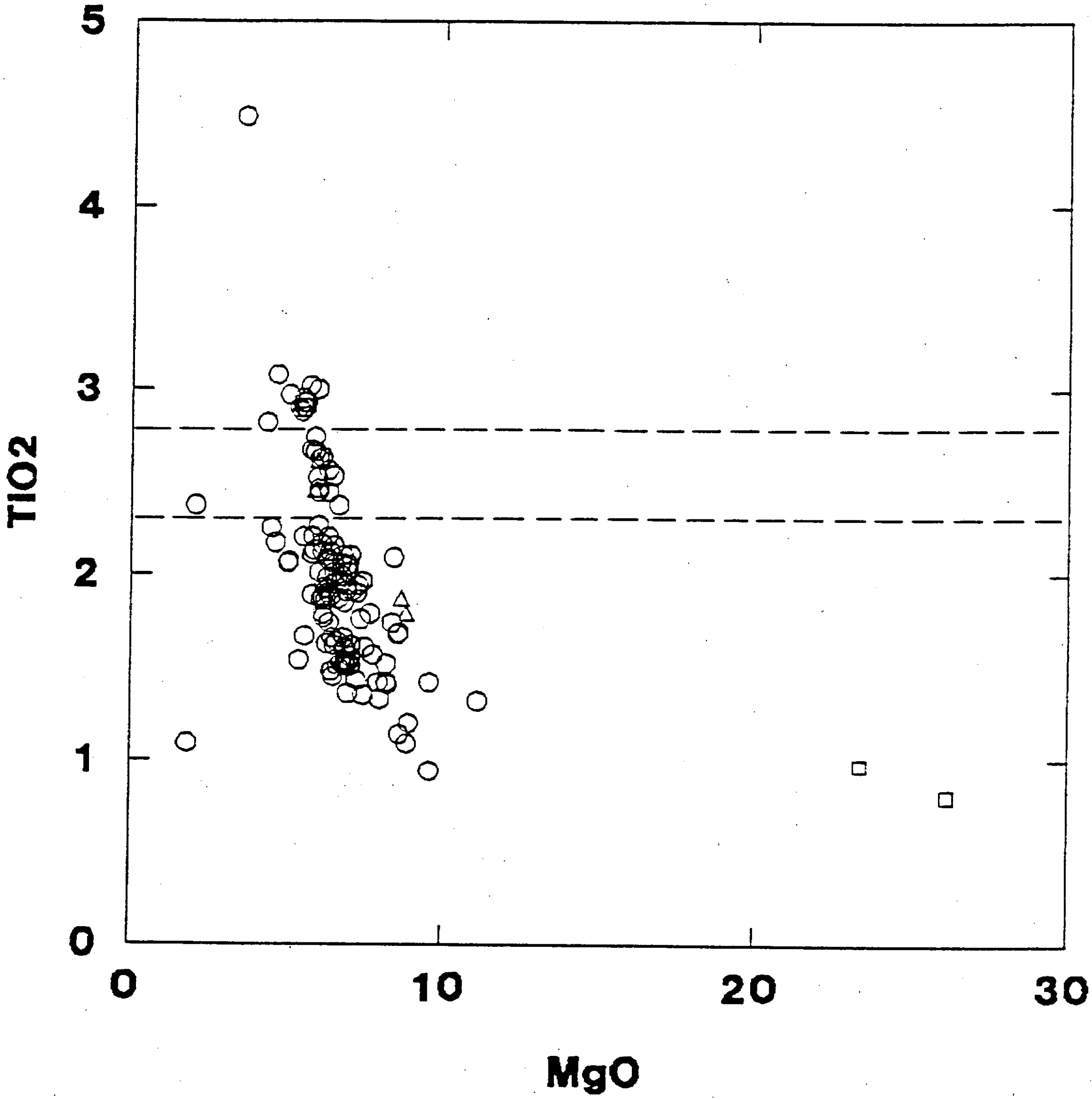

CORRELATION BETWEEN SERFAT SILLS AND NUUSSUAQ STRATIGRAPHY - SPIDERGRAM
100
10
1
Ba
Rb
K
Nb
Sr
Zr
P
Ti
Y
SERFAT QUARTZ-DOLERITE SILL (AF07844)
NUUSSUAQ BASALT 2 (AF07862)
SERFAT PICRITE SILL (AF07842)
NUUSSUAQ PICRITE 2 (AF07833)
NUUSSUAQ PICRITE 2 (AF07925)

FIGURE 30

SVARTENHUK INTRUSIONS



LEGEND

- ○ FELDSPAR-PYROXENE DOLERITE SILL
- □ PICRITE SILL
- △ VARIOUS DYKES

FALCONBRIDGE LIMITED

WEST GREENLAND
SVARTENHUK PENINSULA
GEOCHEMISTRY PLOT

SCALE:			
DATE OF WORK:		CLAIMS:	Figure №
ORIGINAL BY: K.O.	Date:	PROJECT NUMBER: 015-905	31
REVISED BY:	Date:		
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APPROVED BY:	Date:	MAP №:	

MINERAL OCCURRENCES

Introduction

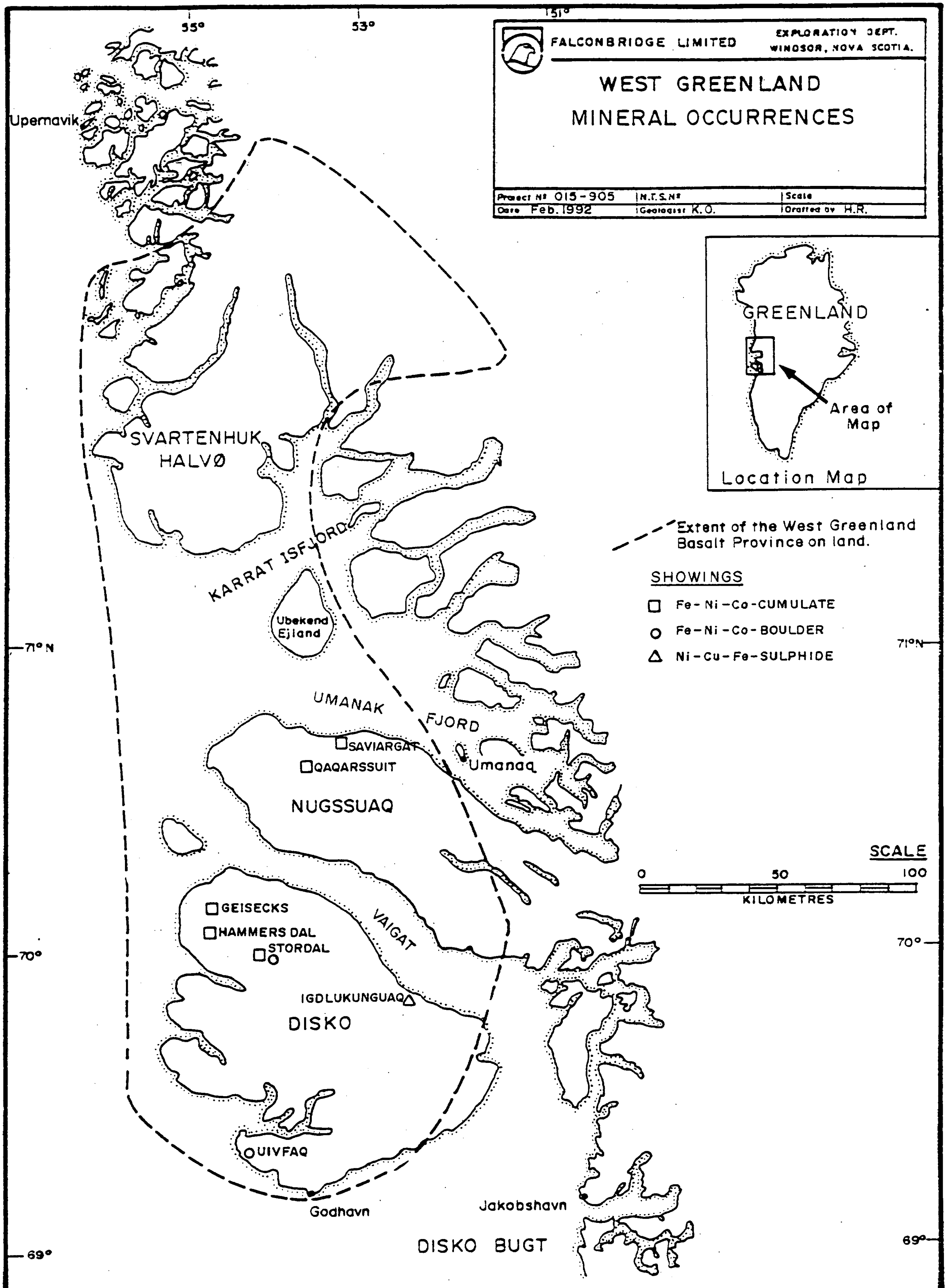
The Tertiary flood basalt province of West Greenland is unusual due to it's large volume of erupted picrite lavas and native iron occurrences. Outside the basalt province, native iron has only been recognized in subvolcanic intrusions related to the Siberian flood basalts. The Siberian native iron is hosted in subvolcanic intrusions about 200km north and south of the Noril'sk mining district where high grade nickel copper and platinum metal deposits occur in synvolcanic flood basalt intrusions. The genetic relationship between the Siberian native iron to the Noril'sk sulphide ores is unknown, however, the presence of native iron in such a nickel rich environment suggests magmatic contamination processes were active and that these same processes were present in West Greenland.

The West Greenland basalt province contains one nickel copper sulphide showing and eight significant native iron occurrences. The significant concentrations of native iron on Disko Island occur at Gieseckes Dal, Hammers Dal, Stordal, Uivfag and on Nuussuaq Peninsula at Saviargat and Qaqarssuit (figure 32). The Qaqarssuit showing was discovered in 1991 by Falconbridge personnel.

The native iron occurs in both lavas and high level feeder dykes as disseminated droplets that locally coalesce to form cumulates averaging 20 to 30cm thick of 10 to 25% iron by volume. The mineralogy of the cumulates is composed mainly of iron, troilite (FeS), cohenite (Fe_3C) and greenalite ($Fe_6Si_4O1_44H_2O$). The later is a hydrous iron silicate that commonly surrounds the iron inclusions (Springer, 1991). Approximately 75% of nickel in the cumulate is contained in the native iron and the remainder in the troilite (5%) and greenalite (20%). .

At Igdlukunguaq, on Disko Island, a 30 ton massive block of magmatic nickeliferous pyrrhotite was extracted from a basaltic dyke in the 1930's. The block consists of pyrrhotite, pentlandite and chalcopyrite and represents the only known significant nickel sulphide showing in the flood basalt province.

Part of the 1991 field program involved visiting and sampling the native iron occurrences and the nickel copper sulphide showing. The samples were analysis for Ni, Co, Cu, Pt, Pd and Au by direct current plasma (DCP). Five samples were reanalysed using the Xray Fluorescence (XRF) method for comparison purposes. The results of the two methods are summarized in Table 1. A straight fire assay method was used on sulphide samples that contained metal concentrations greater than 10,000 ppm. Included in the shipment were two standard control samples (AF07968 and AF07985).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EXPLORATION DEPT.
WINDSOR, NOVA SCOTIA.
WEST GREENLAND
MINERAL OCCURRENCES
Project Nº 015-905
N.T.S.Nº
Scale
Date Feb. 1992
Geologist K.O.
Drafted by H.R.
GREENLAND
Area of Map
Location Map
Extent of the West Greenland Basalt Province on land.
SHOWINGS
Fe-Ni-Co-CUMULATE
Fe-Ni-Co-BOULDER
Ni-Cu-Fe-SULPHIDE
SCALE
0
50
100
KILOMETRES
55°
53°
51°
71° N
70°
69°
Upernavik
SVARTENHUK HALVØ
KARRAT ISFJORD
Ubekend Ejland
UMANAK FJORD
SAVIARGAT
QAQARSSUIT
Umanaq
NUGSSUAQ
VAIGAT
GEISECKS
HAMMERS DAL
STORDAL
IGDLUKUNGUAQ
DISKO
UIVFAQ
Godhavn
Jakobshavn
DISKO BUGT

FIGURE 32

TABLE 1

COMPARISON OF RESULTS FROM THE DCP AND XRF ANALYTICAL METHODS RESULTS				
DIRECT CURRENT PLASMA METHOD				
LOCATION	SAMPLE #	Ni(ppm)	Co (ppm)	Cu (ppm)
Hammersdal	AF07954	4650	997	2120
Nordfjordpasset	AF07959	112	73	193
Saviargat	AF07962	1360	452	357
Tunorssuaq Dal	AF07963	60	76	234
Tunorssuaq	AF07964	592	512	1100
XRAY FLUORESCENCE METHOD				
LOCATION	SAMPLE #	Ni(ppm)	Co (ppm)	Cu (ppm)
Hammersdal	AF07954	4300	1874	687
Nordfjordpasset	AF07959	89	170	43
Saviargat	AF07962	874	244	277
Tunorssuaq Dal	AF07963	39	182	45
Tunorssuaq	AF07964	531	903	509

TABLE 11

1991 NATIVE IRON MICROPROBE RESULTS				
SHOWING	SAMPLE #	Ni(wt%)	Co (wt%)	Cu (wt%)
Saviargat	N9-91-01	3.47	1.28	0.31
Saviargat	N9-91-02	2.48	1.24	0.32
Qaqarssuit	N5-91-03	1.32	0.37	0.38
Giesecke Dyke	AF07951	1.52	<0.20	0.42
Hammers Dal Dyke	AF07952	2.76	0.84	0.34
Hammers Dal Dyke	AF07956	2.55	0.61	0.31
Stordal Flow	AF07958	1.44	0.24	0.35
Hammers Dal Dyke	D-91-01	2.00	0.83	0.35
Stordal Boulder	D-91-02	2.33	0.47	0.33

Lower than expected Ni values were received in the DCP and XRF analytical results from the native iron samples. A representative suite was shipped to Falconbridge's mineralogy lab in Sudbury, Ontario, Canada for microprobe analysis. The samples were analyzed using the EDX spectrometer of the electron probe with cobalt values determined by a wavelength spectrometer (WDX). Results are summarized in Table 11 and a copy of the report is appended.

Disko Island

Gieseckes Dal

At Giesecke Dal, iron droplets form a small cumulate zone in a subvertical dyke that has a high MgO composition. The dyke was discovered in 1985 by Greenex A/S. A limited ground EM survey was carried out along strike of the dyke, however, no anomalous responses were detected. Greenex systemically sampled the cumulate in 1987 and obtained values of 5,900 ppm Ni, 1,560 ppm Co, 860 ppm Cu, 60 ppb Pt and 20 ppb Pd. Grab sample AF07951 collected by Falconbridge returned values of 3,410 ppm Ni, 1,090 ppm Co, 626 ppm Cu, 110 ppb Pt, and 43 ppb Pd by DCP analysis. Microprobe analysis by Falconbridge returned higher grades of 1.52% Ni, 0.20% Co and 0.42% Cu.

Hammers Dal

Native iron from the Hammersdal dyke is the most studied and documented iron occurrence. The mineralization was discovered in 1972, within two subvolcanic dyke-like intrusions located in the gorges on the south facing slopes of the E-W trending Hammers Dal (Ulff-Møller 1975, 1977). The intrusive complex ranges from dolerite to highly contaminated intermediate rocks (Ulff-Møller, 1977) that evolved from an olivine tholeiitic magma that reacted with Cretaceous-Tertiary sediments (Pedersen, 1975). The formation of the iron droplets and cumulate layers are discussed in considerable detail by Ulff-Møller (1977). In summary, several pulses of basaltic magma containing immiscible sulphide intruded along a dyke-like structure with irregular wall contacts. Selective gravitational setting of iron droplets formed cumulates in areas where the attitude of the wall contact flatten, allowing accumulation processes to occur (Plate I).

In 1985, Greenex established a 2.6 km grid along strike of the mineralized zones. A geophysical program consisting of UTEM, HLEM and magnetic surveys was carried out. The UTEM survey was successful in detecting a 500m wide, deep (400-500m), vertically oriented, 1-2 mhos conductor that may represent massive sulphides (Hendry, 1986). The conductor is located up slope and 1.3km north of the outcropping iron cumulates.

Initial sampling of the native iron by the GGU in 1975, returned values of 1-2% Ni, 0.5-0.8% Co, 0.1-0.2% Cu, 1.4ppm Pt with higher values of 2.1 and 2.8ppm Pt obtained from disseminated droplets (Ulff-Møller, 1977). Greenex sampled the showings in 1985 and received slightly lower Pt and Pd values and a Ni/Pt ratio in the order of 8 to 10 times lower. Best values obtained by Greenex were 1.8% Ni, 0.16% Co, 0.48% Cu, 1.0 ppm Pt and 0.6 ppm Pd over 0.4m. The low Greenex PGE's has stirred some controversy over proper analytical procedures for native iron samples. Falconbridge personnel collected three grab (AF07953-55) and three continuous chip samples (AF07952, AF07956-57) from the Hammersdal complex iron cumulates. The most significant results by DCP were 4,650 ppm Ni, 997 ppm Co, 2,120 ppm Cu, 30 ppb Pt and 29 ppb Pd from grab sample AF07954. Sample AF-07954 was reanalysed by the XRF method which returned slightly lower values of 4,300 ppm Ni, 687 ppm Co and 1,874 ppm Cu. The Pt and Pd values are 30 and 80 times lower then results obtained by Greenex and GGU respectively. Microprobe analysis of three representative samples (AF07952, AF07956 and D-91-91) returned significantly high values of 2.75% Ni, 0.84% Co and 0.34% Cu (AF07952).

Stordal

The native iron deposit at Stordal occurs on the north side of the valley at an elevation of 440m (Plate II). The showing was discovered in 1987 by Greenex during a reconnaissance prospecting program. The iron cumulate zone occurs near the base of a 15m thick contaminated flow. It averages 40 to 50 cm in thickness and has scattered iron droplets present for the 3 to 4 m above the zone. Iron mineralization has been traced along strike for up to 600m and has been systematically sampled over a 300m length (Christensen, 1988). Greenex obtained values of >1.0% Ni, 1,630ppm Co, 6,400ppm Cu, 70ppb Pt and 20ppb Pd from a chip sample over an unknown length. Falconbridge Limited collected three chip samples (AF07958, 79 & 80) from 100m strike length of the cumulate. The best grade obtained through the DCP method was 1,050ppm Ni, 171ppm Co, 392ppm Cu, <10ppb Pt and 8ppb Pd over a sample length of 40 cm (AF07980). Microprobe results on sample AF07958 indicates the iron contains 1.44% Ni, 0.24% Co and 0.35% Cu. These latter values concur with the Greenex results.

Also in Stordal is a massive iron boulder located 5 km east of the native iron cumulate zone (Plate III). The boulder is about 2m x 1m x .5m in size and was discovered by Finn

PLATE I: Hammersdal Dyke (looking north) - Iron cumulate along a segment of the dyke where the attitude of the wall contact flattens.

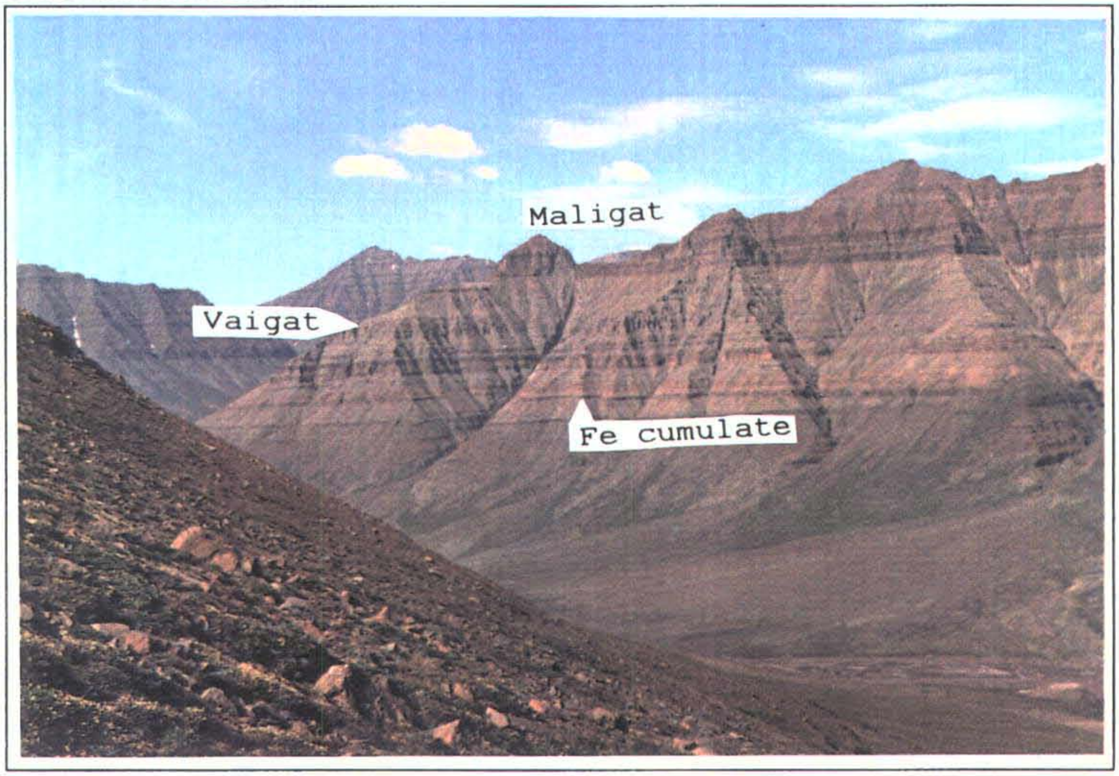

PLATE II: Location of the Stordal iron cumulate (looking NW). Note the tan-orange colour of the contaminated basalts against the pale green picrites.

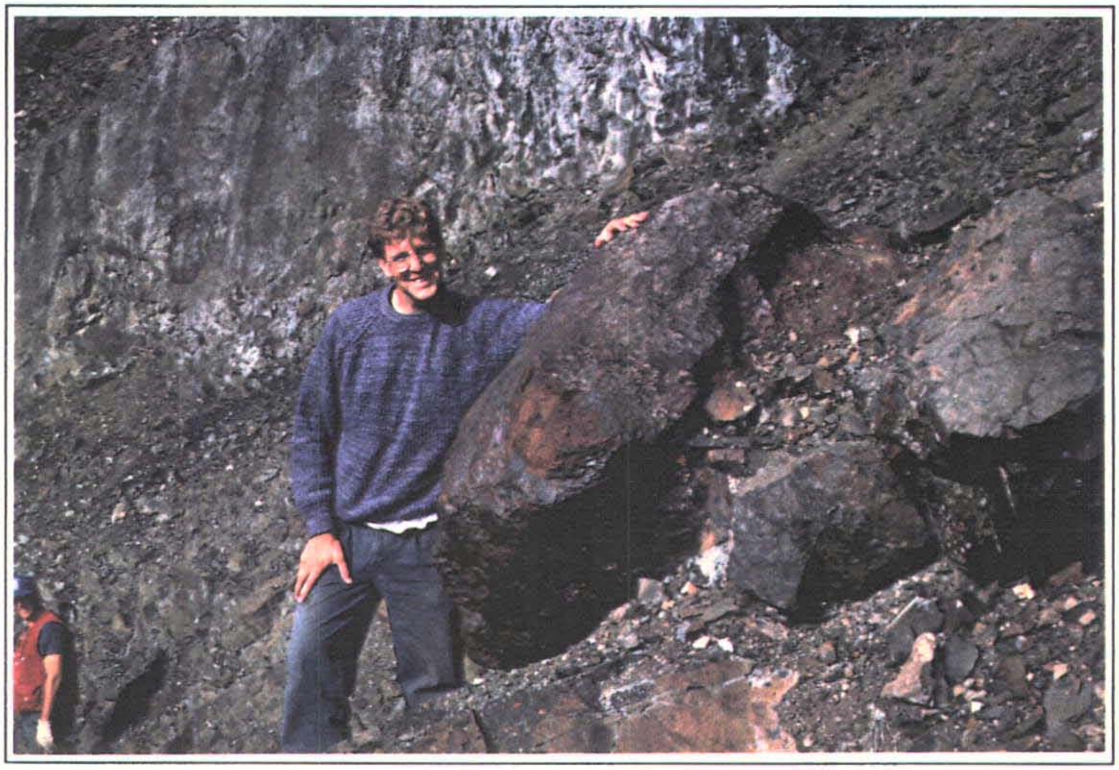

PLATE III: The massive native iron boulder located 5 km east of the Fe-cumulate in Stordal.

PLATE IV: The Igdlukunguaq Dyke on the northeast coast of Disko Island (looking east).

Ulff-Møller in 1987. The boulder is believed to have weathered out from a basaltic dyke nearby. Microprobe results for a small chip sample extracted from the boulder returned values of 2.33% Ni, 0.47% Co and 0.33 Cu (D-91-02) .

In 1870, three iron boulders weighting 22.7, 7.7 and 3.6 tonnes were discovered and removed from the shoreline at Uivfag on southwest Disko Island by A.E. Nordenskiöld. The boulders were shipped to Stockholm, Copenhagen and Helsinki respectively (Bird *et al.*, 1977). Uivfag was not visited during the 1991 field season. Literature states the three iron masses weathered out of a basaltic dyke.

Igdlukunguaq

The nickeliferous pyrrhotite mineralization at Igdlukunguaq is the only occurrence of it's kind in the basalt province. The showing is located several hundred metres from the shoreline at an elevation of 80 metres above sea level. At the time of discovery in the 1860's, the showing consisted of a 28 tonne block of massive nickel sulphide incorporated in a basaltic dyke. In 1871, K.I.V. Steenstrup visited the site and wrote the first detailed description of the occurrence and it's geological setting. In 1931, prospectors excavated the mineralization leaving behind only a small pile of mineralized samples (Plate IV). A detailed textural and composition study of the sulphide was conducted by Pauly in 1958, who identified pyrrhotite, pentlandite and chalcopyrite as the three main constituents along with eighteen accessary minerals. Three samples (AF07972, AF07973 and AF07983) were collected from the mineralized rubble during the 1991 field visit. Analytical results (DCP) ranged up to 6.86% Ni, 0.55% Co, 3.71% Cu and 2.0g/t combined Pt and Pd. These results correspond with past analytical work.

Nuussuaq Peninsula

Saviargat (means "small iron grain" in Greenlandic language)

The Saviargat native iron showing is located on the north coast of Nuussuaq Peninsula (figure 32). Greenex discovered the iron cumulate zone in 1985 during a reconnaissance prospecting program. The showing occurs in a 13 m thick contaminated basalt flow at an elevation of 940m (Plate V). Iron droplets coalesced to form a 20 to 50 cm cumulate layer 2 m above the lower flow contact. The rion cumulate zone has been traced along strike for 200m south. The cumulate zone is 10 to 20% iron by volume overall with a concentration of 30 to 50% iron at the southern most exposure (Plate VI). Disseminated iron droplets occur for several metres above and below the cumulate layer. On the north facing slope of the mountain, thin massive iron platelets ranging up to 2 cm thick were discovered and removed by Kurt Christensen and Finn Ulff-Møller in 1987. Re-examination of the locality in 1991 by Kurt Christensen and Kevin Olshefsky, failed to locate any other examples of this style of mineralization. The best assay results achieved by Greenex were 3.0% Ni, 1.3% Co, 0.5% Cu, 0.16 ppm Pt and 0.09 ppm Pd. The exact sample location for this assay is unclear but is presumed to represent the more massive portion of the iron cumulate zone. One continuous chip sample (AF07961) and one grab sample (AF07962) were collected from the iron layer during the 1991 expedition. The most significant results were from sample AF07962 which ran 1,360 ppm Ni, 452 ppm Co, 357 ppm Cu, 0.30 ppb Pt and 0.13 ppb Pd (DCP method). The sample was checked by the XRF method which returned lower values of 874 ppm Ni, 277 ppm Co, and 244 ppm Cu. These results are a magnitude of 20 times lower in base metal content and 5 times lower in PGEs, then those obtained by Greenex. Microprobe analyses of two representative samples of the cumulate (N9-91-01 & 02) returned encouraging grades of 3.47% Ni, 1.28% Co and 0.31% Cu.

Qaqarssuit (means "steep mountain" in Greenlandic language)

The Qaqarssuit iron showing was discovered by Falconbridge personnel during the 1991 field program. The showing is located on the south side of the Tunorssuaq Dalen 12 km southwest of the Saviargat showing at the same stratigraphic position. Mineralization occurs in the lower flow of a series of contaminated, feldspar-olivine porphyritic basalts at an elevation of 1,410m. An estimated 10-15% native iron droplets coalesced to form a 20 to 50cm thick cumulate (average thickness 30cm) about two metres above the base of the flow (Plate VII & VIII). Scattered iron droplets occur for two metres below and above the cumulate layer. The cumulate has a proven strike length of 2.0km and may extend for another kilometre south before it disappears beneath the scree slope. A total of three continuous chips samples (AF07966, AF07967, AF07970), two grab samples (AF07969, AF07971) and one channel sample (AF07965) were collected from the cumulate. Results obtained for sample AF07965 through the DCP method were low compared to XRF results (417 versus 531ppm Ni, 157 versus 509ppm Co and 178 versus 903ppm Cu). Microprobe results indicate the cumulate iron contains grades of 1.32% Ni, 0.37% Co and 0.38% Cu.

PLATE V : View showing the location of the Saviargat native iron showing (looking east) and a segment of the Nuussuaq stratigraphic type section (profile N-91-09). P = Picrite, B = Basalt.

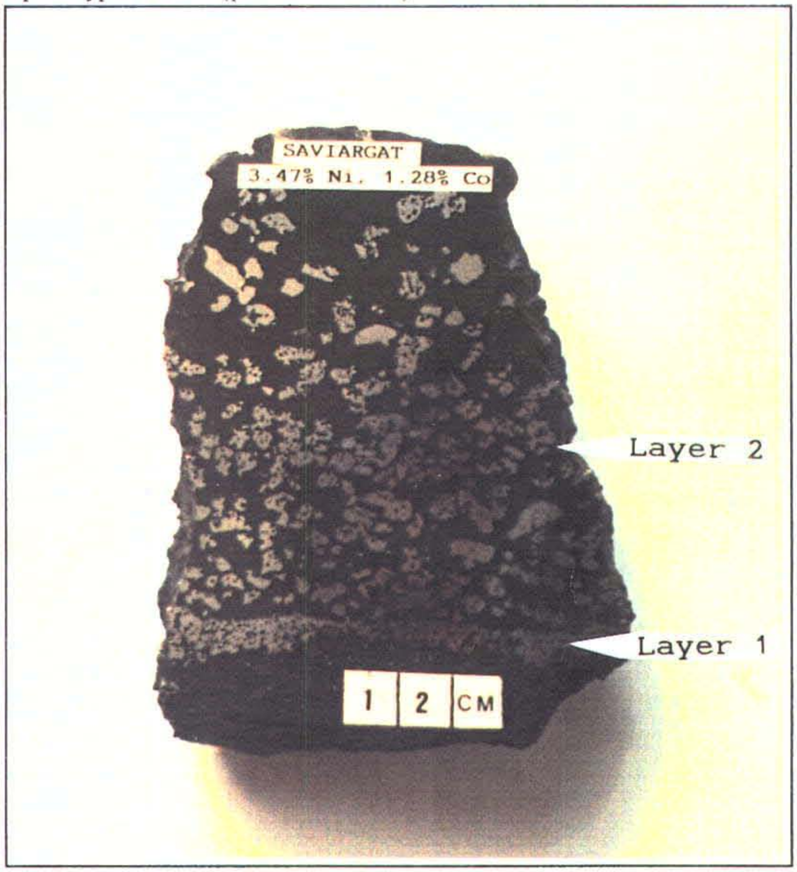

PLATE VI : Saviargat native iron cumulate sample - iron droplets coalescing and settling to form semi-massive iron cumulate layers. (scale: 1cm blocks)

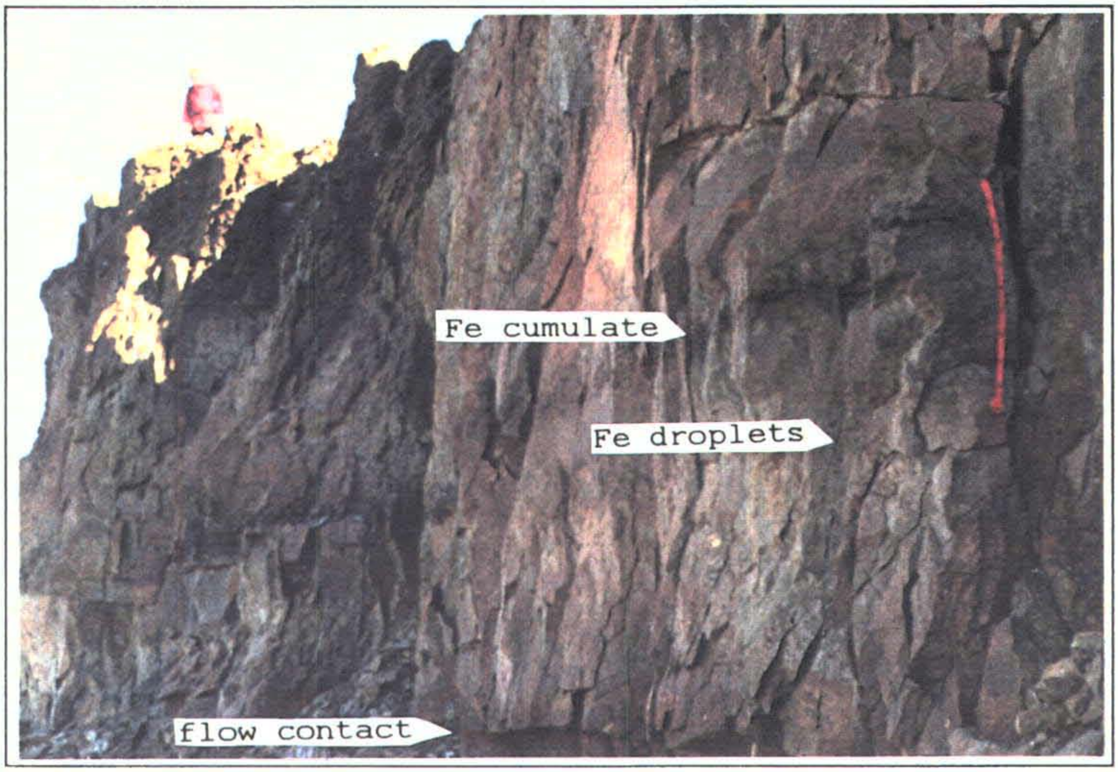

PLATE VII: The Qaqarssuit native iron cumulate (looking north). The red tape in the photo is 1m in length.

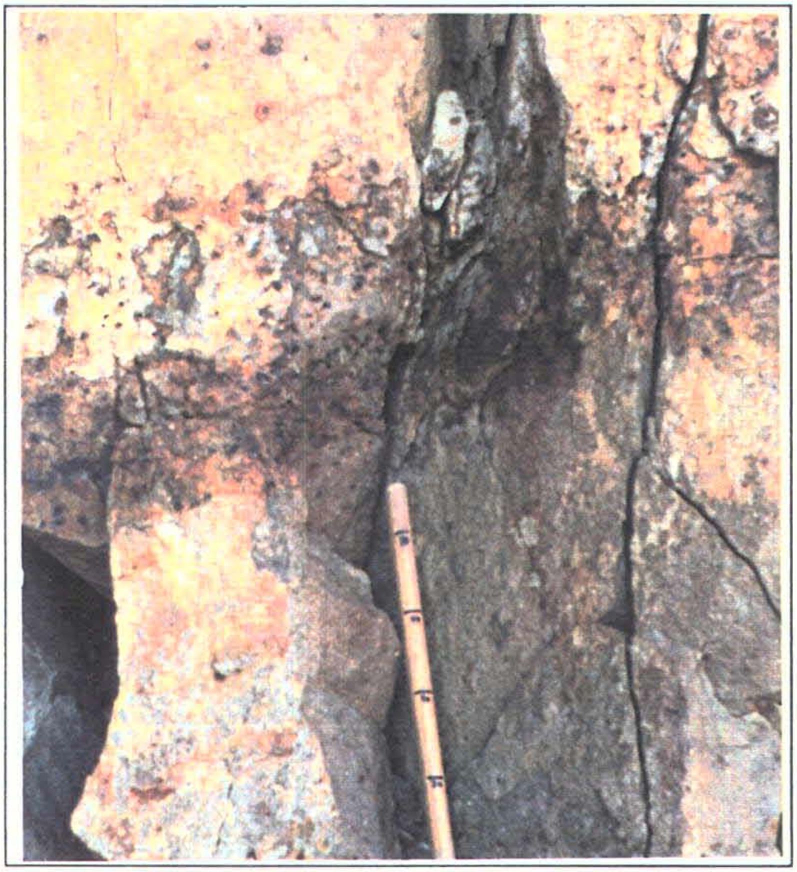

PLATE VIII: The Qaqarssuit native iron cumulate (close-up). The divisions marked on handle are 10 cm intervals.

Discussion

Most of the literature on the West Greenland Flood basalt province deals directly with lithostratigraphy and composition of the volcanic lavas and subvolcanic intrusions. The sulphide and native iron occurrences have received less attention although textural, composition and genetic studies have been undertaken by Bird *et al.* (1977, 1981), Klock *et al.* (1986), Pauly (1958, 1969) and Ulff-Møller (1975, 1977, 1990). Several theories have been postulated regarding the origin and conditions under which the iron and sulphides developed. The most favoured interpretation is that basaltic magma interacted with bituminous shales at a depth less than 3 km below the paleosurface (Bird *et al.*, 1981: Pauly, 1969). Assimilation of the carbon-rich sediment in the chamber caused magmatic layering resulting in a basaltic magma overlain by less dense andesitic magma (Ulff-Møller, 1990). Graphite associated with the iron reveal C^{12}/C^{13} isotope ratios which suggests an organic origin for the carbon rather than a mantle derivative (Pauly, 1969). The added carbon resulted in the reduction of the iron oxides in the melt and the introduction of additional sulphur and phosphate helped depress the melting point of the metallic iron resulting in the formation of immiscible droplets of high carbon-iron and iron carbon liquids. The magmas were then erupted and the transported iron droplets formed disseminations and cumulates in flows, dykes and sills.

A theory suggesting the metallic iron are xenoliths from either the mantle or near the magma source is not strongly supported. This theory is discredited by Bird *et al.* (1981), who indicates an upper velocity limit of 50cm/sec for an erupting magma at 1200° C could only suspend an iron sphere 6 cm and less in diameter. In addition, some iron grains are intergrown with plagioclase and pyroxene, indicating they crystallized as a component of the magma rather than being xenoliths.

Metal zoning within iron grains has been the focus for several studies. It has been suggested that gravitational settling of droplets under reducing conditions down through more oxidizing silicate liquid was the key factor controlling the zoning and formation of cumulates. Klock *et al.*, 1986, indicate a correlation between size of the iron grains and their siderophile content. The smaller in situ grains contain less siderophile elements and are less carbon rich than the larger grains which settled and formed cumulates. Ulff-Møller (1990), also concluded that the iron droplets that remained suspended display no metal zoning. It has been suggested the nickel and cobalt were scavenged by the larger droplets as they settled through the silicate liquid. Klock *et al.*, (1986), considers the larger grains were initially richer in carbon and contained sulphide and phosphide rims . The rims were detached as the grains sank with some sulphides becoming inclusions in the cumulates. The sulphide inclusions consist mostly of troilite containing a few percent Ni, Co and Cu commonly in the form of exsolved chalcopyrite and pentlandite. The decrease of phosphorus, gallium and tungsten in the cumulate iron versus enrichment in the in situ grains supports the theory that cumulates formed in a less reducing environment. (Klock *et al.*, 1986). Despite the documented metal zoning by several authors, no zoning was detected on the samples analyzed by microprobe by Falconbridge.

The iron masses at Uivfag, Stordal and Hammerdal Complex formed near the paleosurface in subvolcanic intrusions. The other occurrences are cumulate zones and disseminations in flows. In all cases, iron cumulate zones are associated with basaltic to andesitic magma reflecting the composition of the upper levels of the magma chamber. Hypothetically, sulphide segregation and the partial removal of the siderophile elements may have occurred in a chamber below the carbon source. As the partially depleted magma erupted, it encountered carbon rich sediments resulting in reduction and the formation of immiscible iron droplets. Settling of the iron droplets caused further depletion of the remaining siderophile elements in the magma. This would account for the very low Ni and Cu values observed from flows hosting native iron occurrences. It has not been determined whether or the amount of Ni and Cu in the iron cumulates is equivalent to the total amounts lost in the magma.

Respectfully Submitted

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Project Geologist

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APPENDIX I

Inter Office Memorandum - Microprobe Results On Iron Samples From West Greenland

(G. Springer, 1991)

FALCONBRIDGE LIMITED **Inter Office Memorandum**

File: 80-330

Date: December 2, 1991

To: K. Olshefsky

cc: S.O. Fekete/D.J. Kemp, File

From: G. Springer/P.J. Whittaker

Subject: **IRON SAMPLES FROM WEST GREENLAND**

Polished sections were prepared of nine native iron samples from West Greenland:

Sample #	PS 91#	Sample #	PS 91#
N9-91-01	584	AF07951	587
N9-91-02	585	AF07952	588
N9-91-03	586	AF07956	589
		AF07958	590
D-91-01	591		
D-91-02	601		

The samples were analysed by electron probe, as requested.

RESULTS:

Apart from native iron, the nickel bearing minerals are troilite, and a hydrous iron silicate surrounding the iron inclusions. The minerals were analyzed using the EDX spectrometer of the electron probe, but the cobalt determinations were checked with a wavelength spectrometer because it provides better separation of the cobalt and iron emission lines. The WDX determinations are considered to be more accurate.

The analyses of the metallic phases are summarized in the attached Table 1 and of the troilite in Table 2. The small Cu and Zn as well as the Ni contents of the troilite are noteworthy. Most of the metal is body-centred cubic alpha iron. On account of its nickel content it may be called kamacite. It contains exsolutions of carbide (Fe_3C, cohenite/cementite). Mostly, these exsolutions occupy less than 5% of the volume of the total metallic phase, but in sample PS 591, the amount is 20-30%. In this case, the exsolutions are 20-50 microns thick lamellae and could be analyzed. As may be seen in Table 1, the nickel and cobalt contents are lower than in the iron matrix. The mode of intergrowth of carbide and kamacite is illustrated in Plate 1. Although variations in the nickel content of the metal can be observed, there are no systematic spatial distributions that might indicate banding. The individual point analyses of nickel and cobalt are given in Table 1a (Lotus spreadsheet). Histograms of these data are also given.

Pentlandite is present as a trace constituent in most of the samples. It is fairly abundant (about 1 vol%) in sections 585 and 590 and was analyzed in these two cases. The results are shown in Table 3. Illustrations of the occurrence of pentlandite are given in Plate 2.

TABLE 3. Composition of Pentlandite (wt%)

	Fe	Ni	Co	Cu	S
PS 91-585					
avg.wt%	34.0	29.0	3.05	0.53	33.2
range	32.7-36.0	27.1-30.5	2.02-4.26	<0.20-1.36	33.0-33.4
cations, avg.	0.59	0.48	0.06	0.01	1.00
PS 91-590					
avg.wt%	32.8	28.7	3.33	1.87	33.0
range	31.7-33.8	27.6-29.8	1.59-5.06	<0.20-3.73	32.8-33.1
cations, avg.	0.57	0.48	0.06	0.03	1.00

The inclusions of metallic iron are usually associated with troilite, but also with a hydrous iron silicate, possibly constituting an alteration product. Plate 2 shows the appearance of this silicate.

Based on the cation ratios derived from the electron probe analyses (see attached Table 4), the silicate is greenalite or cronstedtite or an intermediate member of these serpentine-type minerals. Greenalite has the stoichiometric composition $Fe_6Si_4O_{14}.4H_2O$, while cronstedtite has the same crystallographic structure but ferric iron in some of the silicon positions; its normal stoichiometric formula is $Fe_6(Si,Fe)_4O_{14}.4H_2O$. Table 4 gives the weight percentages derived from these formulae, for comparison. Unfortunately, this material does not occur in masses sufficiently large to analyze by x-ray diffraction so that the identification as greenalite/cronstedtite could not be confirmed.

Since only polished sections were prepared, the minerals forming the rocks associated with the iron inclusions could not be examined in detail. However, it was observed that the main constituents are clinopyroxene, plagioclase, ilmenite and olivine. The olivine was examined in section 591. It has a range of compositions as shown in Table 5.

	TABLE 5. Composition of Olivine							
	wt%				cations (0=4)			
	FeO	SiO_2	CaO	MgO	Fe	Si	Ca	Mg
High Fe	23.8	37.7	0.27	38.1	0.52	0.99	0.01	1.48
Low Fe	15.1	38.8	0.22	45.6	0.32	0.98	-	1.70

The olivine contains less than 0.04% Ni.

COMMENT

When considering the recoverY of nickel from this ore, the nickel content of greenalite/cronstedtite must be taken into account. Depending on the recovery method, at least some of this mineral may be lost to the tailings. In approximate terms, the distribution of nickel among the various Ni-bearing minerals is as shown in Table 6.

	TABLE 6. Distribution of Nickel in Average of Samples			
	Metal	Troilite	Greenalite/ Cronstedtite	Gangue
Vol%	10	7	4	79
Density	7.9	4.6	3.3	3.0
Wt%	22	9	4	65
% Ni	2.07	0.33	3	
Distribution, %	75	5	20	-

The average nickel content of the ore, based on the above data is 0.6%. As demonstrated in Table 6, some 25% may not be recoverable if both troilite and greenalite/cronstedtite are rejected during milling.

Although the samples were searched for platinum-rich minerals, none could be observed. The sensitivity of the electron probe for this element is about 100 ppm, well above the reported bulk level of 5 ppm. Even if all platinum were concentrated in the metal, the local concentration would only rise to about 25 ppm, too low to be detectable with the available instrumentation.

G. Springer

:jam

TABLE 1. Composition of metallic phase (wt%)							
PS91#	Fe	Ni	Co		Cu	S	P
			EDX	WDX			
584 avg. range	94.9	3.47 2.9-4.3	1.28 0.54-1.67		0.31 <0.2-0.6	<0.1	<0.1
585 avg. range	95.8	2.48 1.91-2.73	1.24 0.72-1.52	1.13 10.2-1.17	0.32 <0.2-0.56	<0.1	<0.1
586 avg. range	97.9	1.32 1.15-1.56	0.37 <0.20-0.80		0.38 0.25-0.54	<0.1	<0.1
587 avg. range	97.9	1.52 1.0-1.9	<0.20 <0.20-0.56		0.42 <0.2-0.65	<0.1	<0.1
588 avg. range	95.6	2.76 1.2-5.64	0.84 0.27-1.42	0.83 0.65-1.02	0.34 <0.2-0.6	<0.1	<0.1
589 avg. range	96.5	2.55 1.7-4.7	0.61 <0.2-1.06		0.31 <0.2-0.46	<0.1	<0.1 <0.1-0.14
590 avg. range	97.9	1.44 1.2-1.9	0.24 <0.20-0.48		0.35 <0.2-0.55	<0.1	<0.1 <0.1-0.15
591 avg. range	97.4	2.00 1.55-2.68		0.83 0.73-0.93	0.35 <0.2-0.49	<0.1	0.13 <0.1-0.25
591 carbide avg. range	98.7	0.84 0.78-0.94		0.55 0.50-0.62	0.31 0.18-0.40	<0.1	<0.1
601 avg. range	96.4	2.33 1.91-3.10	0.47 <0.20-0.73	0.65 0.64-0.70	0.33 <0.2-0.57	<0.1	0.37 0.18-0.52
overall avg.wt %	96.9	2.07	0.84	0.86	0.34	<0.1	<0.1
overall range		0.78-5.64	<0.2-1.67	0.64-1.17	<0.2-0.65	<0.1-0.15	<0.1-0.52

TABLE 2. Composition of Troilite (wt%)							
PS91#	Fe	Ni	Co		Cu	Zn	S
			EDX	WDX			
584 avg. range	62.7	0.27 <0.1-0.49	0.26 0.18-0.46		0.33 <0.2-0.68		36.4
585 avg. range	61.7	0.45 <0.1-2.64	0.38 <0.20-0.85	0.16 0.12-0.20	0.65 <0.2-3.65	0.54 0.24-0.86	36.3
586 avg. range	62.1	0.11 <0.1-0.18	<0.20		0.31 0.23-0.42		37.4
587 avg. range	61.5	0.54 0.34-0.84	<0.20		0.94 0.26-2.92	0.59 0.46-0.73	36.1
588 avg. range	61.3	0.44 <0.1-1.67	<0.20 <0.20-0.29	0.19 0.15-0.26	1.45 0.34-4.12	0.56 0-32-0.95	36.1
589 avg. range	61.9	0.30 0.15-0.44	<0.20 <0.20-0.25		0.74 <0.2-1.35	0.52 0.31-0.76	36.4
590 avg. range	57.3	0.30 0.21-0.37	<0.20 <0.20-0.28		2.43 2.1-2.83	0.45 0.36-0.52	37.6
591 avg. range	62.6	0.31 <0.1-1.3		0.18 0.16-0.21	0.40 <0.2-0.62	0.45 0.24-0.72	36.2
601 avg. range	62.6	0.21 <0.1-0.43	0.21 <0.2-0.39	0.15 0.13-0.18	0.71 <0.2-1.0	0.43 0.31-0.57	35.9
overall avg.wt %	61.5	0.33	<0.20		0.88	0.51	36.5
overall range		<0.1-2.64	<0.20-0.85		<0.2-4.12	0.24-0.95	
cation avg.	0.97	0.01	0.00		0.01	0.01	1

TABLE 4. Electron-probe Analyses of Greenalite-Cronstedtite
(cations to basis of 14 unhydrous oxygens)

	FeO	SiO_2	NiO	SO_3	CaO	MgO	Al_2O_3	Total
PS 91-585								
wt%	62.5	20.0	0.54	0.44	<0.1	0.42	0.19	84.9
cations	7.07	2.70	0.06	0.05		0.09	0.03	10.0
wt%	55.7	30.5	0.18	<0.2	<0.1	0.23	0.33	87.0
cations	5.97	3.91	0.02	-		0.04	0.05	10.0
wt%	54.1	31.0	0.24	0.15	0.23	1.39	0.86	87.2
cations	5.66	3.88	0.02	0.01	0.03	0.26	0.13	10.0
mixed, wt%	51.0	22.9	6.40	16.9	0.11	1.05	0.81	98.9
cations	4.43	2.38	0.54	1.32	0.01	0.16	0.10	8.93
-(Ni,Fe)S_2	0.12		0.54	1.32				
remain.silicate	4.31	2.28	-	-	0.01	0.16	0.10	6.86
recalc.silicate	6.29	3.32			0.01	0.23	0.15	10.0
PS 91-591								
wt%	65.2	18.2	<0.2	<0.3	<0.1	0.63	0.23	86.7
cations	7.38	2.46	-	-	-	0.13	0.04	10.0
wt%	57.1	26.2	<0.2	<0.3	<0.1	0.89	0.52	84.9
cations	6.29	3.45	-	-	-	0.18	0.08	10
Stoich.Greenalite $Fe_6Si_4O_{14}.4H_2O$	wt%	58.0	32.3	-	-	-	-	90.3 9.7%H_2O
	cations	6	4	-	-	-	-	10
Stoich.Cronstedtite $Fe_6Si_2Fe_2O_{14}.4H_2O$	wt%	71.9	15.0	-	-	-	-	87.0 9.0%H_2O
	cations	8	2	-	-	-	-	10

Tab.1a. Spot determinations of Ni and Co in metal

	PS 91-584		PS 91-585			PS 91-586	
	Ni	Co	Ni	Co	Co,WDX	Ni	Co
	3.51	1.37	2.46	1.14	1.17	1.13	0.29
	3.60	1.67	2.56	1.37	1.13	1.28	0.20
	3.58	1.05	2.73	1.70	1.12	1.48	0.25
	3.84	1.58	2.58	0.72	1.15	1.53	0.20
	3.32	0.99	2.48	1.38	1.15	1.24	0.39
	3.71	1.55	2.43	1.48	1.02	1.32	0.20
	3.61	1.21	2.34	1.21	1.14	1.36	0.44
	3.77	1.42	2.57	1.10	1.15	1.15	0.52
	3.91	1.43	2.39	1.52	1.15	1.39	0.80
	2.94	1.00	2.70	1.19	1.15	1.21	0.34
	2.89	0.82	2.53	1.09		1.24	0.64
	2.86	0.54	2.41	1.28		1.56	0.26
	3.40	0.90	2.43	1.40		1.22	0.39
	4.19	1.55	2.68	1.30		1.19	0.30
	4.23	1.31	2.58	0.98		1.49	0.38
	4.28	1.59	2.19	1.43		1.19	0.54
	3.94	1.12	1.91	1.18		1.22	0.33
	2.98	1.43	2.29	1.39		1.54	0.51
	3.07	1.33	2.43	0.95			
	3.34	1.34	2.54	1.24			
	3.18	1.24	2.60	1.44			
	2.98	1.44	2.64	1.33			
	3.29	1.36					
	2.84	1.49					
Avg. %	3.47	1.28	2.48	1.26	1.13	1.32	0.39
Min.%	2.84	0.54	1.91	0.72	1.02	1.13	0.2
Max.%	4.28	1.67	2.73	1.70	1.17	1.56	0.80

PS 91-587		PS 91-588			PS 91-589	
Ni	Co	Ni	Co	Co,WDX	Ni	Co
1.61	0.49	3.07	0.62	0.87	2.47	0.86
1.67	0.56	3.00	1.03	0.78	2.49	1.06
1.45	0.20	2.76	0.77	1.00	2.02	0.81
1.64	0.24	2.93	1.20	1.01	2.44	0.61
1.53	0.21	3.03	0.99	0.66	1.99	0.49
1.09	0.20	3.64	0.81	1.02	1.96	0.82
0.96	0.17	2.64	0.79	0.91	1.69	0.33
1.50	0.20	2.57	0.82	0.69	2.15	0.65
1.90	0.20	2.68	1.08	0.68	2.23	0.71
1.29	0.20	3.26	1.40	0.38	2.55	0.72
1.65	0.17	2.70	0.83	0.92	2.45	0.47
1.55	0.20	1.62	0.27		3.43	0.68
1.56	0.20	2.68	1.03		4.72	0.62
1.57	0.20	3.28	1.01		2.89	0.68
1.77	0.20	2.57	0.59		2.82	0.35
1.72	0.23	2.50	0.82		2.84	0.78
1.18	0.26	1.54	0.29		2.68	0.80
1.63	0.20	3.44	0.71		2.92	0.53
		2.68	1.42		2.22	0.51
		2.90	1.11		2.53	0.20
		1.97	0.71		2.64	0.42
		1.07	0.37		1.88	0.47
		1.85	0.68			
		3.31	1.12			
		2.33	0.64			
		5.64	0.87			

1.52	0.24	2.76	0.85	0.81	2.55	0.62
0.96	0.17	1.07	0.27	0.38	1.69	0.2
1.90	0.56	5.64	1.42	1.02	4.72	1.06

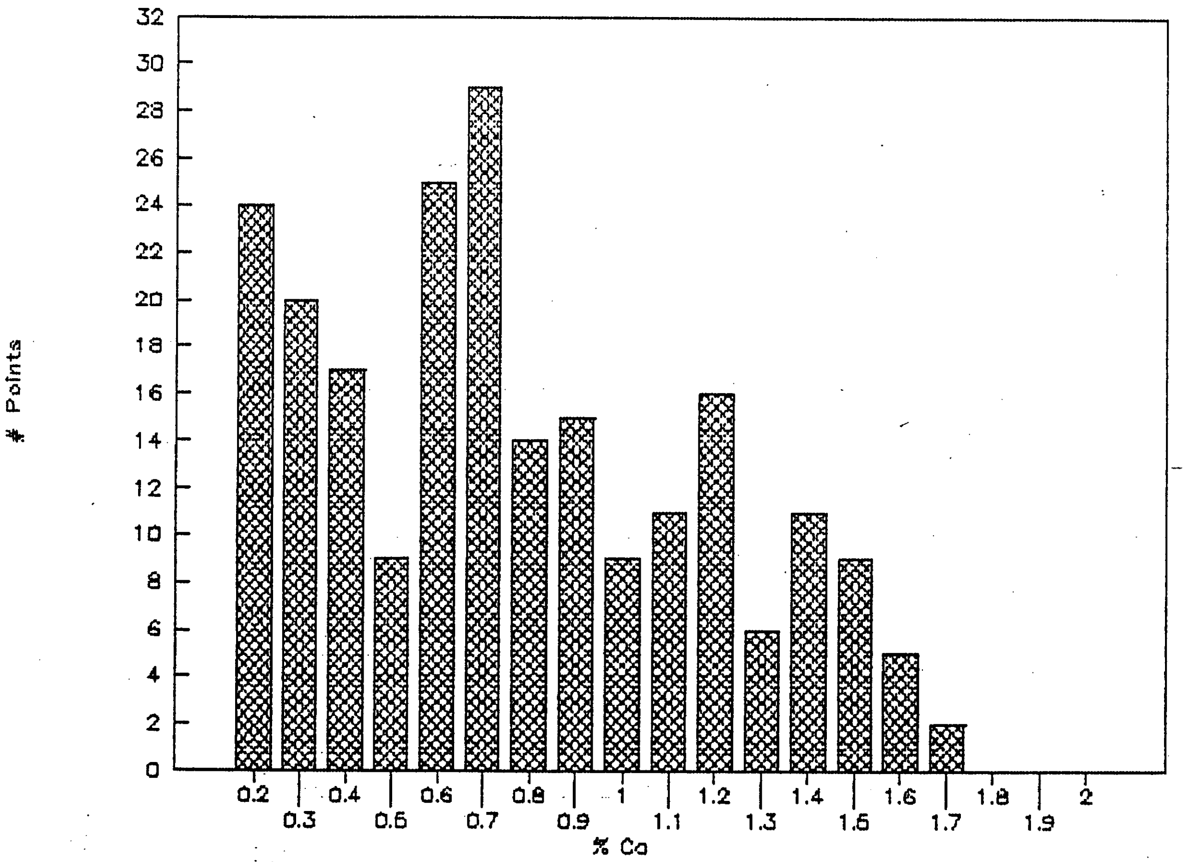
PS 91-590		PS 91 -591		PS 91 -591C	
Ni	Co	Ni	Co-WDX	Ni	Co,WDX
1.54	0.35	2.34	0.85	0.84	0.51
1.31	0.20	2.21	0.81	0.94	0.56
1.45	0.30	1.74	0.83	0.78	0.62
1.19	0.42	1.72	0.73	0.79	0.55
1.34	0.23	2.68	0.76		0.51
1.44	0.25	1.77	0.90		0.52
1.55	0.23	1.55	0.93		0.57
1.26	0.20	1.80			0.55
1.54	0.20	1.81			0.56
1.30	0.38	2.07			0.56
1.47	0.20	2.28			0.58
1.85	0.17				
1.68	0.36				
1.44	0.38				
1.46	0.48				
1.36	0.23				
1.28	0.20				
1.46	0.18				

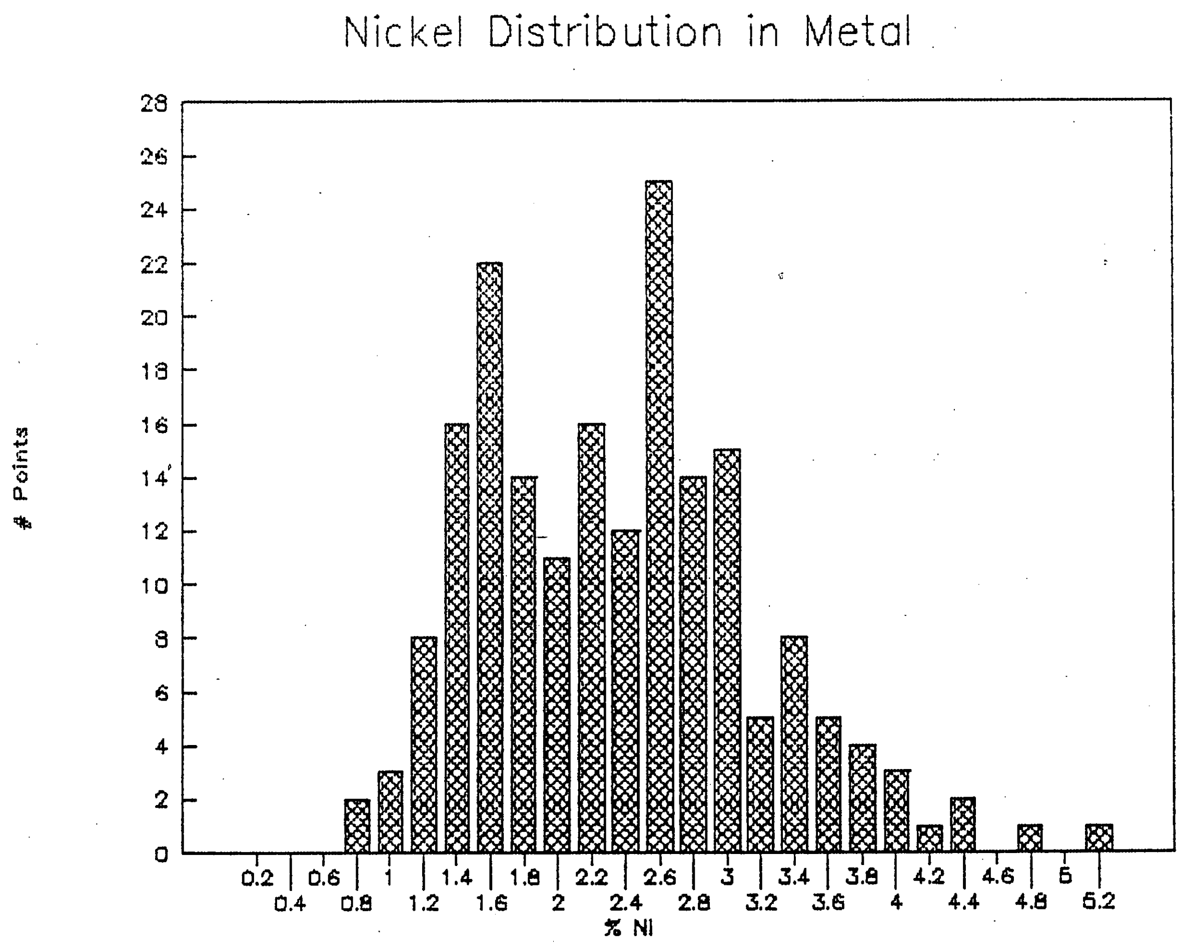
1.44	0.28	2.00	0.83	0.84	0.55
1.19	0.17	1.55	0.73	0.78	0.51
1.85	0.48	2.68	0.93	0.94	0.62

PS 91-601

Ni	Co,WDX	Co
2.19	0.68	0.52
2.30	0.66	0.56
2.49	0.53	0.62
2.06	0.70	0.25
1.83	0.65	0.29
2.27	0.65	0.40
2.81	0.61	0.62
2.10	0.64	0.52
2.14	0.67	0.68
3.10	0.67	0.63
2.01		0.20
2.22		0.23
2.47		0.37
2.18		0.31
2.16		0.54
2.62		0.73
2.14		0.44
2.17		0.33
3.23		0.70
2.14		0.59
2.13		0.30
2.60		0.61
1.91		0.70
2.15		0.51
2.92		0.24
2.33	0.65	0.48
1.83	0.53	0.2
3.23	0.70	0.73

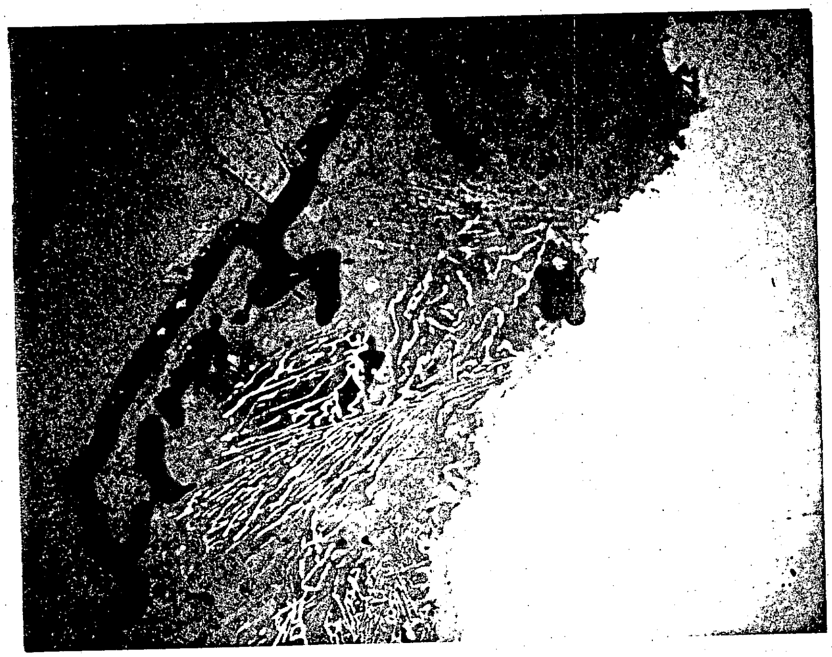
Co Distribution in Metal





Nickel Distribution in Metal
Points
% Ni
0
2
4
6
8
10
12
14
16
18
20
22
24
26
28
0.2
0.4
0.6
0.8
1
1.2
1.4
1.6
1.8
2
2.2
2.4
2.6
2.8
3
3.2
3.4
3.6
3.8
4
4.2
4.4
4.6
4.8
5
5.2

Intergrowth of cohenite (Fe_3C, medium grey) with kamacite (bcc Fe, light grey).
PS91-591 Magn. 200 x



Native iron (white, left) bordered by cronstedtite (grey). The cronstedtite is partly intergrown with nickel rich sulphide. PS 91-585. Magn. 400 x

PHOTOMICROGRAPHS OF NATIVE IRON FROM WEST GREENLAND

Native iron (white) surrounded by cronstedtite with sulphide inclusions. This assemblage in turn is surrounded by troilite with pentlandite (smooth grey troilite with lighter edge of pentlandite) followed by further cronstedtite (with black grain boundaries).

Metallic iron (white) surrounded by cronstedtite (dark grey with black veins) and magnetite (light grey). The medium grey mineral surrounding the whole aggregate is troilite with a band of pentlandite at the edge.

PHOTOMICROGRAPHS OF MINERALS ASSOCIATED WITH NATIVE IRON, WEST GREENLAND

APPENDIX II

Average Range of Nickel In West Greenland Flood Basalt Flows

AVERAGE RANGE OF NICKEL IN WEST GREENLAND FLOOD BASALT FLOWS			
PERCENT MgO	NICKEL IN PPM	PERCENT MgO	NICKEL IN PPM
5	0-35	18	680-815
6	25-80	19	615-750
7	65-125	20	800-930
8	120-170	21	875-1015
9	150-220	22	940-1085
10	200-260	23	1000-1130
11	250-310	24	1065-1210
12	290-350	25	1140-1280
13	370-500	26	1200-1330
14	430-560	27	1265-1400
15	490-620	28	1330-1455
16	560-690	29	1400-1525
17	615-755	30	1460-1590

APPENDIX III

Whole Rock Lithogeochemistry Results

XRAL

X-RAY ASSAY LABORATORIES

A DIVISION OF SGS SUPERVISION SERVICES INC.
1885 LESLIE STREET • DON MILLS, ONTARIO M3B 3J4 • CANADA
TEL: (416)445-5755 TELEX: 06-986947 FAX: (416)445-4152

CERTIFICATE OF ANALYSIS

REPORT 16811

TO: FALCONBRIDGE LIMITED
ATTN: KEVIN OLSHEFSKY
P.O. BOX 398
124 WATER STREET
WINDSOR, NOVA SCOTIA BON 2T0

CUSTOMER No. 1617

DATE SUBMITTED
28-Aug-91

REF. FILE 10691-

Total Pages 45

32 PULPS, 680 ROCKS Proj. GREENLAND

	METHOD	DETECTION LIMIT
WRMAJ %	WR	.01
S PPM	XRF	50.
WRMIN PPM	WR	10.
CO PPM	XRF	10.

DATE 26-SEP-91

CERTIFIED BY ....
Philip Boctor, Laboratory Manager

SAMPLE	S PPM	CO PPM
AF07501	661	32
AF07502	603	38
AF07503	<50	49
AF07504	<50	47
AF07505	<50	41
AF07506	302	49
AF07507	172	42
AF07508	104	136
AF07509	1390	46
AF07510	<50	39
AF07511	99	41
AF07512	<50	45
AF07513	102	42
AF07514	490	45
AF07515	453	43
AF07516	545	43
AF07517	<50	67
AF07518	<50	56
AF07519	<50	64
AF07520	451	41
AF07521	<50	65
AF07522	505	37
AF07523	102	42
AF07530	<50	38
AF07531	<50	39
AF07534	<50	38
AF07535	<50	36
AF07536	<50	42
AF07537	485	40
AF07538	<50	43
AF07539	331	47
AF07540	<50	56
AF07541	<50	71
AF07542	<50	30
AF07543	212	43
AF07544	<50	45
AF07545	198	40
AF07546	314	44
AF07547	146	42
AF07548	116	137
AF07549	152	44
AF07550	<50	38
AF07551	496	40
AF07552	183	47
AF07553	<50	41
AF07554	<50	35
AF07555	55	50
AF07556	405	40
AF07557	288	43
AF07558	525	44

SAMPLE	S PPM	CO PPM
AF07559	566	41
AF07560	540	45
AF07561	288	43
AF07562	<50	44
AF07563	<50	42
AF07564	<50	43
AF07565	<50	43
AF07566	<50	42
AF07567	<50	<10
AF07568	206	45
AF07569	202	36
AF07570	<50	57
AF07571	<50	54
AF07572	669	42
AF07573	<50	77
AF07574	<50	39
AF07575	<50	59
AF07576	<50	57
AF07577	<50	60
AF07578	<50	43
AF07579	<50	38
AF07580	<50	41
AF07581	625	37
AF07582	584	14
AF07583	<50	41
AF07584	<50	42
AF07585	176	41
AF07586	159	41
AF07587	2890	29
AF07588	118	138
AF07589	<50	42
AF07590	129	26
AF07591	225	27
AF07592	107	45
AF07593	156	44
AF07594	1580	39
AF07595	1330	49
AF07596	281	44
AF07597	369	46
AF07598	<50	42
AF07599	<50	41
AF07600	226	44
AF07601	<50	43
AF07602	164	36
AF07603	<50	81
AF07604	<50	67
AF07605	<50	59
AF07606	<50	52
AF07607	<50	87
AF07608	<50	139

SAMPLE	S PPM	CO PPM
AF07609	<50	60
AF07610	<50	72
AF07611	<50	73
AF07612	<50	76
AF07613	<50	73
AF07614	<50	63
AF07615	<50	76
AF07616	<50	64
AF07617	<50	76
AF07618	<50	70
AF07619	<50	75
AF07620	135	45
AF07621	<50	67
AF07622	<50	74
AF07623	245	32
AF07624	296	31
AF07625	348	36
AF07626	251	33
AF07627	265	26
AF07628	141	141
AF07629	413	41
AF07630	447	42
AF07631	324	25
AF07632	317	24
AF07633	<50	57
AF07634	388	24
AF07635	159	35
AF07636	<50	32
AF07637	<50	32
AF07638	<50	35
AF07639	<50	39
AF07640	<50	92
AF07641	<50	86
AF07642	<50	79
AF07643	<50	51
AF07644	<50	75
AF07645	<50	44
AF07646	<50	43
AF07647	<50	39
AF07648	<50	<10
AF07649	<50	69
AF07651	<50	73
AF07652	<50	62
AF07653	<50	72
AF07654	<50	94
AF07655	<50	89
AF07656	<50	31
AF07657	<50	43
AF07658	<50	54
AF07659	<50	37

SAMPLE	S PPM	CO PPM
AF07660	<50	94
AF07661	<50	74
AF07662	161	73
AF07663	<50	57
AF07664	<50	47
AF07665	<50	71
AF07666	<50	<10
AF07667	<50	53
AF07668	<50	85
AF07669	<50	45
AF07670	<50	40
AF07671	<50	44
AF07672	<50	38
AF07673	<50	43
AF07674	<50	43
AF07675	<50	41
AF07676	<50	76
AF07677	<50	81
AF07678	<50	92
AF07679	69	47
AF07680	<50	80
AF07681	334	56
AF07682	218	57
AF07683	<50	70
AF07684	<50	69
AF07685	67	137
AF07686	<50	80
AF07687	<50	76
AF07688	144	70
AF07689	<50	75
AF07690	<50	79
AF07691	<50	76
AF07692	117	73
AF07693	<50	66
AF07694	51	70
AF07695	<50	62
AF07696	<50	71
AF07697	<50	70
AF07698	<50	41
AF07699	<50	36
AF07700	<50	40
AF07701	<50	33
AF07702	<50	37
AF07703	<50	41
AF07704	120	35
AF07705	<50	31
AF07706	<50	28
AF07707	129	32
AF07708	62	136
AF07709	<50	61

SAMPLE	S PPM	CO PPM
AF07710	<50	68
AF07711	12000	69
AF07712	<50	68
AF07713	<50	39
AF07714	<50	38
AF07715	<50	40
AF07716	<50	34
AF07717	<50	40
AF07718	<50	61
AF07719	<50	96
AF07720	5690	22
AF07721	7470	37
AF07722	539	24
AF07723	<50	51
AF07724	<50	55
AF07725	<50	74
AF07726	<50	61
AF07727	<50	70
AF07728	108	144
AF07729	<50	73
AF07730	<50	43
AF07731	<50	42
AF07732	<50	47
AF07733	<50	41
AF07734	<50	56
AF07735	<50	53
AF07736	4750	30
AF07737	4790	33
AF07738	14900	74
AF07739	17200	70
AF07740	<50	39
AF07741	363	35
AF07742	259	46
AF07743	311	43
AF07744	796	44
AF07745	4400	50
AF07761	<50	43
AF07762	66	35
AF07763	360	38
AF07764	<50	37
AF07765	119	36
AF07766	<50	36
AF07767	<50	42
AF07768	264	33
AF07769	<50	45
AF07770	<50	39
AF07771	<50	37
AF07772	<50	44
AF07773	<50	39
AF07774	<50	37

SAMPLE	S PPM	CO PPM
AF07775	<50	42
AF07776	<50	46
AF07777	<50	38
AF07778	<50	42
AF07779	<50	41
AF07780	<50	74
AF07781	<50	79
AF07782	<50	95
AF07783	<50	39
AF07784	<50	38
AF07785	<50	87
AF07786	<50	88
AF07787	<50	86
AF07788	<50	<10
AF07789	<50	73
AF07790	1620	41
AF07791	2990	45
AF07792	639	45
AF07793	<50	80
AF07794	<50	65
AF07795	<50	41
AF07796	179	56
AF07797	3150	49
AF07798	1610	43
AF07799	82	50
AF07800	<50	76
AF07808	59	135
AF07818	<50	82
AF07819	<50	61
AF07820	354	42
AF07821	<50	79
AF07822	<50	78
AF07823	<50	74
AF07824	<50	68
AF07825	<50	38
AF07826	<50	62
AF07827	334	30
AF07828	62	136
AF07829	<50	54
AF07830	<50	48
AF07831	<50	63
AF07832	<50	51
AF07833	<50	63
AF07834	<50	34
AF07835	<50	34
AF07836	<50	34
AF07837	<50	49
AF07838	<50	56
AF07839	<50	13
AF07840	8100	21

SAMPLE	S PPM	CO PPM
AF07841	322	94
AF07842	96	102
AF07843	<50	106
AF07844	527	24
AF07845	3400	23
AF07848	<50	60
AF07851	<50	63
AF07852	<50	83
AF07853	<50	68
AF07854	<50	83
AF07855	<50	69
AF07856	<50	37
AF07857	142	37
AF07858	<50	33
AF07859	<50	41
AF07860	<50	46
AF07861	<50	61
AF07862	<50	28
AF07863	<50	49
AF07864	<50	68
AF07865	<50	43
AF07866	<50	70
AF07867	<50	84
AF07868	132	139
AF07869	<50	67
AF07870	<50	92
AF07871	<50	46
AF07872	<50	63
AF07873	<50	67
AF07874	<50	49
AF07875	<50	66
AF07876	<50	73
AF07877	<50	71
AF07878	<50	76
AF07879	<50	67
AF07880	<50	71
AF07881	<50	68
AF07882	<50	78
AF07883	<50	45
AF07884	<50	71
AF07885	<50	38
AF07886	<50	35
AF07887	<50	80
AF07888	<50	<10
AF07889	<50	81
AF07890	<50	63
AF07891	<50	81
AF07892	<50	82
AF07893	<50	37
AF07894	<50	35

SAMPLE	S PPM	CO PPM
AF07895	<50	36
AF07896	<50	36
AF07897	183	26
AF07898	236	30
AF07899	1470	34
AF07900	<50	46
AF07918	<50	22
AF07919	<50	88
AF07920	148	45
AF07921	162	44
AF07922	<50	90
AF07923	<50	85
AF07924	<50	60
AF07925	<50	81
AF07926	<50	65
AF07928	77	139
AF07939	<50	81
AF07940	<50	83
AF07941	<50	69
AF07942	<50	66
AF07943	<50	55
AF07944	<50	63
AF07945	<50	77
AF07946	<50	62
AF07947	<50	66
AF07948	68	138
AF07949	<50	81
AF07950	<50	50
AF08001	<50	36
AF08002	67	36
AF08003	560	32
AF08004	418	43
AF08005	646	27
AF08006	397	53
AF08007	<50	57
AF08008	<50	81
AF08009	<50	61
AF08010	<50	64
AF08011	<50	72
AF08012	145	45
AF08013	1180	45
AF08014	<50	45
AF08015	<50	79
AF08016	224	42
AF08017	<50	45
AF08018	<50	43
AF08019	531	45
AF08020	<50	84
AF08021	<50	67
AF08022	<50	40

SAMPLE	S PPM	CO PPM
AF08023	<50	55
AF08024	<50	81
AF08025	<50	67
AF08026	<50	80
AF08027	<50	89
AF08028	<50	<10
AF08029	<50	68
AF08030	<50	62
AF08031	<50	62
AF08032	<50	92
AF08033	341	<10
AF08034	81	15
AF08035	7520	27
AF08036	5040	39
AF08037	<50	45
AF08038	<50	48
AF08039	<50	62
AF08040	<50	58
AF08041	<50	93
AF08042	<50	64
AF08043	<50	73
AF08044	<50	61
AF08045	<50	64
AF08046	<50	61
AF08047	103	44
AF08048	<50	141
AF08049	111	45
AF08050	240	39
AF08051	59	29
AF08052	<50	84
AF08053	<50	60
AF08054	<50	78
AF08055	<50	42
AF08056	353	41
AF08057	<50	83
AF08058	550	46
AF08059	<50	46
AF08060	<50	103
AF08061	<50	41
AF08062	139	46
AF08063	364	38
AF08064	<50	107
AF08065	631	36
AF08066	<50	46
AF08067	<50	59
AF08068	79	138
AF08069	<50	62
AF08070	<50	44
AF08071	<50	47
AF08072	<50	44

SAMPLE	S PPM	CO PPM
AF08073	<50	38
AF08074	162	46
AF08075	123	43
AF08076	<50	44
AF08077	325	41
AF08078	146	43
AF08079	53	42
AF08080	128	35
AF08081	161	40
AF08082	51	40
AF08083	<50	41
AF08084	<50	44
AF08085	<50	39
AF08086	<50	35
AF08087	<50	37
AF08088	84	139
AF08089	<50	42
AF08090	<50	44
AF08091	<50	45
AF08092	<50	44
AF08093	<50	44
AF08094	<50	40
AF08095	<50	48
AF08096	<50	39
AF08097	<50	41
AF08098	<50	40
AF08099	<50	44
AF08100	<50	40
AF08101	171	30
AF08102	234	42
AF08103	<50	43
AF08104	<50	38
AF08105	145	39
AF08106	176	40
AF08107	150	41
AF08108	<50	<10
AF08109	236	43
AF08110	203	36
AF08111	<50	42
AF08112	<50	43
AF08113	<50	38
AF08114	<50	44
AF08115	114	43
AF08116	<50	39
AF08117	123	38
AF08118	<50	38
AF08119	<50	37
AF08120	<50	38
AF08121	158	35
AF08122	229	35

SAMPLE	S PPM	CO PPM
AF08123	<50	40
AF08124	249	32
AF08125	57	39
AF08126	234	42
AF08127	297	43
AF08128	<50	140
AF08129	81	35
AF08130	<50	40
AF08131	113	40
AF08132	270	40
AF08133	<50	43
AF08134	52	40
AF08135	<50	38
AF08136	<50	44
AF08137	<50	39
AF08138	<50	39
AF08139	97	44
AF08140	<50	45
AF08141	<50	49
AF08142	<50	38
AF08143	<50	34
AF08144	<50	45
AF08145	<50	36
AF08146	<50	46
AF08147	<50	101
AF08148	<50	136
AF08149	<50	43
AF08150	<50	44
AF08151	<50	42
AF08152	<50	45
AF08153	<50	46
AF08154	<50	43
AF08155	<50	44
AF08156	<50	39
AF08157	<50	41
AF08158	<50	38
AF08159	<50	40
AF08160	<50	42
AF08161	<50	49
AF08162	<50	42
AF08163	<50	39
AF08164	<50	40
AF08165	<50	46
AF08166	<50	40
AF08167	<50	45
AF08168	115	141
AF08169	<50	38
AF08170	<50	41
AF08171	<50	46
AF08172	<50	59

SAMPLE	S PPM	CO PPM
AF08173	<50	41
AF08174	<50	39
AF08175	<50	39
AF08176	<50	44
AF08177	<50	36
AF08178	<50	40
AF08179	<50	45
AF08180	<50	41
AF08181	<50	41
AF08182	<50	43
AF08183	<50	44
AF08184	<50	42
AF08185	<50	43
AF08186	<50	55
AF08187	<50	62
AF08188	70	43
AF08189	<50	46
AF08190	<50	60
AF08191	<50	97
AF08192	<50	76
AF08193	<50	67
AF08194	<50	60
AF08195	<50	56
AF08196	51	41
AF08197	<50	39
AF08198	<50	45
AF08199	<50	42
AF08200	<50	70
AF08201	<50	45
AF08202	<50	45
AF08203	<50	43
AF08204	<50	46
AF08205	<50	46
AF08206	82	39
AF08207	<50	40
AF08208	<50	138
AF08209	<50	44
AF08210	<50	43
AF08211	<50	51
AF08212	<50	46
AF08213	<50	39
AF08214	<50	37
AF08215	<50	41
AF08216	<50	40
AF08217	<50	38
AF08218	<50	42
AF08219	<50	64
AF08220	<50	38
AF08221	<50	37
AF08222	<50	38

SAMPLE	S PPM	CO PPM
AF08223	<50	43
AF08224	<50	94
AF08225	<50	47
AF08226	<50	36
AF08227	<50	71
AF08228	<50	<10
AF08229	<50	62
AF08230	100	43
AF08231	174	40
AF08232	<50	54
AF08233	<50	59
AF08234	<50	68
AF08235	<50	35
AF08236	<50	90
AF08237	<50	32
AF08238	<50	74
AF08239	<50	60
AF08240	63	43
AF08241	<50	43
AF08242	<50	49
AF08243	<50	40
AF08244	<50	41
AF08245	<50	49
AF08246	<50	45
AF08247	<50	42
AF08248	<50	137
AF08249	<50	41
AF08250	<50	48
AF08251	<50	73
AF08252	<50	41
AF08253	<50	67
AF08254	<50	78
AF08255	<50	52
AF08256	<50	37
AF08257	<50	43
AF08258	200	44
AF08259	200	40
AF08260	<50	40
AF08261	<50	40
AF08262	<50	40
AF08263	<50	<10
AF08264	240	45
AF08265	<50	40
AF08266	238	36
AF08267	232	36
AF08268	84	137
AF08269	115	42
AF08270	<50	33
AF08271	<50	38
AF08272	497	43

SAMPLE	S PPM	CO PPM
AF08273	201	40
AF08274	296	44
AF08275	<50	<10
AF08276	<50	38
AF08277	<50	39
AF08278	1380	91
AF08279	230	42
AF08280	<50	31
AF08281	215	43
AF08282	599	46
AF08283	240	40
AF08284	<50	40
AF08285	103	33
AF08286	3110	45
AF08287	83	51
AF08288	86	102
AF08289	98	39
AF08290	384	46
AF08291	354	48
AF08292	<50	42
AF08293	64	40
AF08294	<50	39
AF08295	<50	26
AF08296	2290	30
AF08297	<50	35
AF08298	<50	44
AF08299	<50	39
AF08300	2110	42
AF08301	358	36
AF08302	85	37
AF08303	<50	34
AF08304	125	42
AF08305	12500	19
AF08306	<50	39
AF08307	1530	51
AF08308	256	21
AF08309	363	38
AF08310	<50	48
AF08311	<50	44
AF08312	473	46
AF08313	309	46
AF08314	109	42
AF08315	<50	<10
AF08316	52	47
AF08322	507	46
AF08323	<50	37
AF08324	<50	38
AF08325	<50	42
AF08326	<50	41
AF08327	<50	42

SAMPLE	S PPM	CO PPM
AF08328	<50	11
AF08329	<50	41
AF08330	<50	40
AF08331	166	34
AF08332	71	40
AF08333	<50	44
AF08334	<50	52
AF08335	322	32
AF08336	341	28
AF08337	172	35
AF08338	205	36
AF08346	166	50
AF08348	SMP MISS	SMP MISS

SMP.MISS. - SAMPLE WAS NOT RECEIVED AT XRAL

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF07501	49.1	12.9	8.87	9.46	1.83	.26	10.9	.16	1.57	.19	.09	4.08	99.5
AF07502	48.3	13.8	8.95	3.90	2.90	1.33	15.6	.22	3.63	.59	<.01	.77	100.2
AF07503	46.8	12.7	9.13	4.68	2.79	1.19	16.5	.24	3.87	.55	<.01	1.70	100.3
AF07504	47.2	12.6	9.11	4.45	2.59	1.27	16.4	.24	3.83	.58	<.01	1.85	100.3
AF07505	46.4	12.6	9.40	4.80	2.53	1.13	16.5	.23	3.96	.52	<.01	1.54	99.8
AF07506	47.5	12.7	9.22	4.80	2.66	1.27	16.3	.24	3.72	.55	<.01	1.08	100.2
AF07507	47.2	12.6	9.00	4.40	2.58	1.24	16.3	.23	3.79	.57	<.01	1.54	99.6
AF07508	35.4	1.27	.18	35.6	.13	.04	11.8	.21	.245	.03	---	11.8	99.0
AF07509	47.0	12.6	9.08	4.72	2.84	1.24	16.0	.23	3.77	.57	<.01	1.23	99.5
AF07510	47.6	12.7	9.34	4.71	2.68	1.23	16.3	.24	3.73	.56	<.01	.39	99.7
AF07511	47.2	12.6	9.05	4.43	2.60	1.26	16.3	.23	3.80	.57	<.01	1.39	99.6
AF07512	46.9	12.5	9.10	4.48	2.55	1.24	16.2	.24	3.73	.56	<.01	2.00	99.7
AF07513	47.0	12.4	9.29	4.96	2.52	1.21	16.1	.23	3.66	.54	<.01	1.16	99.3
AF07514	47.2	12.6	9.39	5.03	2.74	1.16	15.8	.23	3.52	.52	<.01	1.23	99.6
AF07515	48.1	12.9	8.60	4.35	2.79	1.07	15.5	.23	3.22	.45	<.01	.70	98.1
AF07516	49.0	14.2	11.8	7.41	2.03	.27	11.8	.18	1.57	.16	.06	1.70	100.3
AF07517	46.1	11.7	10.3	14.0	1.67	.15	12.7	.19	1.38	.15	.15	1.47	100.1
AF07518	46.3	11.9	10.4	13.4	1.57	.14	12.7	.19	1.43	.15	.13	.93	99.4
AF07519	44.5	12.0	11.0	11.6	1.66	.14	12.6	.19	1.36	.15	.14	4.39	99.9
AF07520	47.9	12.2	8.68	4.32	2.68	1.18	16.6	.24	3.80	.52	<.01	1.54	99.8
AF07521	45.9	11.3	9.59	16.0	1.50	.11	12.3	.18	1.28	.14	.18	.93	99.5
AF07522	46.5	12.6	9.44	4.97	2.49	1.13	15.7	.23	3.52	.52	<.01	1.77	99.1
AF07523	46.8	12.5	9.51	5.00	2.47	1.13	16.0	.23	3.62	.52	<.01	1.85	99.8
AF07530	48.7	15.8	12.3	7.43	1.95	.24	10.6	.16	1.42	.14	.06	1.54	100.4
AF07531	47.8	12.3	8.90	4.68	2.65	1.16	16.1	.23	3.69	.50	<.01	1.23	99.4
AF07534	47.7	13.2	11.2	6.09	2.45	.31	14.5	.22	2.17	.22	.02	2.23	100.4
AF07535	47.3	12.8	9.94	5.24	2.57	.60	16.1	.22	3.75	.43	<.01	.39	99.5
AF07536	47.2	12.3	9.72	5.04	2.61	.71	15.9	.22	3.55	.44	<.01	2.39	100.2
AF07537	49.3	14.2	11.6	7.75	2.00	.28	12.0	.18	1.57	.15	.06	.93	100.1
AF07538	46.6	13.6	10.8	5.61	2.62	.94	15.3	.21	3.02	.42	<.01	.77	100.0
AF07539	46.9	12.7	9.53	4.56	2.36	1.05	15.9	.22	3.88	.54	<.01	2.16	100.0
AF07540	46.7	12.7	11.1	12.5	1.70	.20	12.4	.18	1.63	.17	.11	1.08	100.6
AF07541	45.1	10.6	9.02	17.6	1.39	.19	13.0	.19	1.38	.14	.20	.77	99.7
AF07542	48.4	12.9	8.23	3.40	2.91	1.63	16.0	.25	3.50	.71	<.01	2.15	100.3
AF07543	47.2	12.6	9.17	4.56	2.51	1.21	16.2	.23	3.78	.57	<.01	1.47	99.7
AF07544	48.2	14.0	10.3	5.40	2.65	.36	14.8	.21	2.60	.27	<.01	.77	99.7
AF07545	46.3	11.6	8.36	3.42	2.68	1.51	18.7	.28	3.38	1.46	<.01	1.92	99.8
AF07546	46.9	12.6	9.54	5.12	2.50	1.13	15.8	.23	3.54	.51	<.01	1.16	99.2
AF07547	47.2	12.6	8.97	4.51	2.64	1.27	16.1	.23	3.48	.57	<.01	1.47	99.2
AF07548	35.4	1.30	.21	35.6	.15	.05	11.8	.21	.242	.04	---	12.0	99.3
AF07549	45.6	12.1	8.97	4.49	2.51	1.19	17.2	.24	4.48	.55	<.01	1.77	99.3
AF07550	48.5	13.9	11.4	6.80	2.27	.29	13.6	.21	1.98	.20	.03	.93	100.2
AF07551	46.4	12.5	9.48	5.14	2.52	1.11	15.7	.23	3.54	.50	.01	1.54	98.9
AF07552	45.7	12.6	9.79	4.93	2.37	1.00	16.5	.23	4.58	.46	<.01	1.31	99.7
AF07553	46.6	12.4	9.18	4.67	2.63	1.21	16.2	.23	3.75	.56	<.01	1.62	99.2
AF07554	47.2	12.9	9.11	4.48	2.75	1.27	15.9	.23	3.69	.56	<.01	1.54	99.8
AF07555	46.0	12.5	9.44	4.69	2.52	1.11	16.3	.23	4.21	.50	<.01	1.54	99.2
AF07556	47.1	12.5	9.45	4.95	2.56	1.18	15.9	.23	3.62	.53	<.01	1.47	99.7
AF07557	46.7	12.1	9.16	4.59	2.60	1.23	16.0	.23	3.71	.55	<.01	1.54	98.6
AF07558	49.5	14.0	11.6	7.44	2.02	.28	12.2	.19	1.66	.16	.05	.92	100.1

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF07559	49.7	13.9	11.8	6.69	2.13	.29	12.3	.19	1.81	.17	.04	1.00	100.1
AF07560	47.2	12.5	9.25	4.36	2.46	1.18	16.3	.23	3.82	.58	<.01	1.93	100.0
AF07561	49.1	14.4	11.8	7.44	1.96	.20	11.6	.18	1.55	.16	.05	1.77	100.3
AF07562	47.7	12.3	9.66	5.19	2.53	.67	16.4	.22	3.53	.42	<.01	.54	99.3
AF07563	47.7	12.2	9.58	5.19	2.50	.68	16.5	.22	3.59	.43	<.01	.54	99.3
AF07564	47.1	12.2	9.90	5.02	2.40	.54	16.3	.24	3.53	.41	<.01	1.23	99.0
AF07565	46.7	12.5	9.10	4.45	2.58	1.26	16.3	.24	3.80	.57	<.01	1.47	99.2
AF07566	47.1	12.6	9.17	4.47	2.54	1.24	16.3	.24	3.80	.57	<.01	1.31	99.5
AF07567	47.0	12.6	8.97	4.47	2.63	1.28	16.3	.24	3.85	.58	<.01	1.70	99.8
AF07568	70.4	14.6	1.44	.88	3.48	4.28	3.38	.08	.462	.22	---	.85	100.3
AF07569	47.2	12.7	9.06	4.57	2.78	1.19	16.3	.24	3.82	.57	<.01	1.08	99.7
AF07570	46.9	12.5	9.13	4.45	2.49	1.22	16.2	.24	3.80	.57	<.01	1.47	99.2
AF07571	46.7	12.6	10.6	12.7	1.73	.20	12.4	.18	1.42	.14	.12	.62	99.5
AF07572	46.2	12.1	10.3	13.7	1.71	.18	12.5	.18	1.39	.14	.13	.62	99.2
AF07573	49.2	13.3	9.75	10.5	1.74	.43	11.5	.17	1.48	.16	.10	1.93	100.4
AF07574	45.0	10.3	8.75	18.4	1.39	.12	13.0	.19	1.17	.12	.22	.70	99.5
AF07575	47.7	12.5	10.5	6.37	2.62	.33	15.5	.22	2.76	.28	<.01	.77	99.7
AF07576	46.5	12.6	10.8	12.7	1.77	.16	12.4	.18	1.43	.14	.12	.70	99.6
AF07577	46.5	12.5	10.8	12.4	1.72	.19	12.8	.19	1.42	.15	.11	.70	99.6
AF07578	47.0	12.1	9.72	5.05	2.54	.67	16.2	.23	3.54	.42	<.01	1.70	99.3
AF07579	47.2	12.3	9.91	5.23	2.55	.63	16.1	.23	3.43	.40	<.01	1.54	99.7
AF07580	47.7	12.3	10.1	5.41	2.56	.49	16.5	.23	3.94	.44	.01	.62	100.5
AF07581	47.8	12.3	8.50	4.19	2.59	1.19	16.5	.24	3.95	.55	<.01	1.16	99.2
AF07582	56.9	12.9	4.53	1.09	3.80	2.77	11.8	.22	1.38	.40	<.01	2.77	98.8
AF07583	48.4	11.5	8.45	3.77	2.77	.59	18.9	.28	3.38	.42	<.01	1.39	100.0
AF07584	47.8	12.2	8.89	4.40	2.50	1.13	16.4	.24	3.84	.52	<.01	1.47	99.6
AF07585	47.5	12.2	8.90	4.13	2.46	1.12	16.1	.20	3.85	.53	<.01	1.93	99.1
AF07586	47.2	12.2	9.12	4.42	2.46	1.07	15.9	.22	3.77	.49	<.01	2.39	99.4
AF07587	49.6	12.1	6.84	2.53	3.01	1.74	15.7	.26	2.77	.83	<.01	2.77	98.4
AF07588	33.7	1.31	.08	34.4	.08	.03	11.5	.20	.210	.03	---	11.9	95.7
AF07589	48.3	14.0	11.5	7.59	1.96	.37	11.8	.18	1.55	.16	.05	2.70	100.3
AF07590	52.4	12.3	6.36	2.46	3.14	1.99	15.3	.25	2.29	.89	<.01	2.39	100.0
AF07591	52.4	12.5	6.44	2.02	3.17	2.00	15.3	.24	2.26	.83	<.01	3.08	100.5
AF07592	48.0	12.7	9.16	4.70	2.48	1.06	16.1	.23	3.67	.46	<.01	1.31	100.0
AF07593	47.7	12.2	9.17	4.52	2.52	1.10	16.3	.24	3.76	.50	<.01	1.54	99.7
AF07594	49.3	12.8	10.7	6.01	2.20	.37	14.4	.22	2.24	.22	<.01	1.54	100.1
AF07595	47.0	12.5	9.20	4.67	2.56	1.20	16.2	.23	3.81	.57	<.01	1.47	99.6
AF07596	46.9	12.4	9.44	4.72	2.57	1.19	16.2	.23	3.75	.56	<.01	.93	99.1
AF07597	46.9	12.7	9.16	4.56	2.49	1.10	16.2	.25	3.85	.57	<.01	1.54	99.5
AF07598	49.1	14.4	11.7	7.26	2.12	.27	11.7	.18	1.60	.16	.05	1.77	100.4
AF07599	49.1	14.3	11.8	7.26	1.97	.20	11.8	.18	1.63	.16	.05	1.47	100.0
AF07600	49.0	14.0	11.9	7.18	2.02	.26	11.9	.18	1.62	.16	.05	1.77	100.1
AF07601	47.9	11.9	8.31	3.74	2.61	1.24	17.1	.26	4.04	.58	<.01	2.08	100.0
AF07602	47.8	12.1	8.82	4.12	2.52	1.17	16.4	.24	3.85	.54	<.01	1.77	99.5
AF07603	43.3	8.60	7.39	22.5	1.12	.22	12.2	.18	1.23	.14	.26	2.00	99.3
AF07604	44.2	10.4	9.05	17.8	1.30	.07	12.3	.18	1.18	.11	.19	3.08	100.0
AF07605	43.0	11.3	9.69	13.5	1.40	.56	11.9	.18	1.27	.13	.14	6.85	100.1
AF07606	44.0	12.5	10.7	9.88	1.36	.06	12.5	.18	1.49	.15	.07	7.23	100.2
AF07607	42.7	7.73	6.75	23.8	.88	.06	12.8	.19	.900	.10	.26	3.70	100.1
AF07608	35.1	1.18	.11	36.0	.07	.03	11.8	.21	.200	.03	---	11.9	99.0

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF07609	44.5	11.7	9.99	14.2	1.53	.13	11.7	.17	1.24	.14	.18	4.08	99.7
AF07610	42.9	9.11	7.91	20.6	.98	.07	11.9	.18	1.02	.11	.20	4.70	99.8
AF07611	43.2	9.95	8.64	18.4	1.18	.25	12.1	.18	1.18	.15	.22	4.08	99.7
AF07612	43.3	9.38	8.22	18.1	1.21	.38	12.7	.18	1.58	.17	.11	3.70	99.2
AF07613	44.6	9.11	7.96	20.1	1.26	.13	12.9	.19	1.32	.16	.18	2.08	100.2
AF07614	41.9	9.56	8.49	15.8	.85	.22	12.3	.18	1.39	.16	.18	8.77	100.0
AF07615	41.9	8.46	7.38	19.6	.85	.16	12.3	.18	1.23	.15	.18	7.54	100.1
AF07616	44.1	10.8	9.99	14.9	1.38	.09	13.0	.19	1.66	.20	.15	2.85	99.5
AF07617	42.2	8.87	7.74	22.3	1.04	.11	11.3	.18	.825	.07	.27	4.62	99.7
AF07618	44.0	9.71	8.67	17.6	1.21	.09	12.5	.18	1.30	.15	.18	4.08	99.8
AF07619	44.0	9.79	8.44	20.3	1.20	.07	12.1	.18	.989	.09	.24	1.77	99.3
AF07620	42.2	11.1	9.27	12.7	1.34	.92	12.1	.17	2.29	.18	.15	7.93	100.5
AF07621	44.1	9.62	8.53	18.0	1.10	.19	12.6	.18	1.32	.15	.18	3.62	99.8
AF07622	44.8	10.7	9.34	17.5	1.35	.07	12.9	.19	1.20	.12	.20	.93	99.5
AF07623	51.3	13.8	8.82	9.03	1.88	.46	10.4	.16	1.11	.13	.10	3.08	100.4
AF07624	51.8	14.5	9.28	7.57	1.98	.62	10.2	.16	1.17	.14	.08	2.62	100.2
AF07625	52.7	14.5	8.87	7.67	2.03	.53	10.2	.15	1.19	.15	.08	2.08	100.2
AF07626	53.1	13.9	9.61	6.01	2.16	.82	10.4	.16	1.41	.16	.05	2.39	100.3
AF07627	52.1	13.8	9.02	8.72	1.94	.61	10.1	.16	1.20	.14	.11	2.47	100.5
AF07628	35.3	1.17	.10	36.0	.09	.03	11.8	.21	.200	.03	---	12.1	99.4
AF07629	51.7	13.8	9.11	8.97	1.79	.59	10.5	.16	1.12	.13	.11	2.54	100.6
AF07630	51.0	13.4	8.88	10.2	1.92	.43	10.7	.16	1.08	.13	.12	2.31	100.4
AF07631	48.2	14.9	9.10	6.98	1.61	.69	9.06	.15	1.32	.16	.14	7.85	100.2
AF07632	49.8	14.7	8.92	6.76	1.76	.80	9.20	.16	1.30	.17	.14	6.77	100.6
AF07633	45.5	11.7	10.0	14.7	1.43	.07	12.2	.18	1.19	.10	.16	2.23	99.6
AF07634	60.4	11.9	6.32	4.09	1.61	1.11	8.22	.06	.938	.07	.05	5.31	100.2
AF07635	52.6	14.9	9.14	7.47	2.11	.32	9.83	.17	1.12	.14	.06	2.08	100.0
AF07636	52.8	14.8	9.37	7.25	2.20	.34	10.1	.15	1.15	.14	.06	1.93	100.4
AF07637	52.3	14.8	9.52	7.35	2.03	.30	10.1	.15	1.11	.13	.06	2.08	100.0
AF07638	52.7	14.7	8.96	7.85	1.87	.53	9.99	.15	1.13	.13	.07	1.77	99.9
AF07639	53.2	13.4	6.40	7.92	1.45	4.26	9.67	.15	1.14	.12	.08	2.08	100.0
AF07640	41.3	7.34	6.12	24.5	.67	.06	12.1	.18	.798	.08	.28	5.93	99.6
AF07641	41.8	7.35	6.37	25.0	.97	.33	12.2	.18	.759	.08	.27	4.47	100.0
AF07642	42.2	8.02	7.13	22.7	1.11	.34	12.0	.18	.868	.08	.23	5.08	100.1
AF07643	45.3	13.0	11.1	10.3	1.30	.15	11.9	.18	1.38	.14	.08	5.39	100.3
AF07644	43.8	9.45	8.36	20.1	1.07	.12	12.4	.18	1.09	.13	.22	2.77	99.9
AF07645	46.1	14.4	11.7	7.58	1.77	.12	10.9	.17	1.40	.17	.06	5.39	99.8
AF07646	43.6	13.6	10.6	6.41	3.13	.02	11.6	.18	1.68	.20	.04	8.62	99.8
AF07647	46.1	14.0	11.2	7.69	1.75	.21	11.4	.18	1.57	.19	.07	5.23	99.7
AF07648	70.5	14.7	1.45	.91	3.39	4.32	3.42	.08	.460	.22	---	.62	100.2
AF07649	45.2	9.87	8.88	16.4	1.53	.20	13.4	.19	1.58	.18	.16	1.77	99.5
AF07651	45.6	10.3	9.08	17.1	1.55	.12	12.7	.18	1.38	.14	.18	.85	99.3
AF07652	40.5	10.1	7.15	15.5	.79	.12	11.4	.17	1.16	.10	.19	12.6	99.9
AF07653	43.9	9.14	7.92	20.4	1.18	.22	12.7	.18	1.12	.12	.22	2.54	99.8
AF07654	41.7	6.41	6.15	27.3	.86	.21	12.3	.18	.952	.11	.36	3.23	100.0
AF07655	42.4	7.27	6.82	26.4	1.02	.31	11.7	.18	.932	.11	.43	1.47	99.3
AF07656	41.6	7.13	6.86	26.6	.96	.24	11.3	.17	.935	.11	.46	2.77	99.2
AF07657	45.7	11.9	10.6	13.7	1.53	.25	12.6	.18	1.48	.15	.14	1.77	100.1
AF07658	48.6	14.5	9.83	6.93	3.03	.23	11.0	.17	1.56	.16	.06	3.54	99.8
AF07659	44.8	13.6	11.6	8.45	1.49	.22	12.0	.18	1.42	.14	.05	6.23	100.3

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF07660	44.6	11.8	10.0	14.2	1.30	.07	11.4	.17	1.14	.11	.14	4.62	99.8
AF07661	45.9	14.1	12.2	8.87	1.64	.17	11.0	.17	1.34	.11	.12	4.77	100.6
AF07662	42.7	7.13	6.49	26.0	.89	.07	12.8	.19	.753	.08	.31	1.93	99.5
AF07663	43.9	9.51	8.14	20.6	1.19	.12	12.0	.18	.844	.08	.25	3.23	100.1
AF07664	44.3	10.1	9.49	17.7	1.38	.15	13.5	.20	1.26	.16	.20	.93	99.5
AF07665	44.6	12.7	10.9	12.2	1.26	.15	11.9	.18	1.06	.09	.11	4.62	99.9
AF07666	46.7	14.1	12.0	9.45	1.56	.12	11.6	.18	1.16	.10	.08	2.93	100.0
AF07667	44.3	10.6	9.13	17.0	1.12	.11	12.6	.19	.884	.08	.18	3.47	99.7
AF07668	70.5	14.7	1.44	.91	3.51	4.32	3.42	.08	.455	.22	---	.62	100.5
AF07669	47.3	13.7	12.4	8.79	1.97	.14	13.1	.19	1.70	.17	.09	.47	100.1
AF07670	42.5	8.32	7.54	23.3	.93	.13	12.0	.18	.717	.06	.30	3.39	99.4
AF07671	48.5	14.4	10.9	8.25	1.86	.25	10.9	.16	1.12	.12	.06	3.39	100.0
AF07672	47.8	14.2	10.4	8.82	2.02	.25	10.9	.17	1.09	.11	.06	4.31	100.2
AF07673	48.1	14.0	10.0	8.04	2.61	.34	10.8	.17	1.13	.11	.05	4.70	100.1
AF07674	49.0	14.3	11.3	7.97	2.14	.22	10.4	.17	1.03	.11	.05	3.54	100.3
AF07675	49.8	14.2	10.0	8.01	2.36	.92	10.2	.15	.975	.10	.06	3.00	99.9
AF07676	46.9	13.8	10.1	8.50	1.85	.35	10.2	.16	.958	.10	.06	6.85	100.1
AF07677	41.2	8.76	7.54	20.2	.82	.04	11.8	.19	.856	.08	.27	7.70	99.6
AF07678	46.1	13.9	11.9	10.3	1.79	.17	10.2	.16	1.23	.11	.10	4.08	100.2
AF07679	42.8	8.76	7.76	21.9	1.11	.08	12.0	.18	.855	.08	.25	3.54	99.4
AF07680	43.2	8.88	7.38	22.0	.97	.05	12.0	.18	.842	.08	.25	3.54	99.5
AF07681	42.2	7.46	5.93	25.6	.72	.03	12.4	.19	.682	.07	.33	3.47	99.2
AF07682	46.8	13.7	11.9	11.7	1.67	.09	11.3	.17	1.29	.12	.17	1.23	100.2
AF07683	44.3	9.27	8.47	21.8	1.03	.02	12.2	.18	.857	.08	.27	1.00	99.6
AF07684	47.1	12.4	10.1	13.3	1.44	.12	11.6	.18	1.06	.11	.20	1.93	99.7
AF07685	46.8	12.4	10.5	13.6	1.38	.10	11.1	.17	.970	.10	.16	2.31	100.1
AF07686	42.6	9.86	8.62	17.5	1.11	.32	12.4	.18	1.13	.11	.18	5.54	99.8
AF07687	43.0	9.41	8.33	19.3	1.12	.23	12.2	.18	1.11	.11	.21	4.08	99.5
AF07688	35.2	1.24	.14	35.6	.10	.04	11.8	.21	.221	.03	---	11.8	98.4
AF07689	43.6	9.37	8.48	21.4	1.10	.04	12.3	.18	.950	.09	.21	1.47	99.4
AF07690	43.6	9.17	8.37	20.5	1.15	.04	12.4	.18	1.01	.10	.24	2.39	99.3
AF07691	43.8	9.38	8.51	20.4	1.19	.08	11.9	.18	1.11	.13	.27	1.39	98.5
AF07692	44.3	9.55	8.62	20.4	1.21	.09	11.9	.18	1.10	.13	.26	1.70	99.6
AF07693	44.3	9.96	8.72	19.1	1.28	.04	12.6	.18	1.07	.10	.23	1.23	99.0
AF07694	43.0	10.0	9.08	16.3	1.16	.31	12.6	.19	1.28	.15	.18	5.00	99.4
AF07695	42.6	9.63	8.32	16.5	1.20	.26	11.9	.18	1.37	.15	.17	6.39	98.8
AF07696	42.4	9.17	8.11	19.4	1.11	.46	12.2	.18	1.17	.12	.22	4.39	99.2
AF07697	44.1	9.50	8.06	19.9	1.22	.37	12.0	.18	1.17	.13	.21	1.93	99.0
AF07698	47.2	15.5	12.2	5.30	2.16	.40	11.6	.24	1.84	.22	.03	3.23	100.0
AF07699	48.9	15.5	11.5	5.99	2.27	.35	12.3	.19	1.84	.21	.03	.77	100.0
AF07700	48.6	13.7	10.8	8.20	1.77	.24	11.1	.15	1.51	.17	.07	3.39	99.8
AF07701	50.5	14.6	10.3	5.75	2.41	.72	11.0	.16	1.50	.18	.02	2.47	99.8
AF07702	50.8	14.6	10.2	5.82	2.50	.85	11.1	.16	1.53	.18	.02	1.77	99.7
AF07703	46.9	15.2	11.6	5.85	2.11	.27	11.7	.17	1.76	.21	.03	2.54	98.4
AF07704	50.3	14.8	10.7	5.56	2.42	.56	11.1	.17	1.52	.18	.02	3.08	100.6
AF07705	53.3	14.7	9.04	5.63	2.33	.68	10.5	.15	1.64	.21	.06	1.93	100.3
AF07706	53.7	14.6	9.18	5.61	2.22	.65	10.4	.15	1.64	.22	.05	2.08	100.6
AF07707	50.1	14.7	9.50	5.73	2.00	1.27	10.5	.16	1.84	.23	.04	4.23	100.4
AF07708	36.1	1.20	.11	36.7	.12	.03	12.1	.21	.204	.03	---	11.8	100.9
AF07709	44.5	12.1	9.62	12.5	1.13	.39	11.8	.17	1.17	.12	.12	6.62	100.5

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF07710	43.6	10.6	9.00	16.4	1.17	.10	11.8	.18	1.08	.11	.17	5.77	100.2
AF07711	55.2	14.8	6.85	5.08	2.11	.82	9.42	.12	1.02	.15	.06	4.47	100.3
AF07712	45.1	10.8	8.70	18.5	1.88	.09	12.2	.19	.998	.10	.20	1.08	100.0
AF07713	48.1	14.0	9.00	10.4	1.57	.18	10.5	.24	1.18	.14	.18	3.70	99.3
AF07714	48.2	14.2	8.74	10.7	1.38	.17	10.3	.25	1.09	.13	.18	4.62	100.0
AF07715	48.8	13.7	8.29	11.2	1.36	.17	10.5	.19	1.09	.12	.18	4.54	100.2
AF07716	49.6	13.7	8.70	11.1	1.42	.18	10.3	.19	1.12	.14	.17	3.47	100.2
AF07717	51.3	11.9	7.03	12.1	1.83	.85	9.87	.15	1.09	.16	.15	3.54	100.1
AF07718	44.6	11.2	9.59	14.8	1.49	.23	12.2	.19	1.38	.15	.15	3.85	100.0
AF07719	40.3	6.40	4.96	26.8	.48	.04	12.3	.19	.754	.08	.30	6.62	99.4
AF07720	56.9	14.4	7.20	6.18	2.07	1.20	9.46	.14	1.31	.19	.07	1.39	100.6
AF07721	57.4	14.0	6.35	5.03	2.00	1.35	9.19	.13	1.29	.21	.05	2.62	99.8
AF07722	51.0	13.5	8.78	10.6	1.71	.52	9.41	.16	1.29	.14	.16	2.08	99.4
AF07723	44.9	11.7	10.2	12.3	1.30	.84	12.1	.18	1.95	.23	.13	3.70	99.7
AF07724	44.1	11.3	10.6	13.1	1.22	.85	12.1	.17	1.94	.28	.14	3.23	99.2
AF07725	43.0	10.3	8.58	19.4	1.04	.08	11.5	.18	.805	.07	.21	4.08	99.4
AF07726	42.8	11.2	10.5	14.8	1.14	.27	11.7	.17	.978	.17	.16	5.08	99.1
AF07727	43.6	10.1	9.11	18.6	1.35	.11	12.4	.19	1.21	.12	.22	1.77	99.0
AF07728	34.9	1.19	.13	35.4	.12	.03	11.7	.21	.208	.03	---	12.1	98.3
AF07729	44.3	10.1	9.29	18.8	1.28	.05	12.5	.19	1.20	.12	.22	1.23	99.4
AF07730	46.9	13.3	10.7	6.90	2.57	.54	13.9	.21	1.89	.19	.02	2.54	99.7
AF07731	46.5	13.3	11.6	7.02	2.11	.13	13.7	.21	1.85	.17	.02	2.62	99.3
AF07732	47.8	13.6	11.9	6.93	2.05	.10	13.8	.21	1.85	.19	.02	1.77	100.3
AF07733	47.3	13.4	11.8	6.95	2.09	.12	13.5	.21	1.85	.18	.02	1.77	99.3
AF07734	44.8	12.6	9.89	13.2	1.33	.05	12.0	.17	1.18	.12	.12	3.93	99.5
AF07735	46.2	12.9	10.9	11.1	1.46	.25	12.3	.18	1.42	.14	.09	3.16	100.2
AF07736	54.6	15.3	8.20	6.11	2.05	.79	9.75	.14	1.07	.15	.05	1.08	99.4
AF07737	55.7	15.4	7.94	6.16	2.21	.86	9.52	.14	1.06	.15	.05	.70	100.0
AF07738	52.1	14.3	7.26	6.46	1.66	.61	9.19	.13	1.02	.14	.07	7.08	100.3
AF07739	53.1	14.4	6.97	6.34	1.75	.89	9.42	.13	.999	.14	.07	6.08	100.5
AF07740	47.7	14.5	11.9	7.52	2.09	.18	12.4	.19	1.67	.15	.05	.93	99.4
AF07741	49.7	14.9	10.6	5.57	2.32	.30	13.1	.19	2.19	.21	.03	1.08	100.3
AF07742	45.1	12.1	9.96	5.19	2.37	.67	16.3	.24	3.49	.42	<.01	2.93	98.9
AF07743	46.5	12.3	10.2	5.26	2.55	.69	16.9	.25	3.63	.44	<.01	.39	99.3
AF07744	47.5	12.7	9.17	4.58	2.63	1.11	15.8	.22	3.45	.48	<.01	1.16	99.0
AF07745	50.4	14.5	9.07	8.90	1.82	.42	10.8	.15	1.33	.16	.10	2.08	99.9
AF07761	48.4	13.9	11.6	7,93	1.94	.11	11.8	.16	1.61	.19	.08	2.62	100.4
AF07762	48.4	14.4	11.1	6.38	2.26	.17	11.0	.17	1.67	.20	.06	4.62	100.5
AF07763	47.0	14.0	11.1	6.34	1.95	.17	10.4	.16	1.58	.19	.07	7.31	100.4
AF07764	48.0	14.5	11.3	6.76	2.20	.15	10.6	.17	1.55	.19	.07	4.77	100.3
AF07765	47.3	14.2	12.1	7.00	1.84	.11	11.0	.17	1.51	.18	.09	4.70	100.3
AF07766	48.7	14.6	11.6	7.53	1.90	.10	10.8	.17	1.50	.18	.09	3.23	100.5
AF07767	46.9	13.0	10.2	5.72	2.34	.20	15.8	.22	3.03	.32	<.01	1.77	99.6
AF07768	52.0	13.8	9.04	8.65	1.91	.60	10.1	.16	1.19	.14	.11	2.23	100.0
AF07769	45.1	12.3	10.1	5.59	2.21	.17	16.8	.27	3.76	.44	.01	1.93	98.8
AF07770	47.7	13.9	11.4	6.65	2.16	.15	13.6	.20	2.19	.22	.02	1.62	99.9
AF07771	49.5	13.8	10.5	5.62	2.44	.41	14.4	.21	2.44	.30	<.01	.62	100.4
AF07772	47.9	12.9	10.3	5.77	2.33	.18	15.8	.25	2.85	.31	<.01	1.23	99.9
AF07773	48.1	13.4	10.7	6.37	2.23	.19	14.3	.21	2.29	.23	.02	1.93	100.1
AF07774	47.6	14.0	11.4	6.67	2.18	.13	13.1	.20	1.79	.17	.03	2.16	99.5

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF07775	47.6	14.0	11.0	6.69	2.20	.14	13.6	.21	2.08	.21	.02	2.08	99.9
AF07776	47.8	14.1	11.4	6.77	2.18	.16	13.2	.20	2.07	.21	.03	1.62	99.8
AF07777	48.1	14.2	11.5	6.91	2.19	.18	13.0	.21	1.95	.20	.03	1.70	100.3
AF07778	47.4	14.5	11.3	6.43	2.35	.21	13.8	.21	1.96	.19	.01	1.77	100.2
AF07779	47.8	14.4	12.4	7.65	1.95	.17	11.9	.18	1.49	.15	.04	1.47	99.7
AF07780	44.6	9.46	8.19	19.4	1.28	.11	12.5	.18	1.23	.13	.20	1.70	99.2
AF07781	44.0	8.88	8.24	20.4	1.22	.13	12.8	.19	1.31	.14	.24	.93	98.7
AF07782	41.6	6.74	5.15	26.9	.69	.04	12.4	.19	.697	.07	.31	4.39	99.4
AF07783	48.4	13.3	10.1	7.59	2.10	.25	10.3	.16	1.09	.13	.08	6.68	100.3
AF07784	48.7	14.0	10.7	6.87	1.84	.44	10.6	.16	1.07	.12	.11	5.77	100.5
AF07785	42.7	8.49	6.29	19.8	.76	.02	11.7	.17	.833	.07	.29	7.85	99.2
AF07786	42.3	8.29	7.05	20.7	.78	.02	11.8	.17	.784	.07	.31	7.08	99.5
AF07787	42.5	8.21	7.02	23.4	.86	.02	12.1	.18	.798	.08	.29	3.70	99.3
AF07788	70.3	14.7	1.47	.93	3.43	4.30	3.43	.08	.460	.22	---	.62	100.1
AF07789	42.6	9.71	7.60	19.8	.93	.03	11.7	.18	.937	.08	.25	5.77	99.7
AF07790	46.6	13.5	10.5	5.47	2.44	.47	14.3	.21	2.51	.28	<.01	2.93	99.3
AF07791	45.4	13.2	10.4	5.15	2.45	.49	14.4	.22	2.45	.27	<.01	4.62	99.2
AF07792	46.9	13.8	10.7	5.38	2.49	.50	14.7	.22	2.49	.28	<.01	2.16	99.7
AF07793	44.5	9.58	8.64	20.6	1.12	.04	12.3	.19	.936	.09	.27	.93	99.4
AF07794	45.6	11.6	10.4	15.6	1.42	.05	11.8	.18	1.10	.10	.19	.93	99.1
AF07795	49.0	14.4	11.8	6.23	2.39	.27	13.2	.20	1.77	.19	.02	.77	100.3
AF07796	33.4	7.96	6.08	17.7	1.45	.33	9.10	.15	.749	.07	.18	23.1	100.5
AF07797	38.6	13.8	5.07	5.91	.10	.06	13.4	.16	3.07	.37	<.01	19.1	99.7
AF07798	46.7	13.6	9.96	5.90	2.49	.41	14.5	.22	2.52	.28	<.01	2.62	99.3
AF07799	45.8	12.9	11.3	10.1	1.67	.10	12.9	.19	1.48	.14	.06	3.39	100.1
AF07800	41.7	8.48	8.34	20.6	1.11	.17	11.9	.18	.936	.09	.20	5.77	99.7
AF07808	35.1	1.16	.08	35.6	.13	.03	11.8	.21	.201	.03	---	11.9	98.5
AF07818	43.0	7.71	7.05	23.5	.93	.38	12.6	.18	1.01	.11	.23	3.08	100.0
AF07819	44.8	10.8	9.75	14.2	1.53	.17	13.4	.19	1.52	.15	.14	3.92	100.7
AF07820	48.1	14.1	12.8	6.95	2.24	.20	12.6	.19	1.70	.17	.04	1.16	100.3
AF07821	43.7	8.54	7.66	22.4	1.17	.21	12.5	.18	1.20	.12	.25	1.85	100.0
AF07822	42.0	7.65	6.93	25.3	.86	.14	11.5	.18	.922	.09	.41	2.93	99.1
AF07823	44.5	9.18	8.28	21.2	1.24	.24	12.2	.18	1.10	.15	.21	1.08	99.8
AF07824	44.3	10.2	8.68	19.2	1.32	.21	11.9	.18	1.20	.12	.24	1.70	99.4
AF07825	47.8	14.5	11.6	8.27	1.75	.34	11.0	.16	1.37	.17	.08	2.47	99.6
AF07826	44.9	10.8	8.74	16.3	1.24	.30	11.9	.18	1.02	.10	.16	4.08	99.9
AF07827	51.8	14.7	8.03	5.96	3.24	.86	9.60	.17	1.34	.19	.06	3.70	99.8
AF07828	35.1	1.15	.09	35.8	.10	.04	11.8	.21	.197	.03	---	11.9	98.7
AF07829	45.7	13.2	11.2	11.2	1.53	.06	12.1	.18	1.13	.11	.09	3.31	99.9
AF07830	46.9	13.7	11.9	9.03	1.74	.08	12.2	.18	1.42	.13	.07	2.08	99.5
AF07831	44.6	11.6	10.2	13.0	1.33	.05	12.4	.18	1.35	.13	.11	4.47	99.5
AF07832	45.6	13.5	11.1	9.57	1.58	.07	12.1	.19	1.35	.13	.05	4.77	100.1
AF07833	44.3	11.3	9.28	15.6	1.24	.07	11.6	.18	1.02	.09	.17	4.93	99.9
AF07834	48.0	14.1	11.3	7.09	2.05	.31	10.7	.18	1.33	.24	.05	3.77	99.2
AF07835	47.7	14.0	11.0	7.12	2.02	.27	10.5	.16	1.34	.22	.05	4.00	98.5
AF07836	47.5	14.1	10.9	7.09	1.97	.27	10.4	.14	1.32	.22	.05	4.23	98.3
AF07837	45.9	13.4	10.9	9.70	1.72	.23	12.0	.18	1.44	.14	.06	4.00	99.8
AF07838	44.6	11.4	9.70	12.2	1.28	.31	11.7	.18	1.40	.16	.11	6.00	99.2
AF07839	59.0	12.2	6.28	.92	2.65	1.50	10.4	.13	1.62	.28	<.01	4.93	100.0
AF07840	52.9	13.7	9.09	4.57	2.20	.86	10.4	.16	1.60	.18	.08	4.39	100.2

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF07841	42.6	7.79	6.53	23.7	1.00	.08	12.9	.19	.884	.09	.30	2.23	98.5
AF07842	39.9	5.55	5.08	27.6	.71	.05	12.9	.19	.676	.07	.40	6.54	99.9
AF07843	40.2	5.56	4.88	28.5	.62	.04	12.6	.19	.643	.07	.39	6.39	100.3
AF07844	52.7	14.9	8.97	6.04	1.86	.79	9.21	.15	1.20	.14	.09	3.23	99.4
AF07845	48.0	14.1	10.3	3.71	2.27	.71	9.21	.11	1.18	.16	.10	8.93	98.9
AF07848	44.9	11.8	10.7	12.6	1.40	.11	13.0	.20	1.28	.11	.12	3.77	100.1
AF07851	44.1	10.7	9.32	15.6	1.31	.08	12.3	.18	1.32	.13	.15	4.39	99.7
AF07852	42.3	7.20	6.75	24.7	.99	.12	12.7	.18	.968	.11	.28	1.93	98.5
AF07853	44.5	10.2	9.11	17.7	1.38	.12	12.8	.19	1.27	.13	.19	2.23	100.0
AF07854	43.1	8.15	7.24	23.4	1.33	.19	12.2	.18	1.10	.12	.28	1.93	99.4
AF07855	44.1	11.0	9.61	16.3	1.53	.54	12.3	.18	1.27	.14	.23	2.39	99.8
AF07856	47.4	15.4	11.9	5.05	2.15	.34	11.4	.20	1.80	.21	.03	3.23	99.2
AF07857	48.3	15.3	11.2	5.24	2.14	.46	12.0	.19	1.83	.22	.03	2.00	99.0
AF07858	47.8	15.4	11.5	5.40	2.10	.28	11.8	.17	1.81	.21	.03	2.23	98.8
AF07859	48.2	14.5	10.6	7.64	1.85	.31	10.8	.22	1.48	.20	.12	2.39	98.4
AF07860	47.0	12.9	9.85	12.0	1.55	.39	11.0	.17	1.23	.16	.17	1.77	98.3
AF07861	44.6	10.9	8.42	14.8	1.32	.26	11.4	.17	1.24	.16	.14	5.31	98.9
AF07862	50.7	14.4	9.33	5.79	2.87	1.52	9.38	.15	1.29	.18	.06	3.00	98.8
AF07863	45.4	13.4	11.1	9.27	1.55	.05	12.3	.21	1.42	.14	.06	4.23	99.2
AF07864	44.5	11.3	8.96	14.6	1.19	.07	12.4	.19	1.28	.12	.14	5.23	100.1
AF07865	48.5	13.2	10.6	6.88	2.05	.65	12.5	.19	1.93	.27	.12	1.39	98.4
AF07866	43.3	9.90	8.83	18.5	1.22	.06	11.5	.17	.967	.09	.23	4.31	99.2
AF07867	43.6	9.12	8.13	21.1	1.13	.14	12.4	.19	1.03	.09	.28	1.77	99.2
AF07868	35.4	1.27	.17	35.4	.15	.04	11.9	.21	.235	.03	---	11.9	99.0
AF07869	44.1	11.0	10.2	15.6	1.43	.22	12.4	.19	1.34	.15	.20	2.08	99.1
AF07870	42.1	7.79	7.69	22.0	.97	.29	14.0	.21	1.32	.16	.26	3.00	100.0
AF07871	44.9	13.5	11.9	8.88	1.57	.19	11.7	.18	1.38	.14	.06	4.00	98.5
AF07872	42.5	9.97	8.74	17.9	1.07	.25	11.8	.18	1.10	.10	.20	5.54	99.5
AF07873	44.2	11.2	9.82	14.7	1.33	.16	13.1	.19	1.25	.12	.15	2.62	99.0
AF07874	46.2	13.6	11.8	9.28	1.73	.22	12.6	.19	1.45	.14	.06	2.39	99.8
AF07875	44.0	10.7	9.50	15.3	1.31	.23	12.8	.19	1.18	.11	.15	4.16	99.8
AF07876	43.9	10.0	8.70	18.8	1.28	.08	12.5	.19	1.08	.10	.22	2.39	99.4
AF07877	44.3	10.7	8.92	17.2	1.35	.08	12.6	.18	1.05	.10	.20	1.93	98.8
AF07878	42.1	8.68	7.66	20.3	.92	.17	11.9	.18	1.04	.10	.20	5.00	98.4
AF07879	44.8	10.2	8.77	18.8	1.34	.10	12.6	.19	1.10	.11	.20	1.62	100.0
AF07880	44.5	9.98	8.51	18.4	1.34	.09	12.4	.18	1.11	.11	.19	1.77	98.7
AF07881	43.5	10.4	8.83	16.7	1.29	.36	12.3	.18	1.06	.10	.18	3.39	98.4
AF07882	44.8	9.50	8.82	18.7	1.30	.18	13.0	.18	1.41	.15	.22	2.16	100.6
AF07883	45.3	13.5	12.2	9.78	1.72	.28	12.1	.18	1.52	.15	.07	3.00	99.9
AF07884	45.1	10.6	9.52	17.6	1.32	.15	12.4	.18	1.25	.13	.21	1.77	100.4
AF07885	47.6	14.5	11.3	7.17	2.06	.43	11.2	.16	1.38	.21	.05	3.70	99.9
AF07886	50.6	14.5	10.1	5.98	2.36	.86	11.2	.17	1.50	.18	.02	1.62	99.3
AF07887	43.7	9.14	7.84	21.4	1.26	.24	12.5	.19	.925	.09	.24	2.62	100.3
AF07888	70.8	14.7	1.45	.89	3.48	3.99	3.53	.08	.461	.22	---	.54	100.3
AF07889	42.6	8.03	8.03	22.4	1.17	.27	13.0	.19	1.05	.16	.24	2.08	99.4
AF07890	43.9	10.8	9.49	14.2	1.47	.30	13.1	.19	1.49	.15	.15	4.93	100.3
AF07891	42.5	8.19	7.79	23.2	1.04	.22	12.1	.18	1.06	.12	.34	2.23	99.2
AF07892	43.7	7.99	7.26	24.5	1.17	.15	12.1	.18	1.11	.12	.26	.54	99.3
AF07893	46.4	15.5	12.3	5.07	2.00	.15	11.4	.17	1.79	.21	.03	4.62	99.7
AF07894	48.6	15.6	11.5	5.96	2.25	.30	12.2	.18	1.83	.21	.04	1.62	100.4

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF07895	49.5	15.5	11.7	5.96	2.29	.49	12.5	.19	1.82	.22	.03	.31	100.6
AF07896	49.7	15.5	11.4	5.81	2.24	.52	12.2	.19	1.84	.21	.03	.93	100.7
AF07897	51.5	15.7	10.3	6.08	2.02	.35	9.74	.14	1.36	.19	.07	2.93	100.5
AF07898	50.8	15.6	10.2	6.29	1.95	.25	9.82	.14	1.33	.19	.07	3.54	100.3
AF07899	45.7	14.0	9.37	6.01	2.45	.93	13.8	.20	2.58	.49	.03	4.93	100.7
AF07900	45.4	13.7	11.5	7.71	2.00	.19	13.0	.20	1.62	.16	.03	4.85	100.4
AF07918	51.6	16.0	10.5	6.03	2.10	.38	10.2	.16	1.44	.20	.07	1.77	100.6
AF07919	42.9	7.36	6.79	25.4	1.02	.08	13.0	.19	1.05	.12	.34	1.23	99.7
AF07920	47.7	13.8	13.1	8.50	1.92	.08	12.4	.18	1.59	.15	.06	1.16	100.7
AF07921	49.0	12.7	10.9	6.28	2.46	.30	15.7	.24	2.21	.24	.02	.39	100.6
AF07922	43.2	8.15	6.80	23.7	1.10	.08	13.1	.19	.920	.10	.31	1.54	99.4
AF07923	43.5	8.56	7.37	22.4	1.12	.13	13.0	.19	.980	.11	.28	2.08	99.9
AF07924	44.1	11.3	9.75	15.4	1.44	.12	12.2	.18	1.27	.13	.18	4.08	100.3
AF07925	43.8	9.14	8.03	21.5	1.52	.04	12.6	.19	1.08	.13	.21	2.16	100.6
AF07926	44.9	10.1	9.23	17.4	1.47	.10	12.7	.19	1.33	.16	.21	2.23	100.2
AF07928	36.1	1.33	.20	35.9	.12	.03	12.4	.22	.225	.03	---	12.1	101.1
AF07939	42.2	8.63	10.2	19.5	.90	.29	13.4	.20	1.33	.22	.20	3.23	100.5
AF07940	43.9	8.57	7.82	23.0	1.07	.10	12.9	.19	.961	.12	.25	1.23	100.3
AF07941	44.4	10.9	9.59	17.2	1.25	.11	12.3	.19	.989	.09	.23	2.54	99.9
AF07942	44.2	11.5	9.99	14.8	1.34	.12	12.4	.19	1.33	.12	.16	2.85	99.1
AF07943	44.5	12.3	10.5	12.9	1.52	.16	12.1	.18	1.23	.12	.10	3.54	99.3
AF07944	44.7	11.6	10.6	13.5	1.54	.25	13.3	.19	1.54	.20	.12	1.70	99.4
AF07945	42.5	8.74	8.10	20.5	1.05	.08	13.0	.20	1.14	.12	.26	4.00	99.9
AF07946	44.4	11.5	10.4	14.1	1.35	.10	12.7	.19	1.34	.13	.26	4.08	100.7
AF07947	44.0	10.9	9.48	13.4	1.16	.09	12.8	.18	1.27	.13	.12	6.39	100.0
AF07948	35.6	1.17	.11	36.4	.10	.03	11.9	.21	.202	.03	---	12.2	100.3
AF07949	43.6	8.53	7.40	21.1	1.12	.10	13.2	.19	1.14	.12	.20	2.16	99.0
AF07950	45.8	13.4	11.8	10.4	1.66	.38	11.7	.17	1.43	.21	.13	2.16	99.4
AF08001	49.6	13.9	11.0	6.59	2.26	.79	10.7	.16	1.33	.31	.05	2.08	98.9
AF08002	49.4	13.9	11.0	6.57	2.23	.44	10.5	.17	1.31	.24	.05	3.23	99.2
AF08003	45.4	14.7	8.05	4.32	2.79	1.46	14.6	.22	2.69	.58	<.01	3.62	98.7
AF08004	45.2	14.5	7.68	4.21	2.84	1.56	14.6	.22	2.73	.61	<.01	5.00	99.4
AF08005	44.7	15.2	7.88	4.24	2.54	1.23	14.1	.16	2.66	.61	<.01	5.62	99.2
AF08006	46.3	12.7	10.9	5.90	2.32	.42	16.4	.24	2.76	.26	.01	.23	98.6
AF08007	45.2	11.4	10.3	16.0	1.33	.06	12.6	.19	1.08	.10	.18	1.31	99.9
AF08008	40.8	7.34	6.08	24.2	.63	.06	11.9	.18	.799	.08	.28	6.00	98.5
AF08009	44.3	11.1	9.66	16.7	1.37	.07	12.0	.18	1.02	.09	.20	1.47	98.3
AF08010	43.5	10.8	9.64	16.6	1.33	.07	11.8	.18	1.03	.09	.21	5.08	100.4
AF08011	44.4	10.1	8.97	19.2	1.17	.03	12.1	.18	.939	.09	.25	1.08	98.7
AF08012	48.0	13.4	11.4	6.62	2.04	.32	14.2	.21	2.17	.25	.04	1.23	100.0
AF08013	49.4	13.7	11.5	6.97	2.08	.32	12.3	.19	1.67	.17	.05	1.00	99.4
AF08014	47.3	12.6	11.5	6.09	2.28	.22	15.7	.24	2.55	.29	.02	1.16	100.1
AF08015	44.1	9.26	7.58	19.7	1.26	.20	12.4	.18	1.36	.14	.20	2.08	98.6
AF08016	44.5	13.2	10.2	6.79	1.28	2.97	12.4	.18	2.17	.25	.02	5.08	99.3
AF08017	46.8	12.6	9.39	6.63	1.52	3.53	12.6	.18	2.22	.26	.02	3.31	99.3
AF08018	46.9	12.6	9.88	4.58	2.47	.97	16.4	.24	3.62	.47	<.01	1.70	100.0
AF08019	43.0	13.1	10.4	8.96	2.07	2.06	11.4	.18	2.17	.55	.08	4.77	99.0
AF08020	42.2	8.54	7.95	20.5	.99	.11	12.6	.18	1.14	.14	.19	4.31	99.0
AF08021	45.8	10.8	9.46	16.8	1.42	.08	12.4	.18	1.23	.12	.18	1.54	100.2
AF08022	48.4	14.0	11.9	7.53	2.19	.24	13.0	.19	1.91	.20	.04	.70	100.4

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL203	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF08023	45.9	12.3	10.7	11.9	1.72	.10	12.3	.18	1.54	.19	.10	2.62	99.7
AF08024	43.3	8.76	7.49	22.7	1.16	.26	12.2	.19	1.27	.16	.28	1.70	99.7
AF08025	44.3	10.3	8.54	18.0	1.48	.13	12.2	.19	1.20	.14	.19	2.54	99.4
AF08026	42.6	8.48	7.07	22.8	1.34	.18	11.9	.18	1.04	.12	.33	2.93	99.2
AF08027	42.5	7.75	6.63	23.0	1.03	.17	13.4	.19	1.35	.15	.27	2.08	98.7
AF08028	69.6	14.6	1.44	.91	3.36	4.23	3.35	.08	.446	.22	---	.62	99.0
AF08029	43.3	11.1	9.28	14.8	1.39	.15	11.9	.18	1.14	.11	.16	5.54	99.2
AF08030	42.6	11.8	9.66	11.2	1.44	.29	12.7	.19	1.42	.14	.10	7.08	98.8
AF08031	43.5	11.8	10.5	11.8	1.14	.26	12.7	.16	1.36	.14	.14	5.16	98.8
AF08032	43.1	7.02	6.36	26.4	1.05	.14	12.1	.18	.934	.10	.27	1.93	99.8
AF08033	54.6	15.3	3.76	.96	5.49	2.98	9.34	.23	1.14	.24	<.01	4.23	98.8
AF08034	46.9	13.2	7.53	2.79	3.97	1.38	16.1	.31	3.71	.74	<.01	2.93	100.0
AF08035	47.5	12.8	9.19	4.40	3.27	1.07	15.4	.29	2.39	.98	.02	1.54	99.1
AF08036	46.9	13.5	11.1	6.97	2.17	.12	12.1	.19	2.16	.23	.03	3.00	98.6
AF08037	46.1	13.7	10.9	5.84	2.56	.84	14.6	.22	2.54	.31	.01	1.70	99.5
AF08038	45.8	13.9	11.0	8.89	1.63	.56	12.2	.19	1.51	.18	.04	3.16	99.2
AF08039	43.7	10.9	9.44	15.9	1.28	.10	12.3	.18	1.27	.16	.17	3.23	98.8
AF08040	44.1	12.1	10.6	12.7	1.54	.08	12.2	.18	1.31	.15	.11	3.93	99.1
AF08041	41.3	5.76	5.18	27.2	.93	.07	12.7	.18	1.05	.13	.21	4.23	99.2
AF08042	43.6	9.91	8.52	18.9	1.46	.11	12.0	.18	1.10	.10	.22	2.23	98.5
AF08043	42.8	9.29	7.99	20.7	1.00	.21	12.1	.18	.979	.09	.29	3.70	99.5
AF08044	44.7	12.3	11.0	13.0	1.38	.20	12.9	.19	1.43	.14	.12	2.23	99.7
AF08045	44.7	11.2	9.96	13.4	1.35	.17	12.8	.18	1.33	.13	.13	4.77	100.3
AF08046	45.2	12.3	10.8	12.7	1.35	.12	12.4	.18	1.12	.11	.10	3.93	100.4
AF08047	48.2	14.7	12.1	6.89	2.20	.28	13.0	.19	1.90	.19	.04	.62	100.4
AF08048	34.9	1.19	.13	35.5	.10	.03	11.7	.21	.204	.03	---	12.4	98.7
AF08049	47.8	14.1	11.9	8.30	2.04	.24	12.9	.19	1.73	.18	.06	.47	100.0
AF08050	48.1	13.8	11.4	6.80	2.19	.20	13.4	.20	1.91	.20	.03	.77	99.1
AF08051	51.0	5.45	10.8	6.89	.05	.01	6.00	.14	.756	.08	.10	19.2	100.5
AF08052	42.9	7.64	6.76	24.5	1.00	.13	12.0	.18	.918	.09	.20	2.62	99.2
AF08053	44.3	12.1	10.6	12.8	1.40	.14	12.1	.18	1.28	.12	.13	3.93	99.2
AF08054	43.9	9.59	8.21	21.2	1.38	.06	12.0	.18	.985	.09	.25	1.70	99.7
AF08055	48.0	15.2	12.2	6.27	2.32	.14	12.7	.22	1.75	.18	.04	1.23	100.4
AF08056	47.5	13.9	10.7	5.78	2.29	.74	13.7	.19	2.65	.33	<.01	2.08	100.0
AF08057	43.7	8.83	7.27	21.7	1.19	.08	12.8	.19	1.13	.14	.22	2.62	100.1
AF08058	48.0	14.1	10.7	5.85	2.36	.72	13.8	.20	2.67	.34	<.01	1.16	100.0
AF08059	47.9	14.9	12.6	7.57	2.05	.18	12.2	.18	1.52	.15	.03	.77	100.1
AF08060	42.5	6.53	5.78	27.6	.84	.15	12.5	.18	.941	.11	.36	1.54	99.3
AF08061	48.4	13.7	11.7	6.76	2.28	.25	13.9	.21	2.03	.21	.03	.62	100.2
AF08062	46.1	12.4	9.71	4.87	2.52	1.07	16.2	.24	4.01	.53	<.01	1.08	98.9
AF08063	46.0	16.3	11.4	6.98	2.03	.48	11.1	.17	1.72	.20	.02	3.77	100.3
AF08064	41.0	5.72	4.72	28.6	.60	.07	12.2	.18	.853	.09	.37	4.70	99.3
AF08065	44.9	15.3	9.06	6.28	3.66	2.33	11.0	.18	1.96	.67	.02	3.70	99.5
AF08066	49.8	13.7	10.4	8.43	1.84	.54	11.9	.16	1.48	.15	.10	2.08	100.7
AF08067	44.0	11.5	12.3	11.0	1.50	.86	13.0	.19	2.25	.26	.11	3.00	100.2
AF08068	34.8	1.16	.09	35.7	.07	.04	11.7	.21	.201	.03	---	12.1	98.4
AF08069	46.8	13.5	11.1	8.90	1.55	.09	11.7	.17	1.34	.14	.14	4.62	100.1
AF08070	48.0	13.6	11.8	6.98	2.30	.26	12.9	.19	2.21	.24	.03	1.62	100.2
AF08071	47.8	14.9	12.2	6.48	2.25	.10	12.4	.19	1.70	.17	.02	2.08	100.4
AF08072	47.7	15.8	12.2	7.26	2.06	.19	12.0	.18	1.49	.14	.02	1.16	100.3

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF08073	48.1	13.7	11.6	7.01	2.45	.26	13.1	.19	2.24	.24	.03	1.23	100.3
AF08074	47.4	14.3	12.1	8.46	2.06	.21	12.6	.19	1.67	.17	.07	1.00	100.3
AF08075	47.9	15.5	12.7	8.17	2.07	.19	11.2	.17	1.40	.14	.08	.85	100.5
AF08076	47.0	13.8	12.1	7.22	2.22	.23	12.9	.19	1.94	.19	.04	2.08	100.0
AF08077	48.1	14.1	12.1	7.24	2.20	.25	13.3	.19	1.93	.19	.04	.47	100.2
AF08078	48.3	13.7	12.1	6.96	2.34	.29	13.8	.20	2.05	.20	.05	.39	100.5
AF08079	47.6	14.4	11.9	6.74	2.22	.24	13.7	.20	2.09	.20	.04	.77	100.2
AF08080	48.3	16.0	12.1	6.86	2.30	.21	11.8	.18	1.50	.16	.04	.77	100.3
AF08081	48.6	16.0	12.0	6.74	2.24	.22	11.9	.18	1.51	.15	.04	.47	100.1
AF08082	48.5	15.9	12.1	6.85	2.24	.19	11.8	.18	1.50	.15	.04	.62	100.2
AF08083	47.1	14.1	11.7	6.94	2.19	.24	13.0	.19	1.92	.18	.03	1.47	99.2
AF08084	45.0	15.2	10.9	7.33	1.75	.20	12.1	.19	1.68	.18	.03	5.47	100.1
AF08085	48.8	14.2	11.2	6.28	2.41	.18	13.7	.21	1.82	.20	.02	1.54	100.7
AF08086	48.2	13.3	10.1	5.62	2.61	.41	15.3	.22	2.33	.29	<.01	1.08	99.6
AF08087	47.8	15.9	11.7	5.76	2.29	.15	12.3	.18	1.73	.17	.02	2.31	100.4
AF08088	36.0	1.17	.09	35.9	.10	.03	12.3	.21	.205	.03	---	12.1	100.5
AF08089	46.9	13.8	10.9	6.03	2.43	.29	15.0	.21	2.33	.26	<.01	1.77	100.0
AF08090	48.0	13.6	12.3	7.23	2.17	.12	13.0	.20	1.79	.20	.04	1.70	100.5
AF08091	47.3	13.2	10.9	10.7	1.88	.26	12.4	.19	1.57	.16	.13	1.85	100.7
AF08092	47.0	14.3	12.1	7.96	2.00	.20	12.5	.19	1.64	.18	.04	1.93	100.2
AF08093	45.1	13.3	11.2	9.72	1.59	.19	11.4	.17	1.38	.14	.08	5.77	100.1
AF08094	48.0	13.9	11.7	7.96	2.19	.13	12.7	.18	1.76	.18	.06	1.93	100.8
AF08095	47.1	13.5	11.0	5.78	2.41	.09	14.7	.22	2.14	.23	.02	2.93	100.2
AF08096	46.1	14.2	12.5	7.70	1.85	.18	11.4	.17	1.47	.17	.07	4.47	100.4
AF08097	47.7	13.9	12.0	7.15	2.13	.21	12.9	.19	1.81	.18	.04	2.23	100.5
AF08098	48.0	13.4	10.6	5.77	2.42	.23	14.4	.20	2.53	.25	<.01	1.62	99.5
AF08099	48.0	15.0	12.8	7.39	1.94	.10	11.7	.18	1.39	.13	.06	1.93	100.7
AF08100	46.3	14.0	11.0	6.32	2.26	.15	14.0	.20	2.04	.19	.01	2.31	98.9
AF08101	53.1	14.6	8.90	7.14	2.07	.82	10.2	.15	1.41	.19	.06	1.08	99.8
AF08102	48.2	13.6	11.6	6.69	2.40	.21	13.9	.21	2.04	.20	.05	.77	100.0
AF08103	48.5	13.7	11.3	6.26	2.41	.24	13.9	.21	2.05	.20	.02	.62	99.5
AF08104	48.8	13.7	11.5	6.36	2.46	.24	14.1	.21	2.11	.20	.03	.47	100.3
AF08105	48.6	14.2	11.9	6.70	2.28	.21	13.5	.20	1.95	.19	.04	.62	100.5
AF08106	48.0	14.2	12.4	6.73	2.25	.25	13.3	.20	1.98	.19	.06	.70	100.4
AF08107	48.3	14.9	12.0	6.61	2.30	.28	12.6	.19	1.86	.18	.03	.77	100.1
AF08108	70.3	14.8	1.51	.95	3.50	4.26	3.39	.08	.467	.22	---	.62	100.3
AF08109	47.6	14.1	12.4	6.90	2.28	.26	13.2	.20	1.99	.19	.04	.62	99.9
AF08110	48.2	15.2	11.0	4.39	2.76	.33	13.7	.21	2.21	.23	.02	1.54	99.9
AF08111	48.2	14.5	12.0	6.58	2.34	.26	13.1	.19	1.95	.20	.03	.47	99.9
AF08112	47.9	14.1	11.8	7.02	2.32	.25	13.8	.21	2.10	.21	.09	.77	100.7
AF08113	47.9	15.6	12.7	7.87	2.10	.19	11.1	.17	1.41	.14	.06	.47	99.8
AF08114	47.9	13.9	12.3	7.41	2.28	.25	13.4	.20	1.96	.19	.06	.39	100.3
AF08115	47.4	14.4	12.0	6.09	2.32	.25	14.2	.21	2.14	.22	.04	1.08	100.5
AF08116	48.6	15.8	12.0	6.97	2.24	.19	12.0	.18	1.53	.16	.10	.62	100.5
AF08117	47.4	15.6	12.0	6.90	2.24	.20	11.8	.18	1.48	.15	.06	.54	98.6
AF08118	48.4	15.8	11.0	4.95	2.52	.27	13.6	.19	2.04	.20	<.01	1.23	100.3
AF08119	48.2	16.3	12.2	6.91	2.25	.22	11.3	.17	1.35	.14	.09	1.00	100.2
AF08120	48.4	16.9	11.9	6.43	2.28	.21	11.1	.16	1.44	.16	.03	.93	100.0
AF08121	48.7	16.2	12.0	6.75	2.27	.20	11.8	.18	1.54	.16	.04	.62	100.6
AF08122	48.5	16.3	12.1	6.61	2.27	.20	11.7	.18	1.50	.15	.05	.93	100.6

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

X-RAY ASSAY LABORATORIES 1885 Leslie Street Don Mills Ontario M3B 3J4 (416)445-5755 Fax (416)445-4152 Tlx 06-986947
Member of the SGS Group (Société Générale de Surveillance)

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF08123	48.5	16.1	12.1	6.85	2.35	.20	11.6	.18	1.52	.17	.04	.77	100.5
AF08124	48.8	15.4	10.8	4.56	2.64	.31	13.6	.19	2.14	.24	<.01	1.54	100.3
AF08125	48.1	16.2	12.0	6.23	2.33	.22	11.9	.18	1.61	.17	.03	1.39	100.5
AF08126	47.7	14.3	12.1	6.43	2.24	.24	13.0	.19	1.98	.19	.04	.77	99.3
AF08127	48.0	14.0	12.1	7.83	2.12	.20	13.3	.20	1.90	.18	.05	.47	100.5
AF08128	35.7	1.21	.12	35.6	.12	.03	12.1	.21	.210	.03	---	12.2	99.9
AF08129	48.2	14.4	11.6	5.76	2.34	.27	14.4	.22	2.10	.21	.02	.54	100.2
AF08130	48.2	14.0	11.4	6.10	2.42	.30	14.4	.22	2.11	.22	.02	.54	100.0
AF08131	48.3	14.2	11.3	6.27	2.42	.30	14.5	.22	2.08	.22	.02	.23	100.2
AF08132	48.3	14.0	11.3	5.81	2.37	.32	14.9	.22	2.19	.23	.01	.62	100.4
AF08133	48.3	13.1	11.4	6.17	2.31	.28	14.1	.21	1.94	.19	<.01	2.08	100.2
AF08134	47.2	14.8	12.1	8.04	2.20	.20	12.0	.18	1.40	.14	.04	1.77	100.2
AF08135	48.5	14.2	11.6	6.08	2.35	.23	13.7	.21	1.85	.19	.02	.23	99.3
AF08136	48.9	14.4	11.6	6.05	2.41	.17	13.7	.21	1.86	.19	.02	.70	100.3
AF08137	49.1	14.4	11.5	6.25	2.40	.27	13.8	.21	1.86	.19	.02	.39	100.5
AF08138	49.2	14.3	11.4	6.32	2.38	.18	13.7	.21	1.90	.19	.02	.23	100.1
AF08139	48.2	13.1	12.1	6.74	2.26	.20	13.8	.20	1.82	.17	.01	1.85	100.5
AF08140	47.6	13.4	11.2	9.68	2.04	.18	12.3	.19	1.60	.16	.06	1.85	100.4
AF08141	45.7	13.5	11.1	10.7	1.52	.11	11.3	.17	1.18	.12	.08	4.77	100.3
AF08142	47.6	14.5	12.1	6.82	2.24	.24	12.6	.19	1.75	.20	.02	1.77	100.2
AF08143	47.5	14.7	11.9	6.75	2.21	.33	12.3	.18	1.73	.21	.02	1.77	99.8
AF08144	47.3	13.5	11.6	9.16	2.00	.14	12.3	.18	1.52	.15	.06	2.16	100.2
AF08145	47.9	14.8	11.4	5.84	2.47	.47	13.1	.19	1.91	.23	.01	2.16	100.6
AF08146	47.2	13.6	11.3	9.62	2.01	.10	12.6	.19	1.53	.15	.08	2.08	100.6
AF08147	42.4	6.96	6.60	26.4	.82	.12	13.1	.19	.661	.08	.29	2.39	100.2
AF08148	35.4	1.20	.11	35.9	.11	.03	11.9	.21	.206	.03	---	11.9	99.3
AF08149	47.6	13.9	11.9	7.17	2.25	.16	13.1	.20	1.84	.19	.04	1.93	100.4
AF08150	48.5	13.6	11.0	5.91	2.47	.19	14.5	.21	2.50	.24	.01	1.08	100.3
AF08151	47.5	14.5	12.4	7.14	2.06	.08	12.7	.18	1.71	.17	.04	1.77	100.3
AF08152	48.0	14.1	12.1	7.57	2.19	.19	12.4	.18	1.81	.21	.04	1.31	100.2
AF08153	47.8	14.2	12.3	7.33	2.11	.14	12.8	.19	1.67	.18	.04	1.31	100.2
AF08154	48.1	14.3	11.8	6.45	2.35	.15	13.2	.20	1.95	.19	.02	1.47	100.3
AF08155	47.0	14.2	10.9	5.85	2.28	.15	13.7	.20	2.25	.23	<.01	3.47	100.3
AF08156	47.4	14.0	11.9	7.93	1.97	.10	12.4	.18	1.67	.14	.04	2.39	100.2
AF08157	46.7	14.0	11.5	7.43	2.08	.14	13.2	.17	1.95	.19	.03	3.08	100.6
AF08158	47.3	14.0	12.1	7.10	2.19	.21	12.9	.18	1.95	.18	.06	2.08	100.3
AF08159	47.9	13.3	11.3	6.64	2.35	.33	14.3	.19	2.36	.24	.03	1.47	100.5
AF08160	47.9	13.0	10.6	6.33	2.32	.32	15.3	.21	2.61	.29	.01	1.39	100.4
AF08161	45.5	14.6	9.14	10.7	1.80	.44	11.9	.18	1.37	.17	.06	4.47	100.4
AF08162	48.6	13.8	11.1	6.24	2.40	.30	14.0	.20	1.95	.20	.01	1.70	100.6
AF08163	48.5	14.5	11.4	6.37	2.33	.21	13.5	.19	1.93	.19	.03	1.31	100.6
AF08164	48.2	13.4	10.6	5.90	2.51	.37	14.6	.21	2.40	.27	<.01	1.70	100.3
AF08165	47.4	13.6	11.0	5.87	2.41	.21	14.7	.22	2.30	.25	<.01	2.08	100.1
AF08166	47.3	13.5	11.3	6.93	2.17	.13	13.2	.20	1.90	.21	.02	3.54	100.5
AF08167	48.0	13.8	12.1	7.00	2.08	.12	12.8	.19	1.77	.20	.04	1.85	100.1
AF08168	36.7	1.18	.11	36.3	.11	.03	12.0	.21	.208	.03	---	11.9	101.1
AF08169	47.3	14.6	12.3	6.70	2.10	.10	12.7	.19	1.77	.20	.02	2.62	100.7
AF08170	47.5	14.5	12.0	7.03	2.18	.22	12.6	.19	1.70	.19	.03	1.39	99.7
AF08171	47.3	14.2	12.4	7.81	1.98	.08	12.2	.18	1.49	.15	.04	2.62	100.5
AF08172	45.6	11.9	10.4	14.9	1.57	.16	12.1	.18	1.18	.14	.14	1.00	99.4

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF08173	46.1	14.0	11.2	8.06	1.78	.10	11.9	.22	1.57	.14	.04	4.70	99.9
AF08174	46.2	13.5	11.7	7.26	2.03	.14	12.6	.17	1.80	.17	.03	2.77	98.5
AF08175	46.8	14.1	11.8	6.76	2.13	.20	13.3	.20	1.92	.19	.02	2.00	99.5
AF08176	46.6	13.1	11.2	6.73	2.31	.32	13.8	.21	2.29	.23	.03	1.54	98.5
AF08177	48.3	13.4	10.4	5.84	2.49	.37	14.6	.22	2.40	.28	<.01	1.62	100.0
AF08178	47.9	13.7	11.8	7.12	2.21	.25	12.7	.19	1.77	.19	.04	1.08	99.1
AF08179	48.8	13.9	12.0	7.23	2.24	.28	12.9	.19	1.75	.20	.04	.77	100.4
AF08180	48.0	14.6	12.2	6.68	2.22	.15	12.7	.19	1.76	.20	.02	1.08	99.9
AF08181	46.9	14.0	12.1	7.51	1.92	.11	12.1	.19	1.49	.15	.04	2.39	99.0
AF08182	47.4	13.8	11.7	6.90	2.22	.16	13.0	.20	1.86	.21	.02	2.00	99.6
AF08183	46.9	12.4	10.2	5.43	2.43	.35	15.6	.23	3.07	.35	<.01	2.00	99.1
AF08184	47.0	13.7	11.1	6.41	2.26	.21	13.3	.20	1.96	.19	.02	1.93	98.4
AF08185	47.5	13.4	11.8	7.19	2.14	.11	12.6	.20	2.26	.22	.04	2.47	100.0
AF08186	46.5	11.6	9.85	12.1	2.00	.38	13.0	.19	1.89	.21	.12	1.08	99.1
AF08187	43.8	10.7	9.55	15.4	1.48	.14	12.2	.18	1.18	.13	.16	4.93	100.0
AF08188	47.2	13.6	11.5	7.81	1.82	.10	11.6	.16	1.60	.18	.08	2.85	98.6
AF08189	47.2	12.9	11.3	9.39	1.97	.27	13.6	.20	1.77	.19	.06	1.23	100.2
AF08190	44.4	10.4	9.13	16.5	1.36	.22	12.1	.18	1.45	.15	.17	2.47	98.7
AF08191	42.3	6.42	5.70	27.8	.84	.16	12.6	.19	.776	.09	.41	1.77	99.3
AF08192	41.6	8.45	7.56	21.5	.71	.27	11.8	.18	.931	.11	.30	5.31	98.9
AF08193	43.4	10.7	9.09	15.5	1.20	.08	12.2	.18	1.23	.14	.16	5.70	99.7
AF08194	43.6	11.5	10.0	13.2	1.23	.15	12.1	.18	1.25	.15	.11	6.31	99.9
AF08195	45.7	12.9	11.2	11.0	1.68	.06	12.4	.18	1.47	.18	.08	2.93	99.9
AF08196	48.0	14.2	12.2	7.05	2.15	.24	13.1	.19	1.90	.18	.04	.77	100.1
AF08197	48.3	15.2	12.0	6.00	2.36	.27	13.0	.19	2.00	.20	.03	.62	100.3
AF08198	46.9	13.6	12.1	6.62	2.22	.21	13.3	.20	2.07	.20	<.01	1.54	99.1
AF08199	48.1	13.5	11.5	7.26	2.16	.32	12.7	.17	2.17	.21	.03	1.62	99.8
AF08200	44.5	10.1	8.86	17.8	1.32	.10	12.4	.18	1.35	.14	.20	1.93	99.0
AF08201	45.7	14.2	11.7	8.73	1.76	.07	11.5	.17	1.57	.15	.05	4.54	100.2
AF08202	46.9	13.9	11.6	9.09	1.93	.14	12.1	.18	1.59	.15	.06	1.70	99.4
AF08203	45.4	14.1	11.5	7.64	1.74	.13	11.6	.18	1.60	.16	.04	5.93	100.1
AF08204	47.6	13.3	11.3	6.14	2.34	.31	14.3	.21	2.31	.23	.01	1.47	99.6
AF08205	47.8	12.3	10.5	5.62	2.42	.31	17.0	.24	2.96	.31	<.01	.77	100.3
AF08206	47.1	12.9	10.6	5.50	2.36	.23	15.8	.25	2.75	.31	.01	1.70	99.6
AF08207	47.3	13.0	11.0	5.78	2.39	.16	15.1	.23	2.40	.28	<.01	2.54	100.3
AF08208	35.2	1.33	.26	35.1	.14	.04	11.7	.21	.252	.03	---	12.1	98.6
AF08209	48.2	12.6	10.4	6.04	2.48	.28	15.9	.24	2.56	.29	.02	1.31	100.4
AF08210	48.4	13.6	11.2	6.17	2.35	.21	13.9	.21	1.96	.21	.02	1.62	99.9
AF08211	48.6	13.2	10.2	5.43	2.73	.32	16.1	.24	2.56	.32	<.01	.31	100.1
AF08212	47.1	12.4	10.3	6.01	2.28	.13	15.5	.23	2.48	.26	<.01	2.23	99.0
AF08213	49.2	14.2	11.6	6.91	2.10	.13	12.1	.19	1.66	.16	.05	1.39	99.8
AF08214	48.5	15.9	11.8	6.22	2.25	.14	12.0	.18	1.61	.17	.03	1.47	100.4
AF08215	47.7	14.0	12.1	7.62	2.11	.15	12.5	.19	1.66	.15	.04	1.54	99.9
AF08216	45.9	13.7	11.5	7.71	1.89	.09	12.5	.19	1.76	.18	.05	4.85	100.4
AF08217	47.7	13.2	10.2	5.61	2.55	.32	15.6	.23	2.66	.29	<.01	1.93	100.4
AF08218	48.4	13.8	11.2	6.33	2.49	.27	14.0	.22	2.01	.21	<.01	1.39	100.4
AF08219	44.3	11.3	9.13	15.1	1.35	.07	12.0	.19	1.13	.11	.15	5.23	100.2
AF08220	47.6	14.6	12.7	6.85	2.14	.11	12.3	.18	1.65	.18	.03	1.77	100.2
AF08221	47.5	13.9	11.9	6.86	2.20	.12	13.0	.20	1.83	.20	.03	1.77	99.6
AF08222	47.7	12.7	10.3	5.59	2.47	.31	15.4	.24	3.01	.34	<.01	1.70	99.9

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL203	CAO	MGO	NA2O	K2O	FE203	MNO	TIO2	P205	CR203	LOI	SUM
AF08223	48.0	12.6	10.2	5.44	2.60	.35	15.6	.23	3.04	.35	.01	.54	99.1
AF08224	42.8	7.23	5.37	24.9	.92	.17	12.7	.18	1.10	.12	.21	3.39	99.3
AF08225	45.1	13.4	11.1	8.89	1.85	.28	11.8	.19	1.47	.15	.07	5.08	99.5
AF08226	48.2	14.7	12.2	6.52	2.25	.25	13.1	.19	1.94	.19	.03	.77	100.4
AF08227	45.2	11.5	9.02	13.3	1.25	.06	12.4	.17	1.28	.15	.17	5.85	100.5
AF08228	70.2	14.8	1.53	1.03	3.54	4.21	3.30	.08	.472	.22	---	.77	100.3
AF08229	45.9	11.3	9.39	15.1	1.82	.25	12.7	.19	1.39	.16	.17	1.54	100.0
AF08230	48.0	13.9	12.2	7.37	2.06	.17	12.7	.19	1.58	.16	.04	1.93	100.4
AF08231	48.5	14.7	12.7	7.90	2.00	.19	11.3	.17	1.32	.14	.06	1.54	100.6
AF08232	46.0	12.9	11.2	10.2	1.66	.42	12.5	.19	1.56	.17	.07	3.16	100.1
AF08233	45.7	11.0	9.49	14.8	1.63	.20	12.6	.18	1.68	.16	.13	2.08	99.8
AF08234	45.2	10.4	9.23	17.0	1.46	.16	12.2	.18	1.51	.16	.17	2.62	100.5
AF08235	45.9	13.5	12.2	7.68	1.87	.25	11.2	.16	1.74	.16	.13	4.93	99.8
AF08236	43.0	7.44	6.43	24.4	1.07	.09	13.3	.19	.969	.10	.27	1.54	99.0
AF08237	46.9	16.0	12.8	6.63	2.16	.32	10.0	.15	1.34	.14	.08	3.23	99.8
AF08238	43.8	9.45	7.99	19.9	1.26	.09	12.1	.18	1.06	.10	.22	3.39	99.7
AF08239	42.4	11.6	11.1	11.2	1.53	.43	12.7	.18	1.52	.23	.09	6.62	99.7
AF08240	48.4	12.9	10.5	5.83	2.39	.41	15.4	.22	2.63	.30	.01	.77	99.9
AF08241	48.6	12.9	10.5	6.08	2.36	.37	15.6	.22	2.62	.30	.02	.62	100.3
AF08242	45.8	13.3	11.2	9.02	2.05	.13	11.6	.18	1.44	.17	.09	5.47	100.6
AF08243	47.2	13.6	12.0	7.28	2.02	.25	12.7	.19	1.58	.15	.03	3.08	100.2
AF08244	47.6	14.5	12.0	7.65	2.04	.13	12.3	.18	1.49	.15	.04	2.08	100.2
AF08245	46.3	13.5	11.1	8.96	1.95	.14	12.6	.18	1.73	.19	.04	3.23	100.0
AF08246	47.4	13.9	11.6	7.89	2.05	.21	12.2	.18	1.64	.18	.04	2.47	99.9
AF08247	46.8	13.6	10.9	8.65	2.04	.47	12.2	.18	1.80	.19	.04	2.16	99.1
AF08248	34.4	1.15	1.22	35.0	.08	.03	11.6	.20	.196	.03	---	11.8	98.0
AF08249	47.9	14.1	11.4	6.63	2.44	.14	13.1	.18	1.91	.18	.02	1.77	99.9
AF08250	45.5	13.5	11.6	9.51	1.69	.11	11.7	.20	1.68	.20	.06	4.47	100.3
AF08251	45.0	10.1	8.91	17.3	1.51	.12	13.4	.20	1.27	.14	.17	1.23	99.5
AF08252	43.4	12.9	12.7	8.33	1.35	.36	12.1	.18	1.52	.27	.05	6.93	100.2
AF08253	44.3	10.3	8.78	18.2	1.31	.05	11.9	.18	1.10	.12	.19	2.23	98.8
AF08254	42.7	9.24	7.98	19.9	1.19	.15	12.3	.18	.977	.11	.21	4.47	99.6
AF08255	42.4	12.1	13.7	10.0	.85	.72	12.6	.18	1.81	.26	.06	4.93	99.8
AF08256	46.2	13.8	12.2	6.47	1.88	.33	11.7	.17	1.74	.21	.03	5.54	100.4
AF08257	47.1	14.3	11.8	7.01	2.41	.18	11.6	.17	1.53	.18	.04	3.31	99.7
AF08258	47.5	12.8	10.6	6.20	2.36	.40	15.2	.22	2.51	.29	.02	.77	99.0
AF08259	47.6	12.7	10.6	5.62	2.32	.41	15.2	.21	2.61	.30	.01	1.23	98.9
AF08260	48.1	12.9	10.5	5.94	2.35	.41	15.3	.22	2.58	.30	.01	.77	99.5
AF08261	47.9	14.3	12.0	7.57	2.18	.14	11.7	.18	1.53	.15	.04	.77	98.5
AF08262	48.0	14.3	12.2	8.06	2.15	.13	11.8	.18	1.50	.15	.05	.93	99.5
AF08263	48.0	13.1	9.76	5.00	2.68	.94	15.7	.23	2.93	.38	<.01	.77	99.6
AF08264	48.2	13.3	11.1	5.97	2.32	.34	15.5	.23	2.43	.27	.02	.62	100.4
AF08265	49.1	13.9	11.1	6.17	2.51	.28	14.3	.22	1.92	.21	.01	.16	100.0
AF08266	48.7	14.9	11.6	6.78	2.27	.24	12.7	.20	1.60	.17	.02	.23	99.5
AF08267	48.8	14.7	11.5	6.29	2.43	.25	13.0	.20	1.72	.19	.02	.16	99.4
AF08268	35.5	1.25	.18	35.8	.14	.03	11.9	.21	.208	.03	---	11.9	99.5
AF08269	49.0	15.4	11.6	6.89	2.38	.24	12.5	.19	1.54	.16	.03	.00	100.0
AF08270	48.5	14.7	11.5	6.53	2.37	.26	12.9	.20	1.62	.17	.02	.08	98.9
AF08271	48.4	13.6	11.1	6.45	2.55	.31	14.1	.21	2.13	.23	.02	-.07	99.1
AF08272	48.8	14.3	12.2	5.81	2.41	.28	13.8	.21	1.89	.21	.01	.62	100.6

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF08273	48.5	14.2	11.1	5.98	2.40	.29	13.6	.21	1.83	.19	.01	.77	99.2
AF08274	49.1	13.9	11.1	6.40	2.49	.28	14.1	.22	1.87	.20	.02	.23	100.0
AF08275	48.8	13.3	10.6	5.48	2.54	.34	15.5	.23	2.18	.22	<.01	.54	99.8
AF08276	48.3	13.9	11.5	6.78	2.24	.29	12.9	.19	1.88	.20	.02	.39	98.7
AF08277	48.2	12.4	10.1	5.43	2.37	.44	16.2	.23	2.84	.32	<.01	.08	98.7
AF08278	42.8	7.48	6.73	25.5	.90	.10	12.5	.19	.781	.06	.32	2.62	100.2
AF08279	47.6	13.8	11.6	8.59	2.17	.28	13.0	.19	1.85	.19	.06	.08	99.5
AF08280	47.9	12.3	9.97	5.40	2.36	.44	16.3	.23	2.87	.32	<.01	.00	98.2
AF08281	47.7	12.7	10.7	6.22	2.30	.35	15.2	.23	2.39	.26	.03	.47	98.7
AF08282	48.4	13.0	10.8	5.95	2.34	.38	15.3	.23	2.44	.27	.03	.62	99.9
AF08283	48.6	13.6	11.1	6.10	2.40	.27	14.1	.21	1.90	.20	.02	.70	99.3
AF08284	48.3	12.4	9.90	5.38	2.46	.45	16.4	.24	2.84	.32	.01	.00	98.8
AF08285	47.8	14.0	11.8	7.17	2.22	.23	13.3	.19	1.88	.21	.04	.70	99.6
AF08286	47.9	13.3	11.2	6.58	2.42	.33	14.3	.21	2.34	.24	.03	.77	99.7
AF08287	48.6	13.3	10.5	11.0	1.95	.41	11.3	.17	1.30	.15	.12	.70	99.6
AF08288	35.0	1.15	.63	35.5	.08	.03	11.9	.21	.199	.03	---	11.9	98.8
AF08289	49.1	15.1	11.2	6.14	2.53	.30	13.3	.20	1.79	.19	.02	.39	100.4
AF08290	47.2	12.7	11.3	8.25	2.18	.26	13.8	.21	2.05	.21	.06	.47	98.8
AF08291	48.0	11.5	8.88	4.56	2.67	.47	18.4	.27	3.02	.33	<.01	1.39	99.6
AF08292	48.6	12.5	10.0	5.48	2.53	.44	16.5	.24	2.94	.32	.01	-.07	99.6
AF08293	48.9	14.1	6.82	7.40	2.25	3.20	11.8	.19	1.73	.20	.03	2.93	99.8
AF08294	48.2	13.8	11.2	6.41	2.55	.29	13.7	.20	2.03	.22	.02	.16	98.9
AF08295	53.0	10.4	6.72	1.95	3.28	.94	19.0	.32	2.34	.80	<.01	1.70	100.7
AF08296	48.7	13.9	11.1	6.23	2.37	.27	14.1	.22	1.90	.20	.02	1.08	100.2
AF08297	48.4	14.2	10.9	8.45	2.44	.39	11.6	.20	1.66	.17	.07	1.77	100.4
AF08298	48.9	12.5	10.1	5.58	2.53	.49	16.5	.24	2.90	.33	.01	.08	100.3
AF08299	49.4	14.8	11.5	6.19	2.47	.27	13.4	.21	1.77	.20	.02	.31	100.6
AF08300	48.7	14.9	11.8	7.02	2.20	.23	12.6	.20	1.55	.17	.04	.77	100.3
AF08301	48.8	11.2	8.49	3.55	2.94	.63	19.2	.29	4.50	.52	<.01	.23	100.5
AF08302	49.0	14.0	11.4	6.02	2.54	.33	14.2	.21	2.26	.25	.01	.39	100.7
AF08303	49.0	13.9	11.2	6.03	2.52	.32	14.6	.21	2.27	.25	.02	.47	100.9
AF08304	48.9	14.2	12.1	6.85	2.29	.24	13.0	.21	1.59	.17	.07	.39	100.1
AF08305	54.4	23.0	.76	1.61	1.25	2.31	7.79	.09	1.01	.24	.05	8.08	100.8
AF08306	48.9	13.9	11.8	6.79	2.36	.30	13.4	.21	1.65	.17	.03	.62	100.3
AF08307	46.1	13.7	11.8	8.49	1.75	.23	12.0	.20	1.71	.22	.07	3.93	100.3
AF08308	49.3	14.7	9.25	6.88	1.83	.72	9.33	.16	1.33	.18	.14	6.77	100.7
AF08309	48.1	14.8	11.6	5.80	2.51	.35	13.1	.20	2.11	.25	.02	.77	99.7
AF08310	48.9	12.5	10.1	5.61	2.47	.43	16.7	.24	2.94	.34	.02	.08	100.5
AF08311	48.5	12.5	10.1	5.48	2.50	.44	16.4	.24	2.88	.33	.01	.23	99.8
AF08312	46.6	14.4	12.4	9.37	1.78	.22	11.4	.16	1.39	.14	.08	2.08	100.1
AF08313	47.4	12.6	10.8	5.69	2.38	.41	16.6	.25	3.00	.34	.02	.85	100.5
AF08314	47.3	12.4	10.8	5.95	2.38	.41	16.7	.25	2.99	.34	.04	.62	100.3
AF08315	48.4	12.9	10.5	5.93	2.33	.29	16.0	.24	2.51	.28	.04	.93	100.4
AF08316	48.6	14.7	11.9	7.03	2.26	.23	12.8	.20	1.61	.17	.04	.62	100.3
AF08322	48.2	14.4	12.3	6.79	2.03	.13	11.3	.17	1.58	.17	.06	2.93	100.2
AF08323	48.9	14.2	11.8	6.77	2.43	.25	13.3	.20	1.96	.21	.03	-.07	100.1
AF08324	48.5	13.8	11.5	6.87	2.41	.29	13.7	.21	2.03	.23	.03	-.15	99.5
AF08325	49.1	14.8	11.5	6.33	2.28	.34	12.4	.19	1.46	.16	<.01	1.93	100.6
AF08326	47.4	14.8	14.3	9.37	1.27	.12	9.16	.15	.916	.09	.09	2.39	100.1
AF08327	47.4	14.9	12.4	8.69	2.03	.46	10.1	.16	1.17	.13	.10	2.93	100.6

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF08328	69.8	14.6	1.56	.96	3.57	4.13	3.59	.08	.487	.22	---	.77	99.9
AF08329	48.2	14.9	12.7	7.27	1.97	.29	10.8	.17	1.32	.14	.01	2.23	100.1
AF08330	48.8	13.7	11.3	6.31	2.55	.31	14.2	.21	2.20	.25	.02	-.07	99.9
AF08331	48.1	14.6	13.3	8.42	1.85	.29	9.92	.16	1.12	.11	.02	2.62	100.6
AF08332	46.7	16.3	12.4	8.59	2.15	.22	9.31	.13	1.06	.12	.10	2.77	99.9
AF08333	48.5	13.1	11.0	5.87	2.43	.40	15.2	.22	2.43	.29	.01	.47	100.1
AF08334	45.2	13.1	11.1	9.28	1.54	.12	12.5	.21	1.51	.16	.06	5.54	100.4
AF08335	50.6	14.7	11.1	6.67	1.88	.32	10.4	.15	1.39	.17	.12	2.77	100.4
AF08336	51.2	14.7	10.7	6.85	1.99	.32	10.4	.17	1.39	.17	.12	1.93	100.0
AF08337	47.4	14.0	11.3	7.89	1.90	1.08	10.9	.17	1.42	.34	.05	3.77	100.4
AF08338	47.4	13.9	11.7	7.60	1.95	1.07	10.9	.17	1.42	.34	.05	3.23	99.9
AF08346	48.1	11.5	10.8	5.86	2.41	.26	17.5	.26	2.73	.20	<.01	.39	100.1
AF08348	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	---

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF07501	---	11	211	30	143	11	195	154	21	86
AF07502	---	44	366	19	312	75	426	21	200	111
AF07503	---	38	336	49	325	57	440	36	194	117
AF07504	---	46	350	32	328	20	410	31	200	115
AF07505	---	39	343	15	301	75	380	36	200	110
AF07506	---	53	345	34	335	83	431	40	192	118
AF07507	---	52	346	23	317	82	418	33	194	134
AF07508	12500	<10	<10	<10	12	26	187	3330	16	135
AF07509	---	41	334	37	344	53	410	39	187	129
AF07510	---	39	343	47	338	55	383	34	187	134
AF07511	---	26	341	26	333	59	418	29	194	122
AF07512	---	32	374	35	346	76	463	35	199	129
AF07513	---	42	336	32	324	74	497	46	195	118
AF07514	---	49	345	20	305	41	392	48	174	117
AF07515	---	28	313	35	285	40	344	25	115	125
AF07516	---	21	165	27	104	17	107	116	110	83
AF07517	---	<10	174	<10	74	18	56	450	98	75
AF07518	---	<10	163	24	114	11	59	413	109	78
AF07519	---	28	190	23	74	12	111	449	107	79
AF07520	---	56	307	51	327	66	350	27	179	133
AF07521	---	<10	141	25	76	18	65	576	108	84
AF07522	---	43	358	42	280	54	375	42	178	109
AF07523	---	63	347	13	297	50	389	39	191	112
AF07530	---	<10	163	24	73	<10	62	130	98	72
AF07531	---	38	296	44	305	53	334	31	167	117
AF07534	---	17	174	33	133	<10	100	74	241	88
AF07535	---	<10	312	37	255	19	110	48	266	112
AF07536	---	26	274	39	251	13	189	34	262	116
AF07537	---	<10	151	22	94	26	109	120	115	78
AF07538	---	13	314	37	229	43	202	60	226	98
AF07539	---	37	298	39	302	62	359	34	210	117
AF07540	---	21	198	12	102	<10	110	371	127	76
AF07541	---	<10	164	17	79	22	105	645	100	80
AF07542	---	42	365	39	424	70	535	<10	192	124
AF07543	---	<10	348	25	336	52	404	37	186	141
AF07544	---	20	260	23	154	12	89	47	214	97
AF07545	---	56	360	49	412	75	501	<10	178	143
AF07546	---	28	340	21	310	66	395	47	181	109
AF07547	---	16	342	40	321	84	412	35	198	110
AF07548	12500	25	<10	<10	24	<10	163	3320	17	131
AF07549	---	42	336	25	314	73	410	27	310	118
AF07550	---	20	189	29	128	39	110	92	202	79
AF07551	---	28	350	18	301	66	425	44	189	112
AF07552	---	42	347	25	280	68	361	44	230	110
AF07553	---	12	331	35	309	64	432	35	200	131
AF07554	---	41	350	32	325	71	419	36	194	115
AF07555	---	35	348	39	276	70	381	36	235	110
AF07556	---	28	347	40	297	56	413	40	189	113
AF07557	---	22	363	35	316	62	446	36	190	119
AF07558	---	<10	162	37	91	12	82	110	122	77

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF07559	---	<10	172	33	97	20	102	80	128	85
AF07560	---	42	344	42	333	80	440	36	192	126
AF07561	---	15	168	12	108	12	74	116	112	78
AF07562	---	27	274	25	254	23	142	39	253	107
AF07563	---	27	273	43	265	29	140	45	265	109
AF07564	---	<10	276	35	263	42	164	42	258	116
AF07565	---	28	336	24	321	82	438	34	185	127
AF07566	---	41	340	30	340	73	441	36	203	131
AF07567	---	44	342	25	333	67	506	<10	<10	78
AF07568	26	180	128	44	187	19	740	33	191	167
AF07569	---	43	342	30	325	60	455	34	192	127
AF07570	---	27	343	48	343	58	435	370	107	74
AF07571	---	<10	150	27	91	20	82	413	115	71
AF07572	---	<10	153	13	74	30	83	159	50	80
AF07573	---	<10	179	16	118	23	147	691	108	80
AF07574	---	14	115	<10	79	24	83	63	267	90
AF07575	---	13	202	45	172	19	81	385	122	75
AF07576	---	<10	162	<10	88	16	70	395	126	77
AF07577	---	17	171	<10	91	18	79	326	121	85
AF07578	---	13	265	43	249	24	193	40	257	117
AF07579	---	12	285	31	238	23	150	44	231	105
AF07580	---	29	280	29	268	46	147	51	277	111
AF07581	---	24	300	53	321	71	394	19	184	131
AF07582	---	80	315	75	494	107	850	<10	45	138
AF07583	---	12	168	49	276	26	146	16	538	125
AF07584	---	28	296	26	315	69	367	31	171	117
AF07585	---	34	305	35	302	75	354	25	171	121
AF07586	---	39	303	29	321	62	298	33	166	119
AF07587	---	47	295	81	509	74	495	<10	182	138
AF07588	12400	<10	<10	27	12	18	120	3350	16	134
AF07589	---	23	208	<10	110	13	105	125	107	78
AF07590	---	43	312	71	593	96	600	<10	127	142
AF07591	---	47	317	78	579	88	598	<10	114	143
AF07592	---	21	298	33	295	63	347	36	159	109
AF07593	---	29	294	47	306	72	324	30	171	117
AF07594	---	14	152	28	138	14	183	46	170	96
AF07595	---	25	341	45	319	70	457	34	192	129
AF07596	---	27	347	40	326	79	389	34	189	118
AF07597	---	30	355	35	341	78	399	36	188	134
AF07598	---	<10	156	25	102	25	114	125	111	77
AF07599	---	18	170	18	109	22	62	110	126	78
AF07600	---	13	162	19	112	16	71	102	112	86
AF07601	---	34	324	41	359	67	412	12	299	128
AF07602	---	43	303	36	350	66	334	29	180	124
AF07603	---	22	142	<10	94	24	126	1070	97	79
AF07604	---	<10	194	29	66	<10	82	726	92	73
AF07605	---	22	154	12	76	29	209	489	85	71
AF07606	---	14	173	26	74	11	87	222	114	79
AF07607	---	<10	79	<10	65	24	92	1070	81	78
AF07608	12800	19	<10	<10	23	23	172	3340	16	140

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF07609	---	<10	200	18	76	21	94	517	93	74
AF07610	---	<10	105	<10	51	14	84	926	73	78
AF07611	---	12	148	25	65	29	123	719	94	83
AF07612	---	14	116	<10	83	37	144	693	106	81
AF07613	---	19	132	13	88	18	101	913	94	82
AF07614	---	<10	123	26	81	15	113	755	88	80
AF07615	---	<10	117	13	72	19	114	922	79	83
AF07616	---	<10	243	17	106	11	88	562	131	85
AF07617	---	<10	214	15	33	13	96	1090	72	67
AF07618	---	12	133	<10	71	17	96	740	105	80
AF07619	---	<10	104	<10	64	13	89	902	104	72
AF07620	---	47	473	22	130	31	234	110	23	82
AF07621	---	14	124	30	73	19	97	747	103	84
AF07622	---	<10	131	18	78	12	84	690	109	79
AF07623	---	40	185	24	106	11	254	44	27	77
AF07624	---	24	196	16	129	20	281	20	27	74
AF07625	---	32	211	22	120	18	274	26	24	72
AF07626	---	27	200	23	150	19	281	15	38	75
AF07627	---	23	202	<10	120	16	232	29	32	81
AF07628	12700	10	<10	<10	<10	35	162	3360	18	137
AF07629	---	25	176	18	132	27	231	46	32	78
AF07630	---	22	180	<10	101	15	241	43	29	77
AF07631	---	31	212	23	123	17	244	<10	11	70
AF07632	---	31	214	14	138	26	290	<10	15	79
AF07633	---	17	116	10	60	<10	95	531	106	73
AF07634	---	32	146	<10	99	18	231	37	24	63
AF07635	---	25	210	19	133	26	241	59	38	73
AF07636	---	31	203	18	116	19	223	38	33	76
AF07637	---	23	197	20	150	30	215	20	22	77
AF07638	---	15	196	20	119	10	253	29	26	75
AF07639	---	88	129	<10	110	15	851	25	20	77
AF07640	---	18	62	21	41	<10	120	1190	85	76
AF07641	---	39	183	12	42	19	130	1140	72	71
AF07642	---	41	258	12	36	<10	89	1020	82	69
AF07643	---	17	344	18	76	13	104	238	100	77
AF07644	---	13	105	10	57	26	93	855	99	80
AF07645	---	<10	154	23	103	27	104	110	126	72
AF07646	---	<10	100	24	109	29	59	73	159	88
AF07647	---	19	153	25	117	<10	135	143	113	85
AF07648	30	180	135	26	207	21	706	<10	<10	80
AF07649	---	<10	155	<10	83	27	112	612	99	85
AF07651	---	12	165	29	80	44	76	724	117	80
AF07652	---	22	137	11	66	12	116	562	68	77
AF07653	---	<10	196	<10	67	25	119	897	84	78
AF07654	---	<10	349	19	65	17	148	1360	64	76
AF07655	---	21	217	15	65	21	212	1260	72	70
AF07656	---	<10	215	15	65	27	156	30	34	84
AF07657	---	<10	240	27	97	16	96	142	119	72
AF07658	---	33	206	20	101	10	140	491	106	69
AF07659	---	22	229	17	72	15	79	240	114	71

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF07660	---	<10	106	20	62	34	79	1200	74	77
AF07661	---	14	138	24	63	13	55	871	76	75
AF07662	---	14	69	<10	52	31	103	641	116	83
AF07663	---	<10	88	16	38	<10	85	307	125	72
AF07664	---	11	242	19	82	19	146	196	95	71
AF07665	---	20	276	<10	64	33	127	539	94	74
AF07666	---	<10	110	15	70	13	80	<10	<10	82
AF07667	---	<10	100	<10	39	<10	108	172	161	80
AF07668	32	174	135	48	189	28	726	1070	89	71
AF07669	---	12	220	17	89	22	76	171	100	71
AF07670	---	28	87	14	22	<10	132	160	69	71
AF07671	---	<10	168	12	80	29	180	148	91	74
AF07672	---	23	175	31	92	<10	166	145	96	71
AF07673	---	19	172	<10	98	13	170	143	82	73
AF07674	---	18	193	19	85	11	162	193	93	74
AF07675	---	12	173	18	81	30	347	291	75	61
AF07676	---	29	347	<10	77	17	342	962	80	66
AF07677	---	<10	104	16	45	15	86	953	79	75
AF07678	---	<10	97	19	72	17	84	1190	61	73
AF07679	---	26	175	<10	55	<10	105	329	168	68
AF07680	---	12	63	<10	48	15	77	942	101	76
AF07681	---	<10	61	<10	47	11	117	302	96	79
AF07682	---	<10	135	18	65	17	63	317	80	74
AF07683	---	16	60	13	35	15	76	672	102	75
AF07684	---	<10	120	<10	66	25	103	810	94	76
AF07685	---	<10	94	26	74	16	95	3270	17	135
AF07686	---	12	211	11	56	16	208	945	93	76
AF07687	---	12	158	<10	78	23	132	886	100	78
AF07688	12600	18	<10	<10	22	24	150	895	104	72
AF07689	---	22	102	<10	51	18	56	927	108	76
AF07690	---	<10	105	<10	57	24	92	887	100	76
AF07691	---	<10	157	11	71	<10	115	909	104	69
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AF07693	---	<10	120	19	64	17	81	795	105	78
AF07694	---	12	171	16	91	19	182	593	117	79
AF07695	---	<10	216	29	91	25	143	703	77	77
AF07696	---	30	579	18	68	<10	157	837	87	78
AF07697	---	28	147	23	69	<10	224	895	76	76
AF07698	---	25	251	15	142	34	170	70	114	80
AF07699	---	<10	250	<10	103	13	191	75	110	84
AF07700	---	18	219	23	111	19	178	124	53	79
AF07701	---	12	316	41	120	40	707	44	38	76
AF07702	---	16	309	26	119	31	718	46	39	78
AF07703	---	<10	275	17	114	20	162	69	108	81
AF07704	---	21	303	24	132	41	722	47	42	76
AF07705	---	42	250	26	162	20	428	15	22	85
AF07706	---	43	235	12	185	34	430	14	18	84
AF07707	---	35	234	13	199	32	282	30	20	88
AF07708	12800	<10	<10	<10	20	19	148	3320	19	134
AF07709	---	32	112	<10	65	17	1350	401	103	75

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF07710	---	25	370	18	66	<10	73	650	99	79
AF07711	---	30	236	25	151	14	409	790	277	40
AF07712	---	<10	105	23	71	28	110	769	99	69
AF07713	---	16	168	21	121	18	121	11	18	87
AF07714	---	11	150	30	120	20	127	34	22	83
AF07715	---	20	151	20	120	10	183	32	19	78
AF07716	---	15	164	21	120	35	165	24	17	78
AF07717	---	17	229	11	126	31	641	147	26	73
AF07718	---	26	160	<10	75	15	104	534	108	75
AF07719	---	<10	70	12	37	20	121	1300	67	77
AF07720	---	47	197	44	198	<10	336	129	96	61
AF07721	---	50	185	30	221	22	396	278	136	69
AF07722	---	14	214	10	132	16	221	52	27	62
AF07723	---	18	259	38	154	54	271	203	42	73
AF07724	---	34	273	13	172	66	297	292	61	76
AF07725	---	20	204	22	45	<10	89	852	82	65
AF07726	---	33	354	<10	75	26	147	542	82	66
AF07727	---	15	186	<10	89	21	137	780	110	77
AF07728	12400	<10	<10	15	13	18	139	3320	17	131
AF07729	---	<10	160	16	63	24	98	769	108	74
AF07730	---	13	142	33	96	<10	71	81	176	87
AF07731	---	<10	130	25	86	11	55	90	148	91
AF07732	---	<10	172	22	102	28	99	86	203	88
AF07733	---	13	157	<10	92	36	79	85	192	87
AF07734	---	<10	116	10	64	<10	65	433	99	75
AF07735	---	16	113	35	77	16	89	311	138	75
AF07736	---	55	220	10	133	13	329	129	79	34
AF07737	---	28	222	38	173	11	383	143	81	46
AF07738	---	19	210	23	139	20	450	742	253	38
AF07739	---	42	208	14	138	<10	355	787	273	44
AF07740	---	<10	185	38	90	<10	61	127	164	73
AF07741	---	34	217	25	136	11	156	38	130	89
AF07742	---	11	223	26	272	38	194	45	273	114
AF07743	---	17	235	33	258	42	204	46	291	120
AF07744	---	17	332	34	290	60	363	25	137	117
AF07745	---	22	203	25	132	18	192	246	96	83
AF07761	---	<10	186	14	99	15	83	147	127	83
AF07762	---	32	178	<10	105	<10	115	39	93	79
AF07763	---	19	207	22	107	17	94	44	89	77
AF07764	---	10	192	32	110	14	89	47	85	79
AF07765	---	<10	173	14	107	25	85	75	81	83
AF07766	---	<10	204	22	97	21	87	69	89	79
AF07767	---	<10	201	29	208	28	125	46	206	104
AF07768	---	11	193	33	110	20	223	29	29	79
AF07769	---	<10	221	32	264	39	100	52	392	120
AF07770	---	13	181	23	132	15	72	66	195	86
AF07771	---	20	216	25	169	25	99	49	201	90
AF07772	---	13	190	21	192	23	116	42	316	97
AF07773	---	<10	164	44	126	20	70	79	237	94
AF07774	---	<10	172	<10	98	<10	77	79	185	83

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF07775	---	<10	166	37	138	30	84	77	185	89
AF07776	---	<10	165	27	114	20	97	88	141	86
AF07777	---	<10	167	29	120	22	92	85	194	84
AF07778	---	<10	185	20	90	20	82	75	178	87
AF07779	---	18	180	<10	74	20	85	85	114	75
AF07780	---	17	117	<10	60	25	106	860	108	77
AF07781	---	20	190	22	87	27	138	883	109	80
AF07782	---	17	40	20	36	22	127	1350	64	78
AF07783	---	19	203	41	105	21	201	173	90	82
AF07784	---	<10	166	20	84	24	218	39	30	78
AF07785	---	<10	49	<10	64	<10	96	1170	83	73
AF07786	---	<10	57	11	50	<10	97	1160	77	75
AF07787	---	<10	71	<10	37	<10	92	1100	85	76
AF07788	35	180	134	58	197	20	736	<10	<10	78
AF07789	---	14	63	13	48	23	92	833	98	74
AF07790	---	10	290	24	162	32	119	36	190	90
AF07791	---	18	277	23	175	21	147	30	180	89
AF07792	---	22	276	29	185	36	156	36	200	88
AF07793	---	16	75	24	50	<10	97	914	107	69
AF07794	---	<10	100	<10	62	<10	71	586	120	74
AF07795	---	18	189	31	114	27	106	82	212	81
AF07796	---	35	258	10	44	21	471	625	69	59
AF07797	---	<10	13	27	238	42	145	38	184	105
AF07798	---	18	285	21	169	22	157	36	182	86
AF07799	---	<10	173	15	95	12	60	189	125	72
AF07800	---	30	200	12	48	22	140	902	84	71
AF07808	12600	<10	<10	<10	25	13	164	3280	18	133
AF07818	---	22	212	16	72	17	186	1080	71	72
AF07819	---	21	196	<10	83	27	138	450	106	79
AF07820	---	17	191	12	97	29	105	97	157	81
AF07821	---	<10	173	51	68	17	127	1050	76	78
AF07822	---	32	143	<10	63	11	131	1170	67	68
AF07823	---	21	206	<10	74	42	194	928	78	77
AF07824	---	17	180	<10	70	28	174	797	78	72
AF07825	---	15	244	18	102	30	228	59	44	78
AF07826	---	<10	133	23	68	16	161	597	63	74
AF07827	---	36	435	22	134	27	524	34	23	72
AF07828	12800	12	<10	<10	<10	15	141	3330	17	132
AF07829	---	<10	104	<10	56	10	80	259	84	70
AF07830	---	11	131	<10	83	17	52	194	140	74
AF07831	---	<10	143	13	73	13	94	394	106	76
AF07832	---	11	133	28	79	19	75	180	133	70
AF07833	---	<10	121	<10	56	20	74	562	83	74
AF07834	---	<10	371	35	130	43	377	16	18	74
AF07835	---	<10	345	28	119	33	321	16	16	72
AF07836	---	<10	339	<10	112	57	257	<10	16	76
AF07837	---	<10	178	20	88	21	250	217	140	66
AF07838	---	32	253	17	92	21	159	337	99	75
AF07839	---	59	128	44	301	31	515	<10	<10	78
AF07840	---	35	174	<10	184	21	326	<10	<10	79

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF07841	---	<10	80	<10	48	19	101	1130	83	79
AF07842	---	<10	87	<10	42	13	137	1410	50	78
AF07843	---	12	78	11	47	26	113	1440	53	76
AF07844	---	36	204	11	142	22	282	<10	<10	74
AF07845	---	23	203	<10	120	11	270	<10	<10	70
AF07848	---	14	156	23	57	24	112	396	91	80
AF07851	---	16	147	18	71	26	110	586	115	79
AF07852	---	22	200	28	53	23	154	1230	74	72
AF07853	---	<10	301	14	66	11	139	731	103	75
AF07854	---	10	234	<10	65	33	154	1160	80	76
AF07855	---	33	267	27	71	20	303	605	108	75
AF07856	---	16	250	26	127	23	159	65	87	79
AF07857	---	31	269	11	119	22	173	66	100	82
AF07858	---	<10	253	31	126	<10	184	66	102	80
AF07859	---	<10	232	25	116	33	277	41	34	73
AF07860	---	11	214	13	96	22	237	105	41	71
AF07861	---	14	178	27	80	28	232	558	65	75
AF07862	---	29	292	15	121	30	213	37	23	69
AF07863	---	25	152	25	74	<10	73	182	127	76
AF07864	---	13	113	21	39	12	135	524	106	74
AF07865	---	16	238	43	178	19	232	103	202	82
AF07866	---	<10	116	<10	37	29	132	815	94	70
AF07867	---	19	114	18	48	39	132	953	100	72
AF07868	12500	<10	<10	<10	25	30	146	3300	20	131
AF07869	---	21	231	15	89	48	132	532	124	73
AF07870	---	20	248	17	91	43	143	936	113	77
AF07871	---	19	182	21	63	21	105	123	130	67
AF07872	---	14	129	16	47	<10	164	694	72	64
AF07873	---	<10	135	13	71	15	88	446	104	75
AF07874	---	<10	209	23	87	17	108	176	124	76
AF07875	---	18	252	<10	64	<10	123	501	72	79
AF07876	---	15	167	<10	72	18	92	804	95	71
AF07877	---	<10	128	21	80	21	63	689	96	80
AF07878	---	<10	122	<10	59	20	107	953	81	77
AF07879	---	13	208	<10	75	15	111	782	89	71
AF07880	---	11	124	10	53	19	106	787	100	77
AF07881	---	26	143	17	44	25	129	623	85	73
AF07882	---	14	205	<10	95	28	114	774	103	77
AF07883	---	21	250	16	87	29	114	208	117	72
AF07884	---	22	147	18	68	19	110	687	106	75
AF07885	---	24	287	21	100	32	247	59	53	78
AF07886	---	45	303	<10	135	38	724	52	44	81
AF07887	---	22	136	13	61	<10	95	963	90	73
AF07888	48	174	133	41	191	27	704	<10	<10	78
AF07889	---	21	254	13	78	48	170	955	84	76
AF07890	---	17	198	17	89	16	112	442	114	76
AF07891	---	29	227	<10	74	15	157	1020	71	67
AF07892	---	26	152	24	66	27	105	1230	96	75
AF07893	---	11	272	17	142	29	129	73	110	79
AF07894	---	<10	254	26	129	32	202	75	94	80

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF07895	---	13	255	20	121	30	198	70	84	76
AF07896	---	16	246	27	137	36	194	74	116	79
AF07897	---	33	290	<10	135	11	352	37	25	71
AF07898	---	19	296	14	128	22	290	42	24	72
AF07899	---	38	429	<10	182	52	764	66	24	102
AF07900	---	11	144	<10	100	17	72	109	130	81
AF07918	---	17	294	21	138	23	352	44	31	75
AF07919	---	28	151	<10	83	28	130	1140	67	81
AF07920	---	22	201	19	99	22	70	125	134	81
AF07921	---	20	184	34	145	14	113	53	230	101
AF07922	---	12	99	13	45	<10	82	1040	77	81
AF07923	---	14	122	<10	59	20	88	963	85	84
AF07924	---	34	170	<10	66	21	99	608	100	79
AF07925	---	15	109	13	70	23	78	947	71	80
AF07926	---	22	163	31	66	20	78	690	98	85
AF07928	13300	33	<10	<10	11	20	164	3290	18	134
AF07939	---	24	294	<10	98	35	179	715	85	79
AF07940	---	32	114	<10	57	14	128	996	76	77
AF07941	---	28	162	14	53	25	84	632	97	67
AF07942	---	<10	171	11	72	23	91	497	113	76
AF07943	---	<10	200	17	84	<10	114	375	114	72
AF07944	---	<10	252	22	109	16	88	403	132	77
AF07945	---	17	219	20	71	23	110	884	101	72
AF07946	---	24	176	16	63	27	114	428	116	72
AF07947	---	14	122	18	62	19	96	391	91	78
AF07948	12800	15	<10	<10	<10	29	168	3270	19	133
AF07949	---	12	116	<10	79	19	120	953	100	76
AF07950	---	24	221	<10	101	28	142	255	104	71
AF08001	---	20	457	27	149	45	454	20	23	76
AF08002	---	30	387	35	119	42	384	14	16	78
AF08003	---	44	518	29	178	73	998	<10	14	121
AF08004	---	39	521	31	208	71	1570	<10	11	112
AF08005	---	44	545	37	143	62	1390	<10	15	108
AF08006	---	12	276	31	165	45	147	57	251	102
AF08007	---	<10	85	15	78	<10	99	546	121	79
AF08008	---	19	46	17	60	11	99	1080	78	71
AF08009	---	<10	94	14	52	31	80	669	118	72
AF08010	---	<10	97	<10	59	19	90	384	105	78
AF08011	---	<10	78	<10	60	10	67	783	106	69
AF08012	---	<10	180	25	152	19	116	102	233	86
AF08013	---	16	164	25	92	<10	127	80	126	87
AF08014	---	19	213	15	164	28	118	59	269	105
AF08015	---	12	174	<10	96	25	107	869	54	79
AF08016	---	18	1200	18	146	20	150	115	165	73
AF08017	---	32	947	31	145	25	843	87	157	83
AF08018	---	30	298	32	271	50	302	26	189	126
AF08019	---	44	687	21	229	98	916	210	68	87
AF08020	---	11	147	<10	50	15	85	925	76	86
AF08021	---	11	143	<10	77	<10	82	622	113	77
AF08022	---	<10	211	<10	107	11	116	106	171	79

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF08023	---	16	203	<10	85	23	85	357	114	81
AF08024	---	14	165	<10	93	42	133	1010	82	73
AF08025	---	25	130	<10	83	37	82	770	85	74
AF08026	---	16	143	15	85	22	164	1050	77	69
AF08027	---	<10	110	26	81	17	129	1080	73	75
AF08028	32	185	127	57	190	18	664	<10	<10	79
AF08029	---	<10	183	11	76	24	121	551	84	70
AF08030	---	23	254	22	115	23	122	384	101	74
AF08031	---	22	194	<10	84	17	122	466	80	78
AF08032	---	21	122	<10	55	21	127	1410	81	74
AF08033	---	80	500	68	410	101	2910	<10	11	126
AF08034	---	34	673	52	201	120	2280	<10	15	138
AF08035	---	30	598	44	221	61	891	37	30	142
AF08036	---	<10	296	24	129	21	83	122	134	90
AF08037	---	<10	348	40	185	42	182	59	172	86
AF08038	---	18	249	<10	96	31	75	139	118	77
AF08039	---	<10	272	13	76	11	79	571	92	78
AF08040	---	14	320	17	66	31	67	370	85	78
AF08041	---	24	93	<10	87	<10	127	1480	55	88
AF08042	---	15	181	<10	67	14	103	810	92	74
AF08043	---	18	124	<10	63	23	157	936	85	71
AF08044	---	17	257	22	79	26	112	364	107	74
AF08045	---	<10	324	11	85	23	104	419	103	81
AF08046	---	11	278	13	56	23	108	303	94	73
AF08047	---	12	226	23	119	<10	87	95	178	75
AF08048	12700	15	<10	<10	14	23	149	3340	18	141
AF08049	---	15	223	27	97	37	83	131	164	81
AF08050	---	<10	169	<10	117	37	78	111	231	83
AF08051	---	12	83	<10	48	18	72	163	126	47
AF08052	---	24	97	17	52	19	99	1290	70	73
AF08053	---	14	173	31	72	15	108	445	112	68
AF08054	---	13	119	<10	47	25	104	991	92	69
AF08055	---	<10	177	39	119	36	90	100	200	87
AF08056	---	15	345	20	184	60	226	66	144	95
AF08057	---	14	113	<10	80	<10	106	1010	70	86
AF08058	---	25	335	24	213	55	241	57	141	98
AF08059	---	12	221	<10	101	<10	68	102	143	80
AF08060	---	<10	103	<10	74	<10	127	1340	80	74
AF08061	---	<10	174	37	138	29	119	79	246	90
AF08062	---	30	292	51	319	74	336	44	222	117
AF08063	---	24	380	<10	106	29	246	24	17	76
AF08064	---	27	72	<10	71	17	137	1430	70	74
AF08065	---	63	1320	16	267	174	1340	79	43	85
AF08066	---	28	197	23	125	22	203	189	77	79
AF08067	---	30	526	15	155	54	479	236	97	81
AF08068	12700	<10	<10	<10	22	<10	149	3340	16	131
AF08069	---	17	183	28	116	25	128	126	65	79
AF08070	---	14	275	15	134	17	147	109	167	89
AF08071	---	22	206	33	95	24	85	65	144	82
AF08072	---	<10	213	13	74	20	103	91	136	74

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF08073	---	19	270	13	132	30	115	102	161	87
AF08074	---	26	223	14	101	26	87	147	159	74
AF08075	---	13	232	15	92	13	100	138	130	69
AF08076	---	<10	212	28	106	22	90	102	180	90
AF08077	---	16	230	21	96	<10	91	98	177	85
AF08078	---	31	209	21	113	24	103	89	192	81
AF08079	---	24	221	22	135	14	85	80	201	79
AF08080	---	16	198	13	99	14	96	93	150	114
AF08081	---	21	201	31	85	28	122	89	152	73
AF08082	---	24	187	26	77	<10	95	92	148	78
AF08083	---	12	211	17	120	34	73	87	164	85
AF08084	---	40	286	27	94	14	117	122	124	78
AF08085	---	<10	177	25	124	16	117	63	195	86
AF08086	---	<10	190	41	184	25	146	49	201	99
AF08087	---	<10	203	19	125	<10	96	71	158	76
AF08088	13000	21	<10	<10	<10	12	166	3350	17	136
AF08089	---	27	211	25	154	40	151	64	157	93
AF08090	---	11	218	20	107	29	113	97	155	84
AF08091	---	25	177	26	98	32	148	329	122	82
AF08092	---	15	298	21	106	25	348	117	141	78
AF08093	---	26	135	19	62	32	135	238	121	72
AF08094	---	29	164	10	110	40	107	146	124	83
AF08095	---	18	159	28	141	25	91	57	234	96
AF08096	---	22	216	15	81	12	194	135	129	73
AF08097	---	21	200	25	99	34	110	104	151	84
AF08098	---	15	235	12	148	19	125	54	188	100
AF08099	---	34	162	<10	67	23	97	112	138	73
AF08100	---	<10	190	26	155	23	86	71	204	87
AF08101	---	22	230	18	150	20	290	65	25	90
AF08102	---	<10	179	41	109	30	105	90	230	83
AF08103	---	<10	163	30	117	20	103	81	229	87
AF08104	---	21	181	33	115	27	94	76	235	84
AF08105	---	27	166	18	121	17	119	94	225	80
AF08106	---	<10	213	23	103	24	84	84	184	79
AF08107	---	<10	239	18	115	27	101	81	177	74
AF08108	32	177	135	37	200	12	700	<10	<10	77
AF08109	---	11	215	18	129	18	98	88	183	80
AF08110	---	33	202	24	136	33	136	30	227	92
AF08111	---	<10	207	18	119	10	103	79	175	78
AF08112	---	16	207	28	128	24	109	97	187	87
AF08113	---	11	226	18	97	22	47	124	123	71
AF08114	---	17	231	22	108	28	96	103	175	82
AF08115	---	26	234	15	125	22	136	68	196	84
AF08116	---	30	200	<10	77	27	114	91	153	75
AF08117	---	21	187	32	70	25	95	88	153	73
AF08118	---	26	194	17	130	30	110	94	128	67
AF08119	---	18	209	23	72	20	96	37	194	76
AF08120	---	<10	213	22	80	<10	102	83	146	74
AF08121	---	30	201	17	98	25	110	83	146	72
AF08122	---	15	188	21	85	28	119	89	149	75

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF08123	---	17	208	13	90	14	116	85	141	70
AF08124	---	22	205	15	128	32	129	32	225	92
AF08125	---	19	212	24	83	<10	102	73	159	73
AF08126	---	<10	218	26	114	16	63	74	187	83
AF08127	---	27	226	11	112	21	118	120	172	82
AF08128	12900	23	<10	19	17	16	161	3270	14	132
AF08129	---	37	176	25	140	24	126	51	255	89
AF08130	---	16	166	33	149	19	104	61	256	89
AF08131	---	<10	175	31	122	31	131	63	255	86
AF08132	---	22	172	35	150	24	124	56	279	94
AF08133	---	23	181	14	119	26	138	47	172	80
AF08134	---	<10	223	17	81	18	130	105	120	69
AF08135	---	<10	172	35	122	12	142	52	161	84
AF08136	---	16	176	18	105	20	137	57	173	86
AF08137	---	13	191	19	106	20	125	53	169	82
AF08138	---	17	181	52	126	18	125	57	167	89
AF08139	---	<10	170	<10	97	12	125	61	170	78
AF08140	---	15	173	31	91	14	149	264	155	76
AF08141	---	<10	110	13	66	21	102	269	106	70
AF08142	---	<10	299	<10	98	38	285	89	168	82
AF08143	---	21	390	20	114	40	491	84	134	77
AF08144	---	18	173	13	70	23	132	195	120	76
AF08145	---	<10	319	29	133	36	453	57	145	85
AF08146	---	17	166	40	99	19	87	216	138	76
AF08147	---	19	167	21	45	30	176	1130	55	77
AF08148	12800	30	<10	<10	21	21	187	3290	16	130
AF08149	---	<10	187	20	100	26	108	104	151	81
AF08150	---	16	221	14	173	19	132	55	205	98
AF08151	---	<10	207	32	100	<10	71	92	117	77
AF08152	---	<10	224	23	113	29	113	120	146	83
AF08153	---	<10	192	<10	98	32	80	88	129	81
AF08154	---	<10	227	<10	101	31	101	73	153	84
AF08155	---	<10	243	28	121	21	104	59	204	92
AF08156	---	<10	159	15	93	<10	68	135	160	83
AF08157	---	12	211	30	129	13	96	102	138	85
AF08158	---	<10	218	27	122	<10	83	102	138	81
AF08159	---	19	229	24	156	26	107	85	206	91
AF08160	---	11	175	41	161	30	149	60	267	98
AF08161	---	19	280	22	104	<10	188	170	49	75
AF08162	---	15	181	11	115	<10	130	54	222	87
AF08163	---	<10	177	33	109	36	124	73	195	83
AF08164	---	13	214	19	150	26	147	59	222	93
AF08165	---	21	211	21	142	36	113	56	183	96
AF08166	---	11	172	25	114	25	146	95	182	81
AF08167	---	<10	208	29	118	27	90	94	162	83
AF08168	12900	27	<10	<10	<10	23	173	3300	17	129
AF08169	---	<10	294	28	110	25	158	89	159	86
AF08170	---	<10	290	21	102	37	240	101	142	80
AF08171	---	13	186	23	94	29	84	108	129	80
AF08172	---	<10	196	<10	88	29	176	506	99	76

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF08173	---	<10	163	19	83	<10	104	135	157	72
AF08174	---	29	215	<10	112	18	107	93	153	83
AF08175	---	12	214	<10	115	15	109	68	149	79
AF08176	---	15	228	25	150	25	110	87	191	84
AF08177	---	30	204	35	150	<10	143	59	229	95
AF08178	---	16	213	13	99	21	142	87	154	93
AF08179	---	12	226	21	101	23	152	84	146	82
AF08180	---	16	294	24	120	23	231	107	123	73
AF08181	---	<10	170	18	82	47	125	86	147	78
AF08182	---	<10	210	24	104	21	88	80	147	83
AF08183	---	21	237	11	202	22	160	47	287	106
AF08184	---	15	194	15	114	33	72	71	157	89
AF08185	---	21	284	13	113	27	88	151	128	88
AF08186	---	18	213	21	131	36	128	373	105	81
AF08187	---	13	190	<10	62	18	107	527	86	72
AF08188	---	10	160	25	93	20	71	140	120	82
AF08189	---	<10	168	28	109	30	123	176	154	87
AF08190	---	<10	151	14	68	23	81	679	116	84
AF08191	---	<10	122	<10	41	<10	121	1410	64	83
AF08192	---	18	87	<10	55	11	107	928	75	76
AF08193	---	<10	131	16	65	<10	107	553	89	79
AF08194	---	17	167	<10	70	14	123	351	103	79
AF08195	---	<10	169	11	70	20	72	253	123	85
AF08196	---	13	237	12	109	21	91	100	173	81
AF08197	---	<10	225	22	120	31	95	71	176	80
AF08198	---	<10	264	12	95	25	103	64	137	84
AF08199	---	19	283	<10	125	30	109	110	125	83
AF08200	---	13	175	<10	77	16	109	732	108	76
AF08201	---	<10	201	35	81	<10	85	170	101	67
AF08202	---	<10	168	20	102	36	114	185	127	76
AF08203	---	27	194	15	95	37	99	133	113	74
AF08204	---	<10	229	13	139	35	118	62	207	86
AF08205	---	13	163	27	177	29	123	40	283	104
AF08206	---	24	180	41	181	39	119	49	274	101
AF08207	---	17	172	29	175	17	101	47	196	97
AF08208	12400	<10	<10	<10	17	<10	150	3260	16	131
AF08209	---	<10	179	35	178	35	214	41	221	97
AF08210	---	<10	164	28	116	40	123	67	180	87
AF08211	---	19	211	28	188	23	180	45	227	108
AF08212	---	17	171	25	152	17	101	61	146	104
AF08213	---	12	163	24	94	25	138	90	109	80
AF08214	---	20	196	16	99	19	100	86	170	76
AF08215	---	<10	164	19	97	26	86	113	160	79
AF08216	---	10	201	24	100	35	96	132	159	76
AF08217	---	13	190	24	173	44	125	56	286	98
AF08218	---	<10	222	23	121	12	102	59	175	91
AF08219	---	10	108	<10	67	<10	99	536	88	72
AF08220	---	<10	212	31	106	<10	88	78	125	83
AF08221	---	12	203	13	107	16	103	87	150	90
AF08222	---	29	213	37	213	18	99	49	264	111

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF08223	---	<10	217	45	210	27	117	46	256	109
AF08224	---	19	93	<10	67	11	112	1320	73	83
AF08225	---	13	235	17	82	20	132	151	119	74
AF08226	---	18	230	<10	119	24	82	89	181	79
AF08227	---	17	122	15	72	16	91	590	105	75
AF08228	35	183	128	26	185	21	714	<10	<10	66
AF08229	---	<10	164	20	70	28	106	500	105	75
AF08230	---	12	189	33	80	14	111	81	145	80
AF08231	---	29	187	13	62	17	73	100	114	71
AF08232	---	19	208	12	89	30	141	214	100	80
AF08233	---	12	192	<10	107	17	98	556	131	77
AF08234	---	19	168	22	98	36	107	705	106	75
AF08235	---	<10	202	28	102	21	80	123	124	73
AF08236	---	11	95	<10	63	13	81	1130	88	79
AF08237	---	12	239	11	74	27	86	87	96	68
AF08238	---	<10	123	21	67	<10	95	885	98	77
AF08239	---	17	280	<10	135	41	129	257	108	80
AF08240	---	20	200	27	188	42	142	62	243	103
AF08241	---	14	179	38	176	26	171	64	250	100
AF08242	---	<10	409	13	78	14	67	187	88	76
AF08243	---	15	147	31	72	25	95	91	129	76
AF08244	---	<10	191	13	59	12	103	109	125	70
AF08245	---	32	228	40	122	20	85	206	119	77
AF08246	---	<10	194	22	97	21	124	131	117	78
AF08247	---	15	252	29	126	28	96	191	144	78
AF08248	12400	30	<10	<10	21	37	155	3300	17	128
AF08249	---	15	215	21	117	28	72	69	152	77
AF08250	---	<10	244	<10	104	21	95	198	110	78
AF08251	---	<10	132	15	79	13	95	649	162	80
AF08252	---	15	299	16	100	51	174	159	111	73
AF08253	---	<10	106	16	48	<10	82	756	91	77
AF08254	---	12	239	<10	55	25	105	820	80	79
AF08255	---	28	702	20	131	54	351	171	116	72
AF08256	---	<10	189	24	89	11	44	112	111	78
AF08257	---	22	143	12	86	25	64	97	74	74
AF08258	---	<10	187	44	169	27	148	74	245	96
AF08259	---	19	197	27	167	29	144	60	252	97
AF08260	---	17	192	24	158	36	151	62	243	98
AF08261	---	10	162	25	83	<10	73	125	141	72
AF08262	---	13	157	13	75	13	64	141	140	72
AF08263	---	22	284	23	216	38	319	<10	13	27
AF08264	---	<10	199	23	156	20	121	33	169	104
AF08265	---	<10	167	28	131	28	105	52	214	80
AF08266	---	<10	169	38	108	28	87	73	192	83
AF08267	---	16	188	33	124	43	104	55	201	79
AF08268	12600	32	<10	<10	<10	18	164	3290	17	130
AF08269	---	30	178	33	106	14	98	74	171	77
AF08270	---	<10	182	28	90	15	87	66	173	74
AF08271	---	17	202	31	125	22	125	65	192	87
AF08272	---	33	170	32	116	17	109	48	206	84

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF08273	---	<10	167	39	119	21	108	59	206	86
AF08274	---	11	168	20	131	22	126	63	209	90
AF08275	---	<10	172	30	149	31	109	<10	13	25
AF08276	---	18	212	18	108	15	102	33	232	85
AF08277	---	<10	188	40	184	22	146	44	265	104
AF08278	---	15	129	24	35	19	105	1100	64	68
AF08279	---	<10	230	21	113	31	92	172	171	79
AF08280	---	20	183	42	198	22	147	33	186	80
AF08281	---	11	172	34	173	34	121	81	228	97
AF08282	---	21	176	44	158	38	93	69	248	106
AF08283	---	<10	153	42	125	<10	106	58	220	90
AF08284	---	29	183	50	199	24	141	54	275	119
AF08285	---	40	216	12	106	24	76	69	105	65
AF08286	---	19	234	<10	145	22	100	81	213	93
AF08287	---	24	177	20	88	30	184	246	94	75
AF08288	12800	24	<10	<10	12	12	161	2460	<10	103
AF08289	---	22	182	27	113	37	123	54	202	82
AF08290	---	<10	217	23	128	18	110	162	194	88
AF08291	---	<10	144	41	197	28	160	17	369	118
AF08292	---	11	199	36	211	39	136	45	270	106
AF08293	---	179	306	27	99	29	968	91	135	71
AF08294	---	20	212	26	130	30	116	81	197	86
AF08295	---	50	164	92	475	33	282	<10	680	157
AF08296	---	30	156	27	140	19	88	43	150	72
AF08297	---	33	292	39	96	21	366	182	109	84
AF08298	---	33	190	22	206	15	174	48	256	190
AF08299	---	<10	176	42	123	<10	120	56	189	80
AF08300	---	30	165	20	106	33	103	81	174	76
AF08301	---	28	186	43	315	44	259	<10	497	132
AF08302	---	<10	228	27	138	31	186	63	213	89
AF08303	---	34	211	14	151	38	130	62	234	87
AF08304	---	23	205	27	106	<10	155	72	189	83
AF08305	---	107	262	50	265	33	944	68	25	93
AF08306	---	31	220	<10	110	23	418	64	188	76
AF08307	---	30	277	25	112	35	150	257	133	91
AF08308	---	57	225	28	141	22	293	<10	12	76
AF08309	---	19	257	46	162	16	114	73	220	85
AF08310	---	34	195	46	196	24	199	46	280	108
AF08311	---	37	184	42	204	38	205	49	274	115
AF08312	---	35	228	<10	73	26	104	209	116	71
AF08313	---	31	178	37	194	34	146	60	324	110
AF08314	---	37	195	27	184	22	135	56	312	104
AF08315	---	27	166	27	180	25	132	<10	<10	24
AF08316	---	23	169	25	106	<10	122	55	264	104
AF08322	---	30	222	12	93	18	129	120	74	84
AF08323	---	20	218	15	119	19	101	77	186	79
AF08324	---	22	212	34	134	21	136	78	200	83
AF08325	---	28	252	<10	96	30	143	15	43	70
AF08326	---	13	195	<10	53	<10	95	116	75	63
AF08327	---	23	235	<10	58	16	123	105	61	81

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF08328	38	186	144	17	201	11	699	<10	<10	78
AF08329	---	12	228	<10	85	38	135	43	58	67
AF08330	---	18	211	24	151	48	121	69	217	94
AF08331	---	<10	217	14	65	27	108	60	59	70
AF08332	---	16	258	<10	69	31	138	119	59	58
AF08333	---	37	227	35	174	30	212	60	258	99
AF08334	---	24	187	29	101	<10	109	181	116	74
AF08335	---	16	234	30	120	19	177	<10	17	86
AF08336	---	22	236	27	124	24	210	<10	21	81
AF08337	---	21	456	29	133	48	829	56	39	80
AF08338	---	24	453	22	137	54	813	70	43	81
AF08346	---	<10	139	18	135	22	113	34	294	104
AF08348	---	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS

XRAL

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF07905	53.3	15.1	9.02	5.37	2.41	.51	10.2	.15	1.60	.21	.05	2.23	100.3
AF07906	52.6	15.0	9.01	5.46	2.33	.46	9.94	.16	1.58	.21	.05	2.77	99.7
AF07907	51.8	15.2	9.19	5.60	1.96	.28	10.1	.15	1.53	.20	.04	3.23	99.4
AF07908	70.3	14.7	1.42	.92	3.53	4.25	3.34	.08	.452	.22	---	.77	100.1
AF07909	53.1	15.2	9.07	5.42	2.29	.49	10.0	.15	1.52	.20	.05	2.16	99.8
AF07910	44.1	11.8	9.59	13.1	1.39	.07	12.2	.19	1.24	.12	.12	5.00	99.0
AF07911	50.9	15.4	8.21	5.19	2.41	1.12	9.17	.12	1.34	.19	.05	4.85	99.1
AF07912	52.0	15.3	8.90	5.08	2.15	1.03	9.05	.12	1.26	.18	.06	4.16	99.4
AF07913	50.7	15.5	10.0	5.75	2.17	.43	10.5	.16	1.40	.20	.06	2.54	99.5
AF07914	43.3	11.1	9.31	14.4	1.29	.13	11.9	.18	1.11	.11	.16	6.23	99.3
AF07915	45.6	11.5	10.1	13.6	1.57	.06	12.4	.19	1.26	.12	.15	2.16	98.8
AF07916	42.7	7.63	6.40	25.9	.90	.04	12.8	.19	.699	.07	.30	2.54	100.3
AF07917	47.5	13.1	10.9	10.2	1.78	.35	11.6	.17	1.12	.11	.08	2.08	99.1
AF07927	69.0	14.9	.88	.34	5.14	4.80	3.50	.08	.320	.05	.01	.77	100.2
AF07928	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	---
AF07929	64.9	15.3	1.28	.58	5.18	4.84	4.05	.11	.422	.07	<.01	1.85	99.0
AF07930	43.6	7.77	6.62	26.4	.79	.08	12.8	.21	.794	.08	.28	.39	100.0
AF07931	47.2	14.6	12.6	7.66	2.14	.35	10.5	.17	1.51	.24	.06	1.93	99.1
AF07932	48.5	14.7	10.1	5.49	3.14	.71	11.6	.21	2.02	.40	.02	1.77	98.8
AF07933	49.9	16.0	9.75	5.10	3.11	1.08	9.74	.16	1.73	.21	<.01	1.77	98.7
AF07934	47.3	12.5	10.6	11.2	2.33	.13	12.4	.19	1.39	.14	.10	.31	98.8
AF07935	43.7	9.16	6.36	22.0	1.13	.29	12.3	.18	1.03	.10	.19	2.85	99.5
AF07936	44.9	11.2	8.37	14.1	2.09	.13	12.3	.21	1.27	.12	.25	3.70	98.8
AF07937	42.7	8.17	7.34	22.4	.67	.44	12.1	.17	1.08	.13	.21	4.62	100.3
AF07938	45.9	12.3	10.7	11.0	1.75	.11	12.2	.19	1.60	.18	.09	2.77	98.9
AF07954	---	---	---	---	---	---	---	---	---	---	---	---	---
AF07959	---	---	---	---	---	---	---	---	---	---	---	---	---
AF07962	---	---	---	---	---	---	---	---	---	---	---	---	---
AF07963	---	---	---	---	---	---	---	---	---	---	---	---	---
AF07964	---	---	---	---	---	---	---	---	---	---	---	---	---
AF08317	48.9	13.9	11.2	6.06	2.37	.25	14.1	.22	1.86	.20	.02	.77	100.0
AF08318	49.5	15.5	11.4	5.55	2.53	.26	12.9	.20	1.66	.18	<.01	.23	100.0
AF08319	48.8	14.7	11.6	6.41	2.35	.24	13.1	.20	1.65	.17	.02	.16	99.5
AF08320	48.9	12.6	9.95	5.33	2.46	.47	16.5	.24	2.89	.33	<.01	.08	99.9
AF08321	47.3	14.0	9.50	7.00	3.13	.55	11.6	.18	1.67	.19	.03	4.00	99.3
AF08328	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	---
AF08338	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	---
AF08339	49.5	16.2	11.7	5.38	2.52	.26	12.3	.19	1.54	.16	.01	.23	100.1
AF08340	48.5	13.6	9.74	4.28	2.83	.34	16.4	.24	2.79	.23	<.01	.47	99.5
AF08341	48.8	7.77	9.77	6.43	1.99	.35	20.8	.37	2.51	.26	<.01	.39	99.6
AF08342	49.4	14.8	11.9	6.46	2.32	.21	13.0	.20	1.48	.14	.02	.23	100.2
AF08343	49.6	14.4	10.4	5.04	2.78	.33	14.6	.22	2.06	.22	<.01	.39	100.2
AF08344	49.2	15.1	11.8	6.54	2.37	.24	12.9	.20	1.62	.17	.02	.23	100.5
AF08345	49.0	15.0	11.8	6.70	2.34	.23	12.5	.19	1.52	.16	.03	.23	99.8
AF08347	68.3	14.9	.95	.34	5.13	4.69	3.39	.08	.322	.05	.01	.70	99.2
AF08348	35.0	1.18	.10	35.0	.22	.04	11.7	.21	.192	.03	---	12.2	98.2
AF08349	69.0	15.0	.82	.36	5.18	4.79	3.48	.08	.323	.05	.01	.77	100.2
AF08350	67.5	15.6	.91	.37	5.48	4.69	3.71	.08	.351	.06	.01	.77	100.0
AF08351	69.1	15.2	.54	.30	5.19	4.84	3.46	.08	.325	.05	.01	.85	100.3
AF08352	69.2	15.1	.87	.32	5.12	4.76	3.44	.08	.320	.05	.01	.77	100.4

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF08353	47.7	15.3	11.6	6.99	2.43	.57	10.8	.17	1.33	.35	.05	2.54	100.0
AF08354	50.0	13.8	11.7	6.39	2.26	.38	12.3	.19	1.90	.16	.03	.92	100.1
AF08355	46.2	12.4	9.52	5.14	2.39	1.05	15.7	.22	3.31	.47	<.01	1.54	98.1
AF08356	46.7	12.7	9.42	4.77	2.53	1.20	15.7	.23	3.55	.52	<.01	1.47	99.0
AF08357	48.4	14.7	11.2	6.64	2.13	.27	11.3	.14	1.67	.16	.05	2.39	99.1
AF08358	47.7	15.7	10.8	5.61	2.12	.26	10.6	.12	1.71	.17	.06	4.54	99.5
AF08359	49.1	13.9	10.0	6.47	2.05	.71	10.5	.18	1.71	.21	.06	4.47	99.5
AF08360	48.1	15.1	12.3	6.30	2.19	.20	12.6	.18	1.59	.15	.03	1.00	99.8
AF08361	47.9	13.6	8.38	6.70	1.71	.42	11.9	.14	1.03	.08	.08	7.54	99.7

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

X-RAY ASSAY LABORATORIES 1885 Leslie Street Don Mills Ontario M3B 3J4 (416)445-5755 Fax (416)445-4152 Tlx 06-986947

Member of the SGS Group (Société Générale de Surveillance)

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF07524	---	17	154	22	86	22	54	165	176	112
AF07525	---	13	145	29	90	<10	69	161	124	87
AF07526	---	10	175	10	74	30	73	168	124	88
AF07527	---	<10	230	54	152	19	163	51	279	103
AF07528	24	174	144	29	194	35	658	<10	<10	81
AF07529	---	44	344	26	333	84	359	38	195	125
AF07532	---	14	165	18	109	19	97	105	122	78
AF07533	---	57	358	57	507	99	570	<10	180	148
AF07650	---	16	209	24	123	38	228	38	35	70
AF07746	---	<10	137	<10	58	21	87	1110	94	79
AF07747	---	<10	205	30	83	23	101	749	110	83
AF07748	12700	20	<10	<10	14	24	50	3350	25	139
AF07749	---	24	232	<10	108	26	160	855	102	74
AF07750	---	18	203	<10	62	<10	118	1150	75	71
AF07751	---	14	243	32	145	28	174	<10	21	78
AF07752	---	<10	241	<10	141	27	145	<10	14	75
AF07753	---	51	204	16	101	14	238	43	51	73
AF07754	---	13	195	20	131	35	178	41	27	79
AF07755	---	20	215	21	119	25	79	67	187	90
AF07756	---	21	73	15	72	24	88	766	95	69
AF07757	---	<10	79	24	52	<10	54	741	81	66
AF07758	---	20	160	13	91	24	68	403	92	79
AF07759	---	12	391	11	133	44	556	49	20	79
AF07760	---	31	408	<10	140	36	459	26	19	81
AF07801	---	19	186	15	98	<10	100	101	161	79
AF07802	---	<10	200	65	69	<10	148	563	108	75
AF07803	---	19	257	22	114	19	285	40	35	83
AF07804	---	<10	307	13	95	20	203	63	51	78
AF07805	---	22	200	10	116	16	240	181	88	83
AF07806	---	19	158	18	115	42	212	447	62	82
AF07807	---	19	136	14	80	15	131	417	65	76
AF07808	---	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS
AF07809	---	<10	313	32	123	38	253	30	25	75
AF07810	---	22	274	18	153	24	237	43	33	75
AF07811	---	15	279	23	136	32	251	35	32	67
AF07812	---	25	247	24	148	15	344	127	60	74
AF07813	---	43	283	22	124	38	390	51	46	72
AF07814	---	<10	179	32	75	14	67	146	106	74
AF07815	---	14	160	12	75	18	63	211	128	74
AF07816	---	14	161	13	73	16	71	241	125	72
AF07817	---	<10	130	25	78	13	31	214	118	67
AF07846	---	15	157	<10	59	24	51	784	105	77
AF07847	---	19	241	<10	70	30	115	986	80	77
AF07848	---	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS
AF07849	---	<10	190	26	84	19	84	241	106	69
AF07850	---	17	233	26	147	21	215	18	19	80
AF07901	---	<10	204	21	96	17	215	92	35	75
AF07902	---	17	149	<10	74	18	126	372	95	73
AF07903	---	16	322	19	108	31	675	46	36	81
AF07904	---	47	248	30	175	23	352	21	21	84

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF07905	---	48	241	42	183	24	375	13	27	86
AF07906	---	34	239	30	176	21	338	19	22	80
AF07907	---	21	257	30	178	33	215	13	21	83
AF07908	21	192	142	32	177	17	713	<10	<10	83
AF07909	---	18	240	39	173	<10	311	18	19	79
AF07910	---	<10	144	<10	61	18	76	435	103	75
AF07911	---	33	250	15	138	49	442	26	20	74
AF07912	---	21	260	18	130	28	388	25	21	73
AF07913	---	17	276	18	146	36	224	106	49	76
AF07914	---	10	101	<10	62	23	74	510	113	74
AF07915	---	24	123	13	69	22	55	457	122	79
AF07916	---	<10	52	13	18	17	53	1120	80	74
AF07917	---	<10	158	21	76	22	127	207	116	69
AF07927	---	175	69	96	626	111	1970	<10	14	81
AF07928	---	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS
AF07929	---	144	90	72	962	101	1790	<10	17	97
AF07930	---	10	31	11	55	<10	65	1250	29	87
AF07931	---	<10	381	<10	53	24	191	61	38	63
AF07932	---	26	477	12	84	42	566	30	32	91
AF07933	---	33	418	30	138	37	667	15	16	77
AF07934	---	<10	286	32	85	15	137	330	360	92
AF07935	---	12	55	<10	62	37	127	1030	284	72
AF07936	---	16	284	14	62	27	154	538	56	147
AF07937	---	33	78	<10	74	17	187	1120	198	77
AF07938	---	24	270	<10	104	14	141	318	98	81
AF07954	---	---	---	---	---	---	---	4300	1874	---
AF07959	---	---	---	---	---	---	---	89	170	---
AF07962	---	---	---	---	---	---	---	874	244	---
AF07963	---	---	---	---	---	---	---	39	182	---
AF07964	---	---	---	---	---	---	---	531	903	---
AF08317	---	11	168	34	124	<10	134	87	212	86
AF08318	---	15	187	18	102	25	109	43	201	78
AF08319	---	12	159	31	113	37	109	72	181	75
AF08320	---	17	189	36	223	28	171	47	271	111
AF08321	---	21	625	23	83	17	156	99	134	81
AF08328	---	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS
AF08338	---	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS
AF08339	---	25	184	23	87	21	143	49	187	79
AF08340	---	<10	186	22	129	25	142	20	319	95
AF08341	---	<10	103	33	154	12	149	17	410	130
AF08342	---	<10	163	15	85	<10	109	63	176	80
AF08343	---	14	167	20	150	21	131	33	274	83
AF08344	---	20	172	<10	100	19	114	67	189	79
AF08345	---	<10	165	<10	93	11	120	72	171	75
AF08347	---	166	88	84	639	89	2000	<10	15	80
AF08348	12600	17	<10	<10	25	<10	64	3300	17	133
AF08349	---	170	51	103	615	85	1960	<10	16	93
AF08350	---	138	97	116	714	82	2350	<10	12	76
AF08351	---	175	67	109	635	87	1910	<10	<10	79
AF08352	---	145	70	99	657	82	2060	<10	11	91

SAMPLE \ PPM	CR	RB	SR	Y	ZR	NB	BA	NI	CU	ZN
AF08353	---	16	396	<10	88	27	364	44	55	94
AF08354	---	13	147	29	96	20	140	69	162	83
AF08355	---	29	334	30	276	53	424	46	191	112
AF08356	---	39	353	29	293	59	432	40	189	106
AF08357	---	21	171	25	99	20	136	115	127	90
AF08358	---	11	212	32	111	15	125	132	126	87
AF08359	---	23	308	31	158	21	247	67	30	80
AF08360	---	<10	217	<10	100	13	53	80	179	82
AF08361	---	17	182	12	108	18	251	937	407	44

APPENDIX IV

Geochemistry and Assay Results

XRAL

X-RAY ASSAY LABORATORIES

A DIVISION OF SGS SUPERVISION SERVICES INC.
1885 LESLIE STREET • DON MILLS, ONTARIO M3B 3J4 • CANADA
TEL: (416)445-5755 TELEX: 06-986947 FAX: (416)445-4152

CERTIFICATE OF ANALYSIS

REPORT 16714

TO: FALCONBRIDGE LIMITED
ATTN: KEVIN OLSHEFSKY
P.O. BOX 398
124 WATER STREET
WINDSOR, NOVA SCOTIA BON 2T0

CUSTOMER No. 1617

DATE SUBMITTED
27-Aug-91

REF. FILE 10685-H2

Total Pages 12

6 PULPS, 128 ROCKS Proj. GREENLAND

	METHOD	DETECTION LIMIT
AU PPB	FADCP	1.
WRMAJ %	WR	.01
S PPM	XRF	50.
WRMIN PPM	WR	10.
CO PPM	DCP	1.
CO %	XRF	.01
CO PPM	XRF	10.
NI PPM	DCP	1.
NI %	XRF	.01
CU PPM	DCP	.5
CU %	XRF	.01
PD PPB	FADCP	1.
PT PPB	FADCP	10.

DATE 17-SEP-91

CERTIFIED BY ....

Philip Boctor, Laboratory Manager

XRAL

SAMPLE	AU PPB	S PPM	CO PPM	CO %	CO PPM	NI PPM	NI %
AF07524	--	575	--	--	41	--	--
AF07525	--	413	--	--	48	--	--
AF07526	--	420	--	--	45	--	--
AF07527	--	<50	--	--	50	--	--
AF07528	--	<50	--	--	<10	--	--
AF07529	--	<50	--	--	39	--	--
AF07532	--	<50	--	--	39	--	--
AF07533	--	140	--	--	39	--	--
AF07650	--	<50	--	--	24	--	--
AF07746	--	59	--	--	82	--	--
AF07747	--	<50	--	--	71	--	--
AF07748	--	184	--	--	137	--	--
AF07749	--	<50	--	--	74	--	--
AF07750	--	<50	--	--	82	--	--
AF07751	--	<50	--	--	30	--	--
AF07752	--	<50	--	--	33	--	--
AF07753	--	<50	--	--	34	--	--
AF07754	--	<50	--	--	43	--	--
AF07755	--	59	--	--	38	--	--
AF07756	--	<50	--	--	64	--	--
AF07757	--	<50	--	--	74	--	--
AF07758	--	<50	--	--	68	--	--
AF07759	--	<50	--	--	39	--	--
AF07760	--	<50	--	--	32	--	--
AF07801	--	67	--	--	37	--	--
AF07802	--	<50	--	--	63	--	--
AF07803	--	<50	--	--	37	--	--
AF07804	--	<50	--	--	34	--	--
AF07805	--	<50	--	--	45	--	--
AF07806	--	<50	--	--	61	--	--
AF07807	--	<50	--	--	54	--	--
AF07808	--	SMP MISS	--	--	SMP MISS	--	--
AF07809	--	<50	--	--	30	--	--
AF07810	--	<50	--	--	27	--	--
AF07811	--	<50	--	--	25	--	--
AF07812	--	274	--	--	54	--	--
AF07813	--	157	--	--	33	--	--
AF07814	--	<50	--	--	52	--	--
AF07815	--	<50	--	--	45	--	--
AF07816	--	<50	--	--	51	--	--
AF07817	--	<50	--	--	55	--	--
AF07846	--	<50	--	--	74	--	--
AF07847	--	<50	--	--	87	--	--
AF07848	--	SMP MISS	--	--	SMP MISS	--	--
AF07849	--	<50	--	--	55	--	--
AF07850	--	<50	--	--	27	--	--
AF07901	--	66	--	--	44	--	--
AF07902	--	<50	--	--	56	--	--
AF07903	--	206	--	--	30	--	--
AF07904	--	<50	--	--	32	--	--

SMP.MISS. - SAMPLE WAS NOT RECEIVED AT XRAL

SAMPLE	AU PPB	S PPM	CO PPM	CO %	CO PPM	NI PPM	NI %
AF07905	--	65	--	--	26	--	--
AF07906	--	<50	--	--	29	--	--
AF07907	--	<50	--	--	28	--	--
AF07908	--	<50	--	--	<10	--	--
AF07909	--	<50	--	--	29	--	--
AF07910	--	<50	--	--	59	--	--
AF07911	--	<50	--	--	29	--	--
AF07912	--	<50	--	--	24	--	--
AF07913	--	470	--	--	48	--	--
AF07914	--	<50	--	--	62	--	--
AF07915	--	<50	--	--	59	--	--
AF07916	--	<50	--	--	94	--	--
AF07917	--	<50	--	--	50	--	--
AF07927	--	<50	--	--	<10	--	--
AF07928	--	SMP MISS	--	--	SMP MISS	--	--
AF07929	--	<50	--	--	<10	--	--
AF07930	--	<50	--	--	99	--	--
AF07931	--	155	--	--	37	--	--
AF07932	--	<50	--	--	35	--	--
AF07933	--	<50	--	--	26	--	--
AF07934	--	<50	--	--	54	--	--
AF07935	--	<50	--	--	77	--	--
AF07936	--	<50	--	--	62	--	--
AF07937	--	<50	--	--	83	--	--
AF07938	--	<50	--	--	50	--	--
AF07951	37	--	1090	--	--	3410	--
AF07952	12	--	629	--	--	3230	--
AF07953	21	--	841	--	--	3300	--
AF07954	18	--	997	--	687	4650	--
AF07955	19	--	711	--	--	3250	--
AF07956	19	--	629	--	--	2860	--
AF07957	14	--	592	--	--	2150	--
AF07958	5	--	159	--	--	889	--
AF07959	<1	--	73	--	43	112	--
AF07960	2	--	59	--	--	264	--
AF07961	12	--	174	--	--	449	--
AF07962	6	--	452	--	277	1360	--
AF07963	10	--	76	--	45	60	--
AF07964	5	--	512	--	509	592	--
AF07965	4	--	157	--	--	417	--
AF07966	2	--	159	--	--	437	--
AF07967	2	--	160	--	--	432	--
AF07968	22	--	232	--	--	15000	--
AF07969	1	--	134	--	--	364	--
AF07970	<1	--	96	--	--	232	--
AF07971	<1	--	151	--	--	415	--
AF07972	53	--	1590	.23	--	11700	1.13
AF07973	310	--	4350	.55	--	60400	6.86
AF07974	2	--	48	--	--	255	--
AF07975	11	--	96	--	--	1410	--

SMP.MISS. - SAMPLE WAS NOT RECEIVED AT XRAL

SAMPLE	AU PPB	S PPM	CO PPM	CO %	CO PPM	NI PPM	NI %
AF07976	2	--	30	--	--	49	--
AF07977	<1	--	46	--	--	27	--
AF07978	4	--	34	--	--	31	--
AF07979	<1	--	110	--	--	620	--
AF07980	5	--	171	--	--	1050	--
AF07981	5	--	67	--	--	450	--
AF07982	<1	--	63	--	--	76	--
AF07983	63	--	3000	.42	--	24200	2.90
AF07984	8	--	187	--	--	1280	--
AF07985	74	--	190	--	--	13900	--
AF08317	--	503	--	--	47	--	--
AF08318	--	82	--	--	35	--	--
AF08319	--	<50	--	--	37	--	--
AF08320	--	<50	--	--	37	--	--
AF08321	--	4460	--	--	42	--	--
AF08328	--	SMP MISS	--	--	SMP MISS	--	--
AF08338	--	SMP MISS	--	--	SMP MISS	--	--
AF08339	--	143	--	--	29	--	--
AF08340	--	<50	--	--	39	--	--
AF08341	--	85	--	--	56	--	--
AF08342	--	85	--	--	39	--	--
AF08343	--	<50	--	--	37	--	--
AF08344	--	121	--	--	38	--	--
AF08345	--	<50	--	--	41	--	--
AF08347	--	<50	--	--	<10	--	--
AF08348	--	78	--	--	134	--	--
AF08349	--	<50	--	--	<10	--	--
AF08350	--	<50	--	--	<10	--	--
AF08351	--	<50	--	--	<10	--	--
AF08352	--	<50	--	--	<10	--	--
AF08353	--	<50	--	--	36	--	--
AF08354	--	<50	--	--	34	--	--
AF08355	--	450	--	--	42	--	--
AF08356	--	409	--	--	44	--	--
AF08357	--	424	--	--	39	--	--
AF08358	--	476	--	--	44	--	--
AF08359	--	250	--	--	28	--	--
AF08360	--	<50	--	--	39	--	--
AF08361	--	21900	--	--	145	--	--

SMP.MISS. - SAMPLE WAS NOT RECEIVED AT XRAL

SAMPLE	CU PPM	CU %	PD PPB	PT PPB
AF07524	--	--	--	--
AF07525	--	--	--	--
AF07526	--	--	--	--
AF07527	--	--	--	--
AF07528	--	--	--	--
AF07529	--	--	--	--
AF07532	--	--	--	--
AF07533	--	--	--	--
AF07650	--	--	--	--
AF07746	--	--	--	--
AF07747	--	--	--	--
AF07748	--	--	--	--
AF07749	--	--	--	--
AF07750	--	--	--	--
AF07751	--	--	--	--
AF07752	--	--	--	--
AF07753	--	--	--	--
AF07754	--	--	--	--
AF07755	--	--	--	--
AF07756	--	--	--	--
AF07757	--	--	--	--
AF07758	--	--	--	--
AF07759	--	--	--	--
AF07760	--	--	--	--
AF07801	--	--	--	--
AF07802	--	--	--	--
AF07803	--	--	--	--
AF07804	--	--	--	--
AF07805	--	--	--	--
AF07806	--	--	--	--
AF07807	--	--	--	--
AF07808	--	--	--	--
AF07809	--	--	--	--
AF07810	--	--	--	--
AF07811	--	--	--	--
AF07812	--	--	--	--
AF07813	--	--	--	--
AF07814	--	--	--	--
AF07815	--	--	--	--
AF07816	--	--	--	--
AF07817	--	--	--	--
AF07846	--	--	--	--
AF07847	--	--	--	--
AF07848	--	--	--	--
AF07849	--	--	--	--
AF07850	--	--	--	--
AF07901	--	--	--	--
AF07902	--	--	--	--
AF07903	--	--	--	--
AF07904	--	--	--	--

SAMPLE	CU PPM	CU %	PD PPB	PT PPB
AF07905	--	--	--	--
AF07906	--	--	--	--
AF07907	--	--	--	--
AF07908	--	--	--	--
AF07909	--	--	--	--
AF07910	--	--	--	--
AF07911	--	--	--	--
AF07912	--	--	--	--
AF07913	--	--	--	--
AF07914	--	--	--	--
AF07915	--	--	--	--
AF07916	--	--	--	--
AF07917	--	--	--	--
AF07927	--	--	--	--
AF07928	--	--	--	--
AF07929	--	--	--	--
AF07930	--	--	--	--
AF07931	--	--	--	--
AF07932	--	--	--	--
AF07933	--	--	--	--
AF07934	--	--	--	--
AF07935	--	--	--	--
AF07936	--	--	--	--
AF07937	--	--	--	--
AF07938	--	--	--	--
AF07951	626.	--	43	110
AF07952	1280.	--	19	20
AF07953	936.	--	25	40
AF07954	2120.	--	29	30
AF07955	1550.	--	26	30
AF07956	1610.	--	28	50
AF07957	514.	--	21	40
AF07958	263.	--	7	<10
AF07959	193.	--	3	20
AF07960	123.	--	3	10
AF07961	177.	--	8	20
AF07962	357.	--	13	30
AF07963	234.	--	6	10
AF07964	1100.	--	7	10
AF07965	178.	--	8	<10
AF07966	165.	--	7	<10
AF07967	158.	--	6	<10
AF07968	763.	--	190	100
AF07969	146.	--	6	<10
AF07970	84.2	--	4	10
AF07971	158.	--	5	<10
AF07972	5540.	.50	140	130
AF07973	39000.	3.71	1800	210
AF07974	193.	--	7	<10
AF07975	243.	--	23	<10

SAMPLE	CU PPM	CU %	PD PPB	PT PPB
AF07976	39.8	--	2	<10
AF07977	31.6	--	1	<10
AF07978	29.5	--	2	<10
AF07979	344.	--	6	<10
AF07980	392.	--	8	<10
AF07981	320.	--	10	10
AF07982	183.	--	1	<10
AF07983	10900.	1.12	270	30
AF07984	638.	--	17	30
AF07985	713.	--	190	140
AF08317	--	--	--	--
AF08318	--	--	--	--
AF08319	--	--	--	--
AF08320	--	--	--	--
AF08321	--	--	--	--
AF08328	--	--	--	--
AF08338	--	--	--	--
AF08339	--	--	--	--
AF08340	--	--	--	--
AF08341	--	--	--	--
AF08342	--	--	--	--
AF08343	--	--	--	--
AF08344	--	--	--	--
AF08345	--	--	--	--
AF08347	--	--	--	--
AF08348	--	--	--	--
AF08349	--	--	--	--
AF08350	--	--	--	--
AF08351	--	--	--	--
AF08352	--	--	--	--
AF08353	--	--	--	--
AF08354	--	--	--	--
AF08355	--	--	--	--
AF08356	--	--	--	--
AF08357	--	--	--	--
AF08358	--	--	--	--
AF08359	--	--	--	--
AF08360	--	--	--	--
AF08361	--	--	--	--

SAMPLE \ %	SIO2	AL2O3	CAO	MGO	NA2O	K2O	FE2O3	MNO	TIO2	P2O5	CR2O3	LOI	SUM
AF07524	48.4	15.4	11.8	7.96	1.88	.21	10.7	.16	1.31	.13	.06	2.08	100.2
AF07525	48.6	13.8	11.3	8.56	1.90	.24	11.8	.18	1.43	.14	.06	1.39	99.5
AF07526	48.5	14.9	11.5	8.26	1.86	.19	11.0	.17	1.34	.13	.06	2.08	100.1
AF07527	46.9	13.3	11.5	5.51	2.43	.18	15.2	.23	2.29	.25	<.01	1.85	99.8
AF07528	70.6	14.8	1.42	.92	3.40	4.19	3.30	.08	.453	.22	---	.77	100.3
AF07529	47.0	12.4	9.27	4.58	2.49	1.18	15.9	.23	3.67	.55	<.01	1.47	98.9
AF07532	48.7	14.5	11.1	6.80	2.82	.32	11.1	.18	1.50	.15	.05	2.47	99.8
AF07533	49.3	12.0	7.73	3.04	2.80	1.73	17.0	.27	3.08	.85	<.01	2.08	100.1
AF07650	50.6	13.8	8.85	10.8	1.77	.57	9.03	.16	1.31	.15	.16	2.85	100.1
AF07746	43.2	8.01	7.16	24.2	1.12	.13	12.3	.18	1.02	.10	.24	2.62	100.5
AF07747	43.5	9.41	8.24	18.5	1.32	.27	12.3	.18	1.36	.15	.20	3.70	99.3
AF07748	33.7	1.07	.08	34.5	.16	.03	11.4	.20	.194	.03	---	12.4	96.1
AF07749	43.4	9.33	8.33	19.6	1.28	.32	12.4	.18	1.28	.13	.21	3.23	99.9
AF07750	42.5	7.95	7.31	25.2	1.03	.14	11.4	.18	.963	.09	.40	2.85	100.2
AF07751	49.9	14.5	9.39	8.33	1.86	.64	10.3	.16	1.42	.15	.14	2.77	99.6
AF07752	50.5	14.0	9.20	8.40	1.88	.31	9.92	.16	1.37	.15	.14	3.70	99.8
AF07753	46.0	13.0	8.57	7.67	1.92	1.17	9.47	.14	1.30	.12	.13	9.93	99.5
AF07754	50.8	13.1	7.64	10.4	1.76	.78	10.1	.17	1.23	.14	.14	3.39	99.7
AF07755	46.8	13.9	11.6	6.40	2.06	.20	13.0	.20	2.04	.20	.02	3.54	100.1
AF07756	43.1	10.5	8.41	17.5	1.17	.05	11.7	.18	.989	.09	.20	5.62	99.7
AF07757	44.5	11.0	9.29	18.7	1.39	.07	11.9	.19	.890	.08	.19	1.77	100.1
AF07758	44.9	11.9	10.6	12.2	1.49	.11	12.8	.20	1.27	.11	.12	3.85	99.7
AF07759	46.3	13.4	9.83	7.33	1.91	.53	11.3	.14	1.37	.29	.11	7.08	99.7
AF07760	48.0	12.9	10.5	7.42	1.82	.47	10.9	.17	1.38	.29	.13	5.31	99.4
AF07801	48.6	13.8	12.1	7.17	2.21	.15	12.7	.19	1.71	.18	.04	.77	99.7
AF07802	43.9	11.0	9.88	15.0	1.36	.24	12.2	.19	1.30	.14	.20	4.39	100.0
AF07803	48.0	15.0	10.9	7.24	1.91	.31	11.0	.25	1.53	.20	.10	2.62	99.2
AF07804	46.5	14.4	10.9	8.07	1.66	.53	10.9	.22	1.36	.17	.07	4.93	99.8
AF07805	46.2	13.4	10.3	8.68	1.85	.27	11.8	.18	1.58	.20	.06	5.08	99.7
AF07806	46.7	11.0	8.79	13.5	1.78	.49	12.8	.17	1.61	.19	.10	2.00	99.3
AF07807	45.3	12.1	9.61	12.9	1.37	.16	11.2	.17	1.06	.11	.15	5.39	99.6
AF07808	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	---
AF07809	52.3	16.4	10.3	5.45	2.09	.53	9.47	.15	1.33	.19	.06	1.77	100.1
AF07810	51.4	15.8	10.0	5.76	2.04	.27	9.98	.15	1.41	.19	.05	2.62	99.8
AF07811	51.2	15.3	9.76	5.49	1.90	.19	9.57	.15	1.40	.19	.06	3.77	99.1
AF07812	51.7	14.9	9.45	6.23	2.15	.42	10.6	.16	1.35	.19	.06	1.70	99.0
AF07813	52.0	14.8	7.55	5.88	3.03	2.26	9.67	.16	1.31	.18	.07	2.47	99.5
AF07814	44.4	13.1	11.1	8.33	1.47	.16	11.8	.18	1.41	.13	.06	6.85	99.1
AF07815	47.3	13.6	11.5	9.36	1.84	.15	12.0	.18	1.39	.14	.07	1.70	99.3
AF07816	46.2	13.3	11.4	9.91	1.66	.05	12.1	.18	1.39	.13	.10	3.54	100.1
AF07817	46.8	13.1	10.9	9.45	1.52	.04	12.1	.18	1.31	.13	.06	4.93	100.6
AF07846	43.0	9.25	8.41	18.8	1.24	.06	12.4	.18	1.24	.13	.18	3.16	98.2
AF07847	41.8	7.59	7.06	23.9	1.09	.24	13.0	.19	1.08	.11	.30	3.08	99.6
AF07848	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	SMPMISS	---
AF07849	44.8	13.4	11.9	9.82	1.43	.28	11.7	.18	1.43	.14	.07	3.70	99.0
AF07850	51.4	15.5	10.5	6.46	2.00	.35	10.2	.16	1.36	.16	.09	1.39	99.7
AF07901	46.3	12.7	9.67	12.1	1.55	.17	11.0	.17	1.21	.17	.21	3.54	98.9
AF07902	45.2	12.1	9.92	12.4	1.64	.31	12.0	.18	1.27	.14	.13	4.00	99.4
AF07903	49.7	14.6	10.6	5.75	2.49	.53	10.7	.17	1.49	.18	.02	3.23	99.6
AF07904	52.6	14.9	8.99	5.42	2.39	.54	10.1	.16	1.60	.21	.05	2.70	99.8

XRF W.R.A. SUMS INCLUDE ALL ELEMENTS DETERMINED. FOR SUMMATION, ELEMENTS ARE CALCULATED AS OXIDES

APPENDIX V

List of 1991 Expenditures

1991 EXPENDITURES ON EXPLORATION CONCESSION # 165 IN DANISH KRONER

Canadian Dollars converted to Danish Kroner using July 1st, 1991, exchange rate of **0.1701**

SALARIES	175,238.00
OVERHEAD (100% of salaries)	175,238.00
GEOLOGICAL CONSULTANT FEE	229,035.00
BOAT CHARTER (Kissavik)	324,255.00
HELICOPTER CHARTER (Greenlandair Charter A/S)	451,853.00
HELICOPTER FUEL	30,336.00
FUEL SHIPPING COST (Denmark to Jakobshavn/Umanak)	25,992.00
TRANSPORTATION (Airfare)	58,352.00
ACCOMMODATIONS/FOOD	30,562.00
LITHOGEOCHEMISTRY AND GEOCHEMISTRY ANALYTICAL COSTS	188,713.00
SHIPPING COSTS OF ANALYTICAL SAMPLES	45,989.00
MICROPROBE ANALYTICAL COST	17,637.00
TOTAL	1,753,200.00 DDK