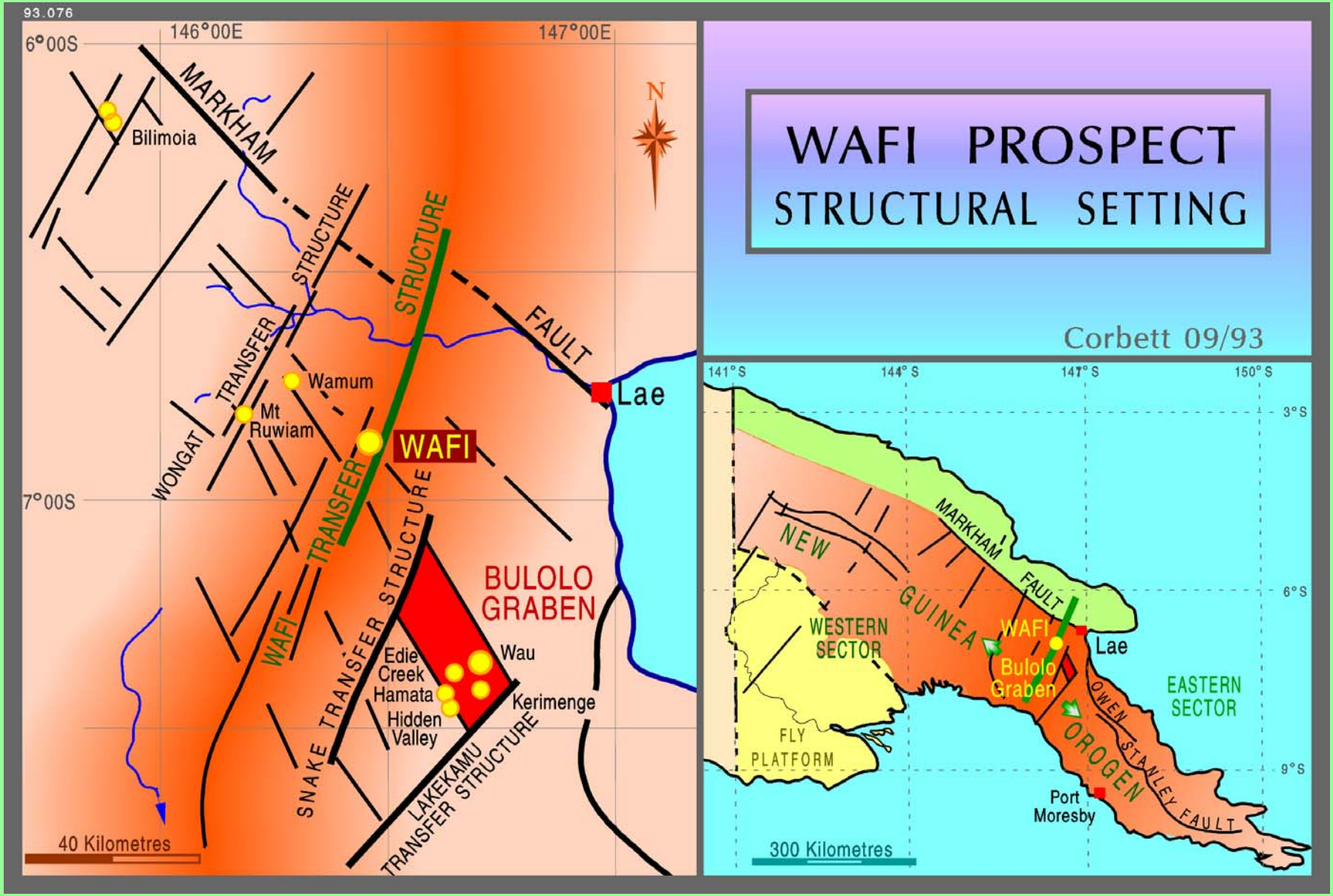
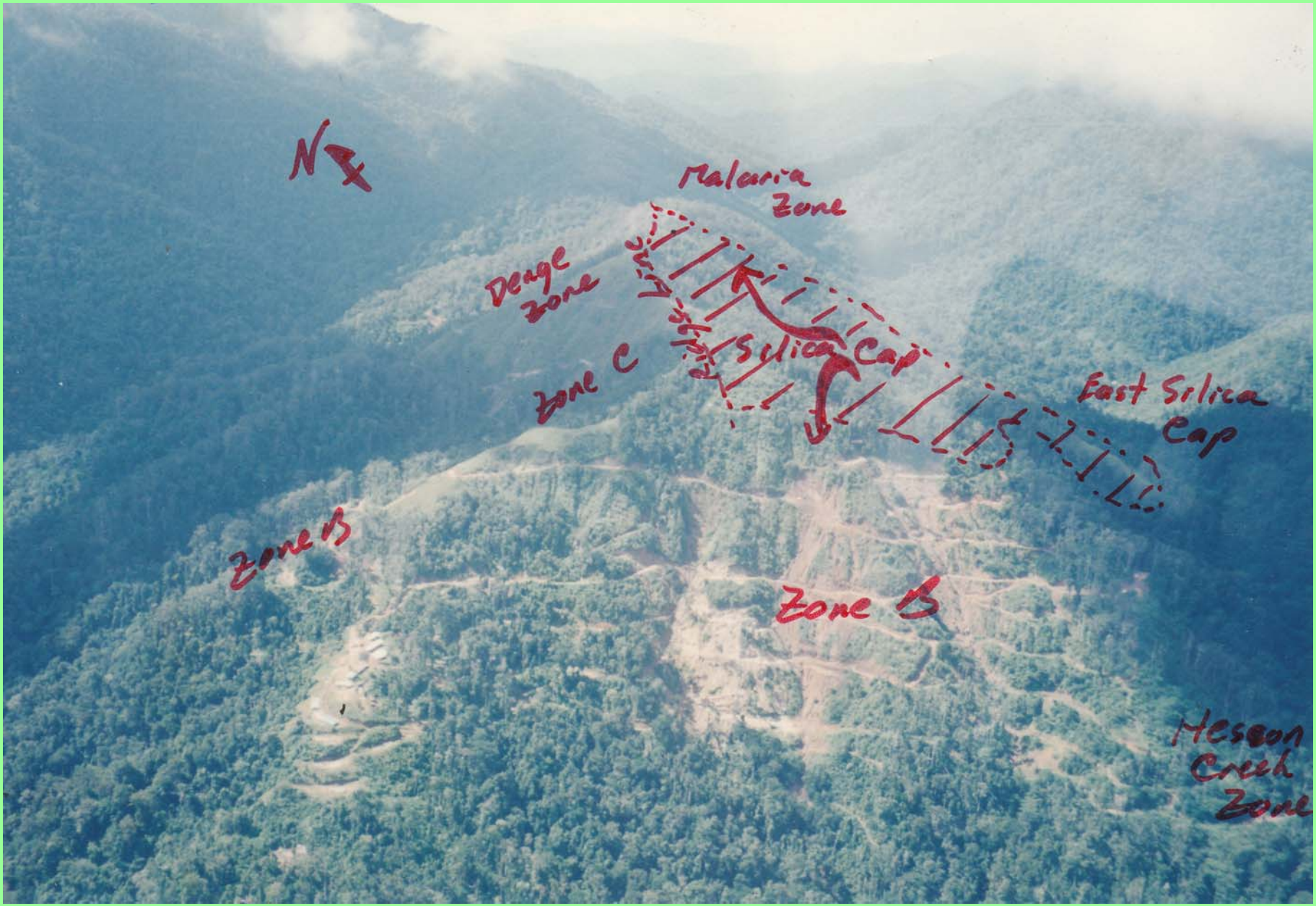
WAFI PROJECT

1989-1991

Terry Leach Symposium

17 October 2008


93.076
146°00E
147°00E
6°00S
7°00S
MARKHAM
STRUCTURE
Bilimoia
TRANSFER
STRUCTURE
FAULT
Wamum
Mt
Ruwiam
WONGAT
WAFI
TRANSFER
WAFI
SNAKE TRANSFER STRUCTURE
BULOLO
GRABEN
Edie
Creek
Hamata
Hidden
Valley
Wau
Kerimenge
LAKEKAMU
TRANSFER STRUCTURE
Lae
N
40 Kilometres
WAFI PROSPECT
STRUCTURAL SETTING
Corbett 09/93
141° S
144° S
147° S
150° S
3°S
6°S
9°S
NEW
GUINEA
MARKHAM
FAULT
WESTERN
SECTOR
WAFI
Lae
Bulolo
Graben
EASTERN
SECTOR
FLY
PLATFORM
OROGEN
OWEN
STANLEY FAULT
Port
Moresby
300 Kilometres


N
Malaria Zone
Dengue Zone
Zone C
Silica Cap
East Silica Cap
Zone B
Zone B
Hesson Creek Zone

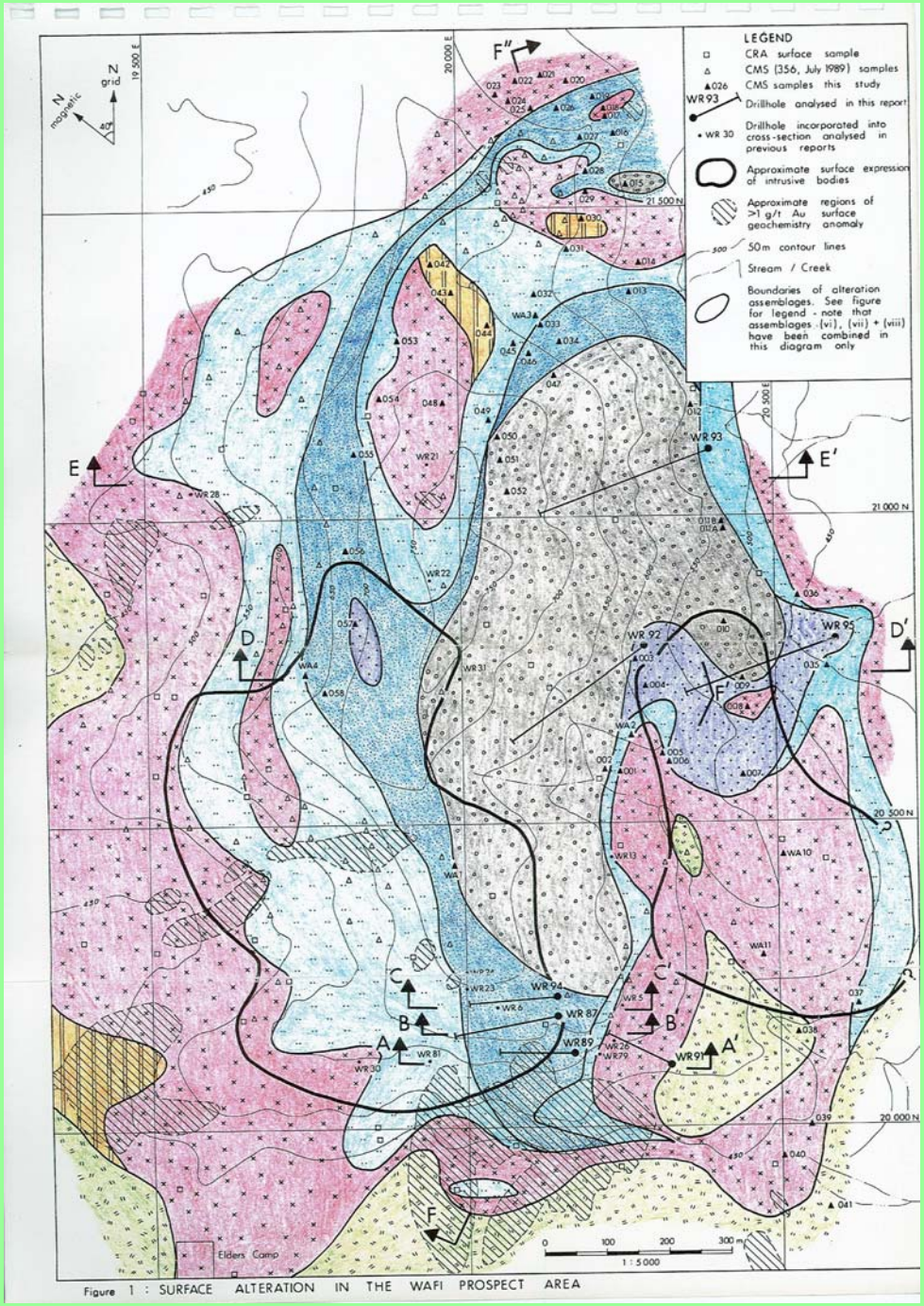


Figure 1 : SURFACE ALTERATION IN THE WAFI PROSPECT AREA

Society of Economic Geologists
Special Publication No. 6, 1998, pp. 5–10

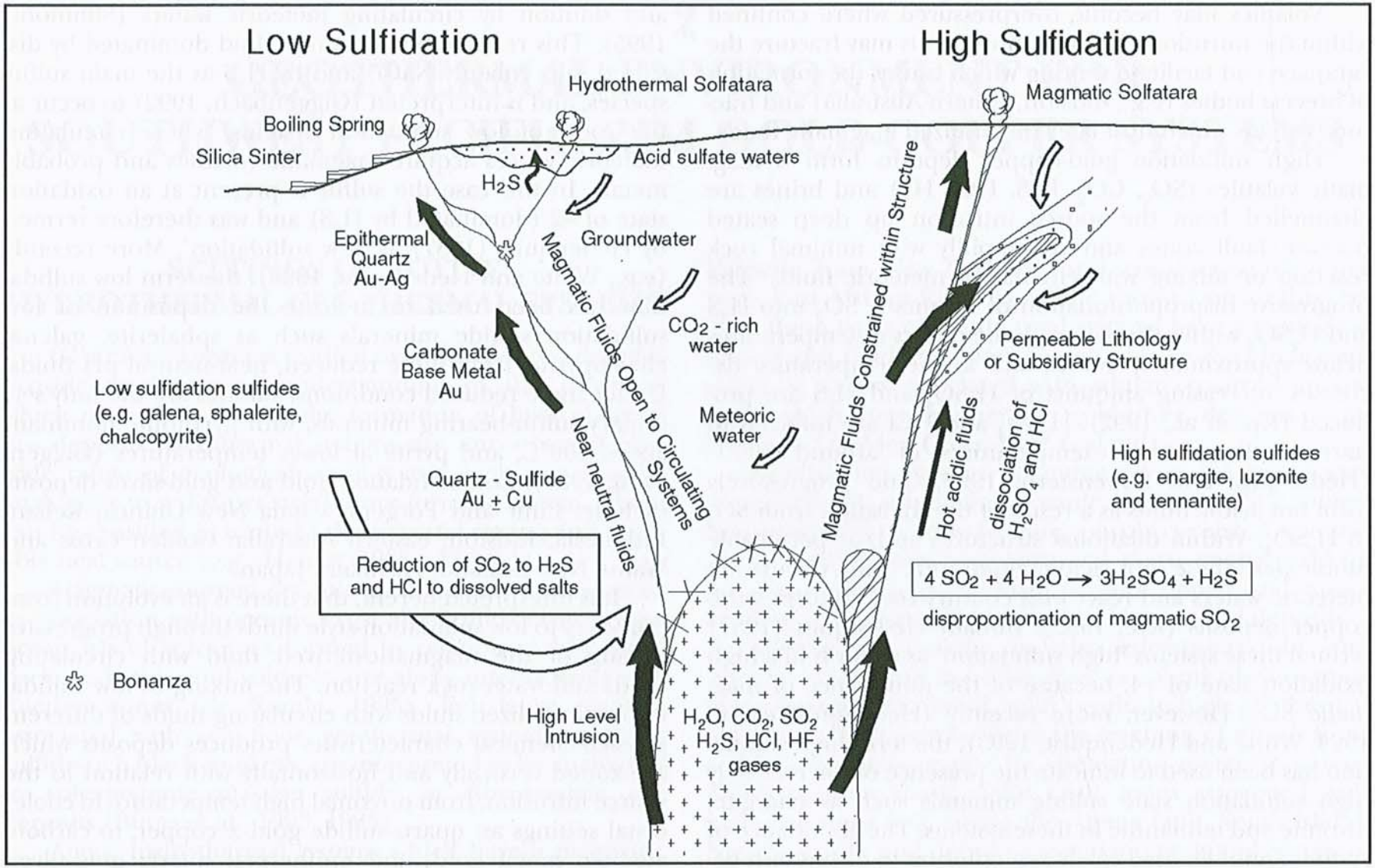
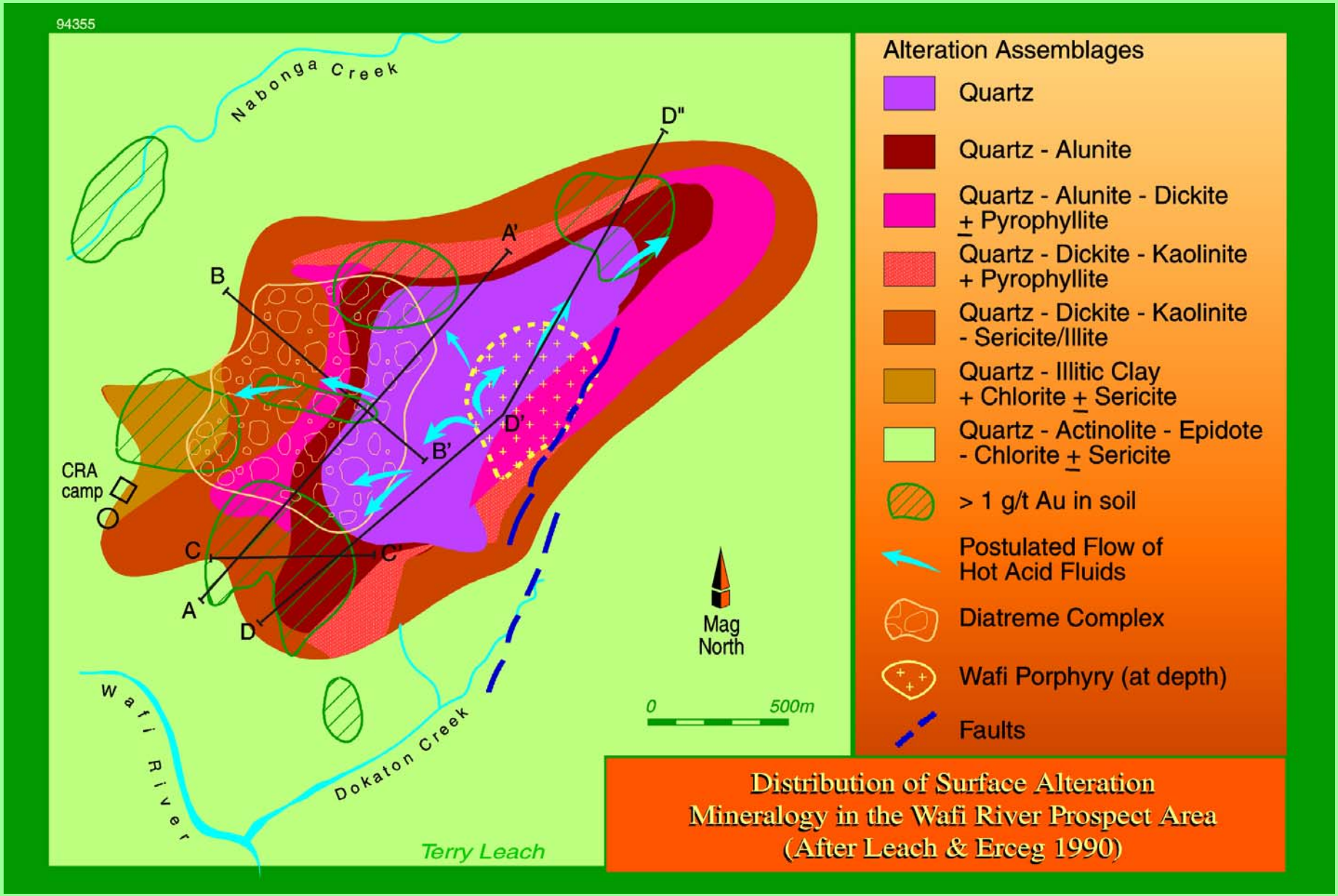
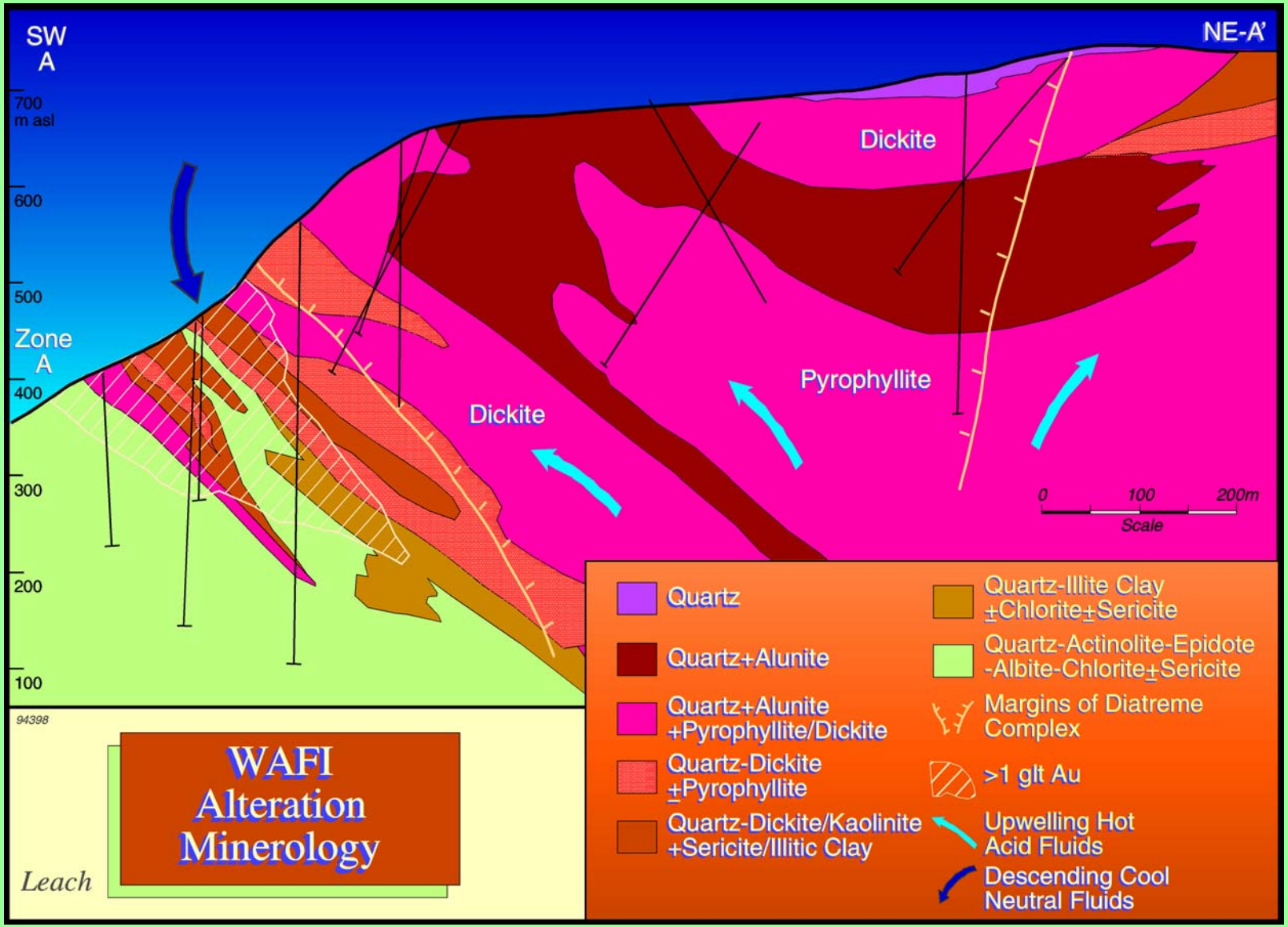


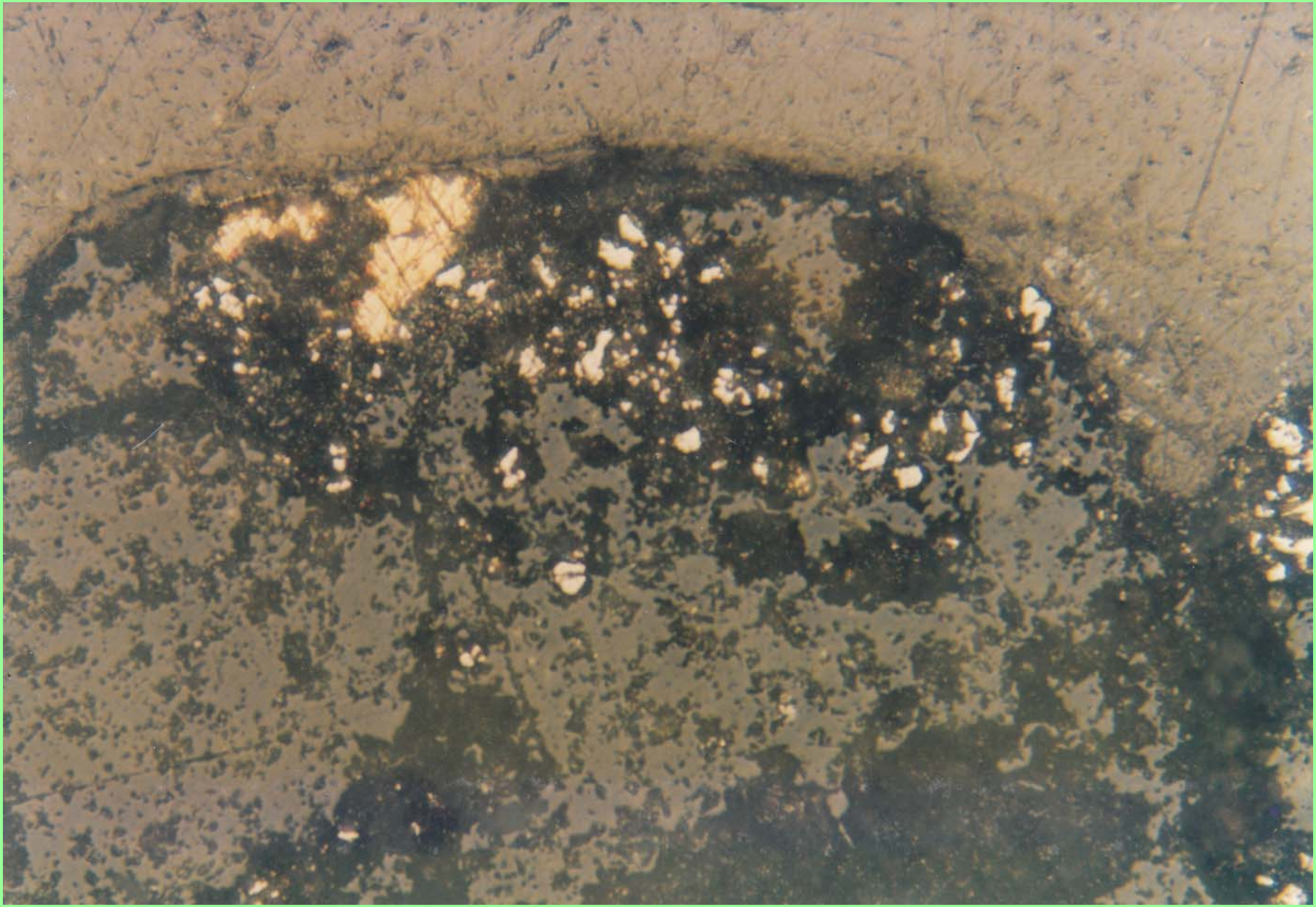
FIG. 1.3 Derivation of high and low sulfidation fluids


94355
Nabonga Creek
D"
A'
B
B'
D'
CRA
camp
C
C'
A
D
Mag
North
0
500m
Wafi River
Dokaton Creek
Terry Leach
Alteration Assemblages
Quartz
Quartz - Alunite
Quartz - Alunite - Dickite
± Pyrophyllite
Quartz - Dickite - Kaolinite
+ Pyrophyllite
Quartz - Dickite - Kaolinite
- Sericite/Illite
Quartz - Illitic Clay
+ Chlorite ± Sericite
Quartz - Actinolite - Epidote
- Chlorite ± Sericite
> 1 g/t Au in soil
Postulated Flow of
Hot Acid Fluids
Diatreme Complex
Wafi Porphyry (at depth)
Faults
Distribution of Surface Alteration
Mineralogy in the Wafi River Prospect Area
(After Leach & Erceg 1990)


SW
A
NE-A'
700
m asl
600
500
400
300
200
100
Zone
A
Dickite
Pyrophyllite
Dickite
0
100
200m
Scale
94398
WAFI
Alteration
Minerology
Leach
Quartz
Quartz+Alunite
Quartz+Alunite
+Pyrophyllite/Dickite
Quartz-Dickite
±Pyrophyllite
Quartz-Dickite/Kaolinite
+Sericite/Illitic Clay
Quartz-Illite Clay
±Chlorite±Sericite
Quartz-Actinolite-Epidote
-Albite-Chlorite±Sericite
Margins of Diatreme
Complex
>1 glt Au
Upwelling Hot
Acid Fluids
Descending Cool
Neutral Fluids


WR86 41·1m
40–42 = 13·0 g/t Au

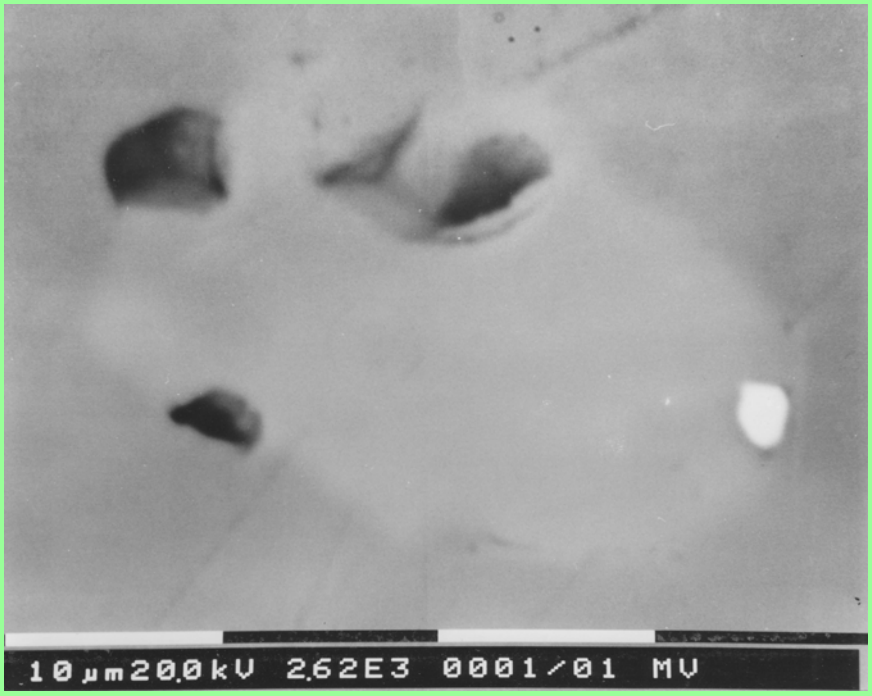

WR86 36·1m
36–38m = 6·08g/t



Coarse gold & pyrite in dickite altered wallrock WD2 68-70m WOV 0.7mm

A rounded chalcopyrite inclusion with a small gold grain in pyrite
WD15 236.5m WOV 0.27mm

SEM image of same inclusion
Gold grain 2.7microns



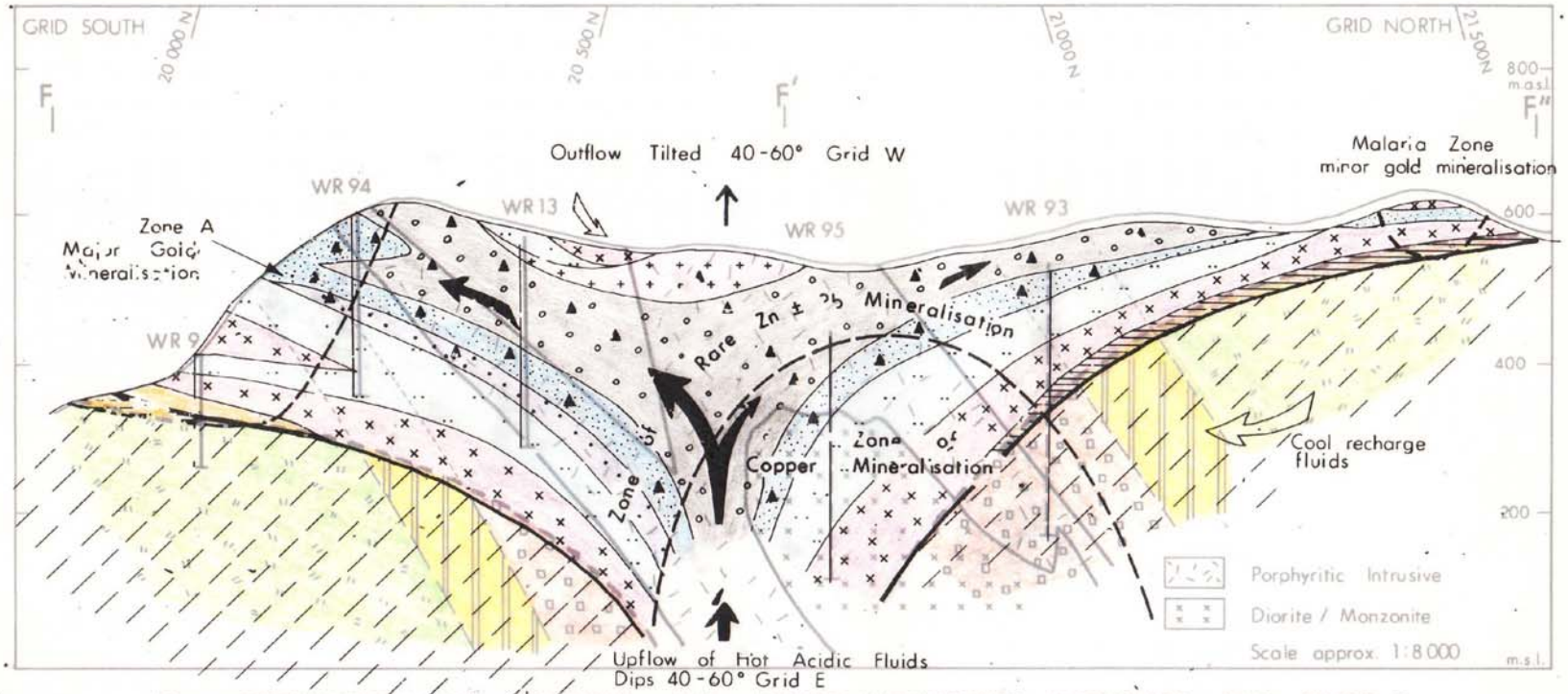
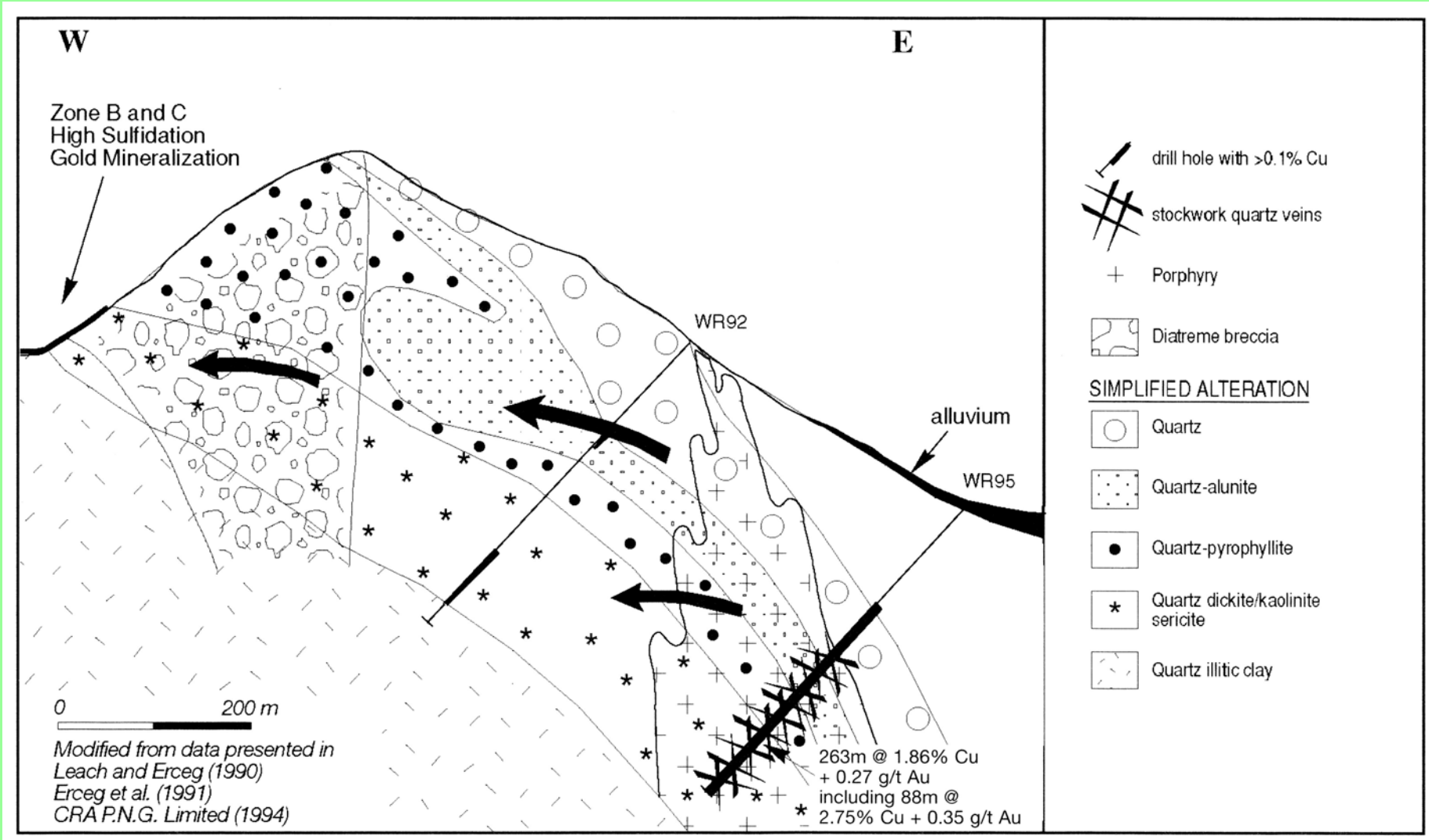


Figure 15a : DISTRIBUTION OF PORPHYRY AND DIORITE/MONZONITE INTRUSIVES AND PHASE I ALTERATION ZONES DURING STAGE I ACTIVITY.

: DISTRIBUTION OF PHASE II - ALTERATION ZONES AND Cu-Au ± Zn (Pb) MINERALISATION DURING STAGE II FLOW OF HOT ACIDIC FLUIDS. LATE ALTERATION ZONE ... ALSO


W
E
Zone B and C
High Sulfidation
Gold Mineralization
WR92
WR95
alluvium
0
200 m
Modified from data presented in
Leach and Erceg (1990)
Erceg et al. (1991)
CRA P.N.G. Limited (1994)
263m @ 1.86% Cu
+ 0.27 g/t Au
including 88m @
2.75% Cu + 0.35 g/t Au
drill hole with >0.1% Cu
stockwork quartz veins
Porphyry
Diatreme breccia
SIMPLIFIED ALTERATION
Quartz
Quartz-alunite
Quartz-pyrophyllite
Quartz dickite/kaolinite
sericite
Quartz illitic clay

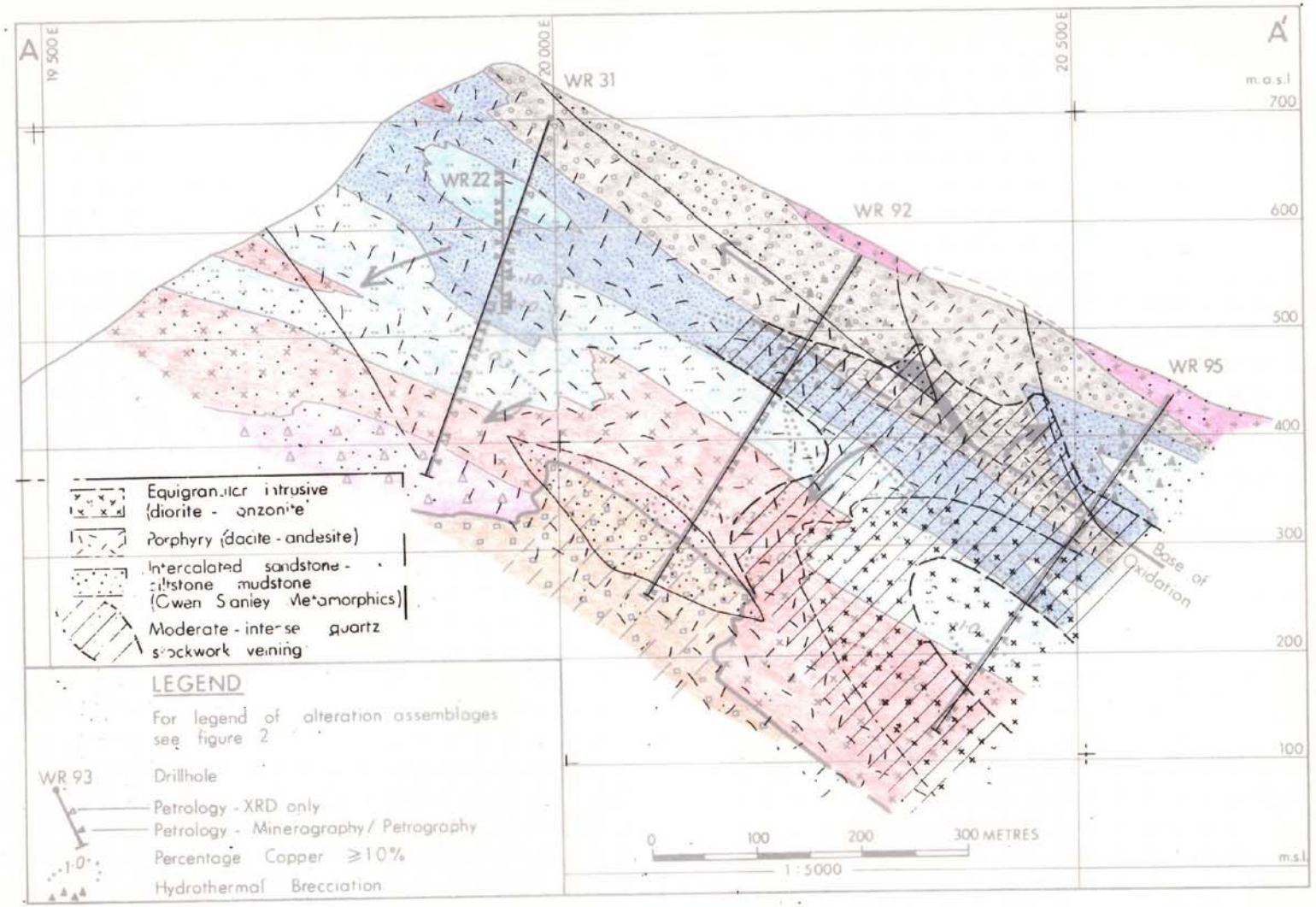


Figure 6a : HYDROTHERMAL ALTERATION : SECTION A - A' - 20 750 N

Photo 1. Sheeted quartz veins cut by shear at a low angle to the core axis with sulphides localised within the shear and at the contacts with quartz veins.

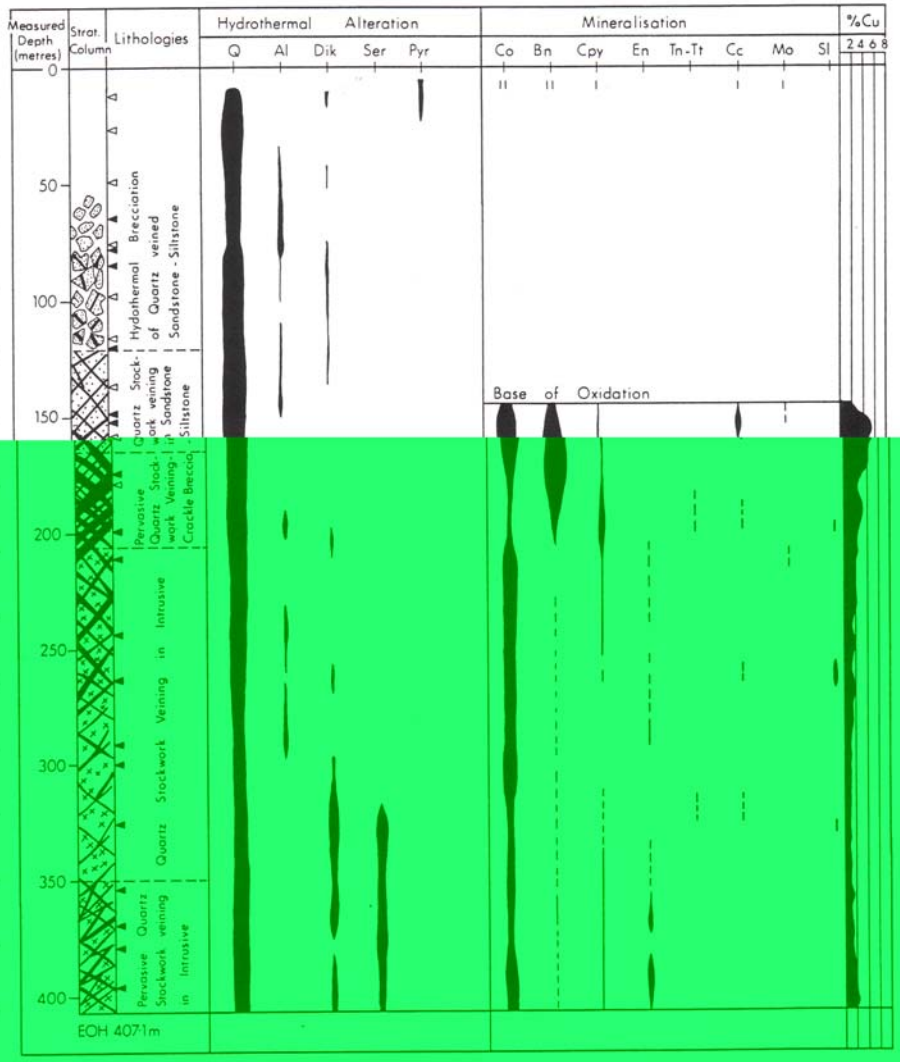


Figure 3 : PETROLOGICAL LOG OF LITHOLOGIES, HYDROTHERMAL ALTERATION AND MINERALISATION FOR DRILLHOLE WR 95

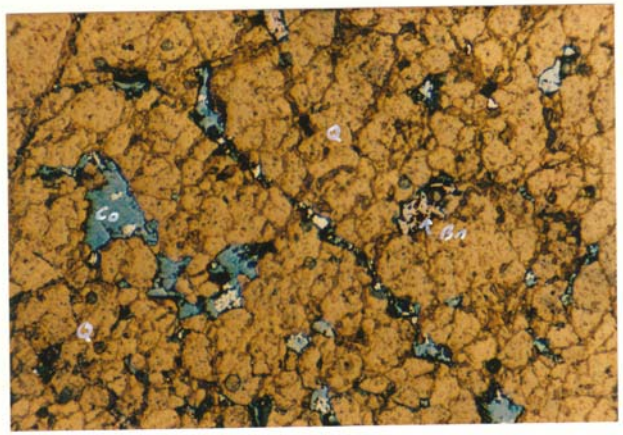


Photo 3 : Stage II-Phase IV disseminated covellite-bornite-chalcopyrite mineralisation infilling cavities and thin fractures in Stage I-Phase II quartz vein. Field of view is 1.3mm

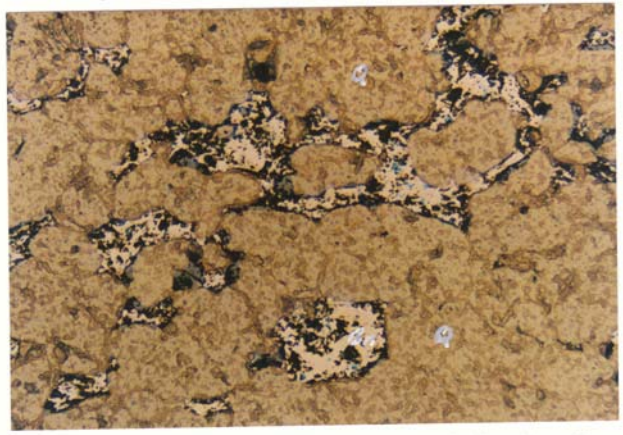


Photo 4 : Stage II (Phase IV) disseminated and veinlet bornite, with covellite inclusions, infilling cavities and fractures in Phase II quartz vein. WR 95-174m. Field of view is 1.3mm

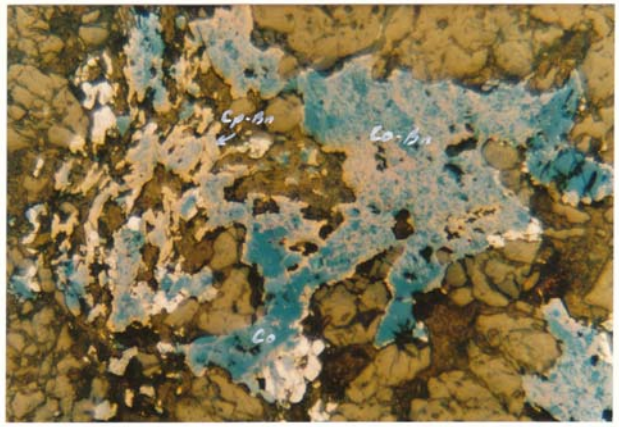


Photo 11 : Paragenetic sequence of covellite → bornite-covellite → bornite-chalcopyrite → chalcopyrite in disseminated grains in Stage II-Phase IV dickite veins. WR 95-369m. Field of view is 0.6mm

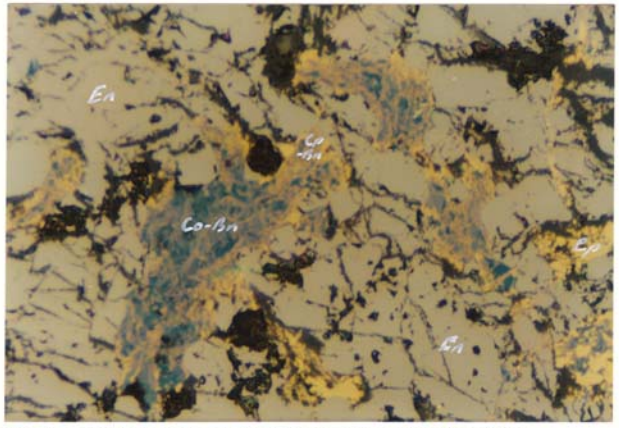
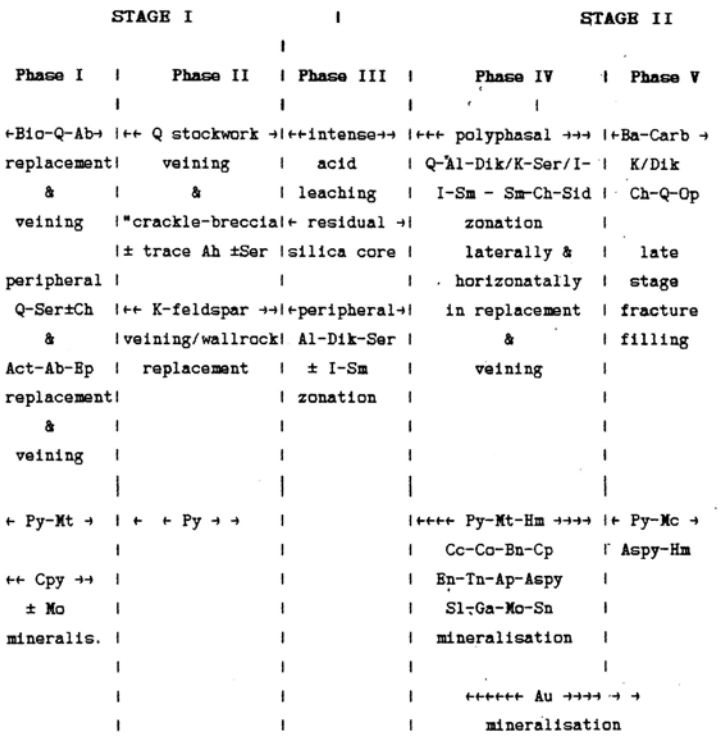


Photo 12 : Sequence of covellite-bornite → chalcopyrite-bornite ±covellite → chalcopyrite infiling fractures in Stage II-Phase IV enargite within sericite-dickite veins. WR 95-396m. Field of view is 0.3mm

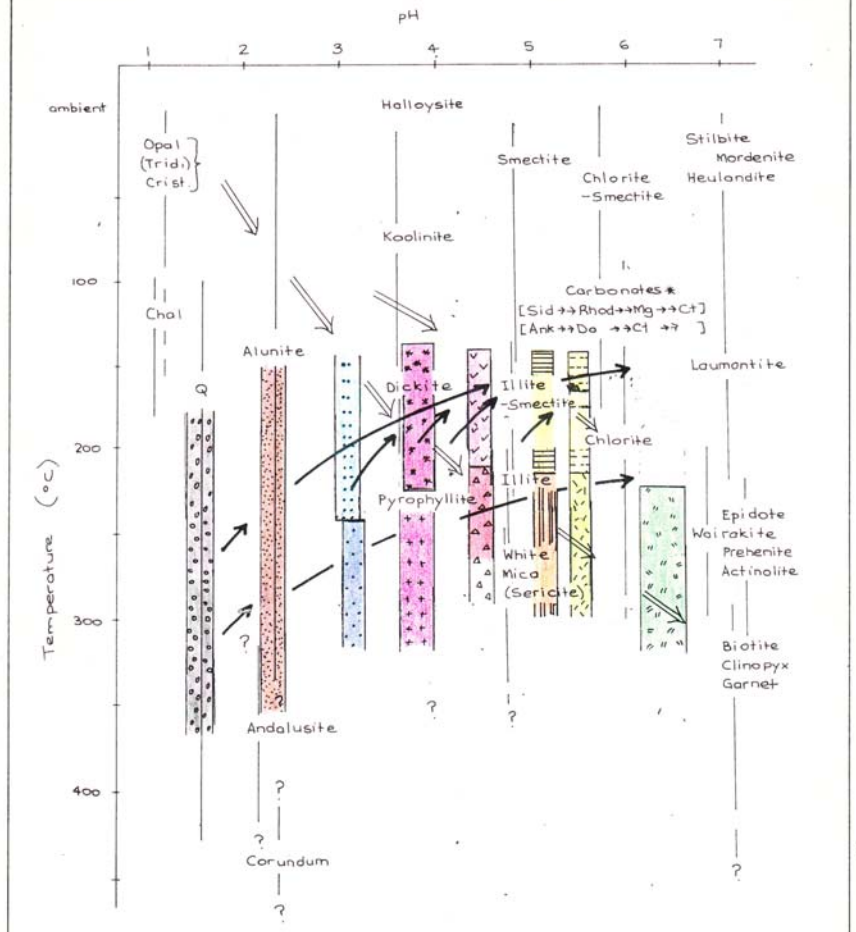
ii) PARAGENETIC SEQUENCE OF ALTERATION AND MINERALISATION

The sequence of wallrock alteration, of fracturing, brecciation and veining, and of mineralisation within the Wafi prospect area may be summarised as follows :



STAGE I

This first major stage of activity at Wafi is interpreted to be directly related to the emplacement of the porphyry intrusives and may be divided into two distinct seperate phases :



* Note: Carbonates are distributed over almost all temperature range

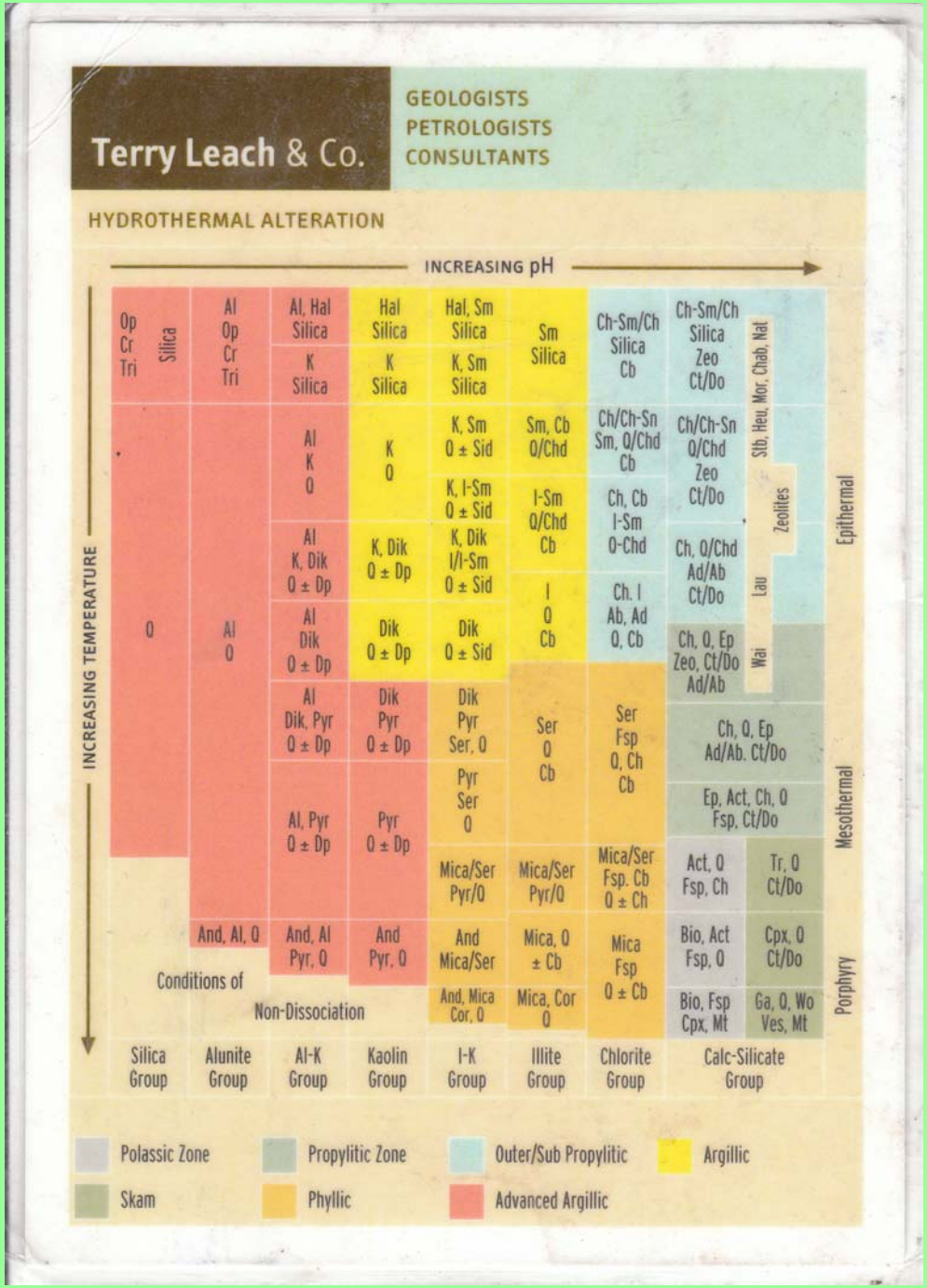
Vertical bars indicate temperature ranges of each mineral Wafi alteration assemblages as for Figure 1

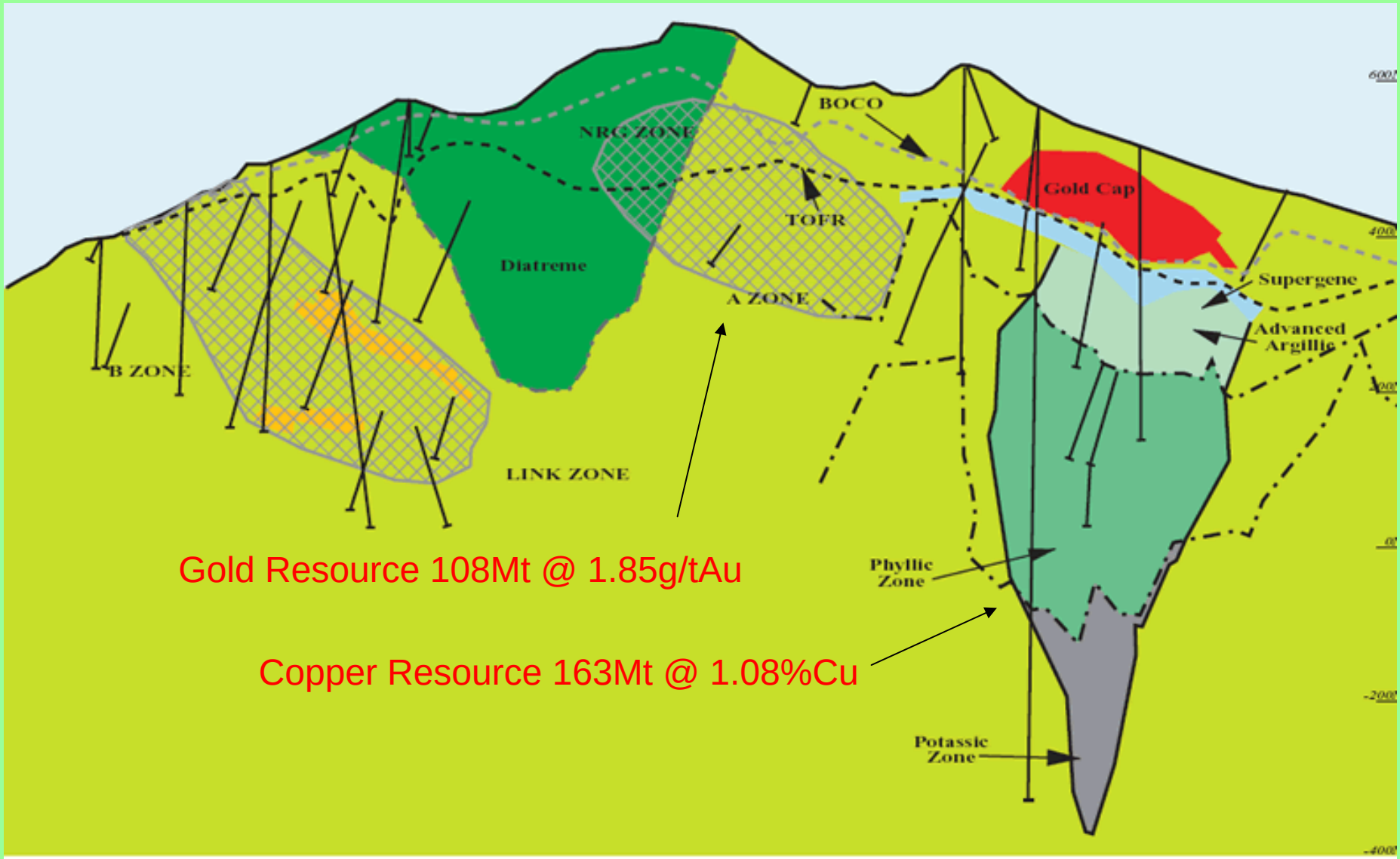
Change in alteration mineralogy from ascending hot magmatic acid fluids

Change in alteration mineralogy from descending cool surficial acid fluids

FIGURE 5

pH AND TEMPERATURE CONTROLS ON HYDROTHERMAL ALTERATION


Terry Leach & Co.
GEOLOGISTS
PETROLOGISTS
CONSULTANTS
HYDROTHERMAL ALTERATION
INCREASING pH
INCREASING TEMPERATURE
Op Cr Tri Silica
Al Op Cr Tri
Al, Hal Silica
K Silica
Hal Silica
K Silica
Hal, Sm Silica
K, Sm Silica
Sm Silica
Ch-Sm/Ch Silica Cb
Ch-Sm/Ch Silica Zeo Ct/Do
Stb, Heu, Mor, Chab, Nat
Zeolites
Lau
Wai
Epithermal
Mesothermal
Porphyry
Al K Q
K Q
K, Sm Q ± Sid
Sm, Cb Q/Chd
Ch/Ch-Sn Sm, Q/Chd Cb
Ch/Ch-Sn Q/Chd Zeo Ct/Do
K, I-Sm Q ± Sid
I-Sm Q/Chd Cb
Ch, Cb I-Sm Q-Chd
Al K, Dik Q ± Dp
K, Dik Q ± Dp
K, Dik I/I-Sm Q ± Sid
Ch, Q/Chd Ad/Ab Ct/Do
I Q Cb
Ch, I Ab, Ad Q, Cb
Al Dik Q ± Dp
Dik Q ± Dp
Dik Q ± Sid
Ch, Q, Ep Zeo, Ct/Do Ad/Ab
Q
Al Q
Al Dik, Pyr Q ± Dp
Dik Pyr Q ± Dp
Dik Pyr Ser, Q
Ser Q Cb
Ser Fsp Q, Ch Cb
Ch, Q, Ep Ad/Ab. Ct/Do
Pyr Ser Q
Ep, Act, Ch, Q Fsp, Ct/Do
Al, Pyr Q ± Dp
Pyr Q ± Dp
Mica/Ser Pyr/Q
Mica/Ser Pyr/Q
Mica/Ser Fsp. Cb Q ± Ch
Act, Q Fsp, Ch
Tr, Q Ct/Do
And, Al, Q
And, Al Pyr, Q
And Pyr, Q
And Mica/Ser
Mica, Q ± Cb
Mica Fsp Q ± Cb
Bio, Act Fsp, Q
Cpx, Q Ct/Do
Conditions of Non-Dissociation
And, Mica Cor, Q
Mica, Cor Q
Bio, Fsp Cpx, Mt
Ga, Q, Wo Ves, Mt
Silica Group
Alunite Group
Al-K Group
Kaolin Group
I-K Group
Illite Group
Chlorite Group
Calc-Silicate Group
Polassic Zone
Propylitic Zone
Outer/Sub Propylitic
Argillic
Skam
Phyllic
Advanced Argillic



Schematic section showing relationships of the Mineral Resource: Please note that the A zone and NRG zones are projected onto this section. The Zones bound the diatreme and are not hosted in it. The NRG zone fall above the Top of Fresh Rock(TOFR) in the weathered profile.