Metal Distribution Within Zone 39, A Proterozoic Vein-Type Cu-Ni-Au-Ag-PGE Deposit, Strathcona Mine, Ontario, Canada

by

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Abstract

The Strathcona Mine is located 56km northwest of Sudbury, Ontario on the northwest rim of the Sudbury Basin. Zone 39 is a Proterozoic massive sulphide stockwork vein deposit occurring stratigraphically below the Sudbury Igneous Complex (SIC) and associated Ni-Cu deposits.

Compared to other ore zones in the mine, Zone 39 is furthest from the SIC and occurs at the down-plunge extent of a regional trend defined by several Cu-Ni-precious metal (PM)-vein systems. The zone contains the highest Cu, Cu+Ni and PM (Au, Pt, Pd, Ag) along with the lowest Fe concentrations. These characteristics are consistent with its interpretation as an end member with respect to a sulphide fractionation model. Vertical zoning and spatial relationships within Zone 38, suggest that Zone 39 may have formed from a differentiated residual sulphide liquid originating from Zone 38. The metal variations could also be explained using a hydrothermal model and thermal gradient.

Results of a detailed sampling program indicate that extreme random variation in Ni and precious metal (PM) content occur due to local heterogeneity within the sulphide veins. Local scale variations in metal content associated with individual samples are similar in magnitude to those occurring across the deposit. The assay data provides poor resolution inhibiting recognition of any systematic metal variations or trends defining PM-enriched target areas within Zone 39. Local Ni and PM estimates are not possible using the existing sampling regime and overall averages should be applied.

Statistical analysis and comparisons of average concentrations for groups of samples representing different regions of the deposit compensates somewhat for the local heterogeneity, although it remains inherent in the means resulting in poor precision. There are however some weakly defined trends of increasing PM's with increasing distance from the SIC and increasing platinum group elements towards the upper and lower plunge extremities of the zone. Extrapolation of these trends may define PM-enriched target areas.

With the exception of the potential increasing PM's towards the footwall, there is no evidence to support internal sulphide fractionation within the massive vein system within Zone 39. Comparisons using individual samples to investigate the presence of fractionation is not possible due to high local variances. Re-calculation to 100% sulphide was not applied as the proportion of sulphide mineralogy is variable and not known for each sample. Concentric lateral Cu and Fe zoning, which is well defined in Zone 38, is not present in Zone 39. Zone 39 contains lower overall concentrations of Fe-rich minerals such as pyrrhotite and cubanite than Zone 38. A re-evaluation of Zone 38 did not support previously documented lateral PGE zoning.

The penetration of trace element and PM-bearing fluids into the silicate host rock suggests hydrothermal remobilization may have occurred. Anomalous trace element (Pt, Pd, F, Bi, Te, As and Se) concentrations occur in the vein wallrock and extend into the structural footwall below the zone for a distance of at least 20 m. These trace element concentrations, which occur with trace amounts of sulphide mineralization, are highest in the footwall. Significantly higher PM/(Cu+Ni) ratios in the wallrock adjacent to the veins, and in isolated secondary veinlets throughout the zone, suggests hydrothermal remobilization occurred, or that last stage primary sulphide liquids were differentiated.

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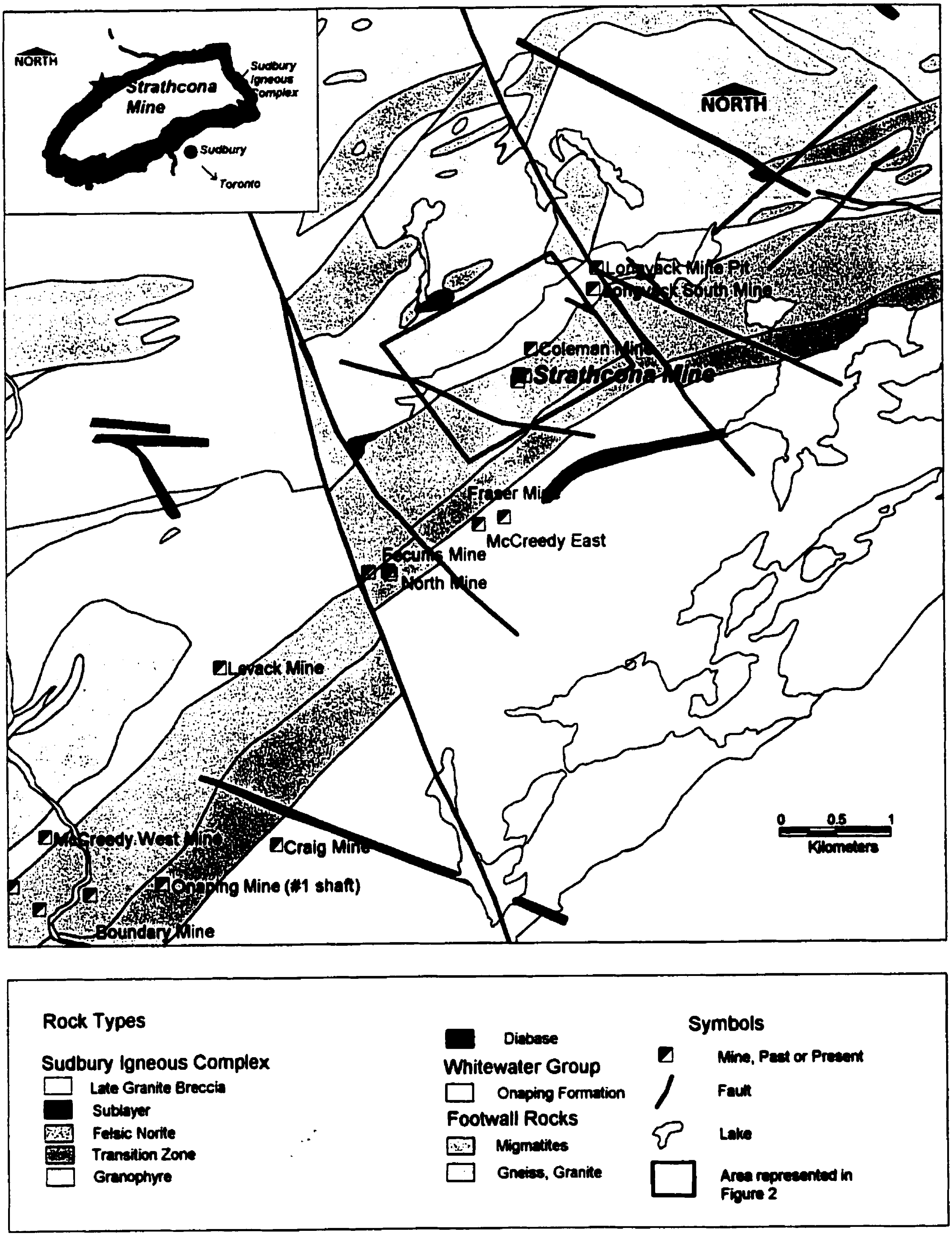
1.0 Introduction

1.1 Location and History

Strathcona Mine is located in Levack Township on the North Range of the Sudbury Igneous Complex (SIC), approximately 56 km by road northwest of Sudbury, Ontario (Figure 1). Falconbridge Limited acquired the property between 1928 and 1944 and subsequently outlined the Main Zone by surface drilling between 1951 and 1960. Underground production began in 1968. Production to the end of 1997 totaled 33 million tonnes grading 1.05% Ni and 1.52% Cu.

The Strathcona deposit (Figures 2 and 3) consists of five zones: the Hanging Wall, the Main, the Deep, the Upper Cu (Zone 36) and the Deep Cu (Zones 37-39). The Deep Cu Zone, which was discovered by underground diamond drilling in 1978, is the only zone currently in production: the other four zones are mined out. Zone 39, was discovered in 1986 and production from this zone began in 1995 with definition drilling nearing completion at the time of this study. The 1997 diluted ore reserves for the Deep Cu Zone are 3.3 million tonnes grading 0.68% Ni, 6.44% Cu, 1.12 ppm Au, 1.71 ppm Pt, 2.05 ppm Pd and 34.4 ppm Ag. The reserves for Zone 39 total 982,000 tonnes grading 0.62% NI, 4.08% Cu, 1.12 ppm Au, 2.57 ppm Pt, 2.76 ppm Pd, 29.7 ppm Ag.

Figure 1: Regional geology and Ore Deposits of the Levack area.



1.2 Scope of Work

The commencement of production in Zone 39 and continuing delineation and exploration drilling around this precious metal-rich vein deposit led to the initiation of this study in 1995, with the following related objectives:

- Define and predict spatial variations in metal concentrations within the main sulphide veins. Identify and quantify factors causing local variances.
- Identify spatial vectors defined by metal distribution patterns.
- Re-evaluate current zoning models for Zone 38 and investigate the relationship between Zones 38 and 39 with respect to metal distribution.
- Determine whether or not a trace element/metal halo exists in the vein wallrock
    - Characterize the halo in terms of distribution and concentration of metals/trace elements.

Practical applications:

- Local grade estimations:
    - To predict metal concentrations in progressively lower parts of the deposit where mining becomes more costly.
    - Define whether narrower main veins or isolated secondary mineralization, which may be sub-economic to mine, contain higher precious metal (PM) concentrations.
- Extrapolate vectors defined by metal distribution patterns to identify target areas where mineralization containing higher precious metals may occur.
- Provide better local grade estimates within Zone 38.
- Supply an accurate estimate of metal concentrations within the wallrock proximal to the veins (wallrock recovered with the sulphide veins).

Methodology

The study involved detailed underground back mapping and sampling of two mining cuts near the top of Zone 39 where mining was in progress (4400' level, cuts 1 and 3). Massive sulphide veins and the host wallrock were systematically sampled every 3 or 6 metres along strike (Figure 5). Assessment of the remainder of the zone utilized assays, core logging and interpretation from definition diamond drilling which was in progress at the time of the study (Figure 6). Drill hole sample spacing ranges from 20 to 40 metres. Previous existing assay data from grade control sampling were utilized for analysis of Zone 38.

A series of detailed sampling programs and statistical analyses were undertaken to measure and partition the components of local scale variance. A qualitative mineralogical study was completed to relate precious metal (PM) grain size and distribution to local variance. Applied statistical techniques and spatial plots were used to interpret the data.

Statistical Methods

The terms variance, confidence interval and limits, coefficient of variation are referred to in the study. Where means are used, they are arithmetic means unless otherwise stated. Weighted averages also used. Definitions for other statistical terms can be found in Appendix VII.

Variance is defined as $\Sigma(\mu - xi)^2/n-1$ where:

μ = the mean for a set of n measurements

xi = the ith measurement,

n = number of measurements

$n-1$ = degrees of freedom

Confidence interval and ranges are measures for precision of means. (An explanation is given in appendix VII.)

Coefficient of Variation (CV) = $sd(x)^{*}100/\mu$ *where:*
$sd(x)$ = standard deviation

Weighted Averages are used to accurately represent means where samples represent different proportions of a variable being measured. In this study Ni correlated negatively with vein width so an average weighted to vein width was used to equalize the fact that a high Ni assays actually represents a smaller relative proportion of the mass of the zone. The formula is:

$(X1^{*}width+X2^{*}width...Xi^{*}width)/\Sigma\ width$

1.3 Regional Geology

Sulphide deposits of the Strathcona Mine are located along the northwest margin of the Sudbury Structure at the base of, and within the footwall to, the Sudbury Igneous Complex (SIC).

The SIC comprises the outer part of the Sudbury Basin which is a Proterozoic, northeast-trending elliptical feature, thought to be a remnant of a deformed meteorite impact crater (Dietz, 1964, Grieve, 1994). The Whitewater Group occurs within the interior of the basin. Surrounding the SIC to the north and east are Archean gneisses and migmatites (Levack Gneiss complex) of the Superior Province and to the south early Proterozoic Huronian metasediment, metavolcanic and granitic rocks of the Southern province. Sudbury Breccia, a pseudotachylite thought to be related to the meteorite impact event, occurs within the peripheral footwall rocks in a broad irregular band approximately parallel to the SIC. The SIC is cut by late Proterozoic diabase/diorite dykes. Later Olivine diabase dykes (1250 Ma) also crosscut the Sudbury basin (Snajdr et al., 1991). The latest magmatic event, dated at approximately 520 Ma (Fedorowich et al. in press), is represented by a diabase dyke which crosscuts the sulphide veins within the Strathcona Deep Cu Zone.

The SIC and related sulphide mineralization was emplaced approximately 1850 +/- 1 Ma (Krough et al., 1984) and is comprised of a layered sequence consisting of granophyre at the top, quartz gabbro in the middle and norite at the base. The base of the norite locally contains an xenolith-rich unit called the Sublayer (Souch and Podolsky, 1969) which contains noritic, footwall and exotic ultramafic xenoliths within a "noritic" matrix. An associated breccia, is referred to as Late Granite Breccia (LGBX) or Footwall Breccia, occurs at the contact with Archean gneisses, below the Sublayer. LGBX, which is not always present, occurs in the east and north parts of the basin. The matrix to this unit is metamorphic-textured and the rock is interpreted to be brecciated, partially recrystallized and melted gneiss (Coats and Snajdr, 1984). Quartz diorite and rock units similar to Footwall Breccia and Sublayer also occur in structures radiating from the SIC contact (Coleman, 1905). These rock units are called Offset Dykes and also host sulphide deposits. Footwall Breccia is the most common ore host in the North and East Ranges, whereas the Sublayer and Offset Dykes are the more common host in the South Range. The geology and ore deposits of the Sudbury Structure are described in Pye et. al (1984).

There are four main deposits types: i) Sublayer or Footwall Breccia hosted deposits which range from disseminated to massive sulphide (up to 85% pyrrhotite, pentlandite and chalcopyrite). Sulphide commonly comprises the breccia matrix. ii) Footwall deposits consisting of massive lenses and veins, proximal to the SIC but completely isolated within the footwall lithology (ie. Archean gneisses in the North Range), iii) Offset Dyke hosted, and iv) Footwall Cu zones which are isolated deposits occurring 100-600 metres into the footwall and are dominated by chalcopyrite-rich veins containing significantly higher PM (Au, Pt, Pd, Ag) concentrations. Footwall Cu zones are typically hosted by Sudbury Breccia which comprises an irregular network of pseudotachylite dykes with a grey to black, fine-grained matrix consisting of milled country rock and predominantly rounded gneiss fragments.

1.4 Mine Geology

Descriptions of the mine geology are detailed in previous studies by Naldrett (1967), Cowan (1968), Abel et al. (1979), Nikolic (1979), Coats and Snajdr (1984), Descriptions of the Deep Cu Zones have been provided by Money (1992), Li et al. (1992), Farrow and Watkinson (1992) and most recently as part of a structural study by Fedorowich (1996). The following description is a summary combining personal observations and information derived from the studied listed above.

The Strathcona Mine occurs within an embayment structure which is defined as a section of the SIC that has an arcuate basal contact protruding into the Levack

Gneiss complex (Archean gneisses and migmatites). Embayment structures contain thicker sequences of Sublayer and Footwall Breccia (Figure 2 and 3) and are favourable environments for hosting ore. They are interpreted to have acted as gravitational traps for down-ward settling immiscible sulphide liquid (Coats and Snajdr, 1984).

The five different ore zones at Strathcona are distinguished by their mineralogy, host rocks and position relative to the SIC. A detailed description of the Hanging wall, Deep and Main Zones is provided by Coats and Snajdr (1984). The Copper zone and Deep Cu Zones comprise four discrete stockwork massive sulphide vein systems occurring 200 to 600 metres into the footwall, hosted by Levack Gneiss and Sudbury Breccia.

Mineral and metal zoning is interpreted to extend from ore hosted in the Sublayer to the Deep Zone as a result of sulphide-liquid fractionation (Keays and Crocket, 1970, Naldrett et al., 1967). This zoning, or sulphide fractionation, is defined by a progressive increase in Cu, Pt, Pd and Au and a decrease in Co and Os, Ir, Rh and Ru. This zonation continues into the Cu zones with progressively higher concentrations of Cu and PM's with increasing distance from the SIC.

1.41 Deep Cu Zones

The massive sulphide veins form a stockwork within Levack Gneisses and Sudbury Breccia (SDBX). The SDBX represents shattered and brecciated wallrock. The breccias, vary in thickness from several 10's of metres to a few cm's and are dyke like in appearance. They include insitu brecciated Levack Gneiss, and transported breccias (Fedorowich, 1996), where variably rounded wall rock fragments sit in a finely comminuted altered rock flour matrix. Brittle extensional fracturing within this breccia localized the emplacement of sulphide liquids and subsequent vein network (Fedorowich 1996).

The stockwork sulphide vein system along with the SDBX host rock forms arcuate bands parallel to the strike and dip of the SIC. The sulphide vein system plunges to the southwest as does the embayment structure. The location of the Cu zones appears to be structurally related to the SIC embayment (Falconbridge internal communications and Fedorowich 1996). There is no evidence to support more than one episode of vein emplacement (contemporaneous) with the exception of sulphide remobilization into a late diabase dyke in Zone 38. The dyke clearly crosscuts the vein system (Farrow and Watkinson, 1992; Fedorowich, 1996).

The veins contain 70-90% sulphide consisting mainly of chalcopyrite and cubanite with lesser amounts of pentlandite, millerite and pyrrhotite. Magnetite, silicate gangue and a suite of accessory minerals comprise the remainder of the vein content. Minor narrower veinlets may contain less sulphide and more gangue minerals. A higher proportion of pentlandite and millerite commonly occurs at vein terminations and in minor, irregular, secondary veinlets in association with bornite and locally native Ag. Accessory minerals, determined by ore microscopy include platinum group minerals (mainly as tellurides and bismuthides), native gold and silver (as well as gold and silver tellurides), galena and sphalerite.

The veins have a sharp contact with the wallrock although there is an area of a few centimeters to one metre in width where an alteration zone and dispersed disseminations and veinlets of sulphides and PM's occur. The alteration zone ranges from a few mm to a couple of cm as selvage consisting of an assemblage of amphibole, epidote, chlorite and quartz. Dispersed sulphide may occur up to two metres from the massive veins. Table 1 summarizes and compares the four Cu zones.

Zone	Dist. To SIC (m)	%Ni	%Cu	Au ppm	Pt ppm	Pd ppm	Comments
36	200	0.39	29.60	0.19	2.55	0.80	Gneiss more common host rock. Dominant vein orientation N-S.
37	300	1.88	20.33	0.28	0.40	0.77	Closer to SIC. More Fe-rich mineralogy. Erratic veins. Dominant vein orientation N-S.
38	400-500	2.28	26.74	0.41	2.43	6.58	Largest zone. Max vein width 6m. Dominant vein orientation E-W
39	500-600	1.95	30.5	1.12	13.47	17.47	Smaller, less laterally extensive veins. Max. vein width 2 m. Dominant vein orientation E-W.

Table 1: Summary of Characteristics for the Strathcona Ore Zones

Zone 39

Zone 39 (Figures 2-5) is located furthest from the SIC and contains significantly higher PM's, Cu and Cu+Ni along with lower amounts of Fe-rich minerals such as cubanite, pyrrhotite and pentlandite. Millerite is more common than in Zone 38. Pentlandite eyes or laminar pyrrhotite, typically found in the Zone 38, are not common in Zone 39. The zone is less extensive laterally than Zone 38 and its down plunge/dip extent had not been defined at the time of this study. The veins crosscut SDBX and are commonly emplaced along contacts between SDBX and Levack Gneiss.

Also common within the zone are blocks of diabase that predate mineralization. Sulphide veinlets intrude these blocks as fine stockwork veinlets, not single continuous veins. Mineralogy within these blocks contain higher proportions of millerite and pentlandite.

1.42 Structural Geology

Massive sulphide veins of the Deep Cu Zones were emplaced within a post-impact extensional fracture system related to an event which resulted in 4 to 10% subhorizontal extension (Fedorowich,1996). The zones dip to the south, sub-parallel to the SIC contact and plunge to the southwest(approx. 30°). The orientation is sub-parallel to the embayment structure. The up-plunge surface expression of Zone 36 may be represented by a surface Cu occurrence (Barnet Trenches, Figure 35). The location of the Deep Cu Zones also may be spatially related to the apex of the embayment structure as seen in cross section (Figure 3). Recognition of the embayment was part of the selection criteria used in the discovery of Zone 39 (Falconbridge Geology Department per. comm.)

Veins within Zone 38 contain several favourable orientations[1] and include E-W (sub parallel to the SIC), as well as NW and NE trending veins. The veins dip from 30° to the southeast, to subvertical to the southeast and southwest. The main vein within Zone 39 has an approximate E-W strike and dips 30 to 40° south, parallel to the SIC. Northwest and northeast striking, steeper dipping (60-90°) narrower veins branch off this main vein into the footwall to the north. The plunge of the zones are often parallel to the line of intersection of two vein sets (Fedorowich, 1996).

Although minor faults and slips occur locally within the Zone 39, no significant displacements of the sulphide veins have been interpreted (Fedorowich, 1996).

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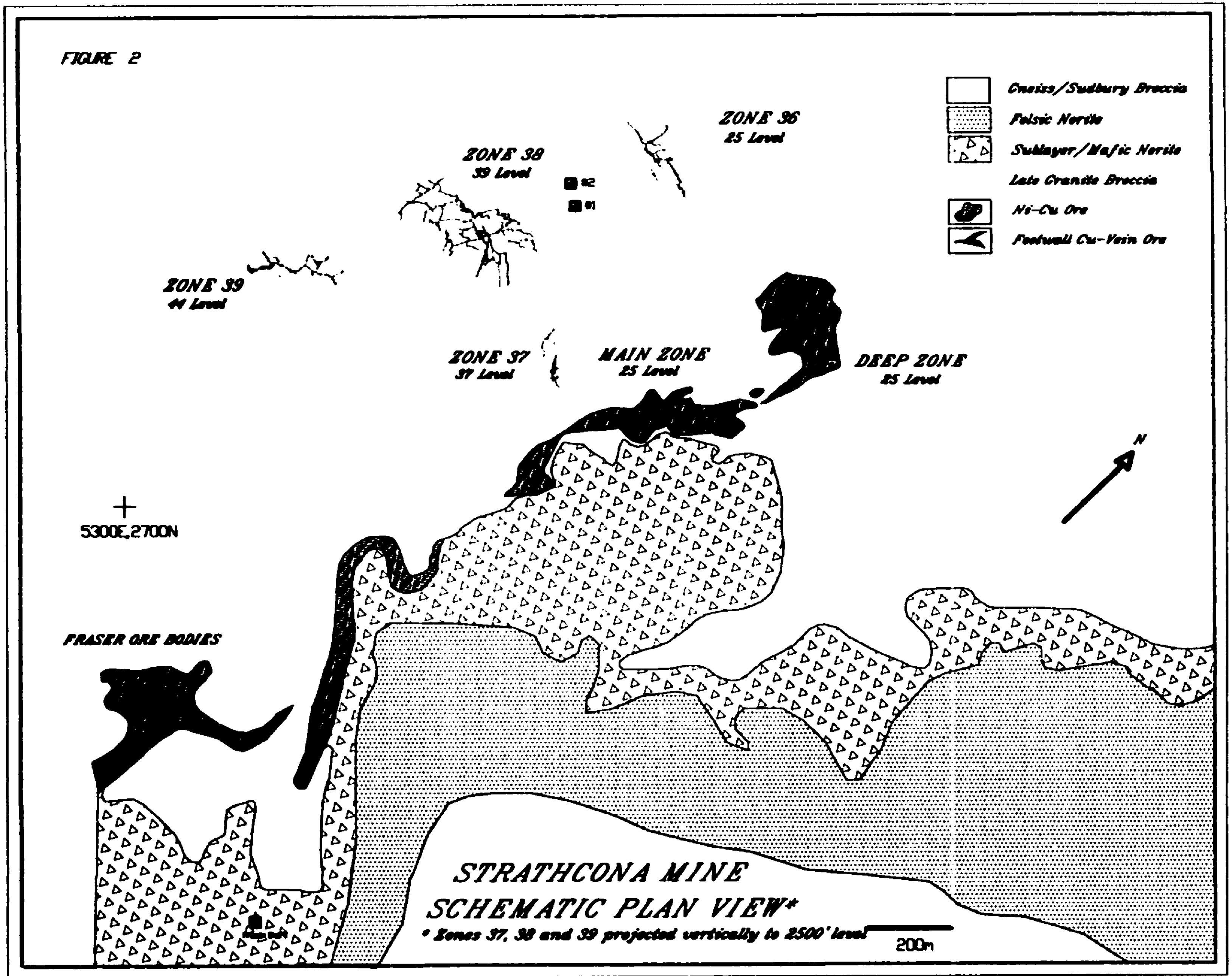
[1] Orientations are given with respect to the mine grid which is oriented at 322°

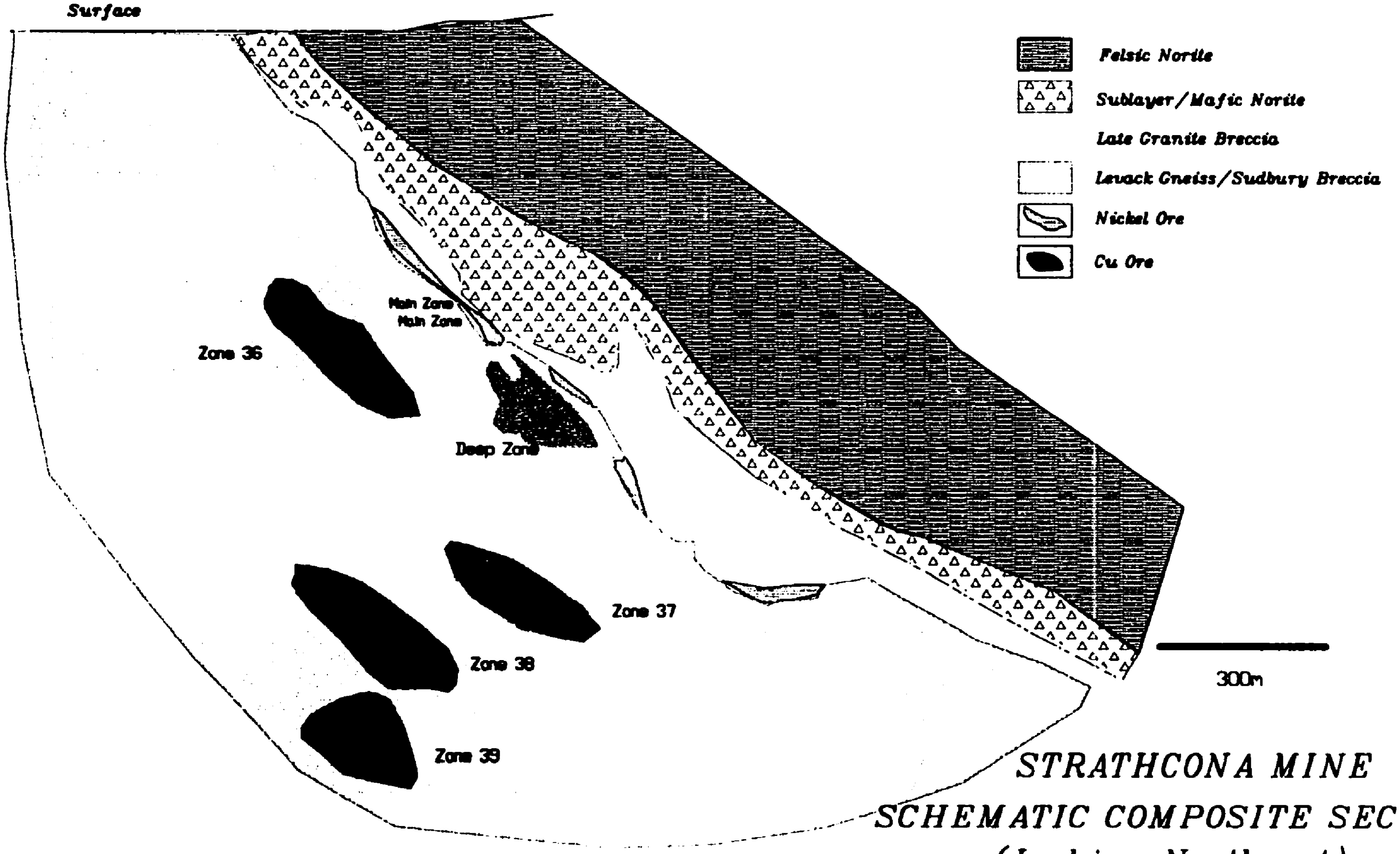
FIGURE 2



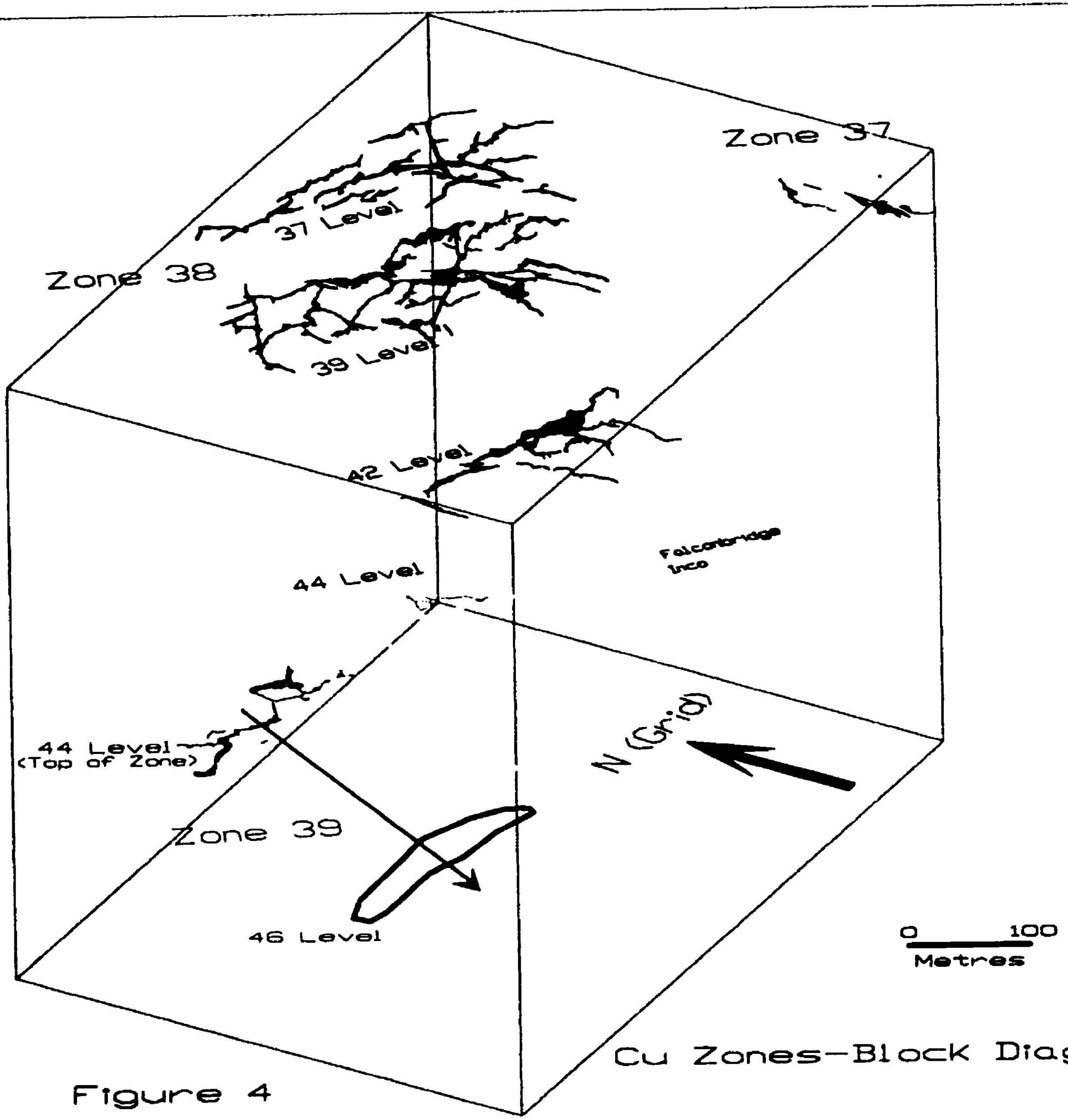
STRATHCONA MINE
SCHEMATIC PLAN VIEW*

* Zones 37, 38 and 39 projected vertically to 2500' level

Figure 3



STRATHCONA MINE
SCHEMATIC COMPOSITE SECTION
(Looking Northeast)



Cu Zones-Block Diagram

Figure 4

Geology
Zone 39 – 44 Level: Cut 3
Plan View

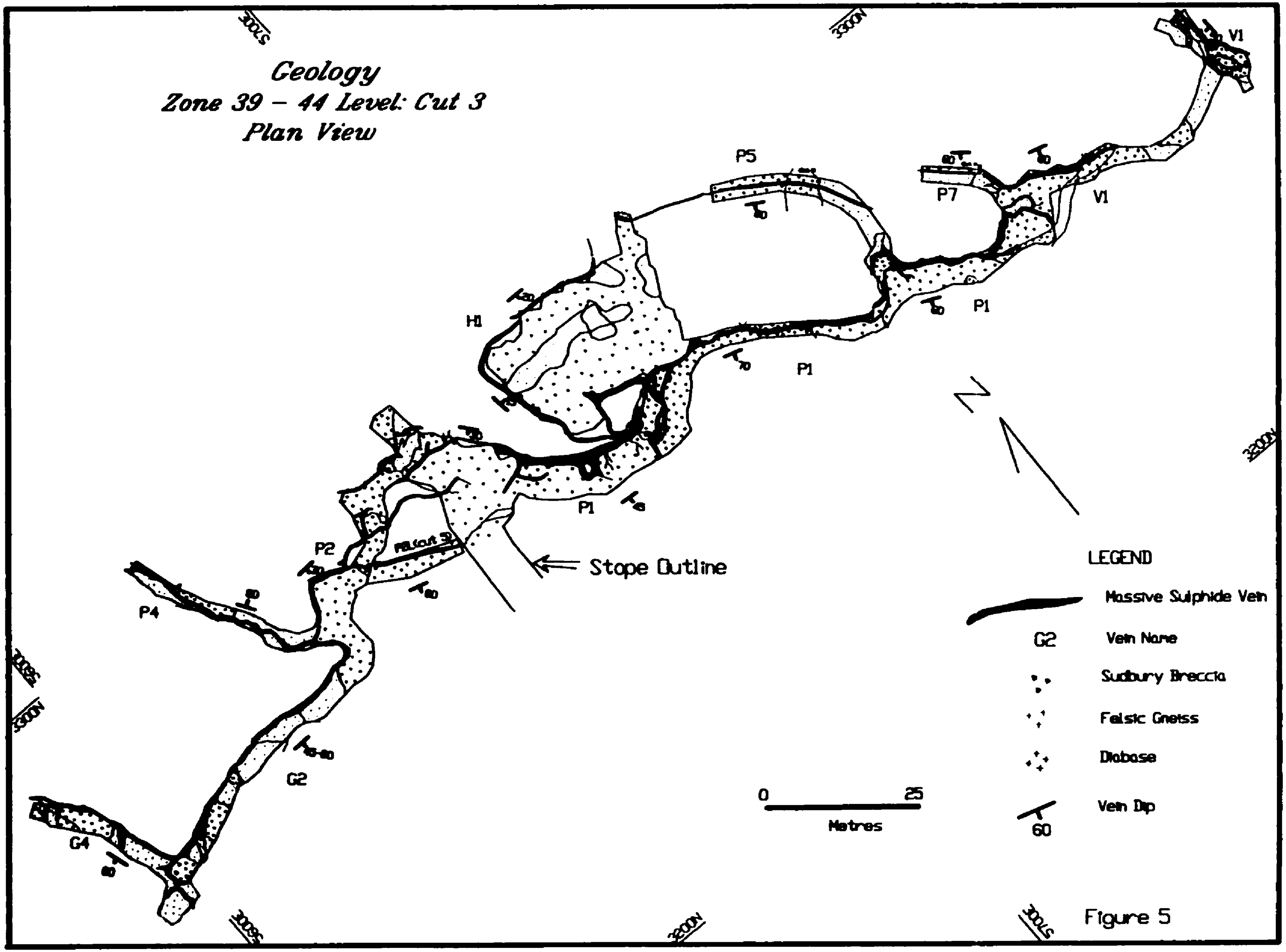


Figure 5

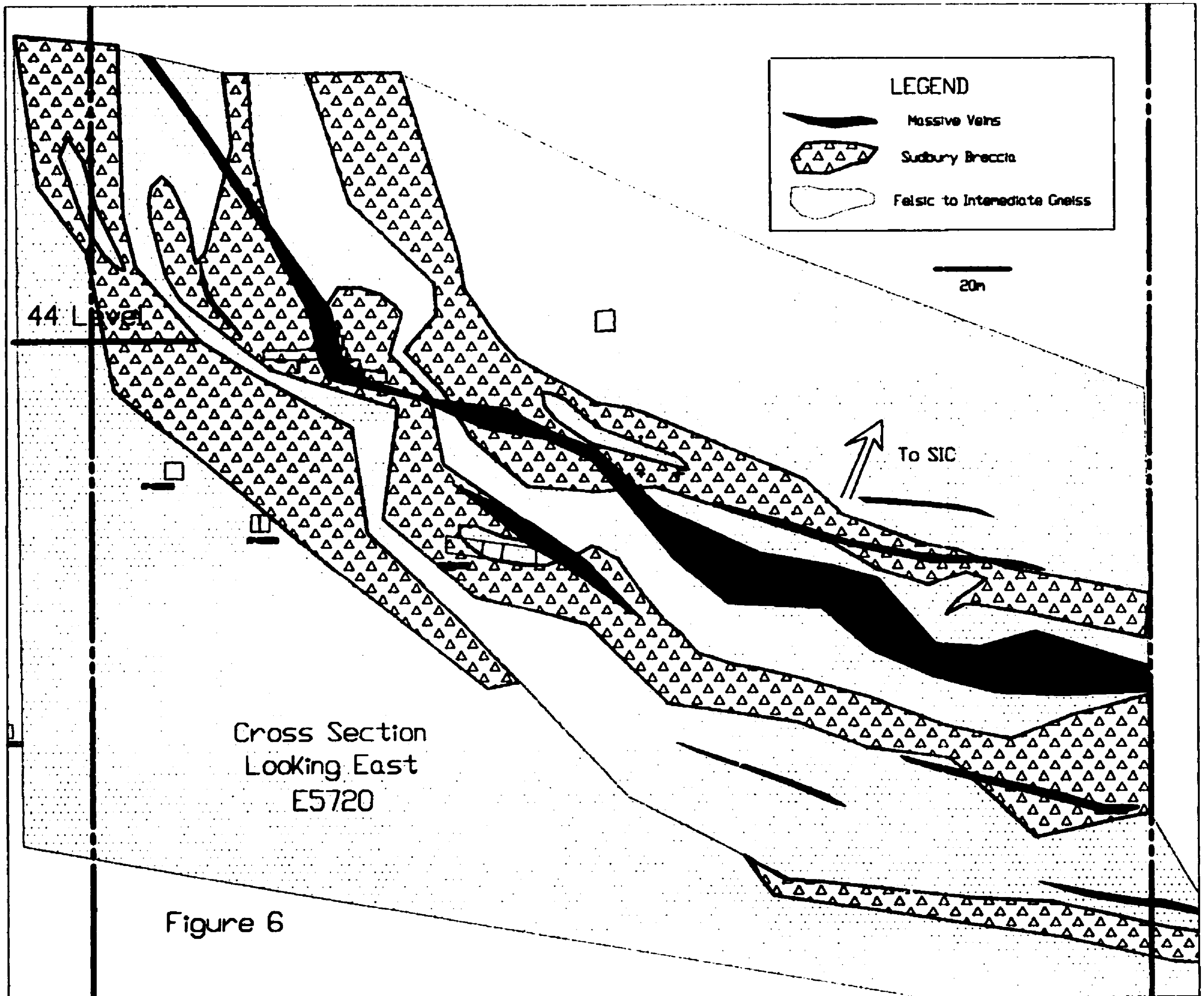

LEGEND
Massive Veins
Sudbury Breccia
Felsic to Intermediate Gneiss
20m
To SIC
44 Level
Cross Section
Looking East
E5720

Figure 6

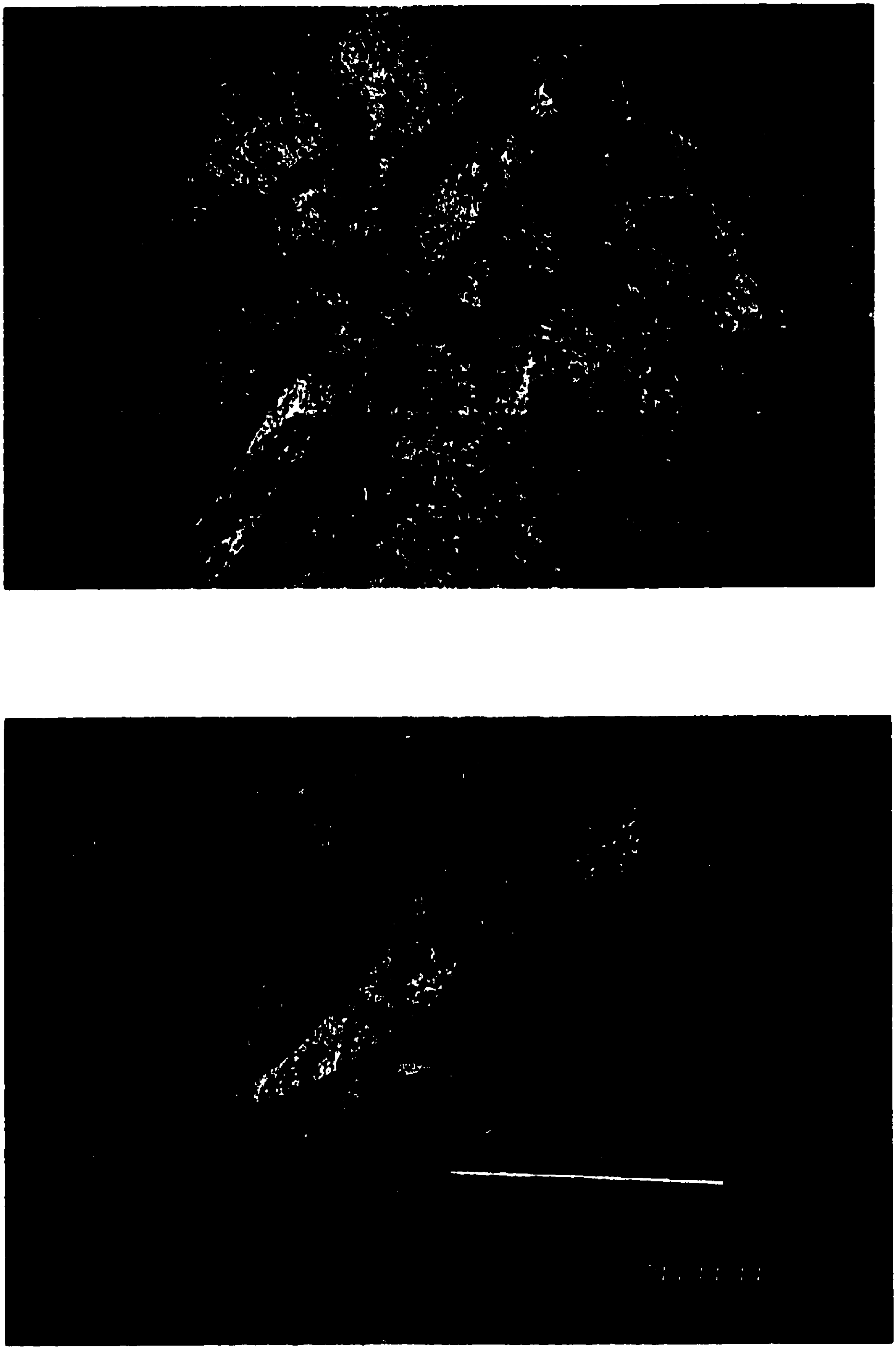


Figure 7a- *Top photo:* Massive sulphide vein hosted by Levack gneiss. A secondary vein is branching off the main vein. A 1-3 cm alteration selvage is well developed on both the main vein and the secondary branching vein. *Bottom photo:* Massive sulphide vein cross cutting Sudbury Breccia. The fracture aperture is variable. Both photos are oriented vertically.

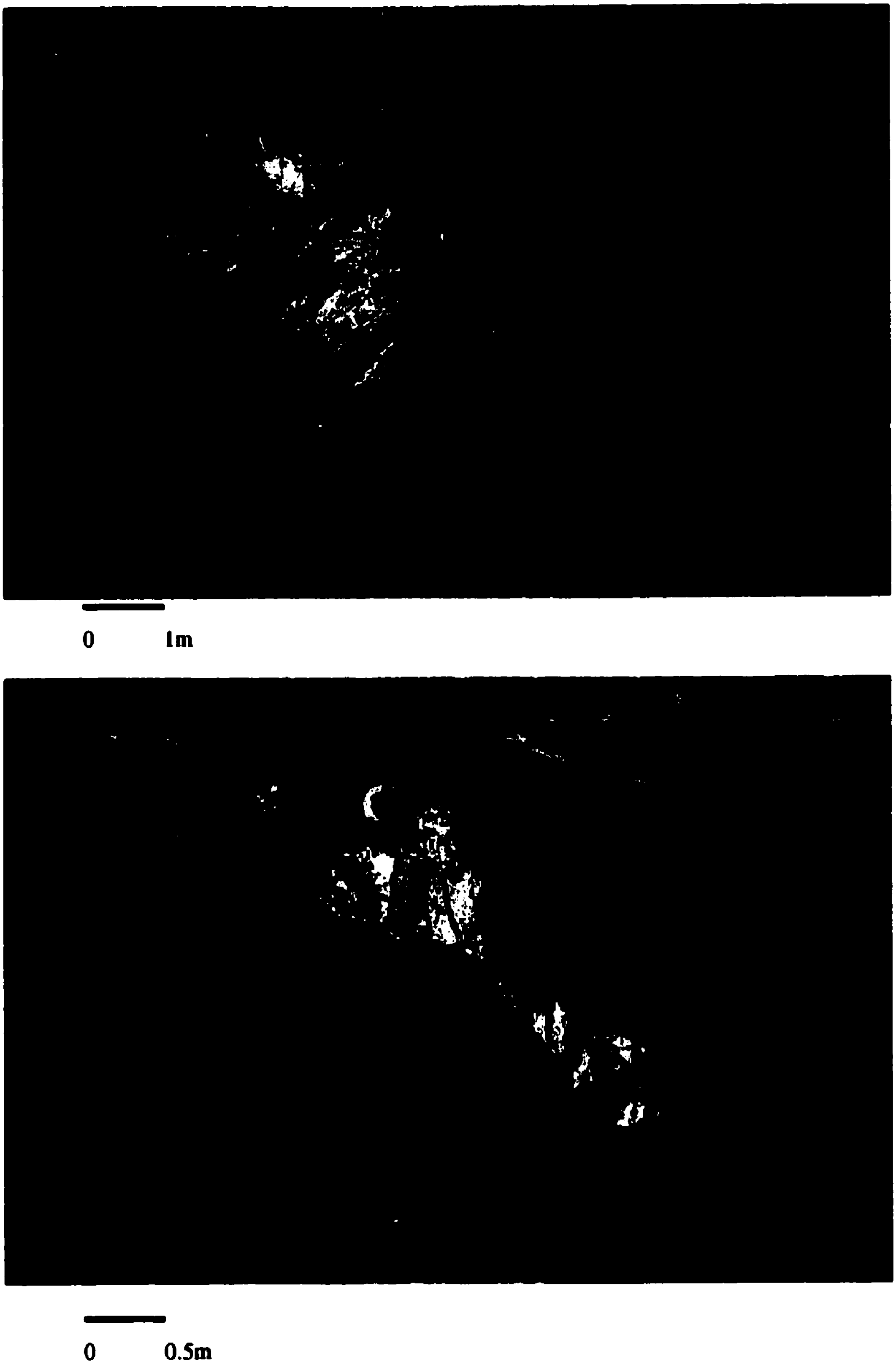


Figure 7b - *Top photo*: Vertical face with P1 vein (thickness is 1.5 to 2m wide) hosted by Sudbury Breccia. *Bottom photo*: Vertical face with massive chalcopyrite-rich vein becoming irregular and Ni rich (top left side of picture).

1.43 Previous Work and Existing Models

With the exception of work included in Fedorowich's (1996) structural report and a limited amount of internal work done during the exploration stage, no previous research has been done specifically on Zone 39. Zones 36 and 38, along with mined out Ni-Cu zones, have been studied by several authors (Naldrett 1967, Cowan, 1968, Abel 1979, Nikolic 1979, Coats and Snajdr 1984, Money 1992, Li et al. 1992, Farrow and Watkinson 1992, Fedorowich, 1996).

The main models for formation of the Cu zones are:

i) Sulphide crystal fractionation (Keays et al., 1970, Naldrett et al. 1967), where a Cu-rich sulphide liquid separated from an original sulphide magma that was undergoing fractional crystallization of a relatively primitive (pyrrhotite-rich) monosulphide solid solution at the base of the SIC. In this model Cu, Pt, Pd and Au are incompatible and preferentially partition into the sulphide liquid whereas Fe, Ni, Co, Rh and Os are compatible and partition in the fractionated MSS. Sulphide fractionation is interpreted to account for increses in Pt/(Pt+Pd) and Cu/(Cu+Ni) within sulphides with increasing distance from the SIC. The fractionation model implies that there should be a systematic variation in the composition of the sulphide related to the progressive fractionation of the sulphide liquid, and that the veins are technically igneous sulphide dykes. This model was used to explain metal zoning observed when comparing the different zones at Strathcona. This fractionation model has been extended to include fractionation within individual Cu zones and veins (Li et al. 1992).

ii) A hydrothermal process where metals are interpreted to have been leached from the Sublayer and Footwall Breccia hosted sulphide and deposited into cross-cutting fractures in the footwall due to cooling. The metal-carrying fluids are interpreted to be post-magmatic hydrothermal fluids associated with the SIC (Watkinson and Farrow, 1992). Evidence supporting this process includes hydrothermal alteration along with associated Cl-rich and hydrous minerals. Systematic metal variations, ascribed to sulphide fractionation, could be explained using a thermal gradient with respect to increasing distance from the SIC.

iii) A combination of i and ii (Li et al. 1992).The veins formed as in i) but also contain mineralization formed by hydrothermal remobilization upon cooling. Hydrothermal features consists of wallrock alteration along with sulphide disseminations and minor stockwork veinlets found adjacent to discrete massive sulphide veins and at the extremities of the zone. The latter include quartz-epidote-actinolite veins with disseminated pentlandite, millerite stockwork veinlets, bornite-native Ag veinlets and veins rich in quartz, feldspar, epidote and calcite (with disseminated sulphide).

Li et al.(1992) concluded that further fractionation of an intermediate solid solution (ISS) resulted in a laterally zoned metal distribution in Zone 38 (levels 39 and 42) with concentrations of Pt+Pd increasing with Cu and Cu+Ni in areas where Fe decreases. This zoning was proposed for areas with increasing distances radially from a point thought to represent an original liquid conduit from the SIC (Figure 8). This also indirectly suggests as the veins become narrower, and nearer to their terminations they contain higher PGE concentrations. The same zonation is also interpreted to occur across each individual vein, outward from the center of a vein into a dispersed sulphide halo within the wall rock and along the progression from massive sulphide to quartz sulphide veins present at vein terminations

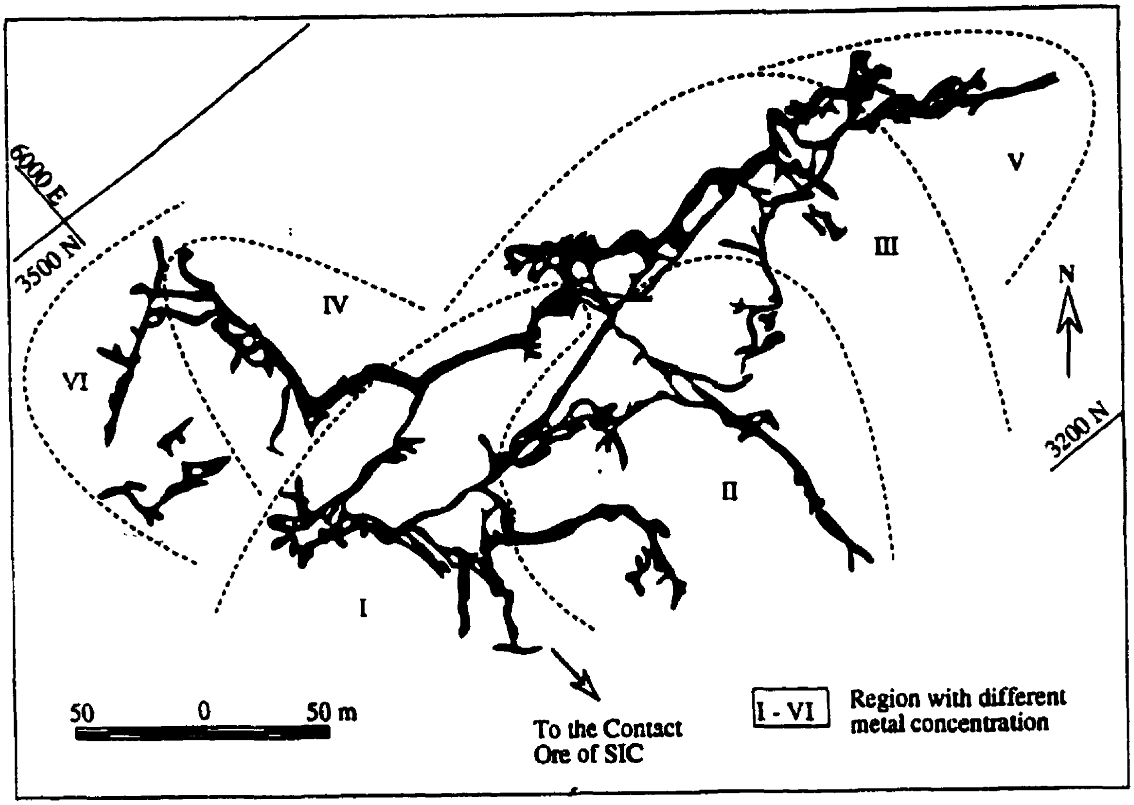


Figure 8 - Level Plan of Zone 38, level 39, with sulphide veins and lateral metal distribution patterns (From Li et al. 1992). Concentrations of Pt+Pd , Cu+Ni and Cu are interpreted to increase from region I to VI. (see table 2 below)

Region	n	Ni	Cu	Pt	Pd	Au	Ag	Cu+Ni	Pt+Pd	Fe
I	106	1.93	24.79	3.52	5.64	0.34	153	26.78	9.16	40.33
II	118	2.32	24.90	3.92	6.06	0.34	148	27.22	9.98	39.55
III	81	1.90	26.49	5.00	7.84	0.25	121	28.39	12.80	38.21
IV	142	2.61	27.47	5.02	8.35	0.31	136	30.08	13.37	36.63
V	65	1.99	29.08	5.97	8.49	0.38	107	31.07	14.46	35.69
VI	46	1.24	30.24	6.63	8.79	0.46	121	31.48	15.42	35.56

Table 2 - Metal values (arithmetic means) for documented lateral metal variations: Zone 38 (Li et al. 1992). Increases were proposed for Cu, Cu+Ni and Pt+Pd with lateral distance increasing radially from an original pathway.

Money (1992) examined at lateral metal distribution patterns within Zone 38 on 3700' level and found a distinct Fe, Ni and Cu zoning, but did not find strong evidence for PGE zoning. Zoning of Fe,Cu and Ni was interpreted to be concentric from the core outward as opposed to a radiating pattern towards the footwall as documented by Li et al. on levels 39 and 42. Money also documented significant local random variations in precious metal concentrations.

Level	n	%Ni	%Cu	Au ppm	Pt ppm	Pd ppm	Ag ppm	%Cu+Ni
37	387	2.27	26.14	0.47	3.92	5.94	121	28.41
37*	386	2.07	26.14	0.37	3.99	7.09	120	28.21
39	1200	2.45	26.26	0.40	4.25	6.70	141	28.71
42	264	1.54	29.77	0.38	4.58	6.98	118	31.31

Table 3: Apparent Vertical Metal Variations, Zone 38

(From existing Falconbridge Data). Showing arithmetic means for Pt, Pd and Cu increasing with depth.

* Means from Money (1992), are, with the exception of Cu, anti-ln means.

Zone 38 grade control data, suggests a systematic increase in Pt, Pd and Cu with increasing depth (Table 3). Cu zoning is also evident in Zone 36 where the top of the zone contains lower Cu as it contains a higher proportion of Cubanite (B. Nikolic per. comm). Cu, Ni and Fe zoning is also evident in Zone 37 (Falconbridge grade control data).

Previous extensive mineralogical studies have been completed on sulphide veins from Zone 38 (Li and Naldrett, 1992, Springer, 1985, 1987). The following descriptions are summarized from Springer (1985,1987). Platinum group elements

(PGE's) within Zone 38 occur mainly as discrete minerals without significant solid solution within sulphide. Some minor solid solution of Pt within pentlandite and Au within chalcopyrite has been documented. Pt occurs predominantly in moncheite $(Pt,Pd)(Bi,Te)_2$ and more rarely as insiswaite ($PtBi_2$). Pd occurs in merenskyite $(Pd,Pt)(Bi,Te)_2$ and froodite $PdBi_2$. Ag and PGE's are closely associated with Pb, Te and Bi minerals. Platinum group minerals (PGM's) as well as Au and Ag-bearing minerals are commonly found in samples with low sulphide concentrations. Most PGM's were found to be generally 10-100 μm in size and spatially associated with gangue minerals. Au is found mainly as electrum (< 50μm). A total of 27 grains of native Au were identified in samples from Zone 38, all found within a gangue matrix.

Limited previous mineralogical work done on Zone 39 (Whittaker, 1994) identified Bi and Te-PGM's, 20-100 μm in size, occurring as grains interstitial to silicates and as subrounded inclusions in pentlandite, chalcopyrite and pyrrhotite. Electrum occurs in 2 modes, as free grains hosted by quartz, feldspar and insizwaite and as free Au grains up to 50 microns. Grain boundaries in insizwaite may be defined by linear arrays of native gold particles.

2.0 Metal Distribution - Zone 39

2.1 Objectives

The main objectives were to:

- Determine if systematic spatial variations in metal concentrations exist in Zone 39, and if so, define how these variations could be used to predict the metal concentrations from different regions of the zone.
    - ⇒ Test the ability to define and predict the grades at two different scales: i) laterally using closely spaced grade control samples, and ii) in 3 dimensions using more widely spaced drill hole data.
    - ⇒ Some specific applications include: (i) providing local vein grade estimates; ii) determining whether narrower veins and vein terminations, which may be sub-economic to mine, contain higher precious metal concentrations; iii) predicting metal concentrations at specific vertical levels within the deposit and; iv) quantifying, and partitioning components of local random metal variations.
- To investigate whether metal distribution trends can be used to define target areas where more highly PM-enriched mineralization may occur.

2.2 - Methodology

Utilizing assay data obtained from different sampling regimes, variations in metal distribution were investigated at three different scales. A detailed documentation of the sampling, analytical and interpretation methodology is included in Appendix II. A list of definitions used in the study can be found in Appendix VII. Flowchart 1, located on page 33, summarized the methodology.

2.21 Local Scale

The local scale is defined as a single minimum mining unit or sample site. Multiple and split samples were collected from active cut and fill mining faces. From these samples, along with repeat and split sampling of pulps and rejects, local variances were quantified and components partitioned. These components are the sum of the natural or intrinsic + sampling + sample preparation + analytical variances (Merks, 1985, Nichol et al., 1989). The local variance is a measure of the confidence or relative error inherent in using a single assay to predict the metal concentration for a given area or volume of influence. This variance is also inherent in mean values (and related precision) from groups of samples used to predict and compare concentrations for larger areas. Figure 9 illustrates the sampling method.

Fifty polished thin sections were examined from the lower and upper parts of the deposit. Optical mineralogy along with electron microprobe (EMP) and scanning electron microscope (SEM) work was completed in order to describe the basic mineralogy and investigate the nature of the PGE and Au mineralogy and its relationship to local variances.

2.22 Lateral Scale

Variations occurring laterally across a horizontal slice of the deposit are based on equal sized (1 kg) single massive sulphide samples taken at a regular interval during the mining of a cut. A total of 305 samples were taken on cuts 1 and 3 (4400' level) at 3m and 6 m intervals respectively. These two cuts occur near the top of the zone which was the only part of the deposit where detailed underground sampling was accessible. Point plots and a statistical analysis of the data were completed and interpreted. Detailed mapping of lithology and structural features was also completed and compared to distribution patterns.

Point plots, used to define lateral variations, consist of plans with metal concentrations plotted (the data was quartiled to define four different metal classes) for each individual sample using a color code (see Figure 12). Patterns were defined by groups of samples that occur together, and contain similar metal concentrations. As this method is subjective, the following interpretation criteria were applied:

I. Zones with relatively high or low concentrations were defined as those comprised of 90% of samples from the lower or upper two metal classes respectively.
II. Two cuts were sampled and plotted. If high or low zones defined using the above criteria are not repeatable on both cuts, the zone was not included.

III. The data was randomized and replotted to test for the subjectiveness of the selection criteria. The number of samples contained within apparent zones occurring due to random chance were defined. Potential zones defined by less than this number of samples were rejected.

2.23 3-D Scale

Variations occurring throughout the zone, are based on sampling of diamond drill holes intersecting veins at 20 to 40 metre spacing. A total of 850 samples were used. These samples include all the assays above an economic grade cut off based on consideration of all six metals (Cu, Ni, Au, Ag, Pt and Pd). Due to the irregular vein contacts, orientation and drill core axis angle, these samples contained various amounts of sulphide. As the study is designed to compare metal concentrations within the sulphide only, the data was subdivided into massive, semi-massive and mineralized groups for comparison purposes. This division was done using %Cu+Ni with >20% classified as massive, 10-20% as semi-massive and <10% as mineralization. The mineralization group is represented by secondary irregular veinlets and disseminations, often with relatively high Ni or PM concentrations. It may occur in a halo region proximal to the massive veins or as isolated veinlets. Normalization methods (to 100% sulphide) were not used as the modal percentages of millerite/pentlandite and chalcopyrite/cubanite are variable and unknown. A lack of correlation between PM's and sulphide content along with high local random variations also suggest re-calculating PM's to 100% sulphide may not be a correct assumption. (Appendix II further describes reasons and subdivision criteria). The sample sizes are not consistent and are dependent on the thickness of the vein. Point plots, contouring and statistical analysis were completed and interpreted. Subgroups based on relative distance from the SIC, position along plunge and strike were averaged and compared to reduce the effects of high local variability on individual samples. Subgroups based on increasing relative distance from the SIC (distance further into the footwall) include Hangingwall (HW), Main (M), Footwall (FW) and Footwall 2 (FW2). The veins all occur in the stratigraphic footwall relative to the SIC. Hangingwall and footwall refer to structural position with respect to the main vein orientation. The Footwall veins, as observed from existing mining, have a relatively steep dip as compared to the Main veins.

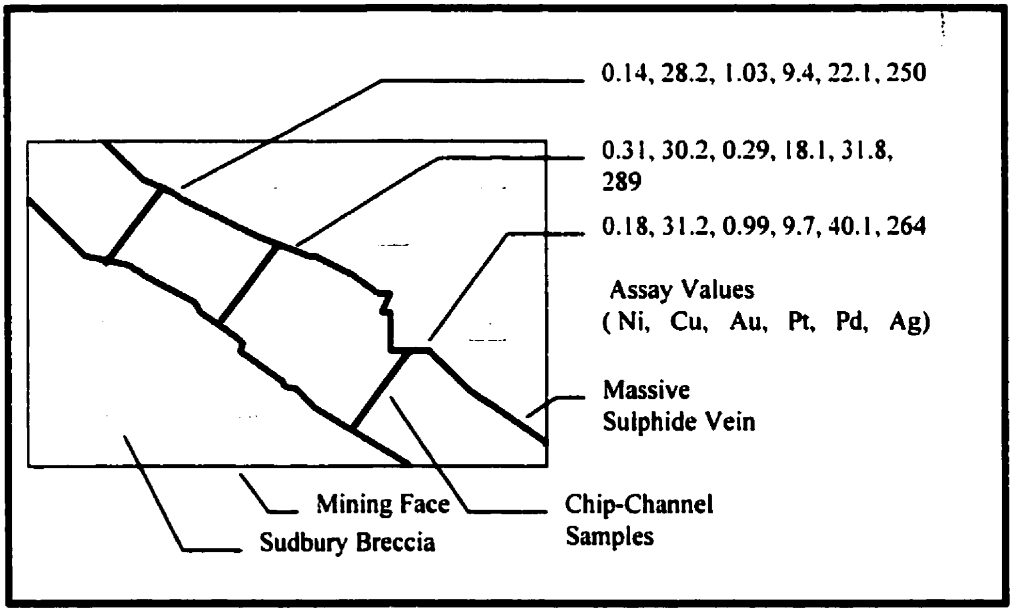
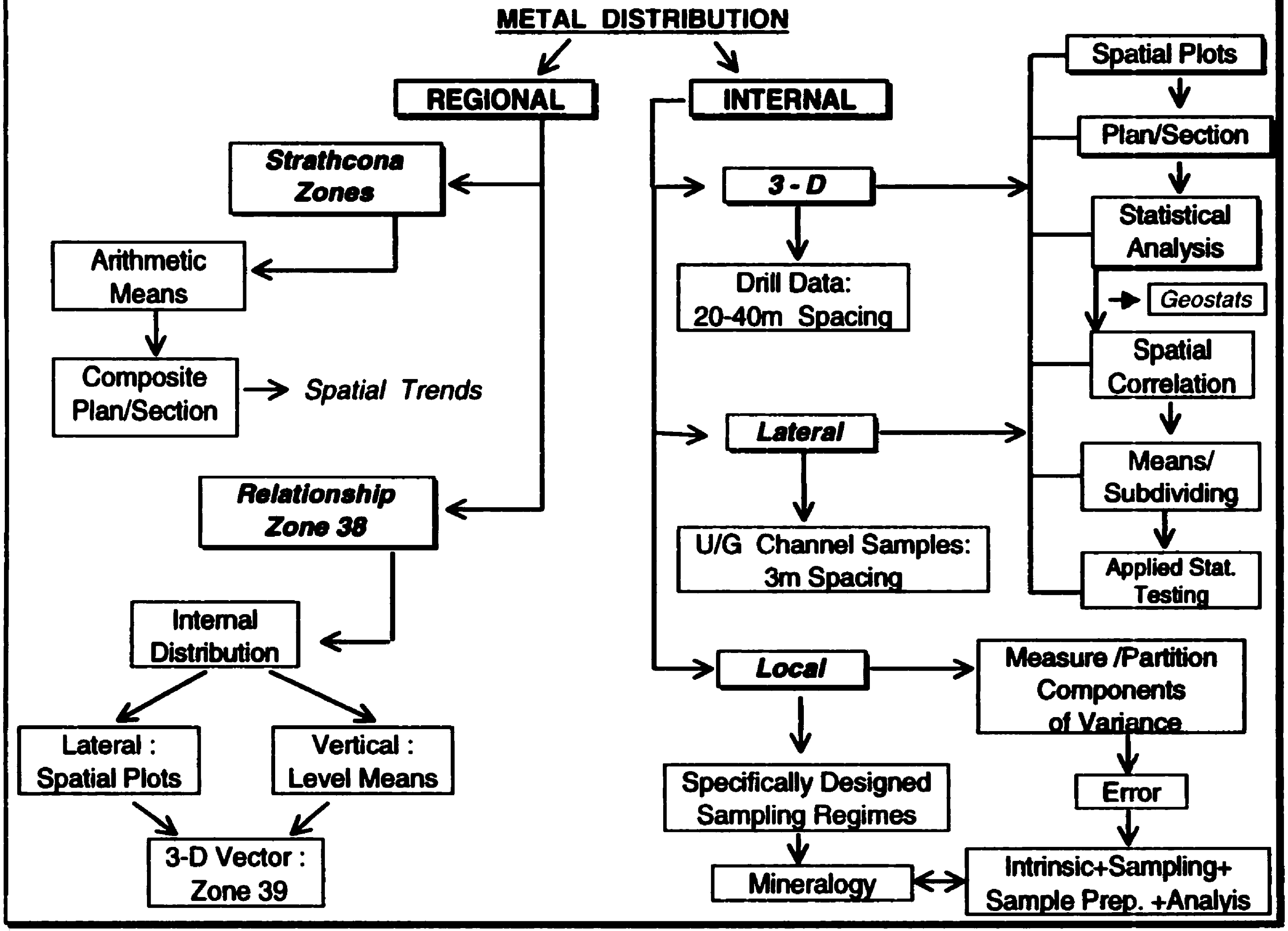


Figure 9: Example of sample locations on a mining face where multiple channel-chip samples (3-6) were taken.

Single channel-chip samples were collected on the other faces (lateral distribution). The vein width in zone 39 varies from 20 cm to 2 m.

METHODOLOGY FLOWCHART

Flowchart 1



2.3 - Results and Discussion

2.31 Local Scale

Mineralogy:

Macroscopic:

Mineral assemblages visible in underground faces, hand and core samples are typically composed of 70-90% chalcopyrite and cubanite (not typically visible), trace to 10% millerite and pentlandite, trace to 2% magnetite (up to 10% locally) and 5 to 15% gangue minerals such as quartz, feldspar, calcite, epidote and chlorite. Veins composed primarily of millerite and pentlandite are also common.

Chalcopyrite has a massive anhedral texture with vague grain boundaries. Millerite typically occurs as laminar lenses often parallel to and near the vein edges. Millerite and pentlandite also are concentrated where minor veins branch off the main veins and where vein aperture narrows such as at vein terminations. Large diabase blocks typically host irregular pentlandite and millerite-rich veinlets. Pentlandite occurs as more blocky irregular lenses and patches. Distinct coarse grained pentlandite eyes or pyrrhotite laminations similar to those seen in Zone 38 were not observed. Magnetite occurs as 1 - 2 mm evenly distributed disseminations of grains. Up to 10% magnetite occurs as aggregates and as trails of aligned grains. Local variations in magnetite content do not have a recognizable spatial pattern. Gangue minerals are found along fractures, as inclusions within the massive sulphide, in branching veinlets and in narrow areas where the massive sulphide veins pinch. Locally, zoning occurs along branching veinlets from chalcopyrite to chalcopyrite/millerite to bornite/millerite to quartz/calcite/bornite/native Ag. Occasionally, pervasive epidote alteration is found in the immediate wall rock where the veins terminate.

Variations in Cu are inversely proportional to variations in millerite and pentlandite. Higher bornite and native Ag can be seen locally in small branching veinlets and in vein terminations and is locally extensive at the termination of the G4 vein (Cut 3, Figure 5) . No other visible Cu variations are evident (variations in cubanite or bornite content). Higher Cu assays in the database indicate that small amounts of bornite or chalcocite may be present throughout the zone.

Pt, Pd, Ag or Au-bearing minerals are not distinguishable to the naked eye and intrinsic variations (if present) are dependent on petrographic work and assaying. No related indicator minerals or other geological features exist with the possible exception of magnetite which shows a very weak statistical correlation with Pd and Pd (Appendix I, see Sill Cut data w.r.t. % magnetite).

Optical Microscopy

In thin section, cubanite exsolution lamellae occur within anhedral chalcopyrite along cleavage planes in two directions and comprise approximately 5-20% of the sulphides. Cubanite however, was not observed in the thin sections taken from the upper part of the deposit indicating the top of the deposit may be richer in Cu and relatively depleted in Fe. Pentlandite and millerite occur as laminae and lenses that cross-cut cubanite. Pentlandite typically occurs as blocky grains often broken or fractured with pieces set in a matrix of chalcopyrite indicating it crystallized and was transported when the chalcopyrite was still a liquid or that it fractured during later deformation, with the chalcopyrite behaving in a more ductile manner. Millerite and pentlandite do not appear to have any systematic distribution pattern in thin section. Magnetite is evenly distributed, and may occur as aggregates with gangue minerals (quartz, epidote, feldspar). Euhedral galena occurs consistently as 50 -100 µm grains. Sphalerite is also a common accessory mineral. Visible gold or recognizable platinium group minerals were not identified under the microscope.

Scanning Electron Microscope (SEM)

Nine thin sections were examined using the electron microprobe (EMP) and SEM (Amray 1830/T , accelerating voltage 20kv). These sections represented two traverses across the massive sulphide veins, one from face samples from the top of the deposit (44 level, Cut 3) and the other from drill hole core from the lower levels of the deposit (~46 level). A sample of massive sulphide containing high concentrations of magnetite and a quartz-epidote-chlorite-bornite- rich sample from a vein termination was also examined. The purpose was to (qualitatively) investigate precious metal (PM) and platinum group mineral (PGM) grain size and distribution characteristics. Figure 10 illustrates SEM backscatter images and areas where individual grains were identified. On these Figures PGM refers to either a platinum or palladium-TeBi mineral.

Pt and Pd occur as bismuthides, tellurides and Te-Bi minerals. They are spatially associated with aggregates of gangue minerals occurring as inclusions within the massive sulphide and within the wall rock a few mm from the vein contact. Minerals containing only Bi-Te were identified as well as one grain of possible native Bi. One Os-Bi-Te grain 10 microns in size was identified. PGM grain size ranged from 10-100 microns with one grain up to 300 microns. Gangue minerals within the sulphide are commonly associated with the PGM's include quartz, Fe-chlorite, Mn-Cl-Fe-silicates and magnetite. Less commonly Cl-bearing biotite, as well as pyroxene, ilmentite and zircon were identified. Ag occurs mainly as hessite (Ag_2Te). Ag-bearing pentlandite was identified in one sample. Other common minerals found within the massive sulphide include galena and sphalerite. Pentlandite in one sample contained a 60/120° fracture pattern filled in with chalcopyrite. Other than the spatial association with gangue inclusions, no spatial distribution patterns such as an increase in PGMs near the vein contacts were observed.

EMP

Results from the EMP analyses shown in the Table below include relatively low Fe contents for both sphalerite and pentlandite.

Mineral	***%Ni***	***%Cu***	***%Co***	***%Fe***	***%S***	***%Zn***
Chalcopyrite	-	34.6	-	30.4	35	-
Pentlandite	37	-	1.55	27.7	33.1	-
Sphalerite	-	-	-	5.6	31.2	61

Table 4: Results of microprobe analysis

(A Cambridge Mark V probe was used, accelerating voltage 20kv.)

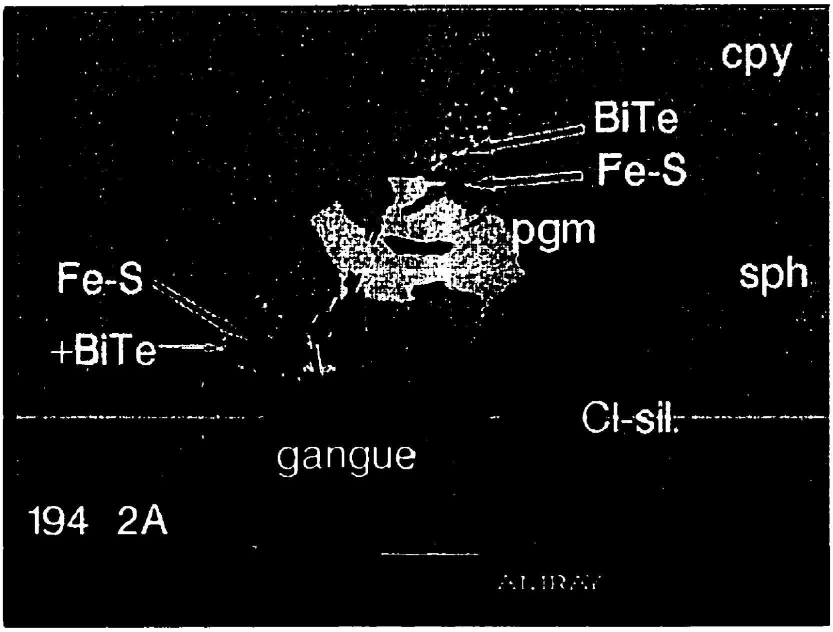


Figure 10 (a) - SEM image displaying a cluster of accessory minerals within massive chalcopyrite (cpy) from drill hole ST44-194 (from lower part of deposit) containing a relatively large platinum group mineral (PGM) 200 by 100 µm. Also present are very fine grained (<10µm) inclusions of BiTe within pyrrhotite, a Cl-silicate mineral and sphalerite. Magnification is 300X.

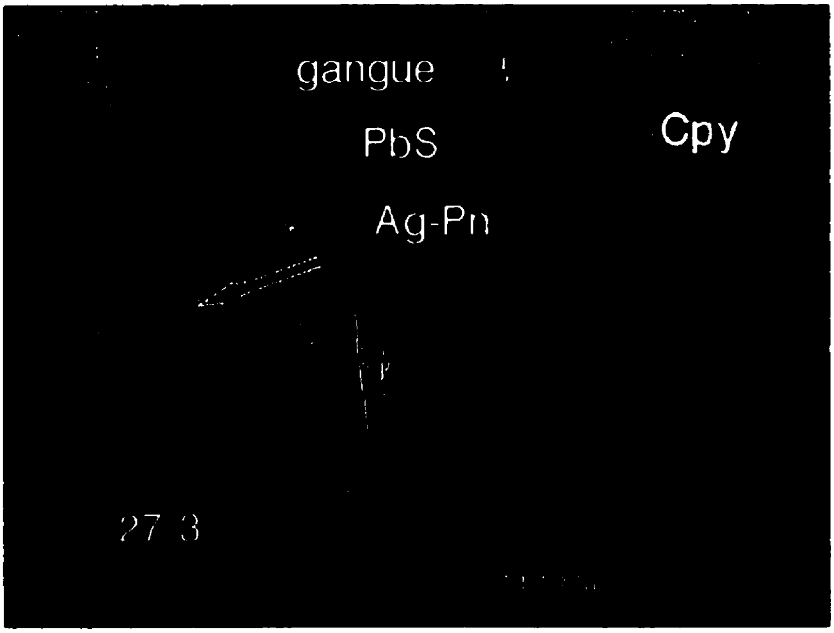


Figure 10 (b) - SEM image of a cluster of gangue minerals within massive cpy containing Ag-bearing pentlandite intergrown (replacing?) with cpy. Sample is from 44 level. Scale bar is 100 µm, Magnification 300X.

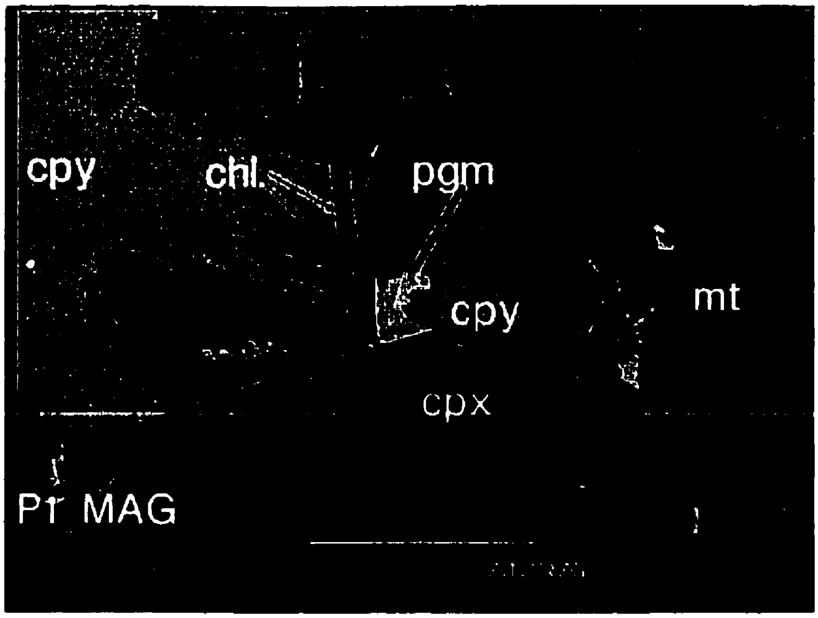


Figure 10 (c) - Massive sulphide sample from 44 level containing 10% magnetite (mt) occurring as 5-10mm aggregates of 0.5-1mm grains. A fine-grained PGM (20μm) is enclosed by surrounding cpy, magnetite, clinopyroxene (cpx) and chlorite (chl). Magnification 680x.

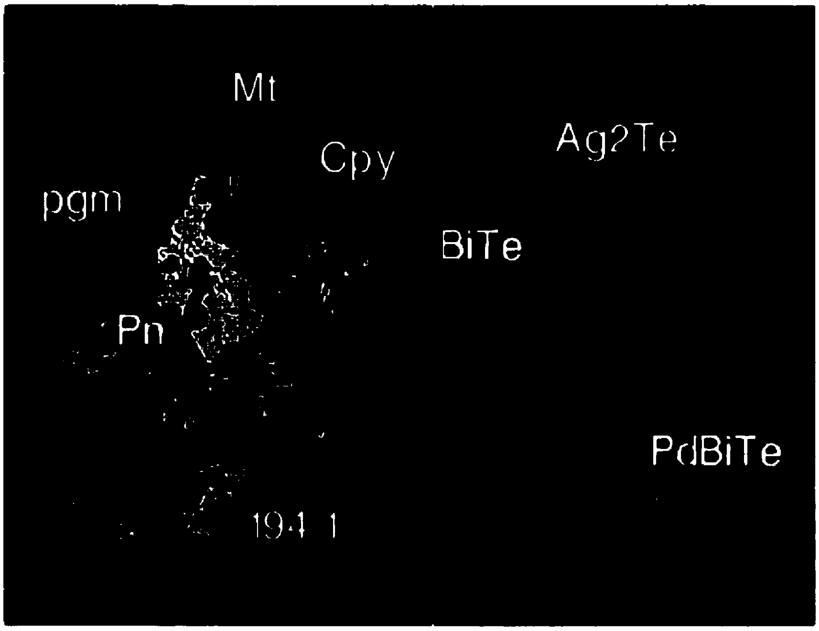


Figure 10 (d) - Sample from drill hole ST44-194 showing an aggregate comprised of hessite (Ag_2Te), magnetite (mt), PdBiTe, BiTe and pentlantite (Pn) within a gangue inclusion. Note: Right side is a close up of centre area.

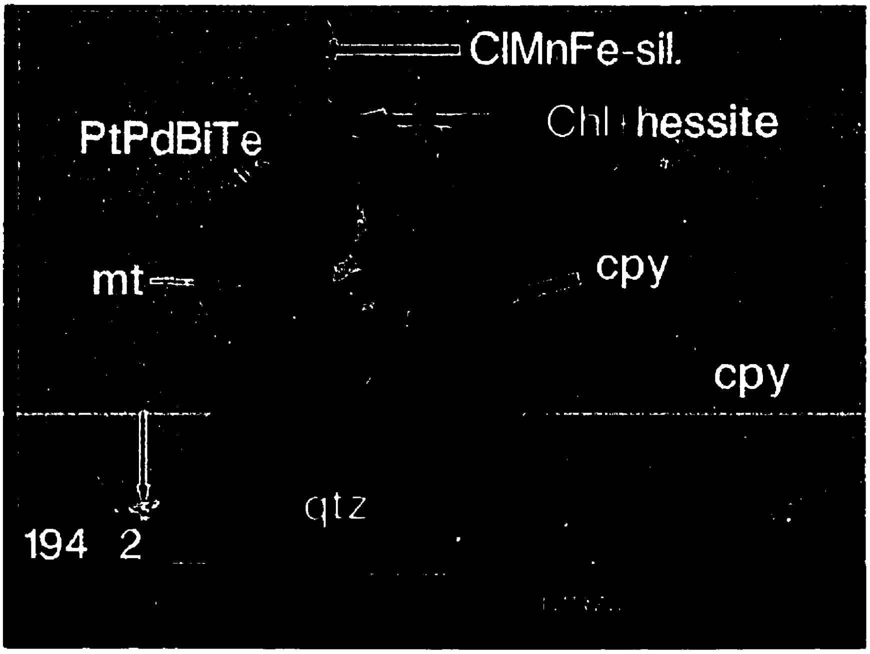


Figure 10 (e) - Sample from drill hole ST44-194 showing a 1mm grain of magnetite (mt) hosted by a quartz inclusion within massive cpy. Contained within the magnetite are 100µm pgm inclusions. Note also remobilized micro-veinlet of cpy within the magnetite.
Note: Scale bar is 1mm. Magnification 50x.

Local Variances

A series of statistical tests, using different sampling regimes were completed to quantify, and partition components of, local variance and the precision of the sampling regime. (A detailed documentation is included in Appendix III)

The following definitions which describe the components of variance:

var (t) =total variance (intrinsic+sampling+sample preparation+analysis)
⇒ *At the scale of a single unit of measurement or volume represented by a single sample.*

var (i) = intrinsic variance (random or ordered natural variation along the length of vein sampled)
var (s) = sampling variance (composition + distribution variance, related to variations due to sample size, mineral grain size, shape and proportions of minerals)
var (p) = sample preparation variance (variations caused by reducing the size of the sample, crushing and homogenizing: heterogeneity in the subsample)
var (a) = analytical variance (variations related to analytical precision and possibly inhomogeneities the final subsample*): Measure of precision of re-assaying sample pulps*
var (spa) = sampling + sample prep.+ analysis (equivalent to variations related to the measurement processes and random variations due to local heterogeneity in the veins). *Referred to as split samples*
var (pa) = sample preparation + analysis: *Measure of precision of re-assaying sample rejects*

Test 1 involved quantifying the var(t) within a minimum mining unit which also represents the sample interval. The results give an approximation of the relative error inherent in individual assays used to represent a given area or volume as used to define lateral and 3-D zoning. Table 5 summarizes the extreme variations that occur for all elements except Cu.

Average of 17 Faces	%Ni	%Cu	Au ppm	Pt ppm	Pd ppm	Ag ppm
Face Mean	1.19	31.38	1.34	15.89	19.98	178
Face Range	2.38	3.28	1.78	13.06	15.35	63
Coefficient of Variation	95%	8%	49%	44%	45%	20%

Table 5: Ni, Cu, Au, Pt, Pd and Ag means and ranges for 17 faces

Results from 17 faces where 3 to 6 samples were collected from different areas of the vein on each face. The range is the average difference between the high and low sample on each face. The extreme local variations, which are much greater than anticipated potential zoning patterns, results in low confidence that a single sample will be representative of the actual vein grade. Note the range is similar to the average concentrations for Ni, Au, Pt and Pd.

Several other sampling regimes were performed in an attempt to measure and partition the components of this high local variance.

The results are summarized as follows (see Tables 6-8):

- The major sources of variance are sampling and intrinsic
- Intrinsic spatial variations (random) are the most significant (Table 6)
- Sample preparation variance is relatively high for the PM's but not significant as compared to var (i) and var (s)
- Analytical variance is insignificant.

	n	Ni	Cu	Au	Pt	Pd	Ag
Relative Error (Reject)	20	7%	1%	30%	15%	11%	16%
Relative error (Split)	10	48%	2%	78%	16%	22%	22%
Coefficient of Variation							
Split sample (Test 4)	10	25%	2%	38%	10%	18%	14%
Multiple Face (Test 1)	17	95%	8%	49%	44%	45%	20%

Table 6: Relative errors (sample repeatability) for samples at same location.

Compared here are relative errors (sample repeatability) for samples taken at the same location on a vein which are the differences between pairs of samples represented as a percentage. Rejects represent Var (pa) and split samples represent Var (spa)

Quantification of Var (s) and Var (pa)

The repeatability (relative error), which is based on repeated assays of sample rejects (measure of var pa), is good for Ni and Cu, moderate for Pt, Pd and Au and poor for Au (Table 6). For split samples repeatability is good for Cu, moderate for Pt, Pd and Ag, and poor for Au and Ni. When comparing coefficients of variation, which is a relative measure of variability, Ni, Pt, Pd relative errors are all significantly higher when samples are taken at different locations on a face (total variance from multiple face sampling as described in Table 5) indicating this is the most significant component of local variations.

These results indicate that lab related variances due to crushing, homogenizing and analysis are not the major cause of this extreme local variation, however they are still significant contributors. Major improvements to sample precision would require much larger or multiple primary and final (sub)samples and finer grained final subsample (Tables 7 and 8 illustrate the precision when larger / multiple samples are taken).

Precision of Densely Sampled Areas

Tables 7 and 8 illustrate confidence levels for areas where sampling density was increased.

	Pt g/t	*Pd g/t*
Mean	13.7	20.8
95% Confidence Interval	4.14	12.66
95% Confidence Range		
Lower Limit	9.5	8.1
Upper Limit	17.8	33.4
95% Asymmetrical Lower Limit	10.4	10.6

Table 7: Results of a PGE sampling test over a 10m strike length

Results of a PGE sampling test where 16 samples were taken along a 10 metre strike length (vs 2 to 3 samples per 10m available for the lateral distribution study). The results indicate that the mean PGE concentration for this part of the vein has a *precision based on a 95% confidence range of +/- 4.14g/T Pt and +/-12.66 g/T Pd. This translates into relative confidences of +/-30% for Pt and +/- 61% for Pd.

* *This precision includes all components and is based on Var(t).*

As illustrated by Table 7, increasing the sample density by 4 to 5 times would not be sufficient for confidently identify systematic variations in Pt and Pd (potential variations at a larger scale would have to be extreme).

	Ni	*Cu*	*Au*	*Pt*	*Pd*	*Ag*
Arith. Mean	0.05	35.00	0.66	12.61	20.28	215
95% Confidence Range	0.005	0.33	0.05	0.96	1.19	9.7
Lower Confidence Limit	0.04	34.72	0.61	11.65	19.09	205
Upper Confidence Limit	0.06	35.37	0.71	13.57	21.47	224
Range	0.09	6.02	0.81	20.8	21.6	303
Min	0.02	32.80	0.30	7.50	11.30	156
Max	0.11	38.82	1.11	28.30	32.90	459
% Coefficient of Variation	49	4	31	32	25	19

Table 8: Statistical parameters from a single face with 72 assays

The results indicate that even by taking 72 assays on one face which is about half the number of assays collected on an entire mining cut, the estimated mean grade of Pt and Pd (within a 95% confidence interval) still has a possible range of approximately* 2 g/T or +/- 6 to 8%. If comparing two faces, each with 72 samples, the difference would have to be greater than this confidence range to be recognized.

* The population distributions for the 72 samples are positively skewed to various degrees and some elements contain outliers. The 95% confidence interval assumes a symetrical continuous normal distribution. It is therefore used only as an approximation of precision. The populations are not simple lognormal distribtions either so transformations were not done.

Spatial Dependency

The only elements showing a systematic (ordered) variation in abundance across the length of the vein sampled (at 30cm intervals) were Au and Cu. Variations for all other elements along the vein are considered to be random using the given sampling regime. The use of geostatistical methods are not supported by these results as the majority of elements show no spatial correlation even at a 30cm sample spacing (see Appendix IV, Table 1)

Relationship of Local Variance to Grain Size

Using grain size results from SEM work, Table 9 outlines the relationship of grain size and frequency to the assay concentration. As an example to illustrate high local variance, equidimensional grains of insizwaite ($PtBi_2$) and a 10g final subsample are assumed (similar relationships can be assumed for the other PGM's or Au). In this scenario, the irregular distribution of grades across a face is explained by the randomness related to the number of grains included in the sample or area of the vein where the sample was collected - essentially a nugget effect. This becomes more significant with increasing grain size. Grains observed using the SEM ranged from 50 to 100 μm but grains larger than 150 μm were also seen. The final material used for the assay subsample is pulverized to less than 150 μm. The sampling precision can therefore be improved by collecting larger primary samples, assaying larger subsamples (30g as opposed to 10g) and pulverizing to a finer grain final size (50μm). The same theory can be applied to Au which occurs in much smaller concentrations and requires larger primary and subsamples to produce adequate precision (see Table 9b).

	150 Microns	**60 Microns**
# of Grains	**Pt Grade: g/T**	**Pt Grade: g/T**
1	12	0.8
2	24	1.5
3	35	2.3
4	47	3.0
5	59	3.8
6	71	4.5
7	83	5.3
8	95	6.0
9	106	6.8
10	118	7.6
15	130	11.3
20	142	15.1
25	153	18.9
30	165	22.7

Table 9: Hypothetical concentrations of Pt for grains 60 and 150 μm

As an example, if most grains within the veins of Zone 39 are 60 μm then approximately 20 grains occur in a 10 g subsample at the average Pt or Pd grade which provides acceptable precision (Clifton et al. 1969). However if larger grains, up to the final mesh size of pulverizing (150 μm) occur, then the precision becomes poor. As previously described 150 μm grains are not uncommon within the veins. Similar relationships with respect to grain and sample size are assumed for Pd, Ag and Au. High Ni variance however is simply due to the irregular/ heterogeneous distribution of millerite and pentlandite (mainly a function of intrinsic variance).

Gold Grain Size - Microns	Precision (95% Confidence Level)
250	220%
125	88%
63	28%
32	10%
16	3.5%
8	1.2%
4	0.4%

b) Theoretical precision for Au in a 10 g subsample (Nichol et al. 1987). The average concentration from face sampling is approximately 1 ppm. The grain size of Au could not be determined as no grains were identified. If the grain size is similar to the final mesh (150 μm) then a single assay will have a poor precision (approximately 100%). A smaller grain size will improve precision. If Au is native and relatively coarse grained (>150 μm) there may also be difficulty reducing it's grain size during pulverization due to it's malleability. PGM's and hessite are not as malleable.

2.32 Lateral Zoning

As discussed above, there are very large local variations in all metal values except Cu. This is due to local heterogeneity of Ni-sulphide and precious metal-bearing minerals in the massive sulphide and the related difficulty in collecting (and reducing/homogenizing) a representative sample from a specified area. The identification of zoning requires that the difference between individual samples be larger than associated var(t) (which is used in this study to derive confidence limits). Using arithmetic means for groups of assays, taken from several faces, to represent a metal concentration for a certain area will reduce the imprecision due to local variance. This needs to be done carefully, as a bias may occur due to skewed distributions or the influence of outliers. These means contain a variability which includes the local variances. If comparing differences between means representing different areas in the deposit, the precision or confidence limits on the mean must be considered before the differences can be considered statistically significant. Statistical tests used to test the comparison of means are described in Appendix IV (p.3).

Population Distributions

Using 285 face samples from cuts 1 and 3, the distribution of elements using histograms (Figure 11) showed the following results:

Nickel

Nickel (Figure 11a) has a strong positively skewed distribution. At least 2 populations (multiple, approximately lognomal) appear to be present with the second being relatively small. The mode of the overall population is only 0.08% compared to a mean of 3.45% and a median of 0.87% indicating a large portion of Zone 39 contains very low Ni concentrations. Transformation to logarithms results in at least two overlapping normal populations on histograms and probability plots. Comparing arithmetic means for Ni for different areas is difficult due to the mixed populations and skewness of distribution which can create a bias resulting in an over-estimate of the average. The means for subgroups being compared is strongly influenced by the relative proportion of outliers or amount of population mixing.

Copper

Copper (Figure 11a) has a negatively skewed distribution and correlates inversely to Ni. There is a small separate population of low concentrations which correlates with the Ni-rich veins. The mean, median and mode are very close in value. Similar concerns to that described for Ni need to be addressed when using arithmetic means.

Gold

Gold (Figure 11a) has a strong positively skewed distribution (close to Poisson to lognormal). There are, however, indications for overlapping multiple populations indicated by probability plots. The mean, median and mode are 1.12, 0.80 and 0.49 ppm respectively. The central tendency (assuming one lognormal population) would be best represented using Sichell's Mean (described in Appendix IV section 1.0, p.3) or an arithmetic mean of the first 97.5 percentile of the data. The variance and mean are similar which is characteristic of a Poisson distribution (common in gold distributions, Sinclair, 1976). The mean from drill hole assay data is significantly higher indicating the sampling method used here may be underestimating the overall Au concentration recovered. This theory is supported, as oppossed to a drill core overestimation, by significantly higher mill head grades for Au, and indications Au is concentrated in the wallrock proximal to the veins, as will be discussed in a subsequent section of this study.

Platinum

Platinum (Figure 11b) has a normal to overlapping (multiple) distribution. The mean, median and mode are very close. There is a small group of enriched outliers. The arithmetic mean provides a relatively accurate estimate of the overall concentration.

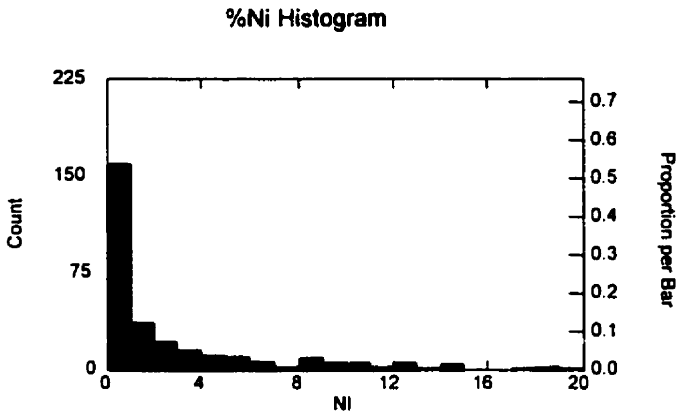
Palladium

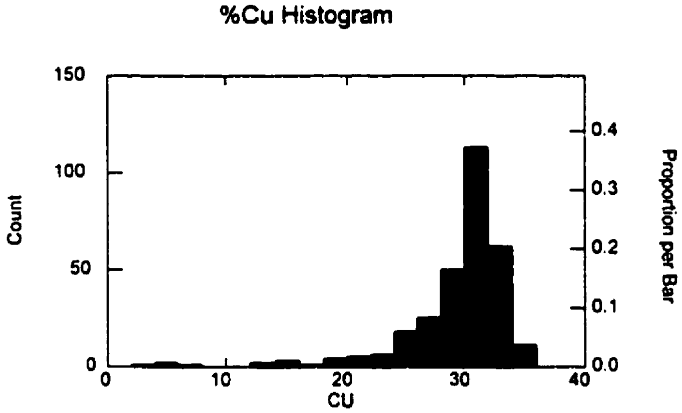
Palladium (Figure 11b) has a positively skewed distribution. There may be two overlapping populations. There is a small group of enriched outliers. The mean is slightly higher than the mode and median.

Silver

Silver (Figure 11b) has a close to normal (weak positive skew) distribution with a single population. Native Ag, can also occur locally (although these veins are not included in this distribution data).

Pt+Pd have two overlapping populations. Cu+Ni along with Pt/Pt+Pd form normal symmetrical populations (diagram not included for the above).





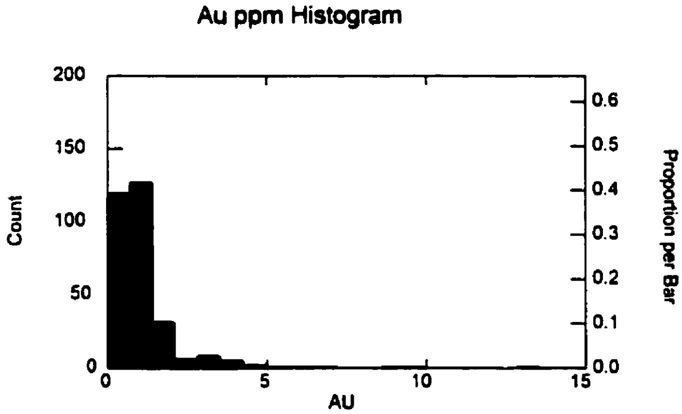


Figure 11: Histograms of Cu, Ni and Au from face samples taken in Cuts 1 and 3

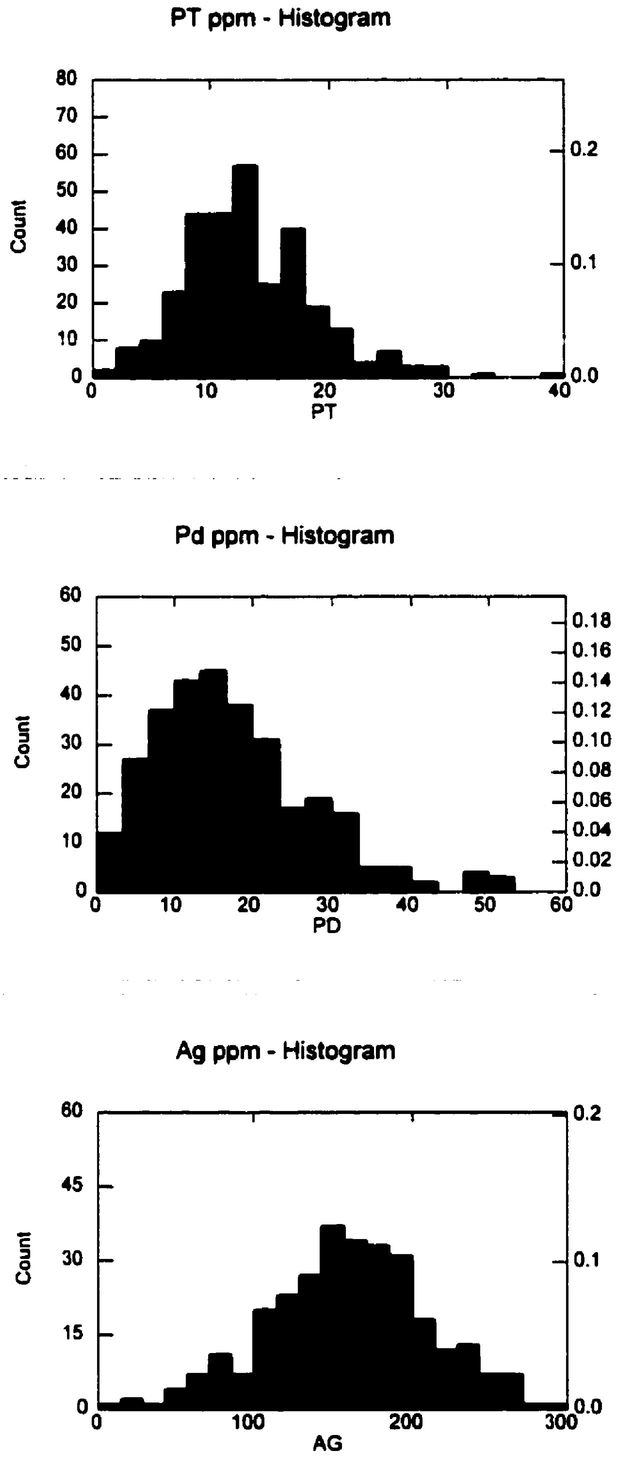


Figure 11(b) - Histograms of Pt, Pd and Ag from face samples taken in Cuts 1 and 3

Even though populations were not always normal, lognormal transformation were avoided as the populations were not simple lognormal distributions either.

Correlations:

Correlation coefficients are listed in Table 10. Ni and Cu have a strong negative correlation. Cu and Pd along with Pt and Pd have very weak positive correlations. No correlations exist between Au and Ag and any other elements. Correlations between estimated visible magnetite content (data in Appendix 1 , Section 1.2) and Pt, Pd and Pt+Pd are very weak (r=0.18, 0.18 and 0.21 respectively). This correlation is supported by mineralogical observations in that magnetite was often spatially associated with PGM's. No significant difference in metal content was found when disseminations and fracture coatings of calcite or quartz were observed.

Vein thickness (thickness data included in Appendix I, section 1.1) has a weak negative correlation with Ni (r= -0.31) and a weak positive correlation with Cu (r=0.33). Very weak positive correlations also exist for Pt (r=0.23), Pd (r=0.15) and Ag (r=0.27). Visual observations suggest there should be a correlation with Ni, Cu and possibly magnetite. Although the above correlations are all very weak and not strongly statistically supportable, the high (random) variably nature of the data may obscure relationships.

	Ni	Cu	Au	Pt	Pd	Ag
Ni	1					
Cu	**-0.89**	1.00				
Au	-0.01	-0.05	1.00			
Pt	-0.10	0.12	0.08	1.00		
Pd	-0.22	**0.25**	0.08	**0.27**	1.00	
Ag	-0.17	0.14	0.03	-0.11	-0.14	1.00

Table 10: Inter-metal correlation coeffients (r) for face sample data (n=305)

Mean Concentrations:

	%Ni	***%Cu***	***Au ppm***	***Pt ppm***	***Pd ppm***	***Ag ppm***
Mean	1.95	30.5	*1.12	13.47	17.47	168
95% Conf. Range	1.5-2.4	30.1-30.9	1.0-1.3	12.8-14.1	16.3-18.6	158-178
+/-	24%	1.4%	14%	5%	6%	6%

Table 11: Mean metal concentrations and associated precision for level 44 of Zone 39

**Drill core data returned an average of 4.0 ppm Au. It is assumed that a small amount of wall rock at the vein contact included in the sample contained higher concentrations of Au.*

All elements in Table 11 are arithmetic means except Ni and Cu, which are weighted averages based on vein width, due to the associated correlation. Millerite-pentlandite veins* (Ni>20%) are not included as they represent a different population. The precision is good for all elements except Ni and Au.

(Note : The overall Ni is underestimated and Cu overestimated somewhat. The true volume of the Ni dominated veins could not be confidently represented in the data so the samples were not included).*

A selection of trace elements (Table 12) within the massive sulphide analysed returned the following average concentrations:

n	***Te ppm***	***Bi ppm***	***% Zn***	***As ppm***	***Sn ppm***	***% Pb***
17	68.7	78.7	0.17	0.65	49	0.04

Table 12: Mean trace element concentrations within massive sulphide veins

Inter-element correlation coefficients for these trace elements are listed in the Table 13. Unexpectedly, Te and Be do not correlate with Pt and Pd. There is no obvious explanation for this lack of correlation given the results of the mineralogy work and the exclusive association between PGE's, Bi and Te. Bi and Te correlate strongly with each other. Zn, Sn and Pb correlate moderately with each other. Zn and Pb correlates weakly with Te and Bi.

	Ni	***Cu***	***Ag***	***Pt***	***Pd***	***Ag***	***Te***	***Bi***	***Zn***	***Sn***
Te	0.00	0.16	-0.08	0.22	-0.02	-0.10	-			
Bi	0.20	0.05	-0.21	-0.03	0.14	-0.35	**0.71**	-		
Zn	-0.35	**0.60**	0.15	0.13	-0.04	0.38	0.34	0.32	-	
Sn	-0.50	**0.53**	0.29	0.29	0.38	**0.67**	0.08	0.00	0.46	-
Pb	-0.30	0.30	0.03	0.06	0.34	0.17	0.24	0.25	**0.41**	**0.62**

Degree of freedom = 15 R>0.48 @ 95% Confidence.

Table 13: Inter-element correlations for trace elements within massive sulphide veins

Lateral Distribution Patterns

Through visual inspection and interpretation of point plot plans from two cuts, only weakly defined areas of relatively higher or lower metal concentrations were identified. Descriptions included below are based on Figures 12 and 13 which illustrate these areas along with the geology. Figure 12k, a plot generated using randomized data, is included to illustrate the number of samples required to conclude a zone is not occurring by random chance. As up to 10 samples may randomly form a zone using the selection criteria on randomized samples, zones defined by fewer samples were rejected.

Systematic variations in metal distribution consistent with a sulphide fractionation model are not present. Cu, Cu+Ni and Fe zoning similar to that developed in Zone 38 was also not evident. Narrow veins or vein extremities do not show higher PM concentrations.

With the exception of Ni enrichments in narrower and more irregular veins and a very weak indication of relative Cu and Fe depletion towards the footwall, no significant correlations with spatial or geometrical characteristics of the veins, geological structures or rock type are apparent.

Although many of the patterns are vague and subjective they do define patterns that are not completely random (as illustrated by randomized plots in Appendix V and in Figure 12k).

Nickel

Unlike the precious metals, the heterogeneous nature of Ni is not closely related to variances attributed to measurement of low element concentrations but is mainly due to local random intrinsic variations. Variations are also related to fracture aperture and continuity. Ni is enriched at vein terminations and in narrower more irregular veins (see Figure 7b). Aside from this small subpopulation millerite and pentlandite appear to be randomly distributed and not associated with vein thickness (underground mapping indicates the millerite is often found as laminar bands close to the edge of the vein).

The only trends evident in the spatial plots (Figure 12a, Appendix V-Figure 13a) is a relative enrichment in the H1 vein. In the next mining cut H1 was shown to be at it's vertical extremity confirming the theory that Ni is enriched at the end of the vein.

Multiple populations can therefore be confirmed spatially at least for the extreme, enriched subpopulation. The difference between the very low concentrations (mode = 0.08%) in the main part of the population and the intermediate concentrations don't show any systematic spatial distribution patterns.

Copper

Except for some isolated highs, no significant patterns were observed on the point plots (Figure 12b, Appendix V-Figure 13b). Concentric zoning similar to Zone 38 (as will be described in Section 3) is not present.

Gold

Relatively high concentrations occur in an area that cross cuts the G2/P4 vein. Overall there is no evidence of systematic variations in Au or support for multiple populations (Figure 12c, Appendix V Figure 13c).

Platinum

Relatively high concentrations occur in an area that cross cuts the G2/P4 vein. Relatively low concentrations occur in the P3 vein and the eastern end of P1.There is no spatial evidence for two populations (Figure 12d, Appendix V-Figure 13d).

Palladium

Relatively high concentrations occur in the G2/P4 and P3/P5 area (Figure 12e, Appendix V-Figure 13e).

Silver

Relatively high concentrations occur in the eastern part of the P1 vein. Low concentrations occur in the H1 and P4 veins. Extremely high concentrations occur at the end of the G4 vein (cut 3 only) where extensive native silver and bornite were observed (Figure 12f, Appendix V-Figure 13f).

Copper + Nickel

There is a weakly defined increase in the footwall veins towards the north (further from the SIC) and relatively low concentrations in the P1 vein. A well defined Cu+Ni low which occurs in the core of Zone 38 (discussed in Section 3) is not obvious in Zone 39. (Figure 12g, Appendix v-Figure 13g)

Platinum + Palladium

Relative high concentrations occur in G2/P4 area and the H1/P1 intersection area. The east end of the zone has relatively low concentrations (Figure 12h, Appendix V-Figure 13h).

Platinum/(Platinum+Palladium)

Elevated areas include the H1 vein and eastern end of the zone with lower values found in the P5/P3 area (Figure 12i, Appendix V-Figure 13i).

Copper/(Copper+Nickel)

Data from both cuts shows a low in the H1 area and at the G2/G4 junction. These regions are coincident with high Ni in the H1 vein and high PM's in the G2/P4 area (Figure 12j, Appendix V-Figure 13j).

Copper+Nickel/Sulphur (decreasing Fe):

Data from cut 3 shows a weakly defined increase towards the ends of the NW and NE trending (footwall) veins (Appendix V- Section 1.2).

Copper Equivalent:

The only significant region indicated is an enrichment through the area cross cutting the G2/P4 veins influenced by enriched PM's (Appendix V, Section 1.0).

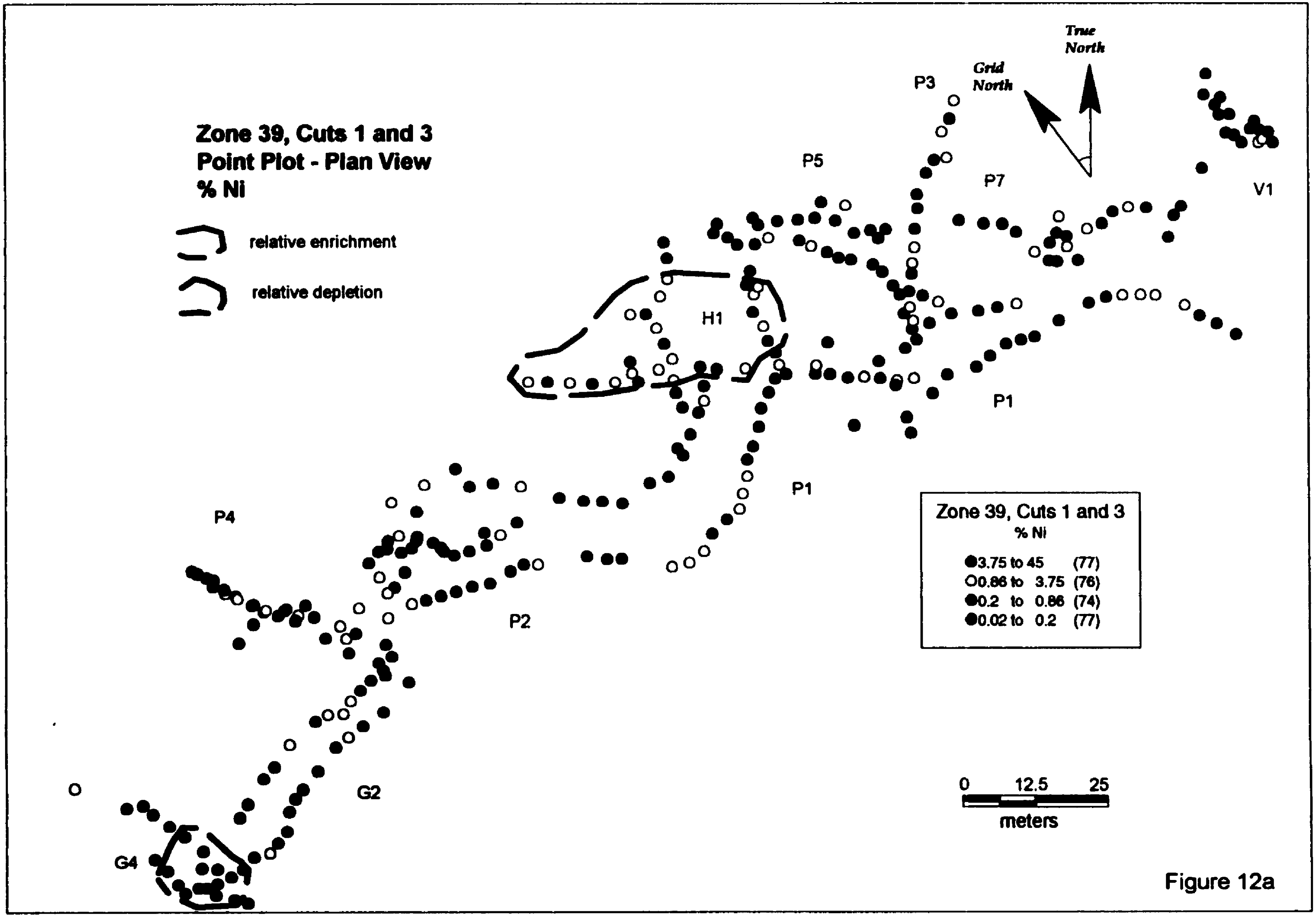

Zone 39, Cuts 1 and 3
Point Plot - Plan View
% Ni
relative enrichment
relative depletion
Grid North
True North
P3
P5
P7
V1
H1
P1
P1
P4
P2
G2
G4
Zone 39, Cuts 1 and 3
% Ni
●3.75 to 45 (77)
○0.86 to 3.75 (76)
●0.2 to 0.86 (74)
●0.02 to 0.2 (77)
0
12.5
25
meters

Figure 12a

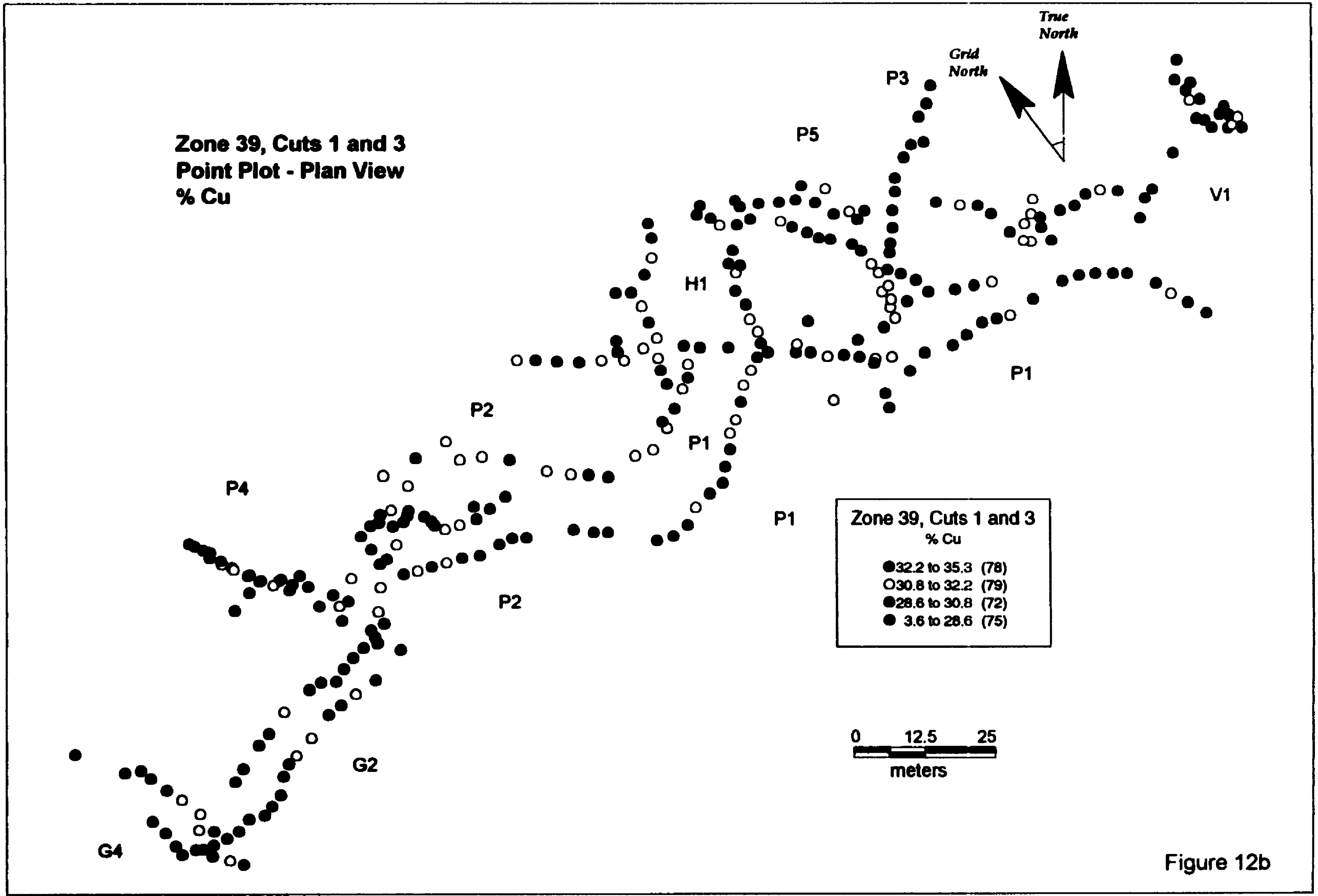
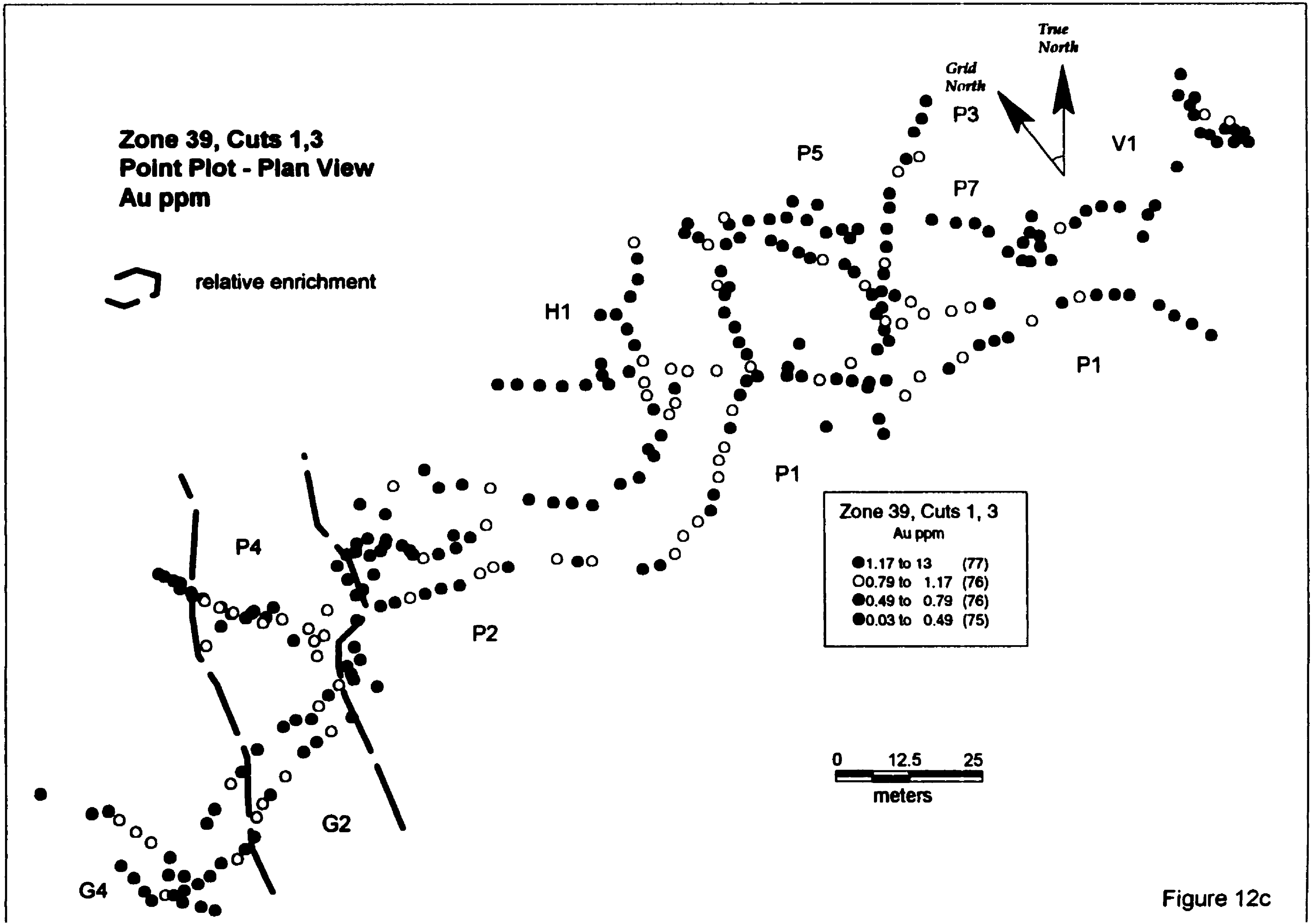

Zone 39, Cuts 1 and 3
Point Plot - Plan View
% Cu
True North
Grid North
P3
P5
V1
H1
P1
P1
P1
P2
P2
P4
G2
G4
Zone 39, Cuts 1 and 3
% Cu
●32.2 to 35.3 (78)
○30.8 to 32.2 (79)
●28.6 to 30.8 (72)
● 3.6 to 28.6 (75)
0
12.5
25
meters

Figure 12b



Zone 39, Cuts 1,3
Point Plot - Plan View
Au ppm

Figure 12c

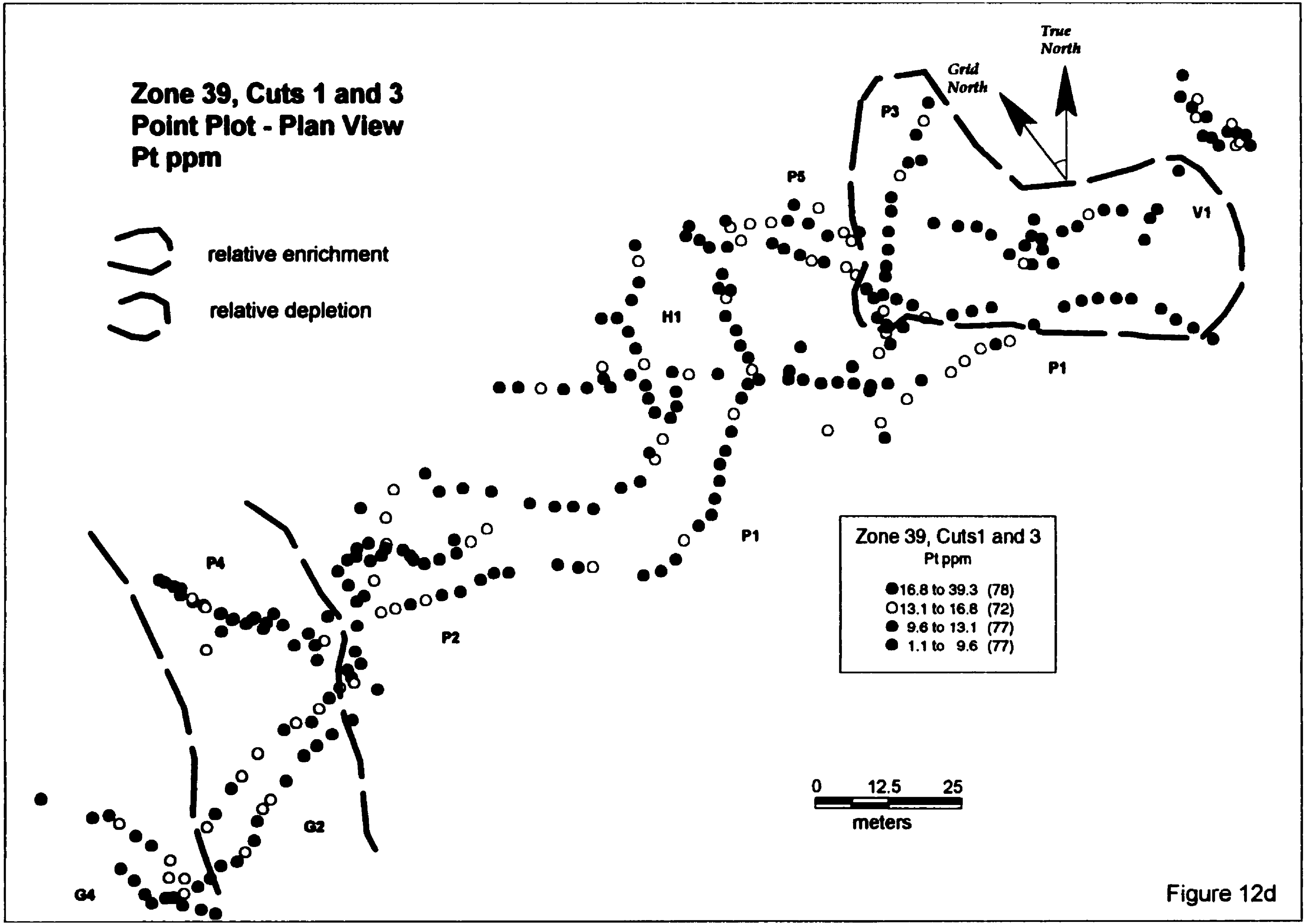

Zone 39, Cuts 1 and 3
Point Plot - Plan View
Pt ppm
relative enrichment
relative depletion
True North
Grid North
P3
P5
V1
H1
P1
P1
P4
P2
G2
G4
Zone 39, Cuts1 and 3
Pt ppm
● 16.8 to 39.3 (78)
○ 13.1 to 16.8 (72)
● 9.6 to 13.1 (77)
• 1.1 to 9.6 (77)
0
12.5
25
meters

Figure 12d

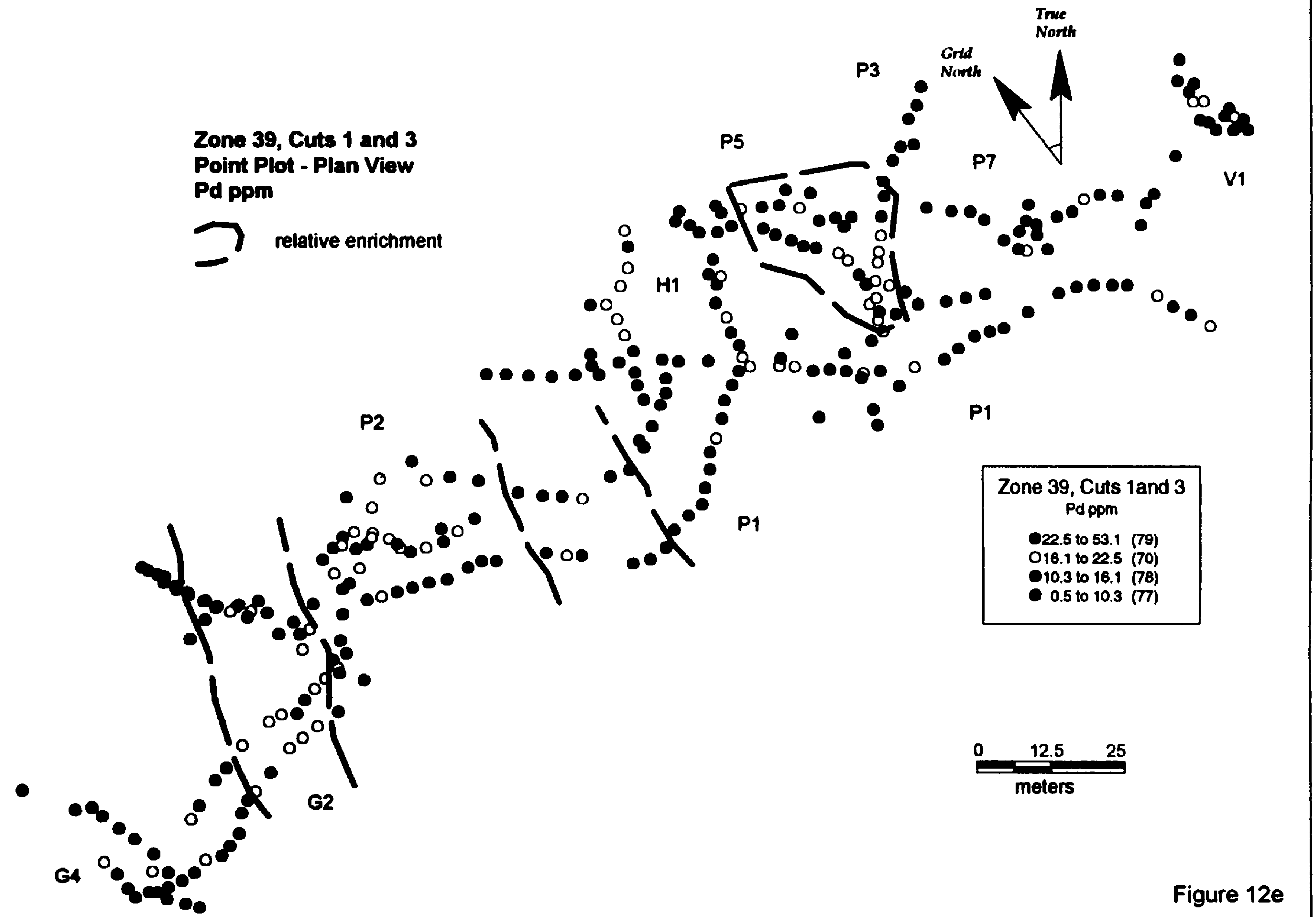
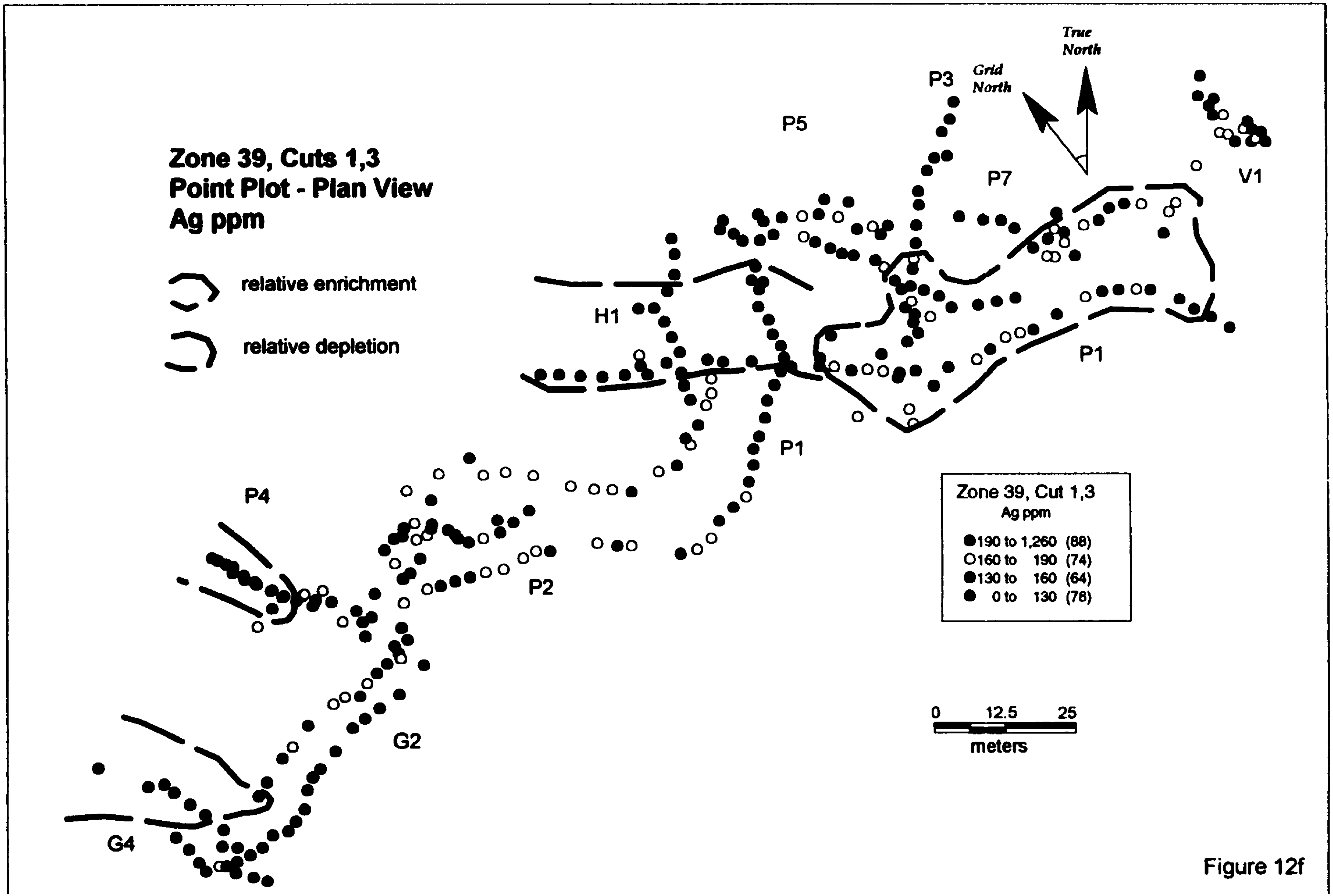

Zone 39, Cuts 1 and 3
Point Plot - Plan View
Pd ppm
relative enrichment
True North
Grid North
P3
P5
P7
V1
H1
P1
P1
P2
G2
G4
Zone 39, Cuts 1and 3
Pd ppm
●22.5 to 53.1 (79)
○16.1 to 22.5 (70)
●10.3 to 16.1 (78)
● 0.5 to 10.3 (77)
0
12.5
25
meters

Figure 12e



Zone 39, Cuts 1,3
Point Plot - Plan View
Ag ppm

Figure 12f

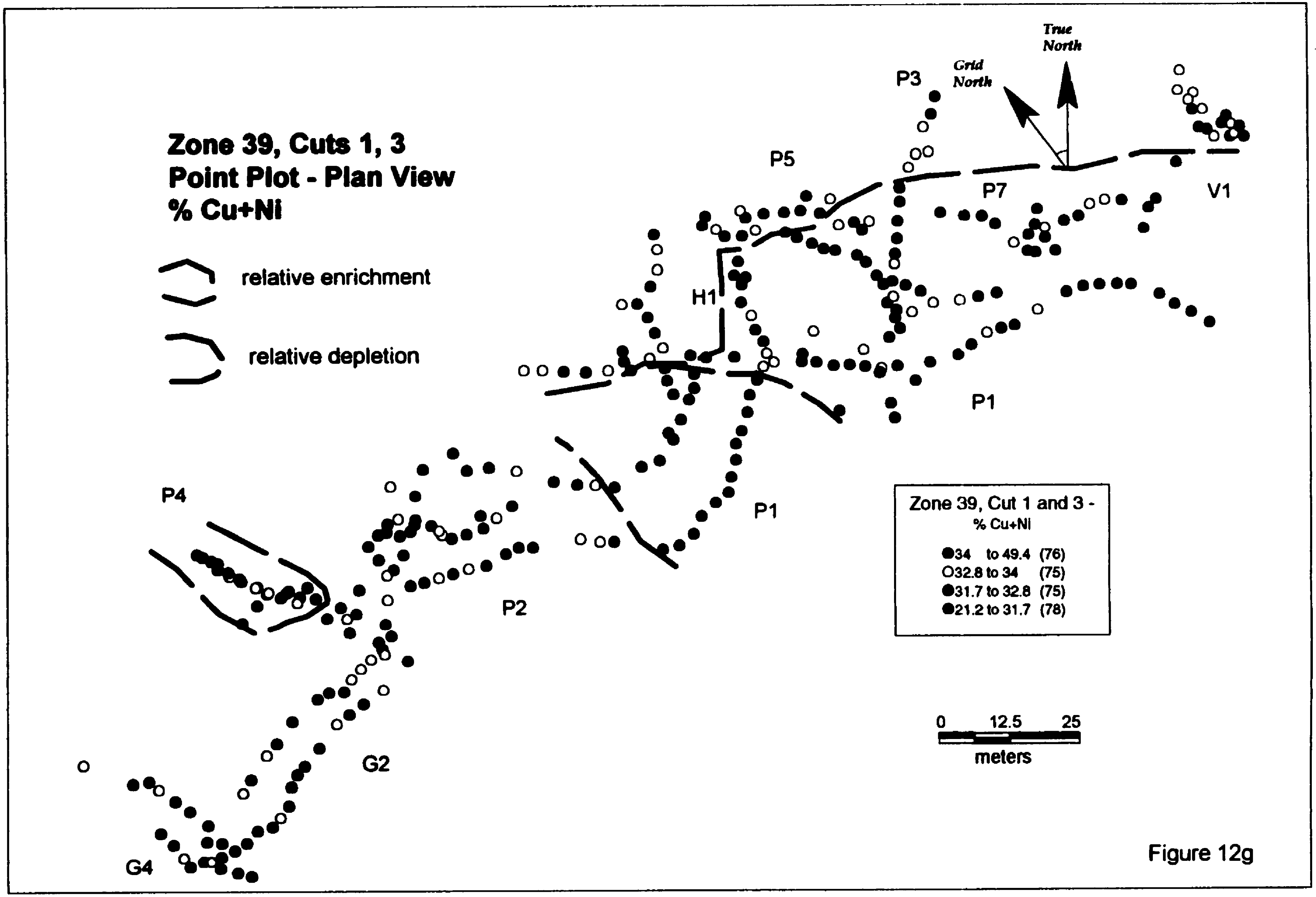

Zone 39, Cuts 1, 3
Point Plot - Plan View
% Cu+Ni
relative enrichment
relative depletion
True North
Grid North
P3
P5
P7
V1
H1
P1
P1
P4
P2
G2
G4
Zone 39, Cut 1 and 3 -
% Cu+Ni
● 34 to 49.4 (76)
○ 32.8 to 34 (75)
● 31.7 to 32.8 (75)
● 21.2 to 31.7 (78)
0
12.5
25
meters

Figure 12g

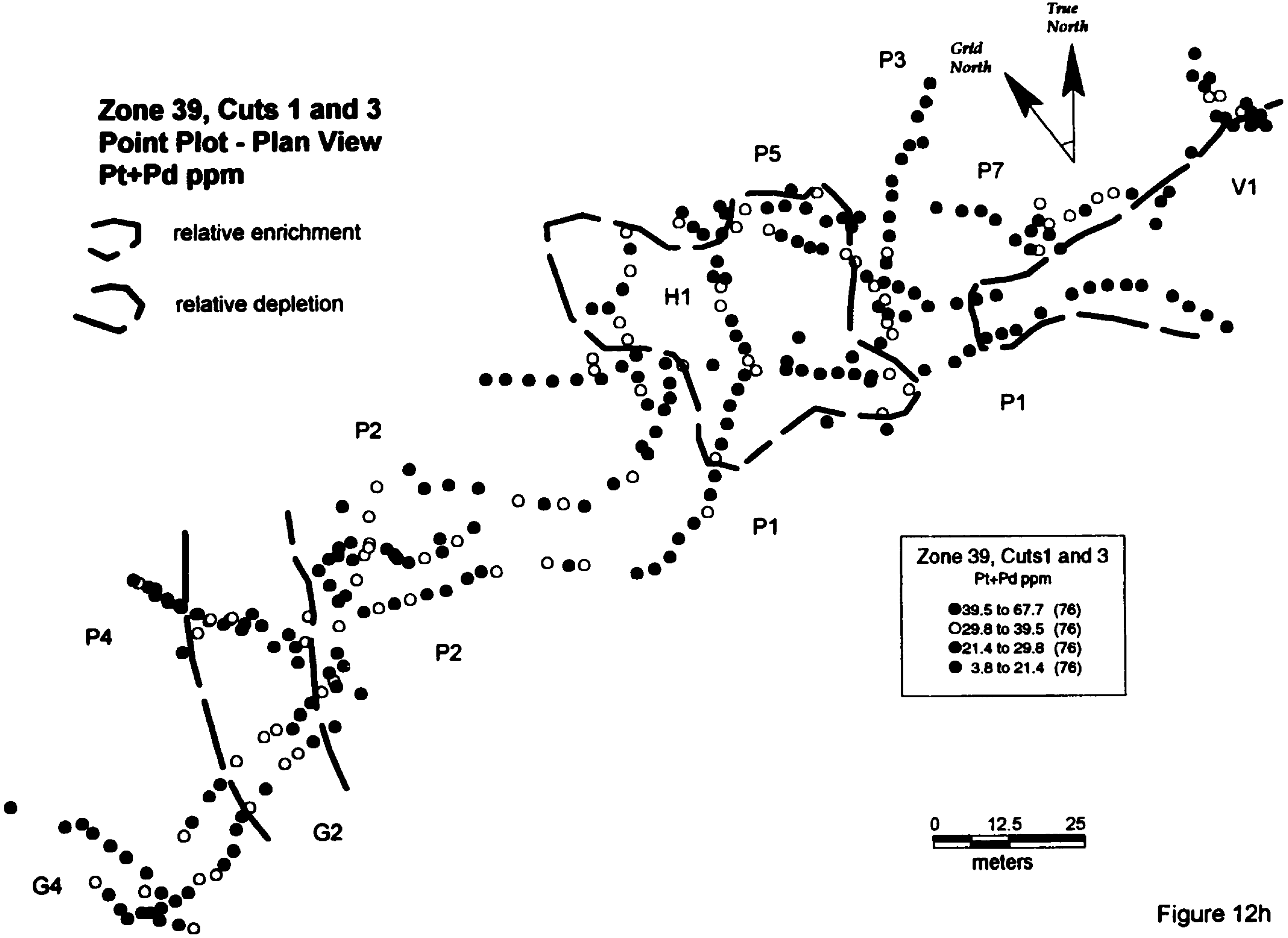

Zone 39, Cuts 1 and 3
Point Plot - Plan View
Pt+Pd ppm
relative enrichment
relative depletion
True North
Grid North
P3
P5
P7
V1
H1
P1
P1
P2
P2
P4
G2
G4
Zone 39, Cuts1 and 3
Pt+Pd ppm
●39.5 to 67.7 (76)
○29.8 to 39.5 (76)
●21.4 to 29.8 (76)
● 3.8 to 21.4 (76)
0
12.5
25
meters

Figure 12h

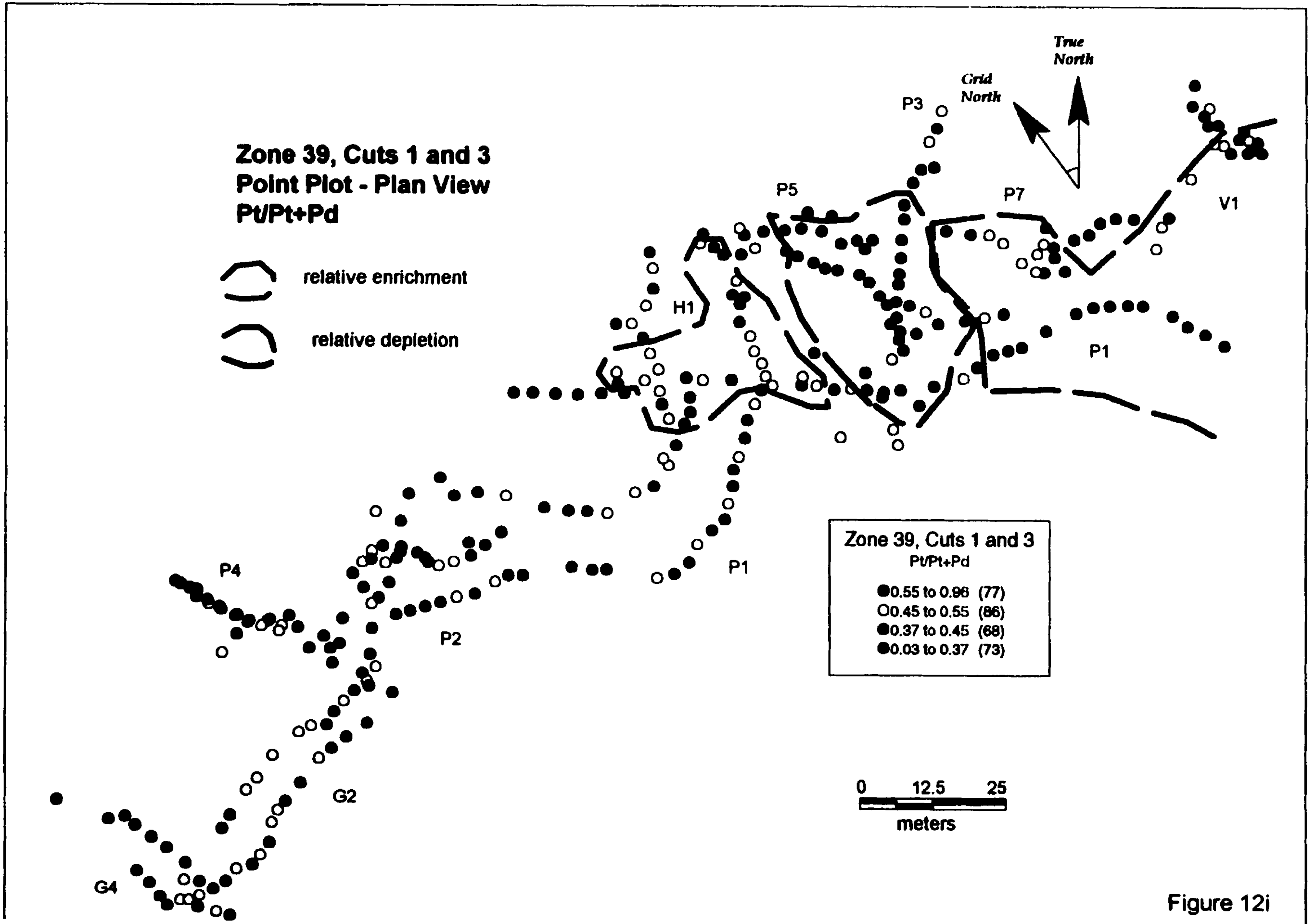
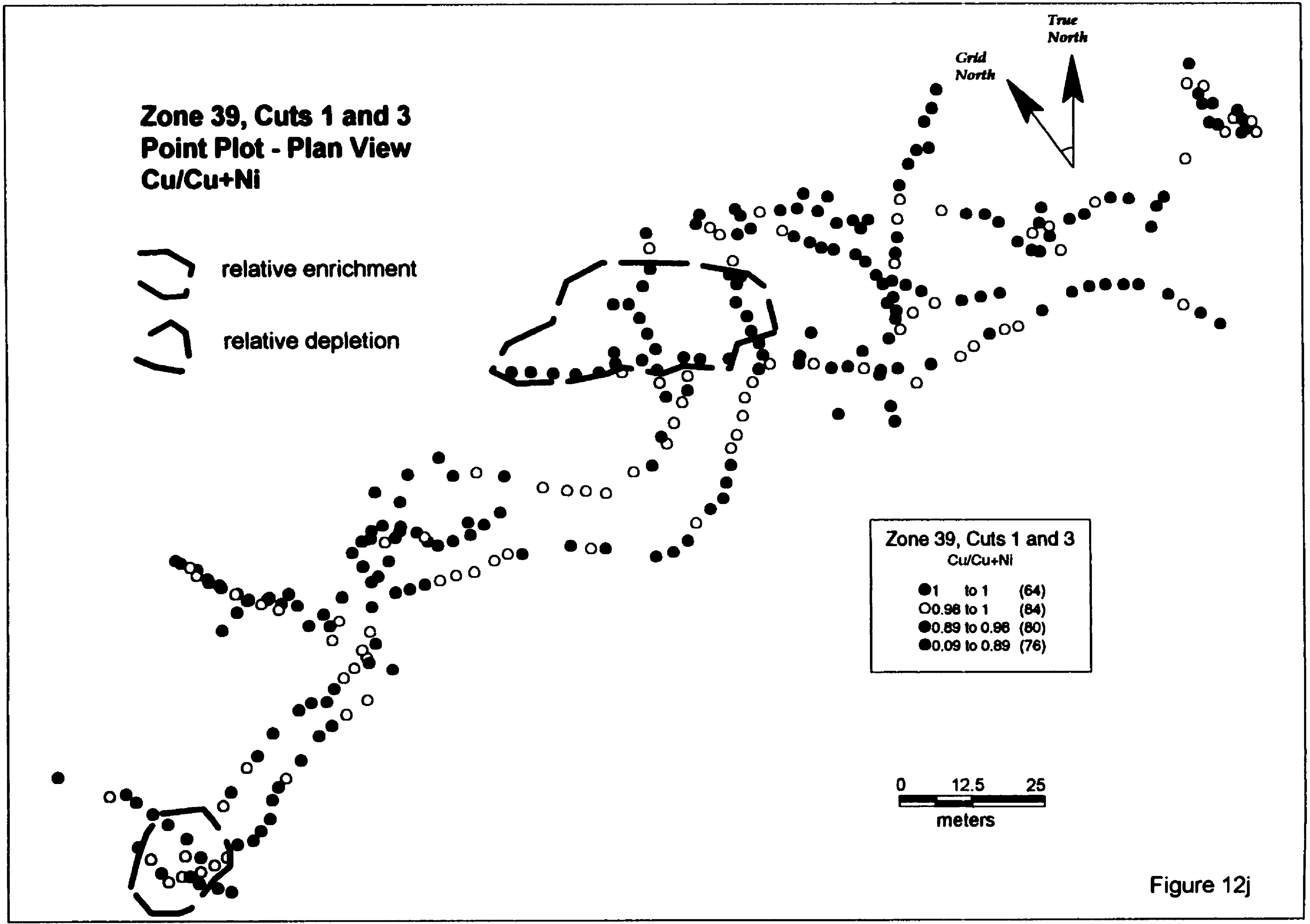

Zone 39, Cuts 1 and 3
Point Plot - Plan View
Pt/Pt+Pd
relative enrichment
relative depletion
True North
Grid North
P3
P5
P7
V1
H1
P1
P1
P4
P2
G2
G4
Zone 39, Cuts 1 and 3
Pt/Pt+Pd
●0.55 to 0.96 (77)
○0.45 to 0.55 (86)
●0.37 to 0.45 (68)
●0.03 to 0.37 (73)
0
12.5
25
meters

Figure 12i



Zone 39, Cuts 1 and 3
Point Plot - Plan View
Cu/Cu+Ni

Figure 12j

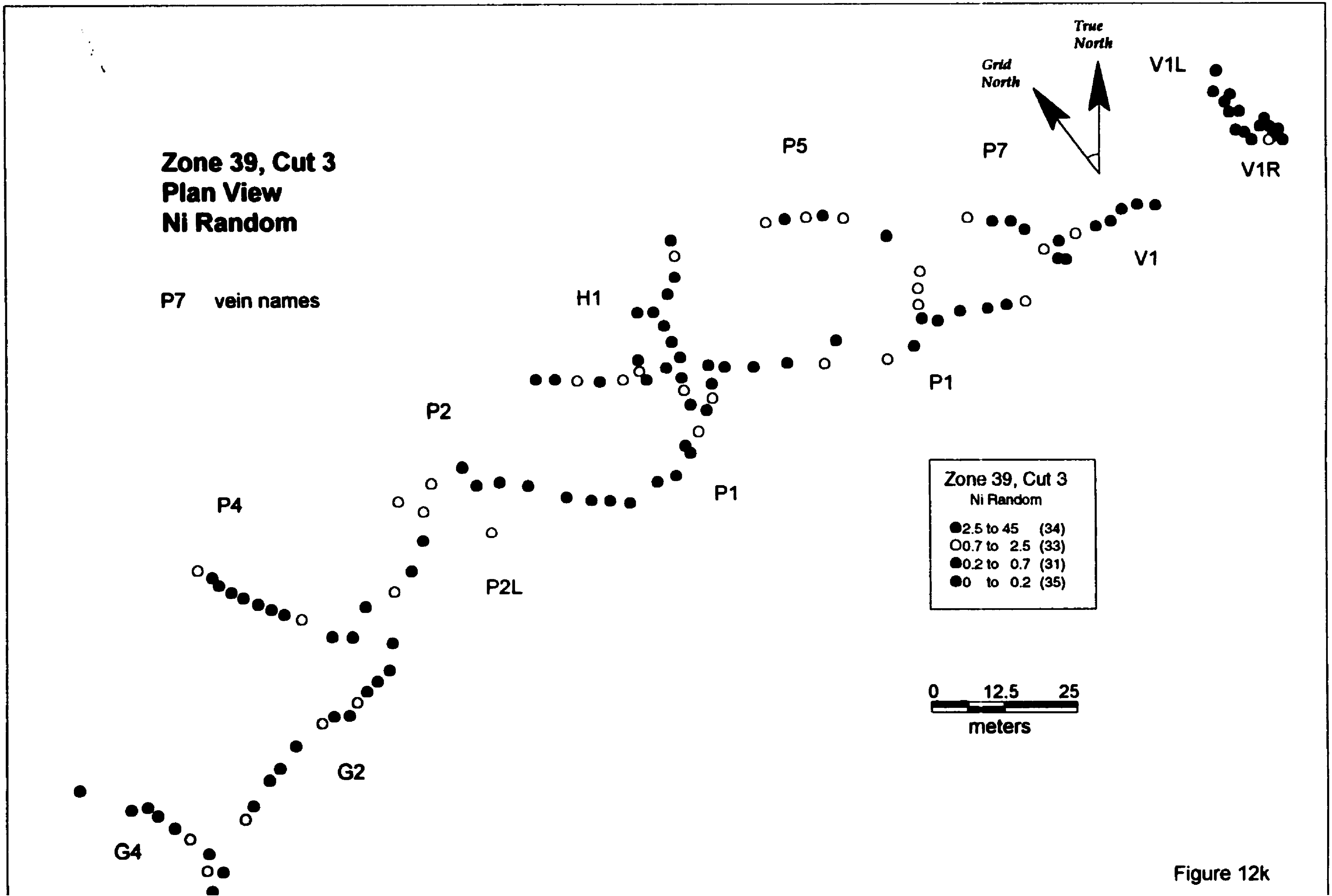

Zone 39, Cut 3
Plan View
Ni Random
P7 vein names
True North
Grid North
V1L
V1R
P5
P7
V1
H1
P1
P2
P1
P4
P2L
G2
G4
Zone 39, Cut 3
Ni Random
●2.5 to 45 (34)
○0.7 to 2.5 (33)
●0.2 to 0.7 (31)
●0 to 0.2 (35)
0
12.5
25
meters

Figure 12k

Metal Distribution
Zone 39 – Sill Cut and Cut 3
Plan View

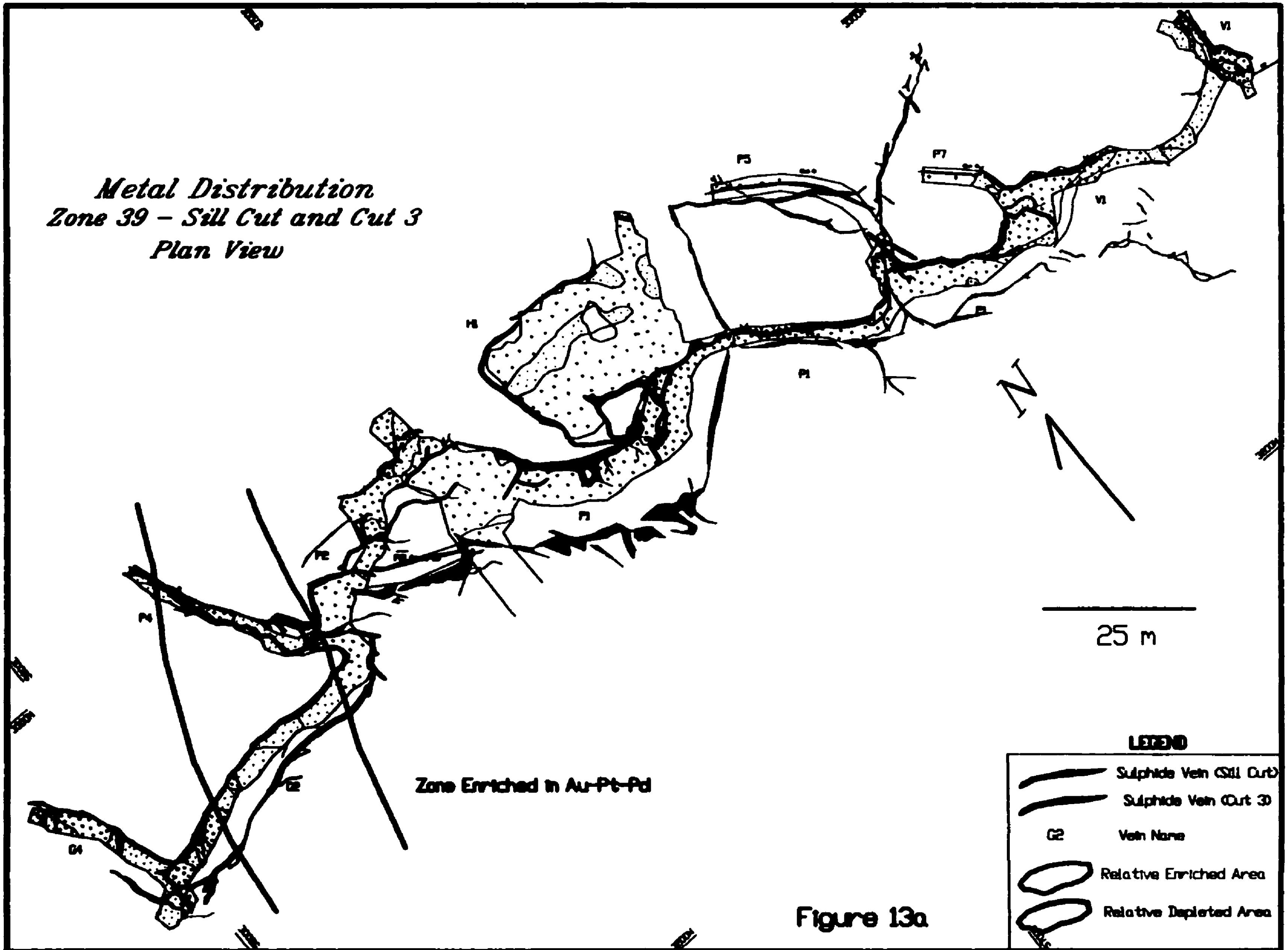


Figure 13a

Randomizing

The data was randomized and re-plotted (see Figure 12k and Appendix V - 1.3) in order to check for subjectivity of the interpreted zonation. It is apparent that a proportion of these areas of relative enrichment and depletion can be attributed to random chance. Groups of up to 10 samples on randomized plots form apparent zones using similar visual observational methods. Therefore zones defined by less than 10 samples and without a geological control or similar distribution on two cuts, are considered to be random. They may or may not be real and further sampling is required to verify their existence.

Footwall vs Main Veins

Footwall veins are steeply dipping veins and strike NW or NE, branching off of the east-west striking main vein. They are situated structurally further beneath the SIC. The H1, P4 and P5 veins as illustrated in Figure 5 are examples of footwall veins. P1, G2 and P2 are main (east-west) veins.

Based on diamond drill assays, as will be described in the following section on 3-D zoning, there is some evidence for a PM enrichment in veins found progressively further into the footwall (greater perpendicular distance from the SIC contact).

Comparisons of arithmetic means for Footwall and Main veins from the same face data used above are illustrated in Table 14. Obvious higher concentrations within the Footwall veins are not evident. Ag appears to decrease in the footwall veins. Pd is higher although the confidence intervals on the mean overlap (see bar graphs in Appendix IV- Figure 2) and the medians are similar.

Ni, which appears to be higher in the footwall, is difficult to confirm due to the possible difference in the proportions of millerite samples (mixed/skewed Ni populations) contained within the averages being compared. The negative statistical correlation between vein width and Ni, along with the footwall veins having narrower widths than the east-west veins, supports the implication in Table 14.

Statistical tests (described in Appendix IV, section 1.0) indicate that only the differences in Ni and Ag are statistically significant. The data therefore does not support a model suggesting PM's increase towards the footwall. The enriched footwall veins in the drill hole data however, are found significantly further into the footwall than these footwall veins. Level 44, where these samples were collected, is near the top of the zone and the enriched footwall veins found in the drill hole data occur in the bottom half of the deposit.

	Ni	***Cu***	***Au***	***Pt***	***Pd***	***Ag***
EW (n=125)	2.65/0.52	29.58/30.8	1.01/0.87	13.89/13.30	16.91/16.0	176/176
FW (n=106)	3.94/1.72	29.46/30.6	1.07/0.70	13.83/13.27	18.64/16.6	150/156

Table 14: Mean/Median values for Main veins vs. Footwall (FW) veins
EW = east/west striking (main) veins.

Comparison between Cut 1 vs 3

With the exception of Cu, the average metal concentrations for cuts 1 and 3 are similar (Appendix IV - Figure 3) . The arithmetic mean of samples (~130) results in a statistically precise and accurate estimate of the average precious metal concentrations for the veins within each of the 3 metre high horizontal cuts through the deposit. The similarity in metal content indicates that there is no vertical variation in metal content over the distance of the cuts (vertical distance of 6.5 metres). The fact that the average for both cuts is statistically identical suggests that these average concentrations are close to the unknown true means.

Statistical tests (see description/methodology in Appendix IV) showed that there was a slight difference in Cu but differences in means for all other elements could not be shown to be statistically significant. Comparisons for Ni, Cu or Cu+Ni are difficult due to mixed populations and correlations with widths, these averages are not weighted to width.

Spatial Dependency and Geostatistics:

Variograms were constructed along the east-west striking Main vein from cut 1 (Appendix IV- Figure 1, Table 1) where samples were taken every 3 metres. The only element which produced a well defined variogram was Pd. All other elements showed no spatial correlation at this sample spacing. Variography suggest the variance is almost entirely due to "nugget effect" (as referred to in geostatistical terminology), which is equivalent to the term total variance. If lateral systematic variations in metal concentrations (zoning) were present, a spatial correlation would have been expected. This information further supports observations from point plots that no lateral zoning is present (or that it isn't detectable due to high local relative error on individual assays).

2.33 3-Dimensional Distribution

Population Distributions

Cu, Ni, Au, Pt, Pd and Ag within the massive sulphide drill hole data, used to investigate 3-dimensional metal variations, have similar population distributions as those described for the face sample data (see Figure 11).

When considering all drill hole data (massive, semi-massive and mineralization, Appendix IV, Figure 15) the Ni distribution is similar to the massive data, however the Cu appears to form three populations defining an approximate partition between massive, semi-massive and mineralization. Ag has a strong positively skewed distribution. Au has an approximate lognormal distribution similar to the massive group. Pt and Pd have approximate lognormal distributions (they are closer to normal in the massive data).

Correlations

Correlation coefficients and scatter diagrams are tabulated (with degrees of freedom and 95% significance levels) in Appendix IV (Tables 6).

Inter-element

Significant correlations within the massive subgroup include a strong inverse correlation between Ni and Cu (r = -0.77), and a positive correlation between Ni and Cu Eq (r = 0.86). Cu has a weak positive correlation with Ag (r = 0.38) and Pd (r = 0.32). Au and Ag have a very weak correlation (r = 0.24). Pt and Pd have a weak correlation (r = 0.30). The semi-massive subgroup exhibits no significant correlations except for a negative correlation between Ni and Cu. The mineralization subgroup exhibits moderate correlations between Pt and Pd and does not contain a correlation between Ni and Cu. Combining data from the three subgroups, weak correlations exist between Cu and Pt (r = 0.26), Pd (r = 0.34) and Ag (r = 0.21). Data from all drill hole assays (approximately 2500) results in only weak correlations between Cu and Pd (r = 0.37) and between Cu and Ag (r = 0.41).

A lack of strong correlation between PM's and Cu or Ni suggests there are significant concentrations of PMs in the wall rock or higher proportions of PM's in irregular secondary veinlets (samples with low sulphide content). The concentrations of PM's within the samples are not necessarily proportional to the amount of contained sulphides. Thus, recalculating PM's to 100% sulphide may not be correct as this procedure implies the sulphide vein contains all the PM's. High, local, random variation may have obscured or reduced possible correlations if they existed.

Spatial Correlations

Correlations with respect to distance into the footwall (measured as a relative perpendicular distance from the base of the SIC), depth (distance down dip/plunge) are summarized in Table 15. No significant correlation exists with position along strike. Scatter diagrams illustrating relationships along plunge depth and distance from the SIC are included in Appendix IV (Figure 4, 5).

Type	Pt	Pd	Au	Ag	Pt+Pd	Pt/Cu	Pd/Cu	(Cu+Ni) /S	df	95% CL
Mass	**0.27**	**0.27**	0.11	0.13	**0.34**	0.09	**0.26**	0.18	248	>0.13
Semi	0.17	0.17	0.11	0.14	**0.20**	0.05	0.14		175	>0.15
Minz	0.18	0.17	**-0.29**	-0.05	**0.20**	**0.21**	**0.26**		364	>0.11
All	0.16	0.11	0.02	-0.12	0.16	0.18	**0.23**		787	>0.07

Table 15: Correlation coefficients (r) for distance from SIC

(df = Degrees of Freedom, 95% CL is the critical value r must exceed to be considered statistically significant. Minz= Mineralization). There are very weak correlations with distance from the SIC for Pt and Pd. These correlations are slightly stronger in the massive data. Within the mineralization data a weak negative correlation exist with Au. The relative range of distances are ~100m (~500-600 m from the SIC)

Comparison of Main, Hangingwall and Footwall Veins

The following Figures illustrate comparisons of metal concentrations after isolating data representing massive veins into subdivisions based on relative distance from the SIC. Different methods for subdividing the veins were used. The apparent spatial segregation observed on cross sections was used to separate hanging wall, main, and two sets of footwall veins (Figure 14). The distance from the SIC increases from the hanging wall to the footwall veins. However, there was a large discrepancy in the number of samples available in each group with a low number in the farthest footwall and the hanging wall groups. Therefore a subdivision was also made by ranking based on increasing distance from the SIC and splitting the data into groups of 50 samples each representing increasing distance from the SIC (Figure 15).

Comparisons with distance from the SIC were also done for all the drill hole data, representing massive, semi-massive and mineralization assays combined (Figures 19-21).

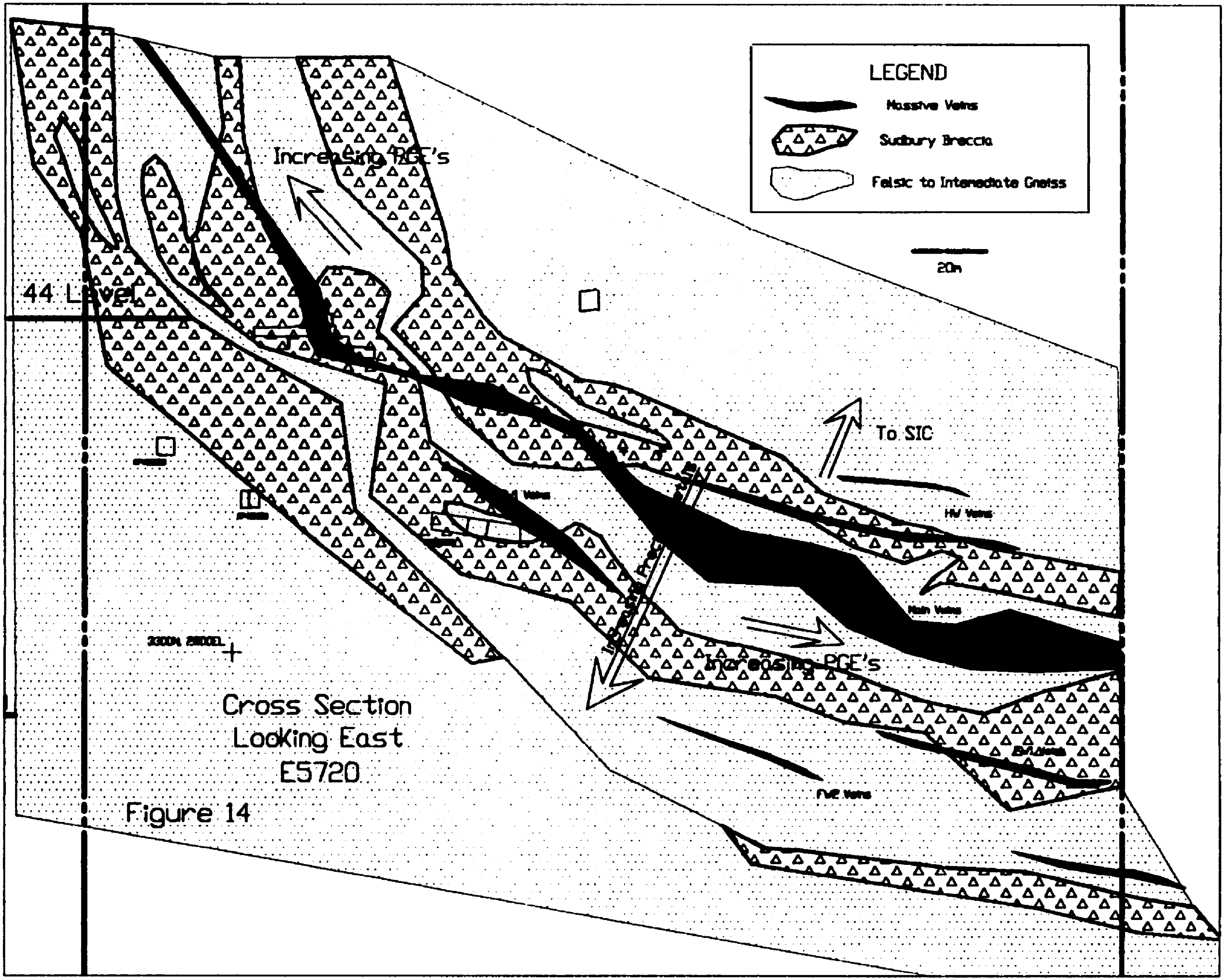
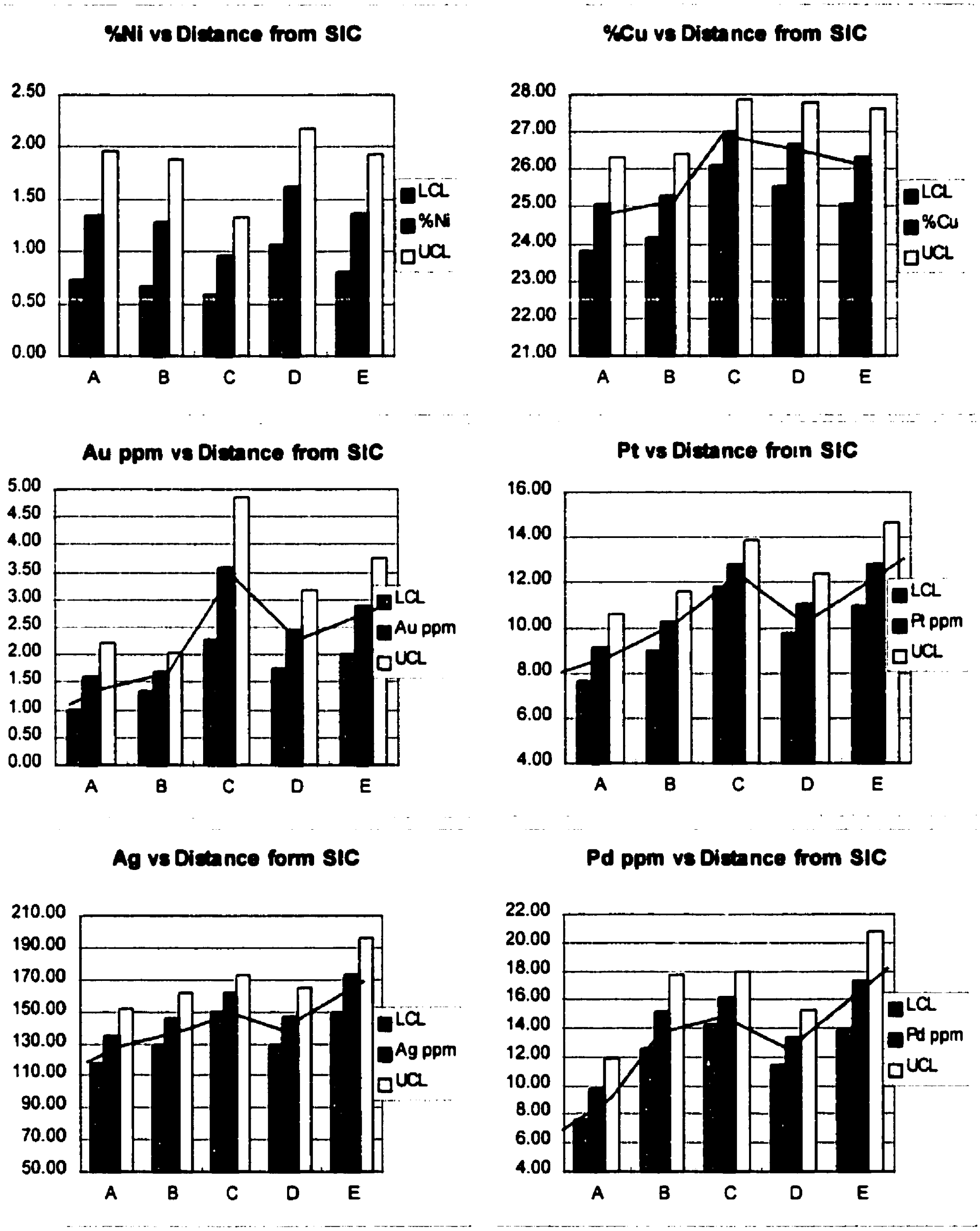

LEGEND
Massive Veins
Sudbury Breccia
Felsic to Intermediate Gneiss
20m
Increasing PGE's
44 Level
To SIC
HW Veins
Main Veins
Increasing PGE's
FW2 Veins
33004 2800EL
Cross Section
Looking East
E5720

Figure 14



%Ni vs Distance from SIC

%Cu vs Distance from SIC

Au ppm vs Distance from SIC

Pt vs Distance from SIC

Ag vs Distance form SIC

Pd ppm vs Distance from SIC

Figure 15: Comparison of massive vein metal concentrations vs. distance from SIC

Arithmetic mean concentrations (central bar) from approximately 50 samples for each subdivision with increasing distance from A to E (relative increase from A to E is ~ 100m). Outliers have been removed for comparison purposes. (associated 95% confidence limit bars are included, LCL = lower confidence level, UCL = upper confidence level).

Interpretation of Figure 15 results in the following:

- Ni is inconclusive due to the large and overlapping confidence ranges.
- Cu and Au do not show any systematic trends but generally contain lower concentrations in the hanging wall side of the zone and the highest conentrations in the middle of the zone.
- Pt, Pd and Ag show a common pattern with increasing concentrations from the hanging wall to the middle of the zone then a decrease towards the footwall, followed by an increase in the veins furthest from the SIC. The Pt and Pd concentrations in the farthest footwall veins are similar to the middle of the zone. The pattern is not as well developed for Ag
- Cu/(Cu+Ni) and Pt/(Pt+Pd) do not show any patterns (not shown in Figure 15)

The following graphs (Figures 16-18) illustrate comparisons between hanging wall, main, and footwall veins. Footwall veins are compared together and as two separate groups (FW1, FW2) with the smaller grouping (FW2) found the farthest from the SIC.

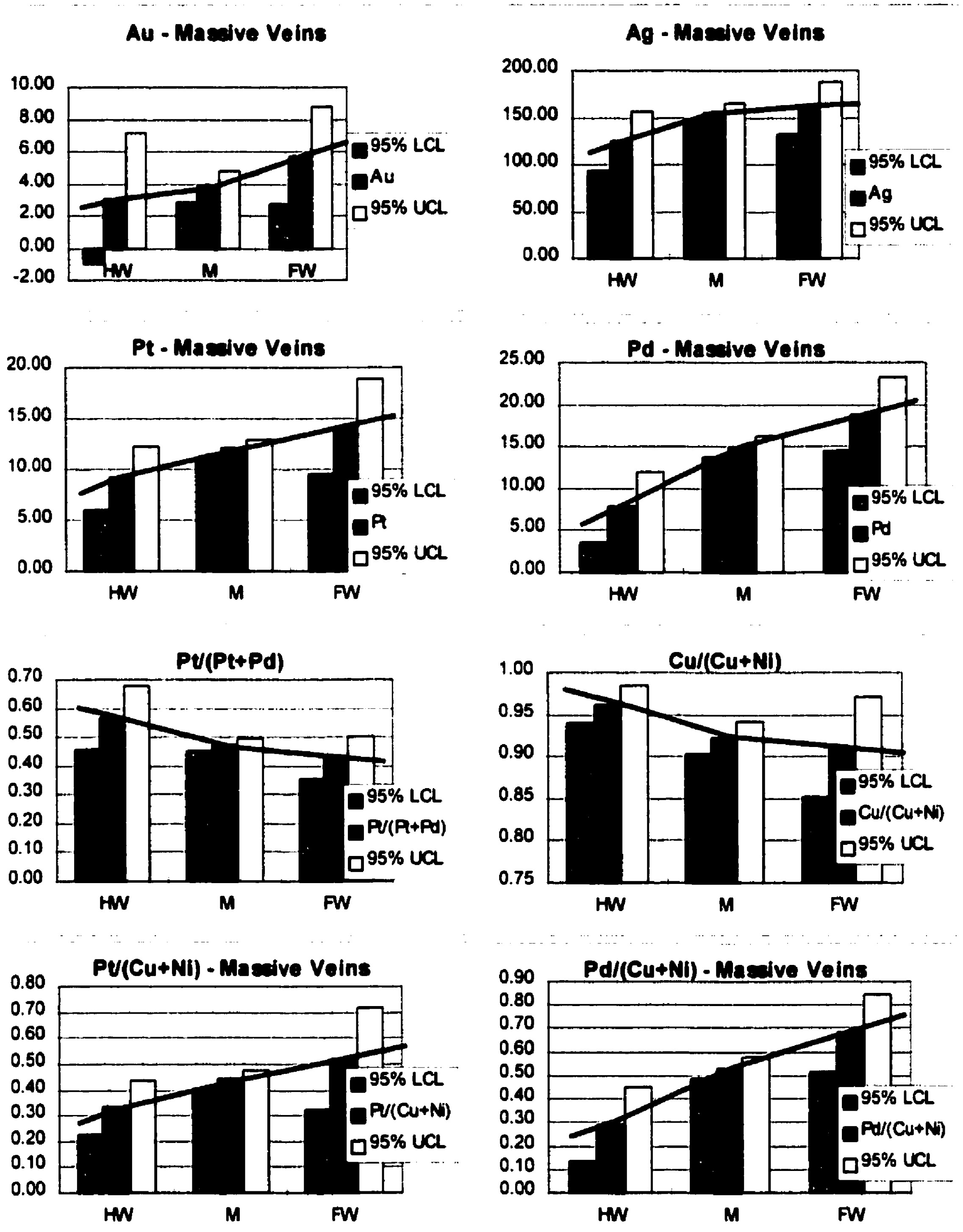


Figure 16: Comparisons of arithmetic mean concentrations between massive veins representing increasing distances from the SIC

The central bar is the arithmetic mean and is bracketed by upper and lower 95% confidence intervals. Medians (Appendix IV, Figure 11) showed similar results.

Figure 16 illustrates the following trends:

- A systematic increase in precious metals towards the footwall. This trend is best defined for Pt and Pd although the confidence range for the FW vein overlaps the M vein. This trend suggests a process such as the proposed sulphide fractionation continued within the liquids which formed Zone 39
- A systematic decrease in Cu/(Cu+Ni) and Pt/(Pt+Pd) towards the footwall. This trend is contrary to the fractionation model which suggests these ratios should also increase with increasing distance from the SIC (Jago et. al 1994). It also suggests that there are not higher relative concentrations of millerite and pentlandite in the foowall veins.

The arithmetic means in the above and following comparisons represent a central tendency from data that has a high amount of variability. When considering confidence intervals, some of the differences and apparent trends are less probable as confidence intervals overlap to various degrees. In particular, variations in Au are less supportable, along with Pt in the FW vs Main veins. The fact that similar trends occur for more than one element however somewhat compensates for large and overlapping confidence intervals. Statistical tests do not confirm the significance for means between the main and footwall groups (at a 95 % CL) but do confirm differences between the HW and Main veins along with the HW to FW difference. As illustrated in Figure 17, it is actually the set of veins found farthest from the SIC (FW2) that influence the FW Pt, Pd and Ag average (the FW1 veins contain lower concentrations than the Main veins).

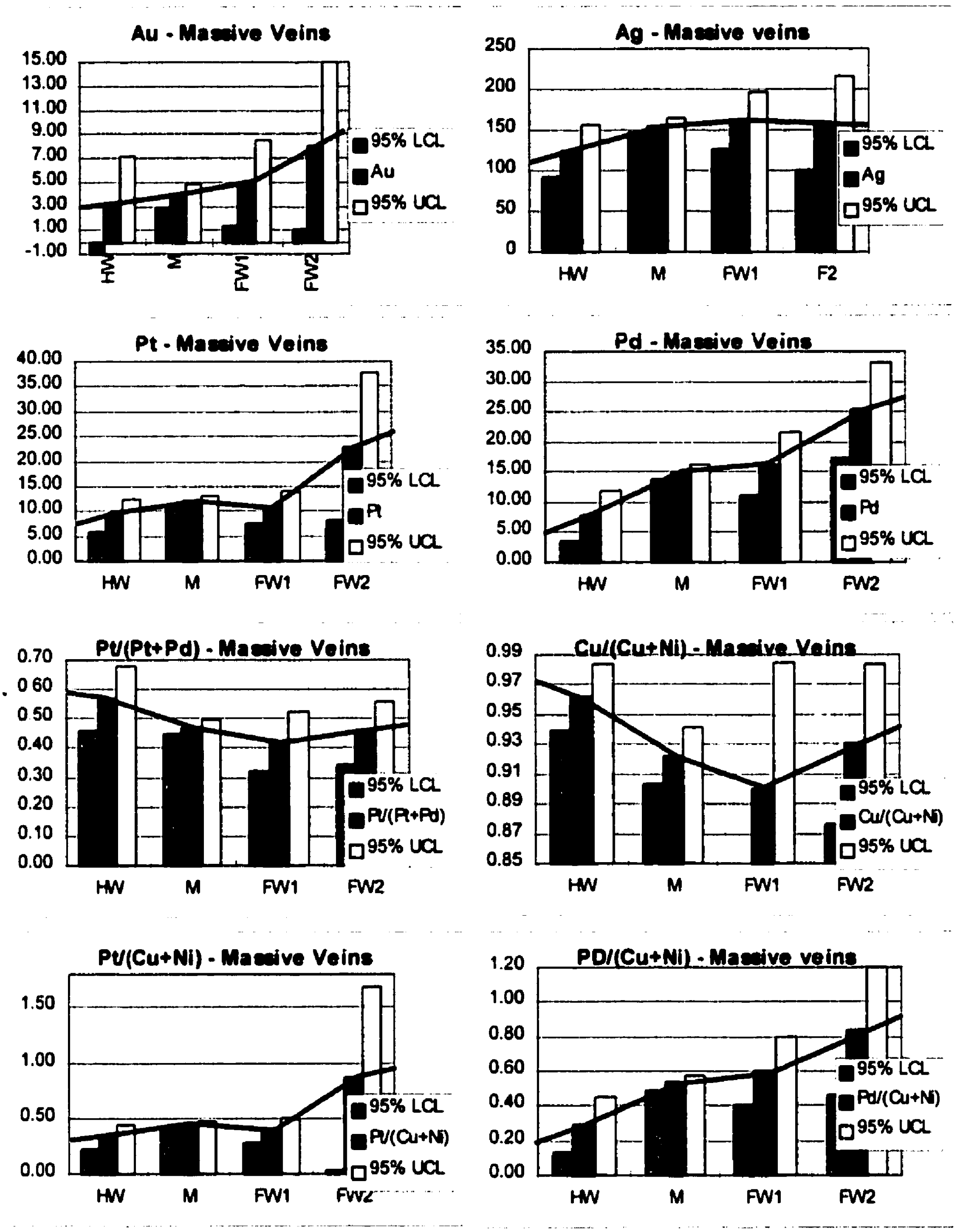
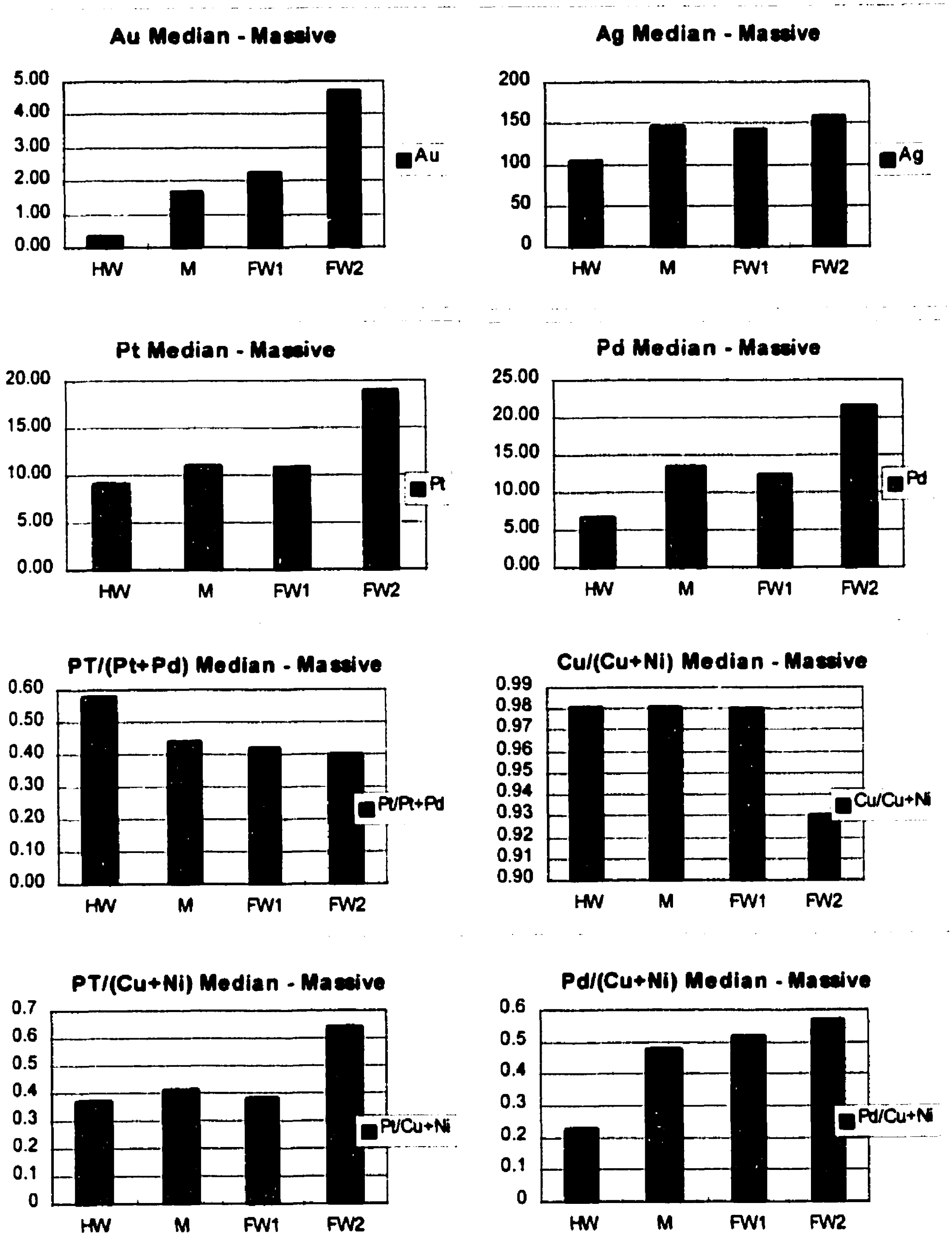


Figure 17: Comparisons of means for massive veins with the footwall veins further subdivided

Au, Pt and Pd appear significantly enriched in the FW2 veins although only 8 samples are available (although similar trends are seen in Figure 15 where 50 samples were used). The FW2 veins also correlate with a southwest down plunge location (The majority of these assays occur at the downplunge region of the zone).



Au Median - Massive

Ag Median - Massive

Pt Median - Massive

Pd Median - Massive

PT/(Pt+Pd) Median - Massive

Cu/(Cu+Ni) Median - Massive

PT/(Cu+Ni) Median - Massive

Pd/(Cu+Ni) Median - Massive

Figure 18: Comparisons of medians for massive veins with the footwall veins further subdivided

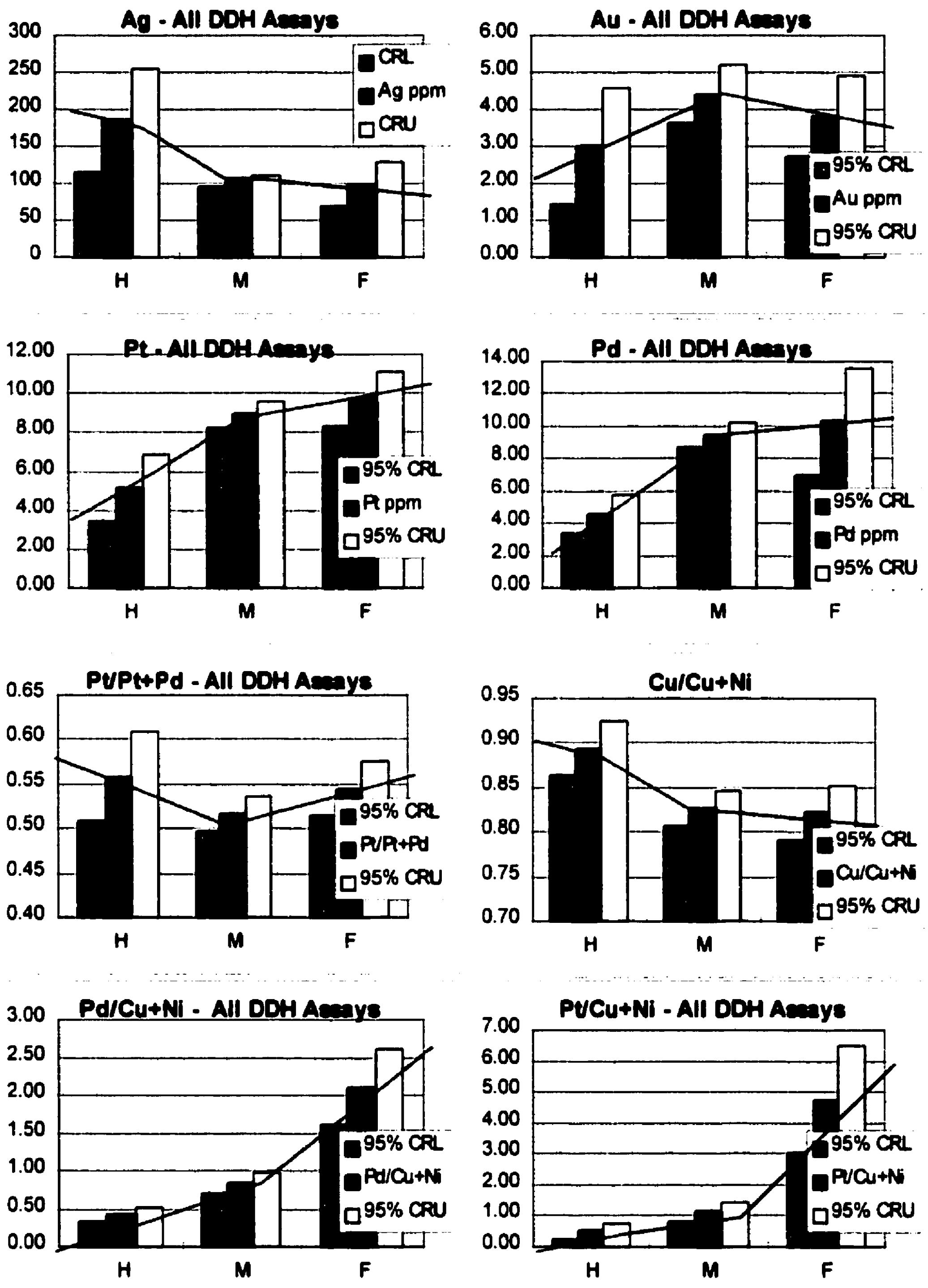
Medians are used as a measure of central tendency not as biased by skewed distributions or outliers.

Figures 17 and 18 show the following trends with footwall veins further subdivided:

- Au increases systematically towards the footwall although all confidence intervals overlap significantly resulting in low statistical confidence that the differences are significant
- Pd shows a progressive increase towards the footwall. Pt shows an increase towards the FW1 vein, then decreases and once again increases in the FW2 vein. The highest apparent Pt and Pd concentrations within the FW2 veins are not statistically supportable as only 8 samples are available
- Decreasing trends in Cu/(Cu+Ni) and Pt/(Pt+Pd) towards the footwall are not as well defined with the footwall veins further subdivided
- Ag continues to show a very weak increase towards the footwall (although it is not higher in the FW2 vein)

PGE's and Au within the semi-massive and mineralization data (Figures not shown) also appear to increase towards the footwall, with the exception of Ag within the mineralization (Ag is higher in the HW).

Figures 19 and 22 compare the Hanging wall, Main and Footwall veins for all data (massive, semi-massive and mineralization). These results are more reliable (than comparison discussed in figures 16 and 17) as a significantly larger number of HW, FW1 and FW2 samples were used in the comparisons.



Ag - All DDH Assays

Au - All DDH Assays

Pt - All DDH Assays

Pd - All DDH Assays

Pt/Pt+Pd - All DDH Assays

Cu/Cu+Ni

Pd/Cu+Ni - All DDH Assays

Pt/Cu+Ni - All DDH Assays

Figure 19: Comparison using all data (massive, semi-massive and mineralization)

Confidence intervals for Pt and Pd show a wide range for the FW veins indicating the FW concentrations may not be different than the main veins. Pt and Pd ratios to Cu+Ni are significantly higher in the FW veins indicating there are higher proportions of PGM's in sulphide or higher concentrations of PGM's in the wallrock.

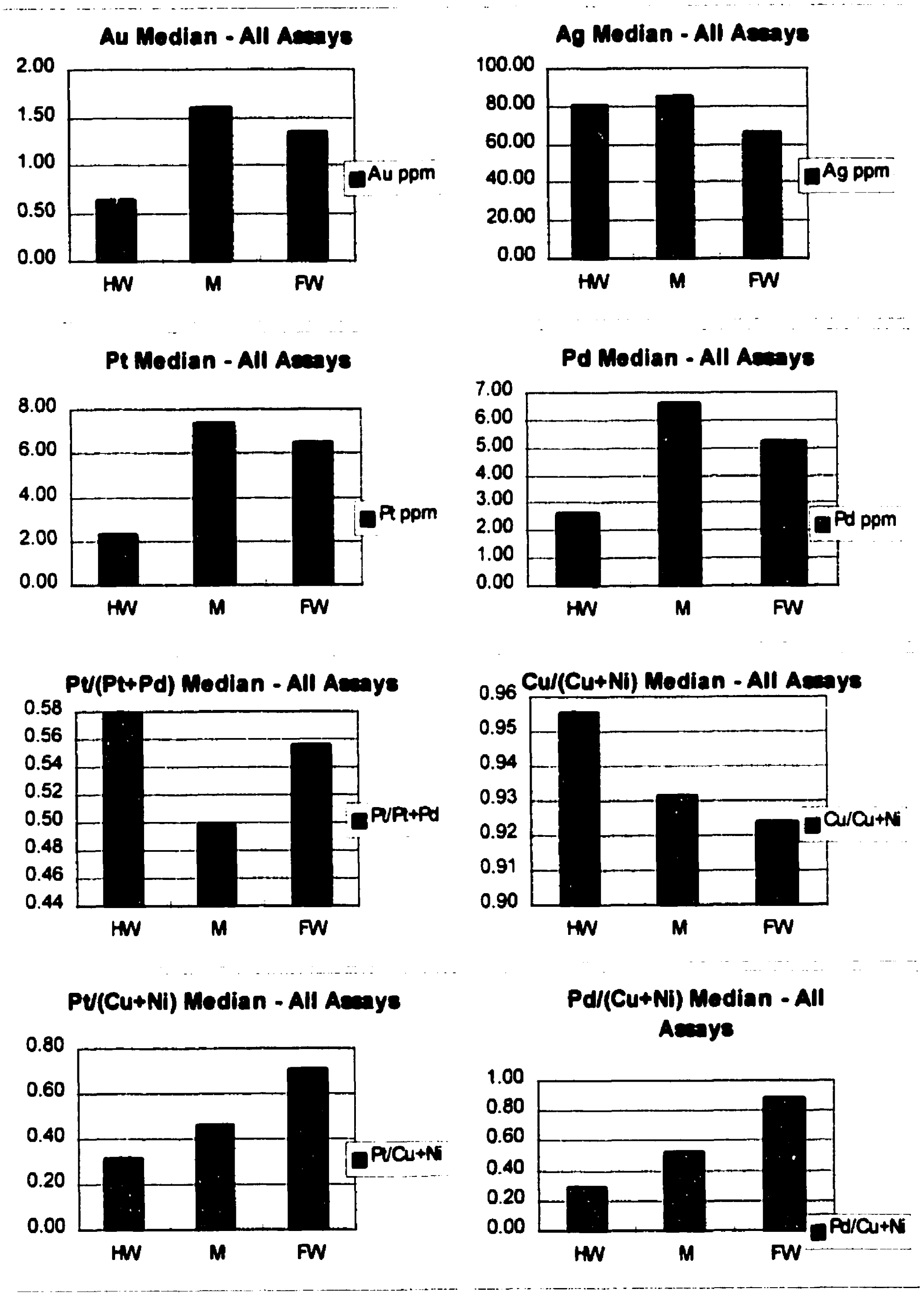


Figure 20: Comparisons using medians as a central tendancy

Footwall PGE concentrations are now lower than the main veins indicating the influence of outliers on mean values. The proportion of PGE's to sulphide remains highest in the footwall veins however.

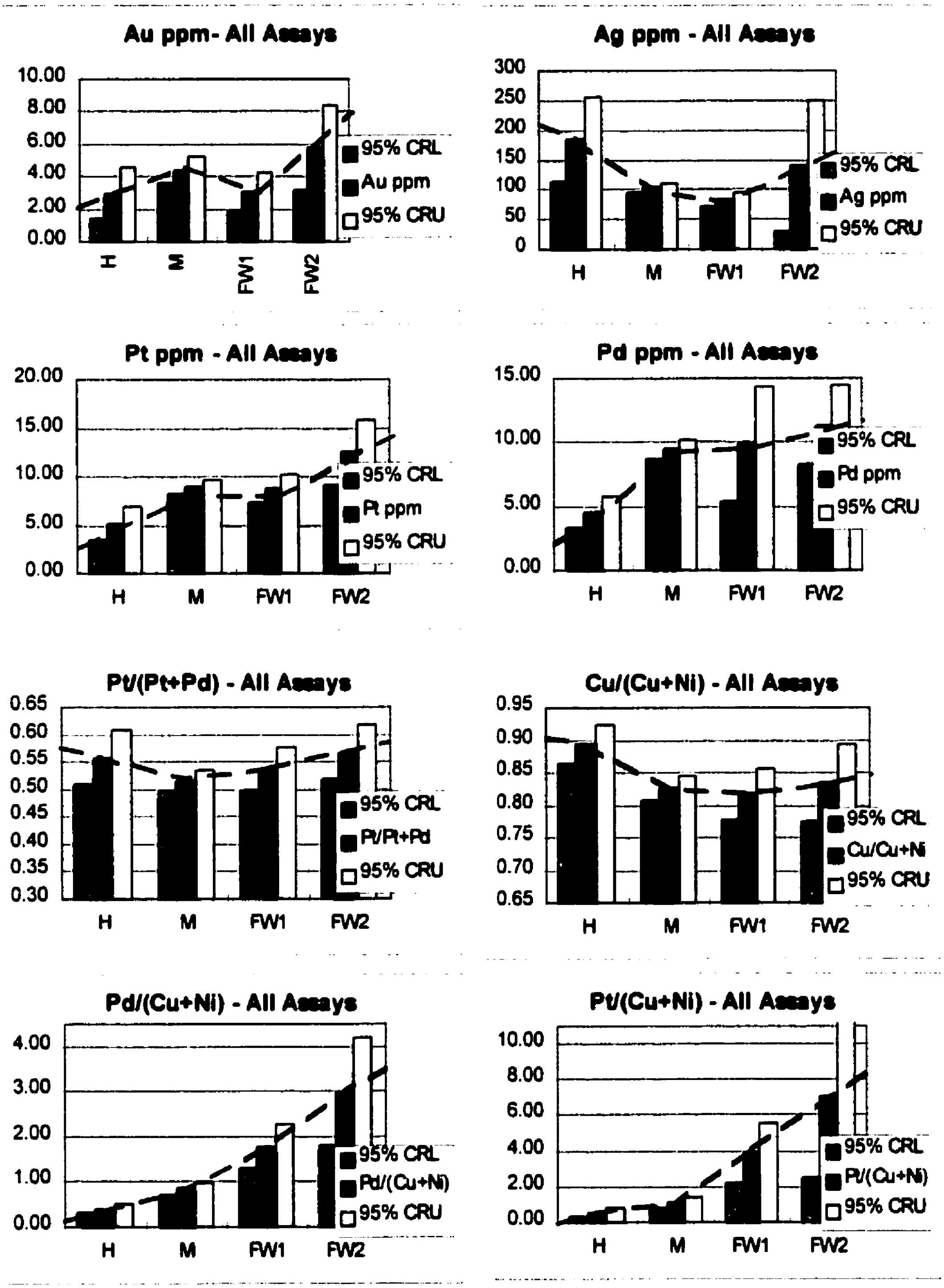


Figure 21: Comparison for all data with the FW veins further subdivided

Pt and Pd show a decline (as in the massive data) from the main to the FW1 veins. The proportion of Pt and Pd to sulphide shows a progressive increase across the four subdivisions.

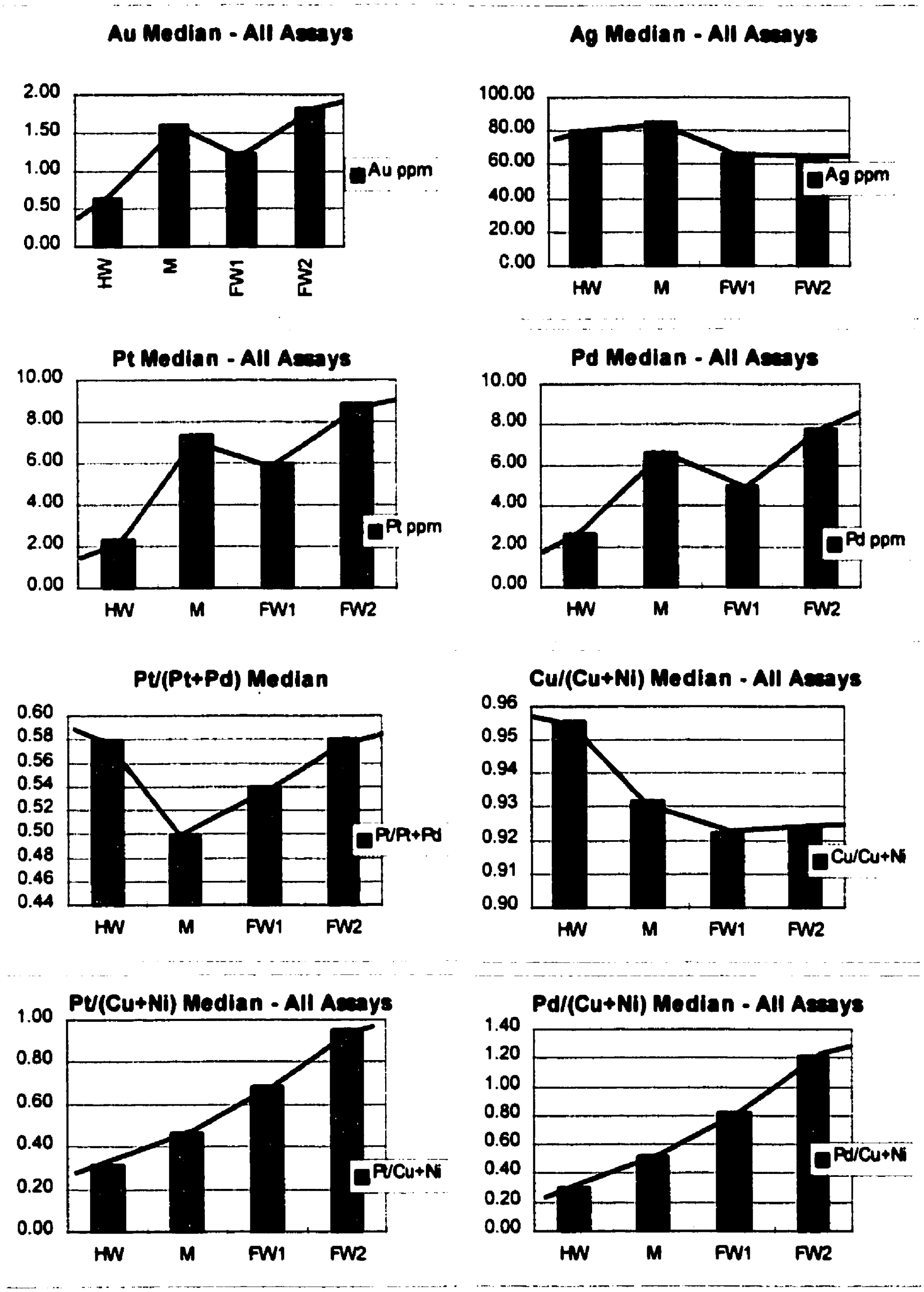


Figure 22: Comparison of median values

Trends are similar to the comparison using means.

Figures 19 and 20 illustrate the following observations using all assay data:

- Contrary to the massive veins alone, Au and Ag do not increase towards the footwall
- Pt and Pd shows similar trends to the massive veins althought this is not supported by median comparisons indicating ouliers or skewed distributions may be biasing the means. Pt and Pd ratios vs (Cu+Ni) show well defined increases towards the footwall.
- Pt/(Pt+Pd) does not decrease towards the footwall although Cu/(Cu+Ni) does show an increase

Figures 21 and 22 show comparisons for all assays with footwall veins further subdivided into FW1 and FW2:

- Au shows a similar pattern as the massive veins
- Ag does not show an increase towards the footwall
- Pt and Pd show similar patterns as the massive veins
- Pt/(Pt+Pd) and Cu/(Cu+Ni) do not show decreases towards the footwall
- PGE/(Cu+Ni) increases are well defined towards the footwall

Summary

Pt and Pd trends are consistent showing lower concentrations in the hanging wall and the highest concentrations in veins furthest from the SIC for both the massive veins and for all veins combined. The subtle increase is further supported by both the massive veins and all veins forming the same trends. The FW1 veins appear to have lower Pt and Pd than the main veins. Increasing Au and Ag along with decreasing Cu/(Cu+Ni) and Pt/(Pt+Pd) towards the footwall are not consistently supportable. Proportions of Pt and Pd in sulphide (vs Cu+Ni) show strongly defined increases towards the footwall. This indicates that there is a relative enrichment in PGM's contained in sulphide towards the footwall or that there are increasing discrete PGM's contained in the wallrock.

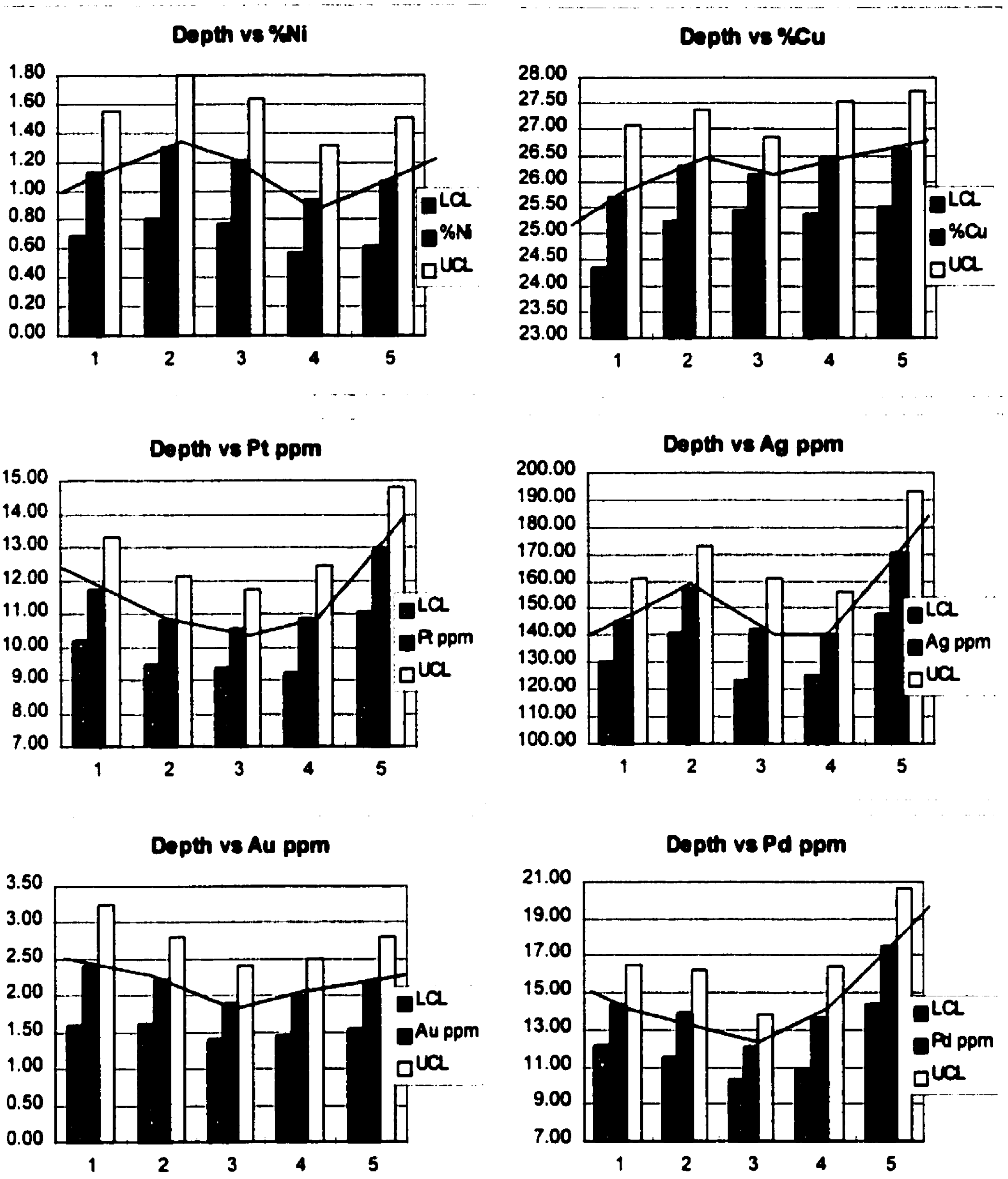


Figure 23: Metal Concentrations within massive veins vs. vertical depth (equivalent to distance down the plunge of the zone)

Approximately 50 samples per subdivision were averaged and are plotted with 95 % upper and lower confidence levels (UCL, LCL). Depth is represented as increasing from subdivision 1 to 5, which covers a vertical range of ~250m. Outliers have been removed. Depths correspond with the following elevations: 1=2748 to 2677m, 2=2676 to 2651, 3=2650 to 2628m, 4=2627 to 2594, 5=2593 to 2494.

Correlation with Depth

Figure 23 illustrates comparisons between averages for assays partitioned into groups of equal numbers with progressively increasing depth. Variations include increasing concentrations of Pt, Pd and Au from the centre of the zone outwards (towards the upper and lower plunge extent). The pattern for Au is less pronounced. Ag is highest in the lowest subdivision (group 5). Although confidence ranges for adjacent means overlap significantly, similarities in the patterns for different elements and similar trends defined by confidence limits lend support to the observed variations.

Spatial plots

Point plots on vertical cross sections and plans used to identify metal distribution patterns are found in Appendix V (section 2.1 and 2.2). The high local random variations and low sample density makes it difficult to place much confidence in the apparent trends. The sample spacing is 20 to 40 metres as compared to 3-6 metres in the lateral distribution study.

Composite Sections

(See Appendix V, section 2.1)

Massive Subgroup:

There are a few vague patterns including low PM concentrations along the HW, and isolated areas of high Ag and Pt+Pd concentrations. There is a weakly defined low Ni+Cu (high Fe) area near the core of the vein system. Some of these trends, such as low PM's in the hanging wall veins, support those suggested by statistical comparisons with distance from the SIC. Au appears randomly distributed contrary to weakly defined trends observed by averaging veins grouped by distance from SIC.

Semi-Massive Subgroup:

The only apparent pattern is an area of low Pd along the HW contact and higher concentrations towards the footwall veins.

Mineralization Subgroup:

The only pattern is a moderately well defined area of higher Pt occurring in veins furthest form the SIC. Overall there is less support, for increasing PM's with increasing distance into the footwall (distance the SIC) indicated by the point plots, as compared to observations derived from the statistical correlations with distance from the SIC and comparisons of means from vein subdivisions.

Composite Plan
(See Appendix V, section 2.2)

No well defined patterns were observed from the massive M veins. Weakly defined areas of high Pt, Ag and (Ni+Cu)/S occur at the southwest /downplunge extent of the zone.

Predictive model/Relative Error

Drill hole assays in proximity to the elevation of cut 1 and 3 were compared to the true value (assumed to be approximated by the mean of 280 face samples) for that given part of the deposit (Table 16). As the drill hole assays contain variable amounts of wall rock, and do not represent only sulphide vein material (as the face samples do), it is difficult to compare Cu and Ni.

	n	%Ni	%Cu	Au ppm	Pt ppm	Pd ppm	Ag ppm
True Mean	280	1.95	30.5	1.12	13.47	17.47	168
95% CR				0.97-1.27	12.84-14.1	16.34-18.6	158-178
Drill Estimate	9	1.23	29.10	3.15 *	14.73	17.9	191

Table 16: Comparison between drill hole assays and true mean concentration

The true mean is assumed to be represented by grade control data from lateral distribution study of 44 level. Comparisons between Cu, Pt and Pd came very close to the estimated true mean value for the veins. (The confidence interval for the drill hole data is assumed to be very high as only 9 assays were used to represent the area). There is a chance the similarity is coincidental. Au is higher in the drill hole data supporting the theory that there are significant amounts of Au in the wallrock. (* The mean was calculated after an outlier was removed, the original mean was 10 ppm. The outlier was removed for comparison purposes).

Results from Table 16 indicate that for a given area of the zone, the current drill hole spacing will give a fairly accurate estimate of the mean metal concentrations within the veins. However it will not necessarily recognize spatial variations which may occur across the deposit.

The average grade for drill assays (using only massive sulphide samples) representing a sample from the whole deposit vs more intensely sampled cuts 1 and 3 are compared in Table 17.

	n	%Cu	Au ppm	Pt ppm	Pd ppm	Ag ppm
Face Assays	180	29.52	1.12	13.47	17.47	168
Drill Assays	242	29.32	4.20	13.10	17.19	178
95% Conf. Range (Drill Assays)		29.0-29.6	2.9-5.5	11.9-14.3	15.5-18.9	167-189

Table 17: Average metal concentrations for the deposit

based on massive sulphide drill assay compared to the average concentrations determined by face sampling from top part (level 44) of the deposit. (average Ni concentrations are difficult to compare as there are multiple populations and a correlation with width).

Table 17 illustrates concentrations are comparable except for Au which is significantly higher in the drill samples. A further discusion of Au is included in the wallrock study.

Massive vs Mineralization:

Table 18 compares massive main veins to secondary veinlets and disseminations (mineralization subgroup).

	Pt/ (Cu+Ni)	Pd/ (Cu+Ni)	Au/ (Cu+Ni)	Ag/ (Cu+Ni)	Cu/ (Cu+Ni)	Pt/ (Pt+Pd)
Massive Veins	0.43	0.53	0.14	5.5	0.92	0.58
Mineralization*	3.45	1.72	2.61	36	0.77	0.47
Difference	8X	3x	19x	7x	-16%	-19%

* Subdivided based on less than 10% Cu+Ni

Table 18: Comparison of relative amounts of PM's, massive veins vs. mineralization

The results show much higher proportions of PM's occur within the mineralization subgroup, especially Au. This indicates that either the sulphide in this subgroup contains higher PM proportions or that the wallrock contains significant PM's. The proportion of Pt vs Pd is lower within the mineralization subgroup. As can be observed underground minor veinlets typically contain higher proportions of pentlandite and millerite which is reflected in lower Cu/(Cu+Ni).

2.4 Summary

- Extreme local random variations occur for Ni, Pt, Pd, Au and Ag. The majority of this variance is caused by random intrinsic and sampling variance related to local heterogeneity within the veins. Individual assays have an associated large relative error and are not representative of a given surrounding volume of vein. It is most significant that the range of values returned by multiple sampling at the same location is similar to the range of values across the entire data base. The detection of systematic variations in metal concentrations by comparing individual samples, which are essentially random numbers, is not possible. This is particularly important to metal zoning and sulphide fractionation studies that are based on relatively small individual samples
- Comparisons of mean concentrations for groups of assays, representing given areas of the deposit, reduce the effects of local variances and suggests that some metal distribution (zonation) patterns may be present. These differences in metal concentrations between different areas are subtle. Local variances result in estimates with poor precision. Skewed distributions, outliers and possible multiple populations reduce confidence in the composition of means.
- When comparing groups of veins representing different structual and plunge positions there are some weakly defined trends. PGE's appear to increase from the centre of the zone outward up and down plunge. PM's increase towards the footwall (increasing distance from the SIC). Target areas where further PM enriched mineralization may occur are further into the footwall. Higher PGE-enriched regions would be up and down plunge.
- The only strong statistical correlation between the metals within the massive sulphide veins is a negative correlation between Ni and Cu. There are weak correlations between PGE's and distance from the SIC. The correlations may be obscured by high random variations.

- Point plots indicate that subtle spatial variations may exist for the Precious metals, although the results are inconclusive due to the poor resolution of the data.
- Significantly higher proportions of PM's occur within the mineralization subgroup (low sulphide) as compared to the massive sulphide subgroup suggesting they contain higher proportions of PM's or there are more PM's in the adjacent wallrock.
- Lateral Cu, Cu+Ni and Fe zoning, which may support a fractionation process, is not present. PM's zoning ,if present, is un-detectable due to high local variance.

The following distribution characteristics were observed:

Nickel

Millerite (NiS) is more abundant than in Zone 38, where pentlandite (Fe, Ni)$_9$S$_8$ is the dominant Ni-sulphide. Coarse grained pentlandite eyes and pentlandite/pyrrhotite laminations typical of Zone 38 are not common (less Fe than Zone 38).

Ni forms a strongly skewed distribution containing two to three populations. The mode from grade control sampling is only 0.08% Ni. There are also areas which contain significantly higher concentrations similar to the arithmetic mean (>2% Ni). The highest Ni concentrations occur locally at vein terminations (the last 2 to 3 metres of the vein) and in areas where fracture aperture is narrow or erratic. Secondary branching veinlets are also typically enriched in Ni. These areas also contain higher concentrations of silicate minerals. There is a weak, inverse correlation between Ni and vein thickness (fracture aperture). With the exception of the local distribution patterns defined by a relatively small subpopulation described above, spatial variations in Ni concentrations are random.

Copper

Cu occurs as chalcopyrite ($CuFeS_2$) and cubanite ($CuFe_2S_3$). The only significant variations in Cu are inversely related to Ni. Variations in the relative proportions of cubanite and chalcopyrite may also define Cu and Fe zoning. From visual observation, less cubanite occurs in the upper part of the zone indicating the extremities (vertical extremity in this case) of the zone may be more enriched in Cu relative to Fe. This zoning may also be used as an indication of proximity to the bottom of the deposit (which was not defined at the time of this study). Variations in Cu within the assay data do not support this observation however.

Bornite occurs at the end of some veins along with native Ag and strong pervasive and vein type alteration. This distribution pattern is isolated and appears to be controlled by a hydrothermal process.

Gold

Au-bearing minerals were not identified visually. Drill assay data shows a weakly defined increase in Au in the massive veins with increasing distance from the SIC. When all veins were included this increase was not apparent. Similar findings were not found with respect to lateral distribution using face sampling on 44 level, although in this part of the zone the veins don't extend as far from the SIC as the veins represented by the drill data. Spatial plots indicate local areas with relatively higher and lower concentrations, but these areas are not consistent with the above patterns, geological characteristics or possible genetic models and may be random.

The assay data suggests significant concentrations of Au may occur within the wall rock adjacent to the massive sulphide veins or at vein contacts . This is evident in drill hole data (Table 17), where a small portion of wall rock was included in the sample, resulted in concentrations 4 times higher than face samples in which no wall rock was included. The wall rock contains a small amount of sulphide as disseminations and veinlets (The amount of wall rock included with the massive sulphide drill hole samples would be typically less than 5% but may comprise up to 15%).

Platinum and Palladium

Pt and Pd occur as discrete Bi and Te-minerals typically 50 to 100 μm in size. They are found spatially-associated with clusters of gangue minerals within the massive sulphide and as isolated grains within the wall rock silicates. No other small scale distribution patterns were observed based on visual thin section or hand sample mineralogy. Compared with Au, the massive vein drill hole assay data containing some wall rock do not contain higher Pt or Pd (or higher proportions relative to Cu+Ni) than those containing massive sulphide only. However, the mineralization subgroup contains significantly higher proportions of Pt and Pd relative to sulphide content than the massive subgroup.

With the exception of a few localized zones, no significant systematic lateral distribution patterns were observed using spatial plots. Statistical analyses indicate weak positive correlations with distance from the SIC. Spatial comparisons using averages from vein groupings show that hanging wall veins have lower concentrations compared to footwall and main veins. Weakly defined increases in Pt and Pd occur towards the upper and lower plunge extremities of the deposit. This symmetrical pattern may suggest that the lower extent of the deposit, which had not been defined at the time of this study, has actually been reached based on PGE distribution patterns.

Silver

Ag occurs as mainly hessite (Ag_2Te), and does not appear to have any systematic distribution patterns except locally at some vein terminations where native Ag occurs. Some lateral distribution patterns were observed on spatial plots although these don't appear to be related to geological features or 3-D distributions patterns observed for the other PM's. There is a weakly defined increase with increasing distance from the SIC and depth in the massive veins. When using all assay data there is no increase with increasing distance from the SIC.

Ratios

There are no well-defined trends for Pt/(Pt+Pd) or Cu/(Cu+Ni).

3.0 Regional Zoning, Metal Distribution Within Zone 38 and Relationship to Zone 39

3.1 Objectives

1. To investigate lateral and vertical metal distribution patterns within Zone 38. Zoning patterns within this more extensive and intensely sampled zone may provide a model for comparisons with Zone 39.
2. To determine if any metal distribution patterns within Zone 38 form a spatial relationship with Zone 39. Is there a gradational increase in PM's and Cu within Zone 38 that forms a vector towards Zone 39?
3. To investigate spatial and metal distribution relationships between Zone 39 and other Strathcona orebodies in order to define target areas for PM-rich ore deposits.

3.2 Methodology

Data

Approximately 1850 grade control samples, previously collected from mining faces and muckpiles on three mining levels (37, 39 and 42) were used for Zone 38. A smaller number of assays (29) from level 44 were also utilized. Although there are fewer samples than would be statistically desirable for 44 level, the data was still considered as 44 level appears to be offset from the plunge of Zone 38 and possibly forms a physical connection between Zones 38 and 39. Grade control samples were used for Zones 36 and 37. Zone 36 * was also sampled as part of a previous study (Li et. al 1992). Data from a study by Money (1992) including multiple face, reject and pulp samples were used to determine and partition components of local variances. All samples utilized represent massive sulphide vein material (~ 80-95% sulphide) without the addition of wall rock or internal wallrock fragments. The data, although not recalculated to 100% sulphide, is assumed to represent the original liquid composition.

The metal values and corresponding grid location for each sample was transferred from a Paradox® data base into Mapinfo®, Surfer®, Excel® and Systat® programs for plotting and statistical analysis. The population distribution characteristics of each element was investigated using histograms and probability plots (Appendix IV).

**The PGE values from Li et.al 1992 were found to be significantly higher than the grade control data. This discrepancy has not been resolved. Previously published data for Zone 36 (Coats et al. 1984) is used in this study.*

Zone 38

Lateral Distribution:

The data was quartiled and colour coded point plots were constructed using individual samples divided into four metal classes, for each level and in some cases for individual cuts within a level. Patterns in the distribution were visually inspected and isolated into areas of relative high and low concentrations. Results were then compared to existing genetic models. The data was also randomized and re-plotted in order to compare and evaluate the contribution of randomly occurring "coincidental zones".

Outlines of previously documented distribution patterns (Li et al., 1992) were superimposed on the point plots for comparison. Li used the same data (not re-calculated to 100% sulphide) although mine grid coordinates were not utilized for individual samples. Instead, samples representing mining stope blocks were averaged and compared. Although averaging helps to offset large local random variations, problems in the interpretation include the use of arithmetic means from skewed or mixed population distributions in combination with comparing means derived from statistically too few or significantly different numbers of samples. The influence of variances in Ni and PM's due to local heterogeneity were not fully addressed.

Vertical Distribution

The same assay data used in the lateral distribution study was utilized to investigate vertical (i.e. down plunge) metal variations. Arithmetic means and medians were compared for each level or for different cuts within certain levels. Comparisons were also done removing possible outliers (using the same methodology as for Zone 39). The means for each level were tested statistically to see if differences between their means could be shown to be significant.

3-Dimensional Distribution

Lateral PM distribution patterns for the three levels in Zone 38 were plotted on a 3-D block diagram, and inspected for any trends or vectors.

Regional Distribution

The Strathcona zones were plotted with corresponding metal concentrations on a composite plan and section. Potential sulphide liquid and metal enrichment pathways or vectors were examined. The vectors were defined by variations in metal concentrations as well as geometric and spatial relationships between the zones.

3.3 Results and Discussion

Zone 38

Local Variance

Comparing metal concentrations using individual samples is difficult as there are high, local, random variations due to heterogeneity within the veins (similar in magnitude to Zone 39). Comparing averages of groups of assays which represent concentrations for specific areas may also be misleading due to skewed population distributions and bias created by outliers or mixed populations. Table 19 summarizes the statistical results from faces where multiple samples were collected on 37 level of Zone 38 (data from Money, 1992).

	%Ni	%Cu	Au ppm	Pt ppm	Pd ppm	Ag ppm
Avg Face Mean	4.98	23.73	0.21	4.38	6.66	133
Avg. 95% CI	5.54	6.37	0.14	3.38	4.05	82
Avg. Coeff. of Var.	78%	18%	41%	48%	47%	47%
Avg. Coeff. of Var. (Zn 39)	95%	8%	49%	44%	45%	20%

Table 19: Average statistical parameters from Zone 38 (level 37)

The data represents the average of 4 faces where multiple samples were taken (4 samples per face). The coefficient of variation is a measure of the variability or spread of the data. As was the case for Zone 39, there is a large relative error inherent in each individual assay. The result is that individual assays are not necessarily representative of the true metal concentration for the given areas they are used to represent.

Population distributions

Histograms located in Appendix IV (Figure 7-9) show all elements to have single populations all with different levels of skewness. Although no obvious multiple populations are apparent, Ni can be seen to occur locally as distinct pentlandite rich veins (at vein terminations). Comparing averages for Ni can therefore be difficult as the populations may be mixed to different degrees.

Vertical Distribution

Comparisons of arithmetic means from three levels (37, 39 and 42) representing the upper, middle and lower parts of Zone 38 suggest there are systematic variations in metal concentrations (increases in Cu, Pt and Pd) which have a correlation with depth (Figure 24). Similar vertical trends are not apparent in Zone 39.

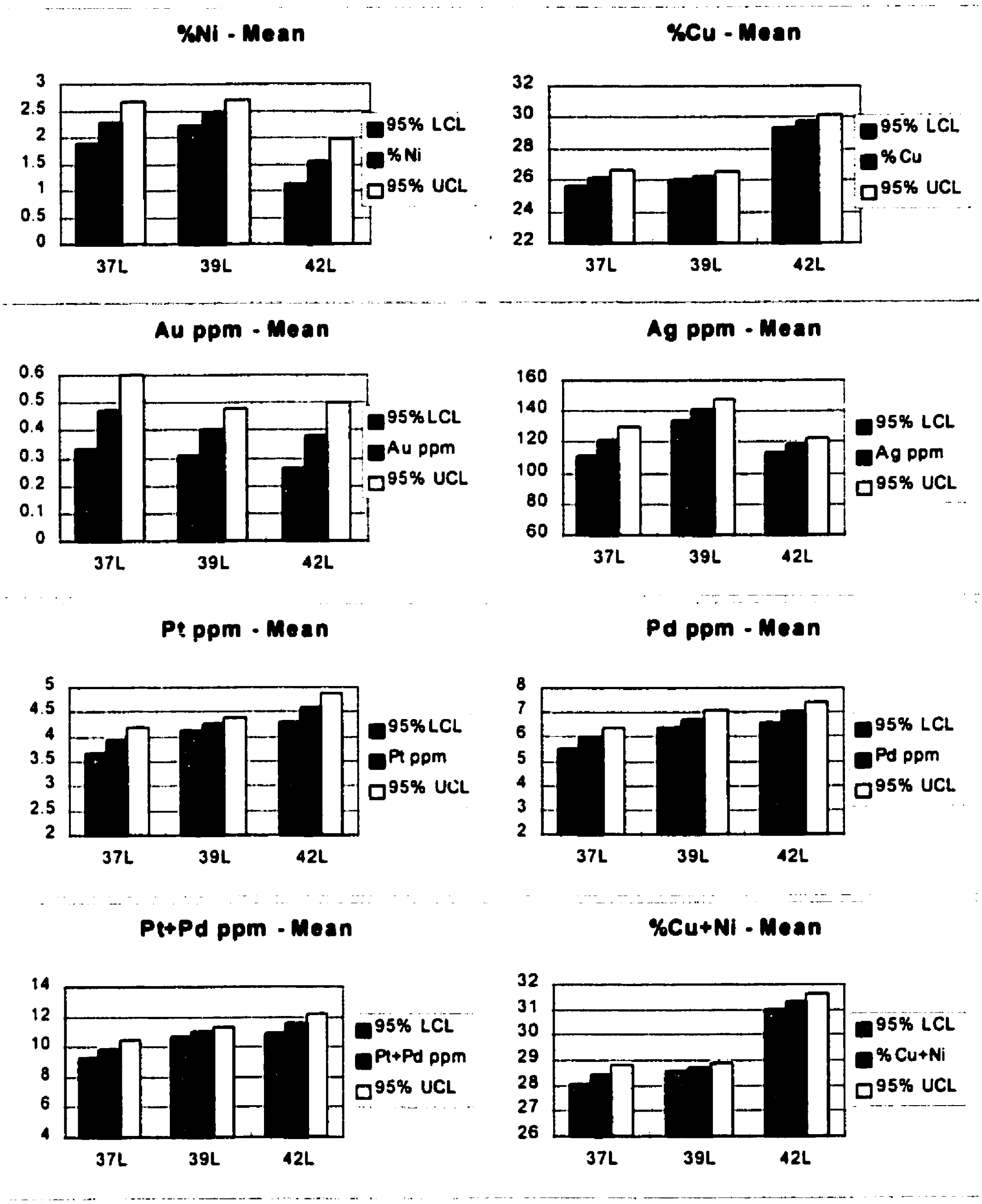


Figure 24: Comparison of arithmetic mean concentrations for different vertical levels within Zone 38

Arithmetic mean concentrations are bracketed by 95% confidence limits. When considering the confidence limits, which are used to approximate the error on the estimated means, some of the variations with depth become questionable. This is illustrated in Au, Pt and Pd where confidence ranges between levels overlap indicating correlations with depth (as defined by means) may be coincidental.

This trend is subtle however, with some doubts raised by overlapping confidence ranges along with comparisons of arithmetic means using different numbers of samples (n= 387 for 37 L, n=1203 for 39L, n=264 for 42 L), possibly containing different proportions of samples from certain areas. A mean calculated from a smaller number of samples with a more strongly skewed distribution may create a bias. The inclusion of higher grade samples in the average did not however, affect the overall trends. Similar results were obtained after removing outliers.

Figure 25 illustrates comparisons using a similar number of samples for each level. Assays for individual cuts (cuts 1, 2 and 3) on level 39 were subdivided in order to reduce the sample base to approximately 270-370 samples, a similar number to that of levels 37 and 39. The results contradict the previous patterns in that Pt and Pd in level 39 contain higher concentrations than level 42, when only cut 3 is considered. When only considering cut 2, Pt has a lower concentration than level 37. These comparisons suggests the apparent trends could be coincidental.

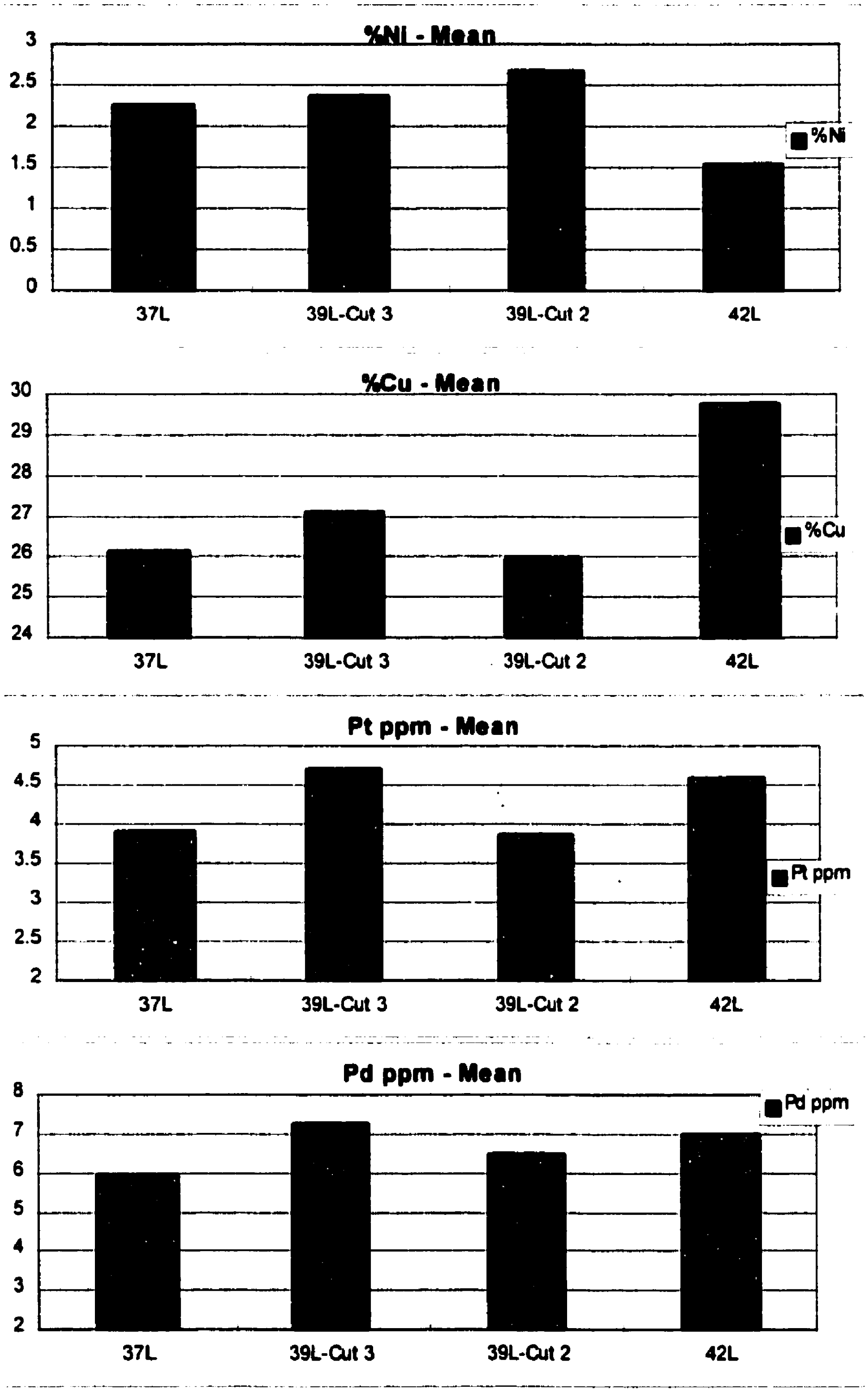


Figure 25: Comparisons using a similar number of samples

This comparison subdivides specific mining levels on 39 level. Pt and Pd are no longer highest on the lowest level.

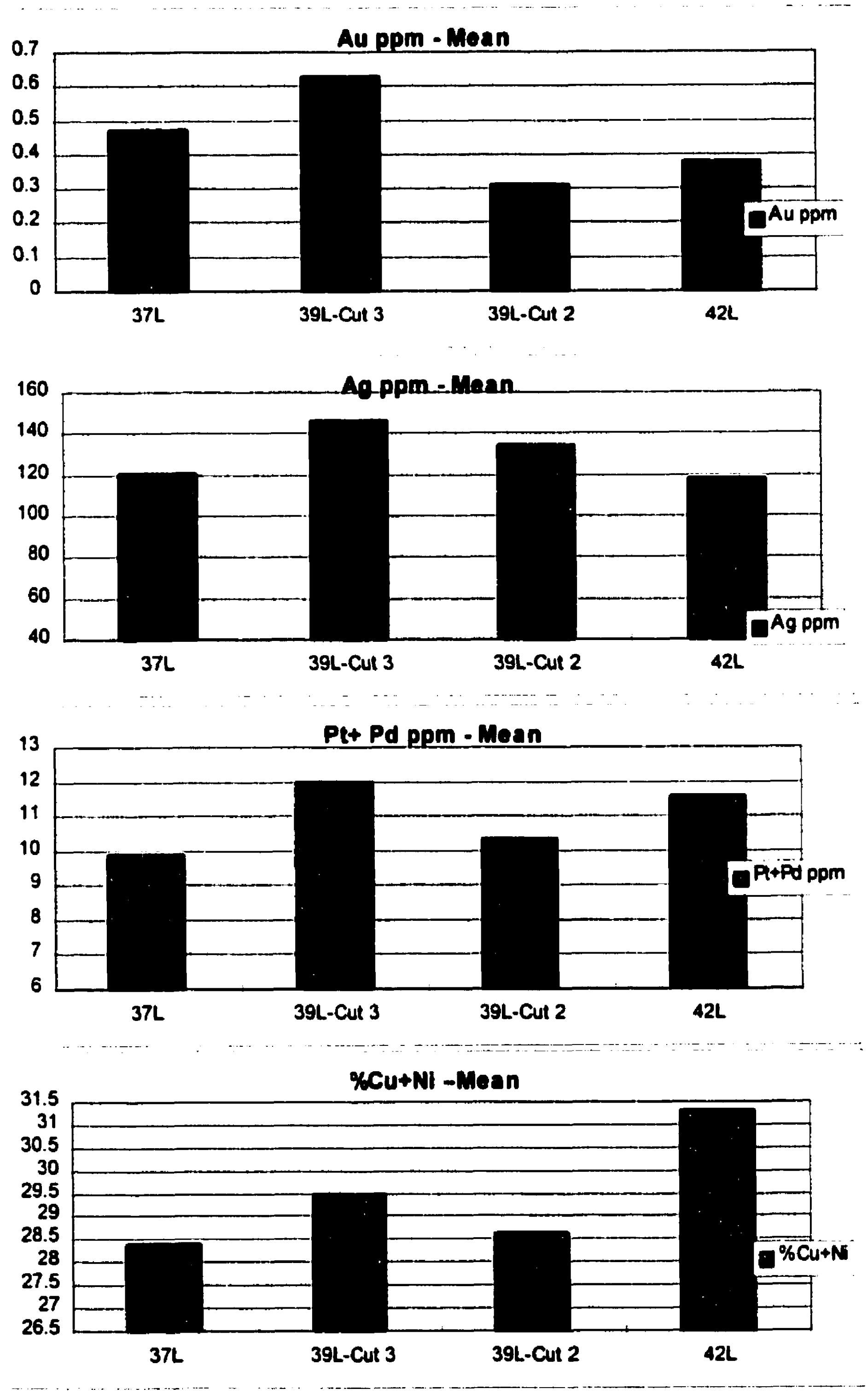


Figure 25b - Comparisons using a similar number of samples
Au is now highest on level 39. If cut 2 were sampled Au would have had the lowest concentrations on 39 level. Pt+Pd is highest on 39 level (cut3).

Limited data (26 samples) from the initial cut on level 44 appears to further support increasing Pt and Pd with depth. The preliminary PM concentrations from level 44 are transitional between Zones 38 and 39. Due to property position however only the west end of the orebody was accessible at this elevation, not allowing a representative sample to be collected. The location of this cut is also significant as it does not occur down plunge of the upper three levels of Zone 38, but rather forms a plunge trending further to the west (see Figure 34) suggesting the two zones may be physically connected.

Statistical testing was done to compare arithmetic means. Comparisons between levels 37 and 39 show statistically significant differences in means using T-tests for Cu, Pt, Pd and Ag. Using a non-parametric test all elements except Au appear to have statistically significantly different means. Comparisons between Levels 39 and 42 show only that Ni, Cu and Ag have different means using both statistical tests. Pt, Pd and Au could not be shown to have significantly different means.

Figure 26 compares differences in metal concentrations between the three levels using histograms.

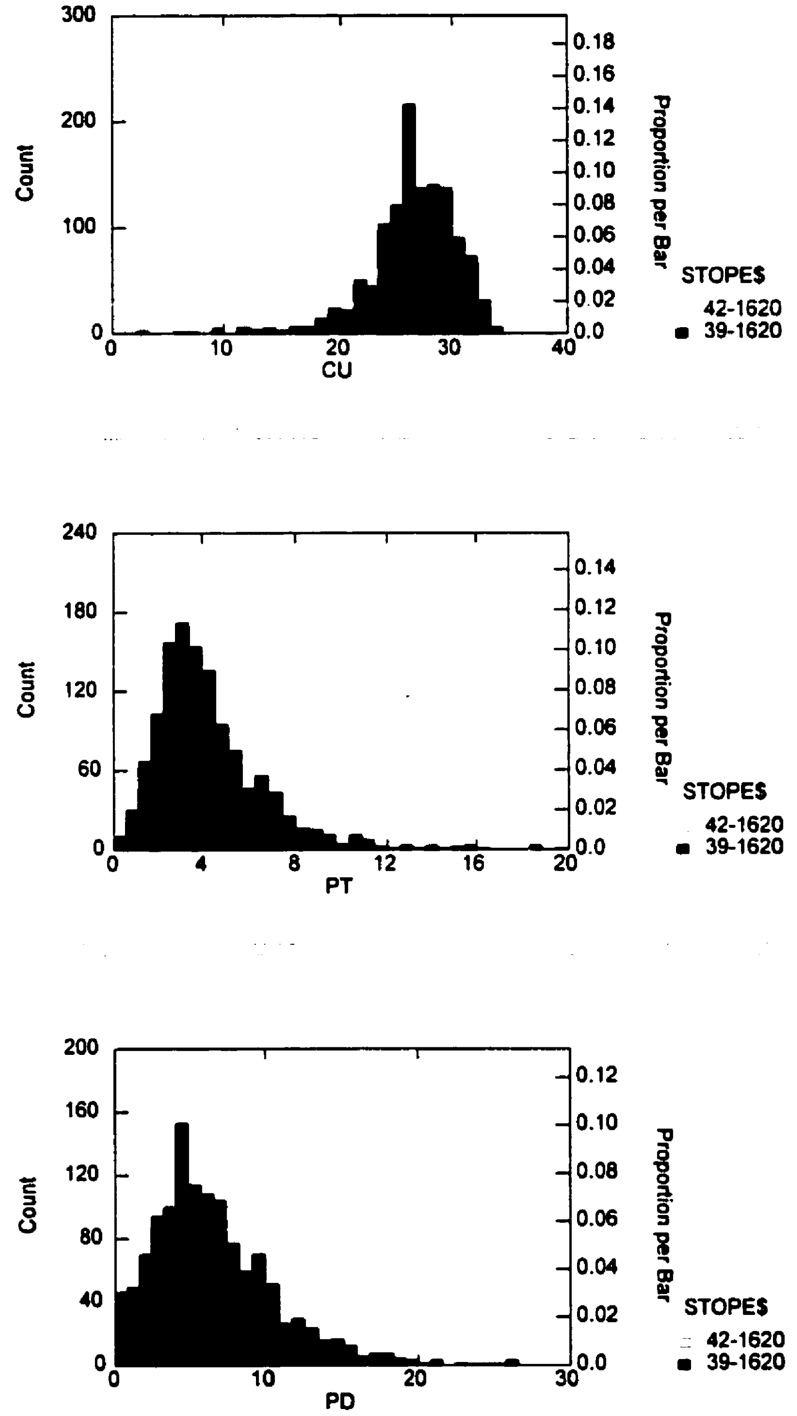


Figure 26: Multiple histograms comparing levels 39 and 42.

Distinct sub-populations occur for Cu, but not for Pt or Pd. This supports only Cu as having different concentrations between levels 39 and 42.

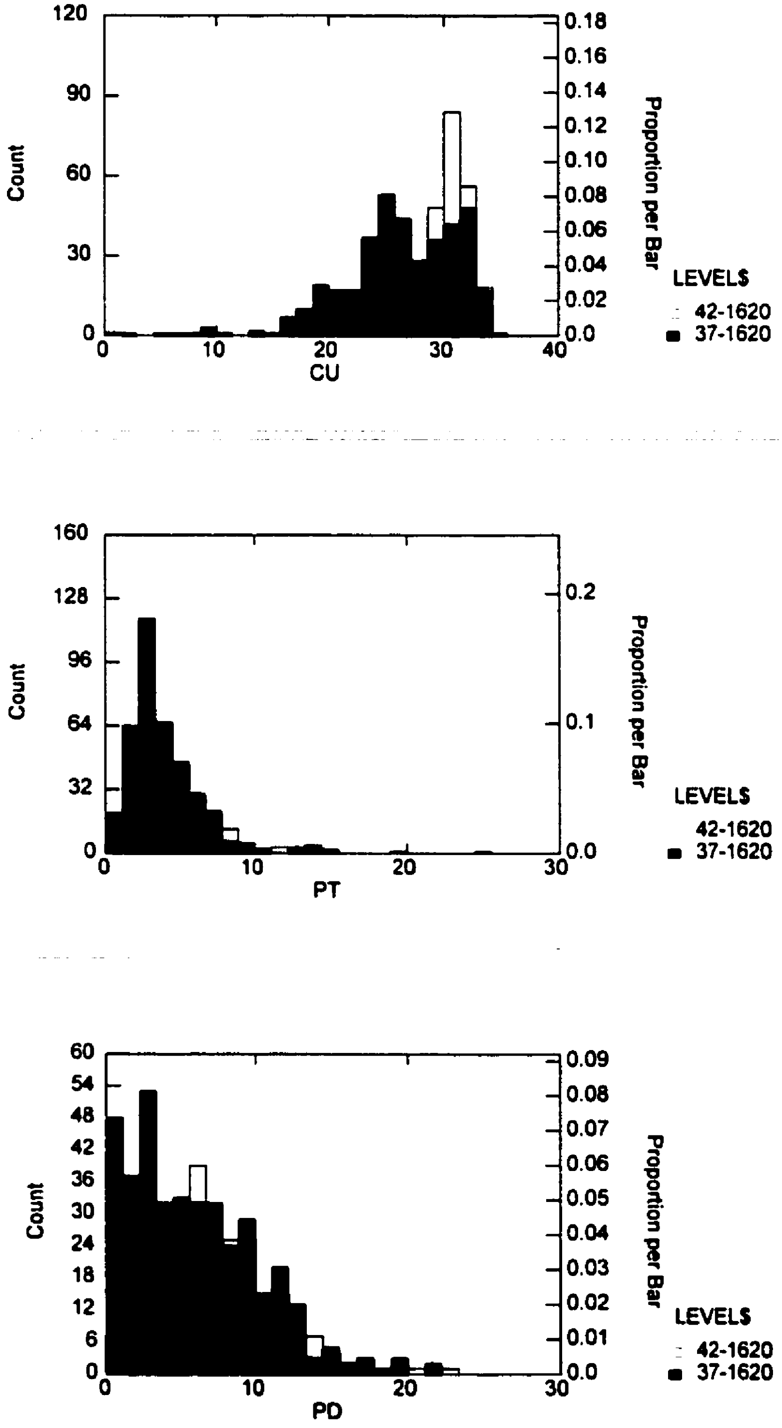


Figure 26b: Multiple histograms comparing levels 39 and 42. Cu and Pd show distinct separate population characteristics, supporting different concentrations for the two levels.

Lateral Distribution:

Population distributions (see Figure 26, and Appendix IV, Figures 7-9) for each level are positively skewed except for Cu which is negatively skewed. Two populations are well-defined for Cu on level 37 indicating the presence of metal zonation.

A plan view of the geology from existing back mapping of level 39 is shown in Figure 27. The following observations were made from point plot plans (Figures 28-32, Appendix VI, 1.0):

As was previously identified by Money (1992) and Li et al. (1992), Cu and Cu+Ni are strongly zoned. The patterns for levels 39 and 42 are significantly different than the interpretation of Li (Figure 8). Levels 39 and 42 are more concentrically zoned with lower concentrations in the core and higher concentrations around the lateral perimeter, as opposed to increasing concentrations radially with increasing distance from the SIC (Figures 29-30). This observation is similar to that of Money (1992) for level 37 except that the Ni distribution is random. This zoning also defines variations in Fe indicating the core areas contain higher concentrations of minerals richer in Fe (cubanite and pyrrhotite).

In addition, contrary to observations documented by Li et al. (1992), Pt, Pd and Pt+Pd do not correlate spatially or statistically with the Cu, Ni+Cu and do not form similar lateral zoning patterns (Figures 31-33).

The erratic distribution (high local random variance) of the Ni and PM data becomes more obvious using point plots than when grouping and averaging areas based on mining stopes (the method used by Li et al. 1992).

Nickel

Variations in Ni are random with the exception of: i) Level 37, where there appears to be a higher concentration in the core area (see also Money, 1992) and ii) Level 42 where there is a weakly defined area of higher concentration in the west side of the level (Appendix VI, 2.0). No patterns are evident on level 39. (*Figure 28*)

Copper

Levels 37 and 39 (*Figure 29*) shows strong zoning with lower concentrations in the core areas and higher concentrations in the extremities. This is not as well developed on level 42 (Appendix VI, 2.0).

Gold

Level 39, and to a lesser extent level 37, contain higher concentrations in the western half of the vein system. Level 42 shows no obvious pattern (Appendix VI, 2.0).

Platinum

There are only weakly defined areas with higher concentrations in the extreme eastern and western ends of level 39 *(Figure 31)*. Zoning is not apparent on level 37 or 42 (Appendix VI, 2.0).

Palladium

On level 37 higher concentrations occur in the core area (apparently correlating with Cu). This is not apparent on levels 42 and 39 (Appendix VI). The eastern and western extremities of level 39 contain weakly defined higher concentrations. *(Figure 32)*

Silver

The only patterns indicated are an area with higher concentrations in west end of level 42 (Appendix VI, 2.0) and more weakly defined areas with higher concentrations correlating with Au and Cu enrichments on level 37.

Platinum+Palladium

There are only weak indications of higher concentrations occurring along the footwall and the southwest hangingwall vein on level 37 and along with the east and west extremities of level 39*(Figure 33)*. Metal zoning is not evident on level 42 (Appendix VI, 2.0).

Copper+Nickel (Infers inverse correlation with Fe):

A well-defined concentric distribution pattern occurs on levels 37 and 39 with lower Cu+Ni concentrations in the core and higher concentrations around the periphery of the vein system. This low Cu+Ni core area indicates higher Fe (pyhrrotite, cubanite) concentrations *(Figure* 30*)*. The pattern is only weakly developed on level 42 (Appendix VI, 2.0).

Pt/Pt+Pd

The only apparent pattern is a relative high in the core area on level 37.

Cu/Cu+Ni

A weak trend occurs on level 39 with high Cu/(Cu+Ni0 at the eastern extremity (Appendix VI). There is also a moderate trend on level 37 with a low Cu/(Cu+Ni)core area (indicates Ni and Fe enrichment).

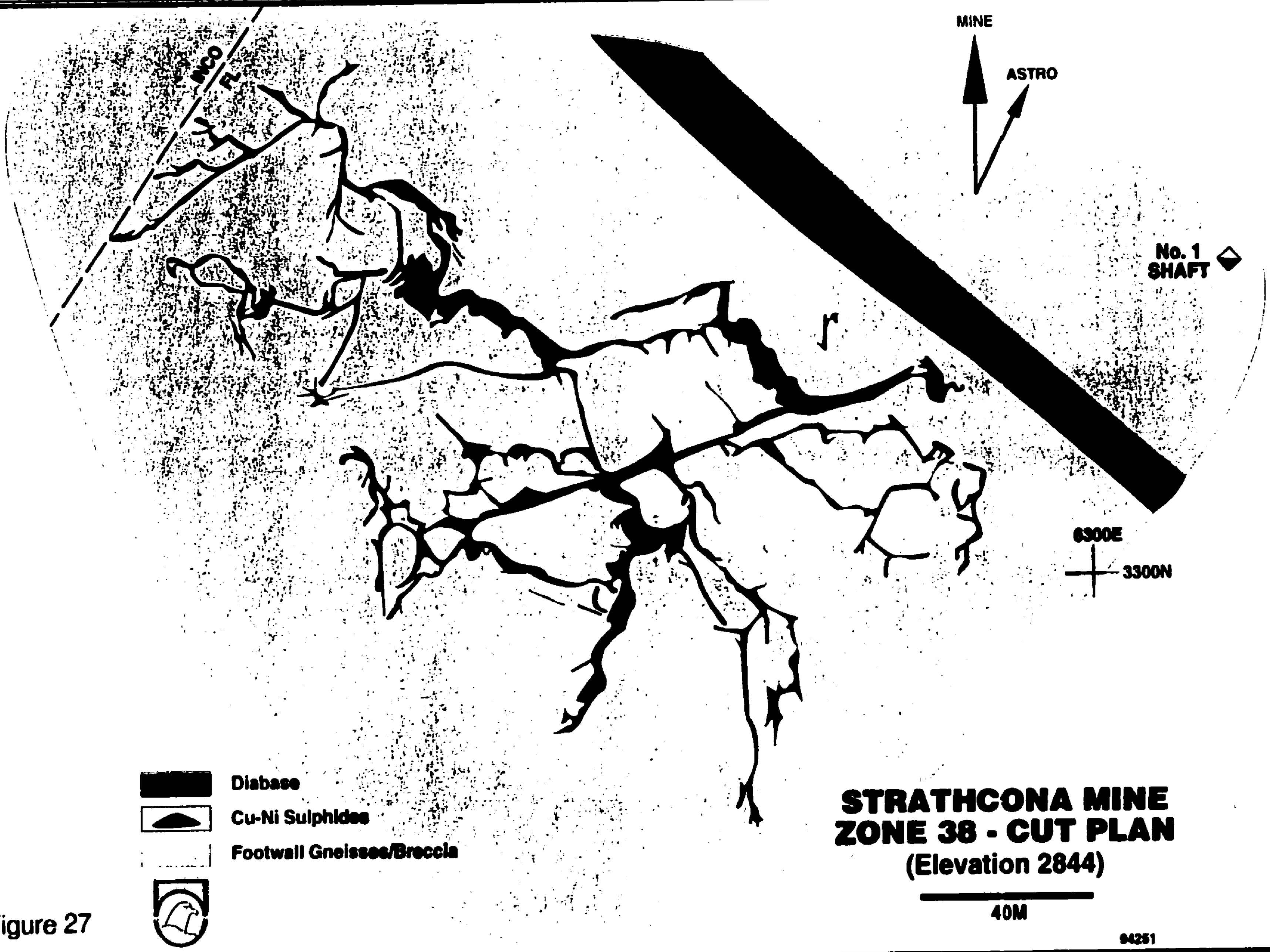

STRATHCONA MINE
ZONE 38 - CUT PLAN
(Elevation 2844)

Figure 27

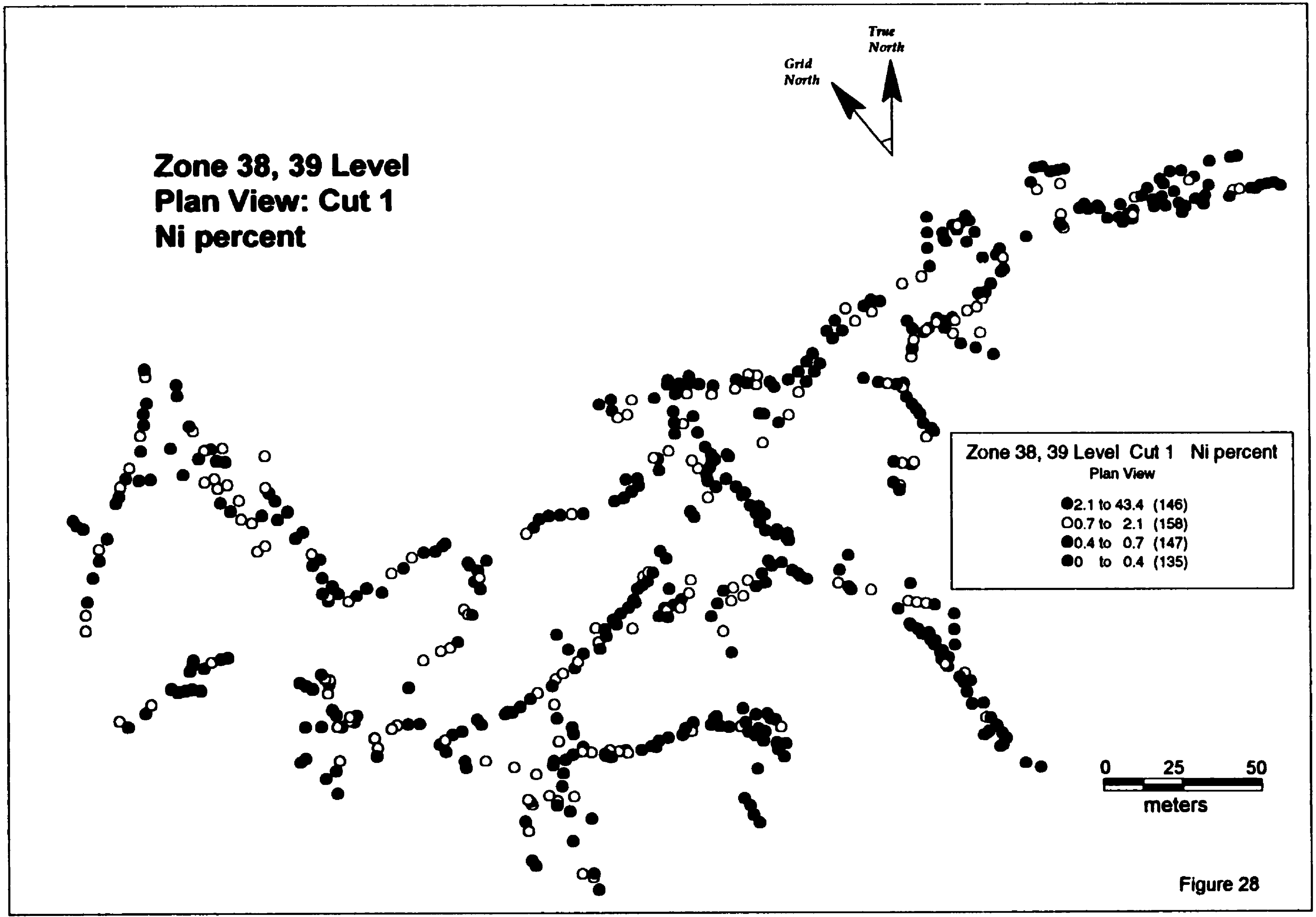

Zone 38, 39 Level
Plan View: Cut 1
Ni percent
Grid North
True North
Zone 38, 39 Level Cut 1 Ni percent
Plan View
●2.1 to 43.4 (146)
○0.7 to 2.1 (158)
●0.4 to 0.7 (147)
●0 to 0.4 (135)
0
25
50
meters

Figure 28

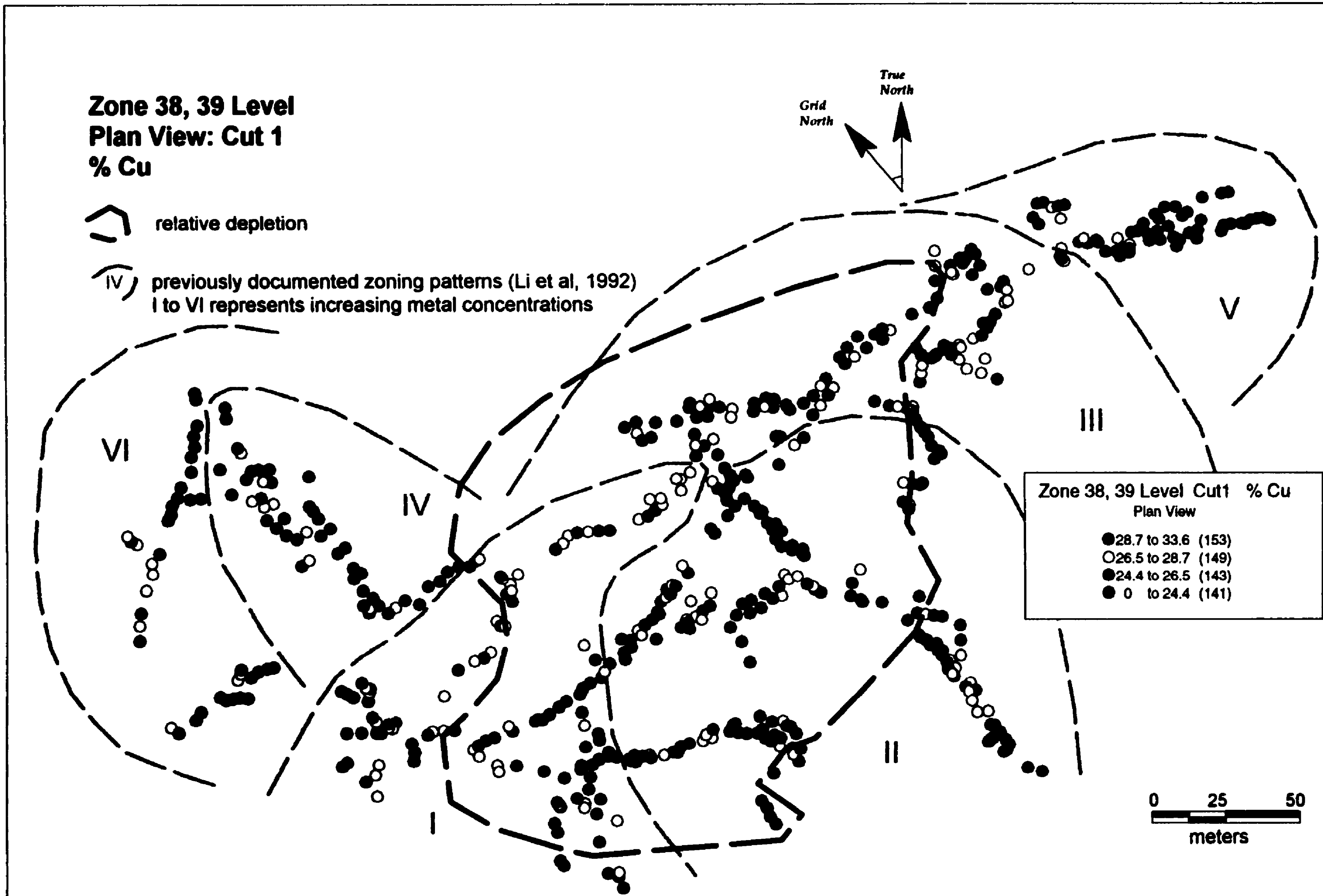
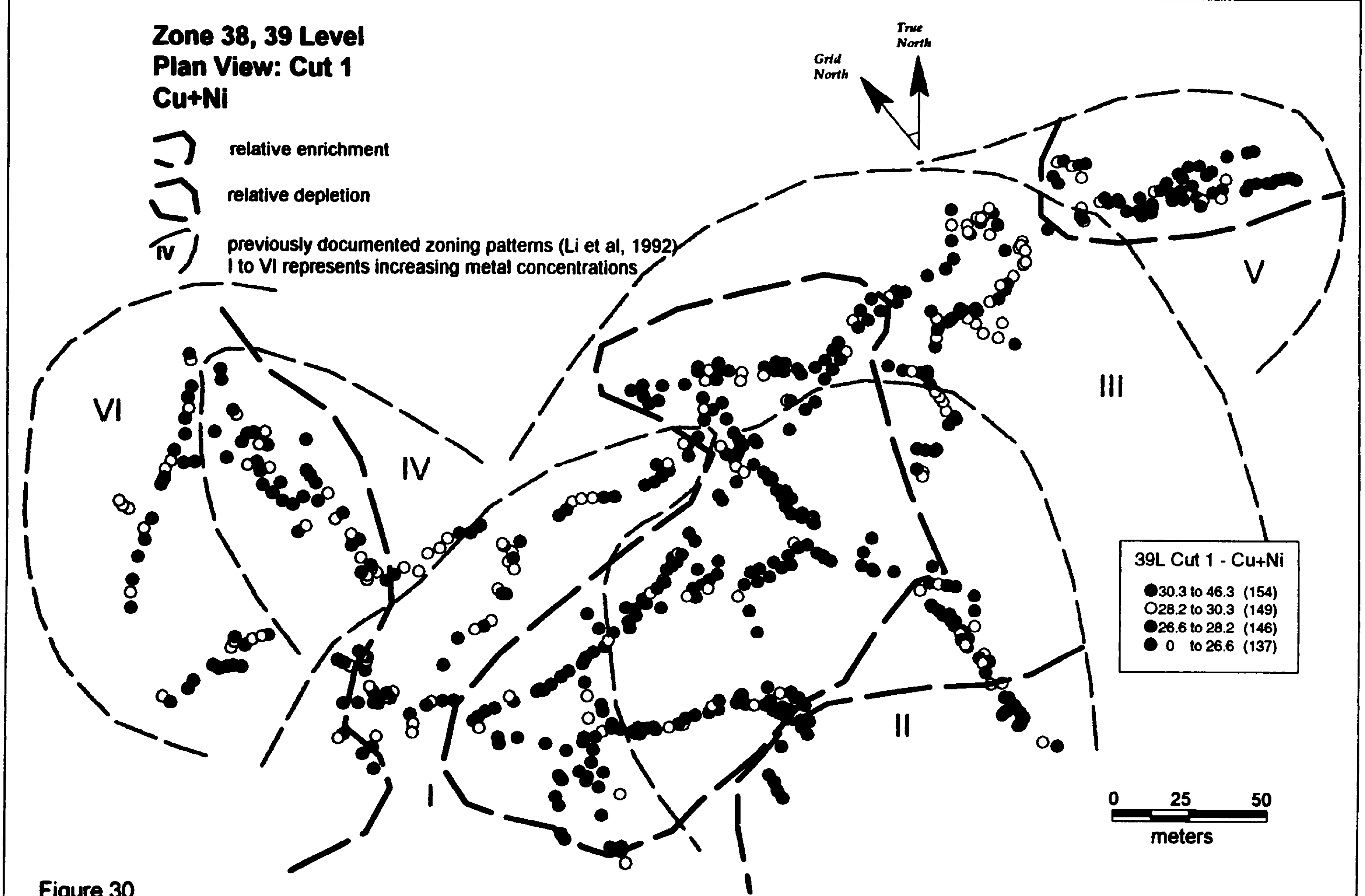

Zone 38, 39 Level
Plan View: Cut 1
% Cu
relative depletion
IV previously documented zoning patterns (Li et al, 1992)
I to VI represents increasing metal concentrations
True North
Grid North
VI
IV
I
II
III
V
Zone 38, 39 Level Cut1 % Cu
Plan View
● 28.7 to 33.6 (153)
○ 26.5 to 28.7 (149)
● 24.4 to 26.5 (143)
● 0 to 24.4 (141)
0 25 50
meters

Figure 29



Zone 38, 39 Level
Plan View: Cut 1
Cu+Ni

Figure 30

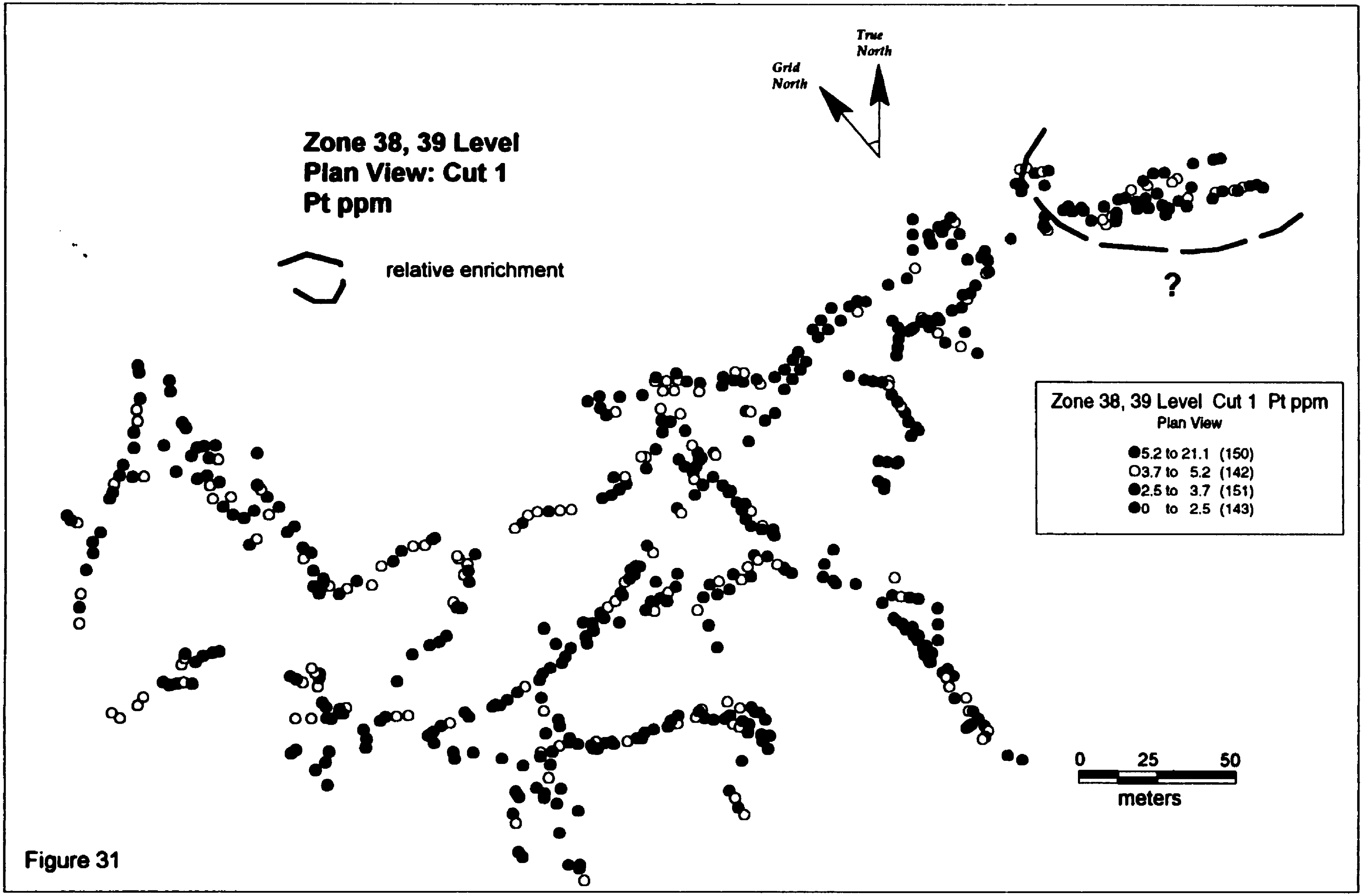

Zone 38, 39 Level
Plan View: Cut 1
Pt ppm
relative enrichment
True North
Grid North
?
Zone 38, 39 Level Cut 1 Pt ppm
Plan View
●5.2 to 21.1 (150)
○3.7 to 5.2 (142)
●2.5 to 3.7 (151)
●0 to 2.5 (143)
0
25
50
meters

Figure 31

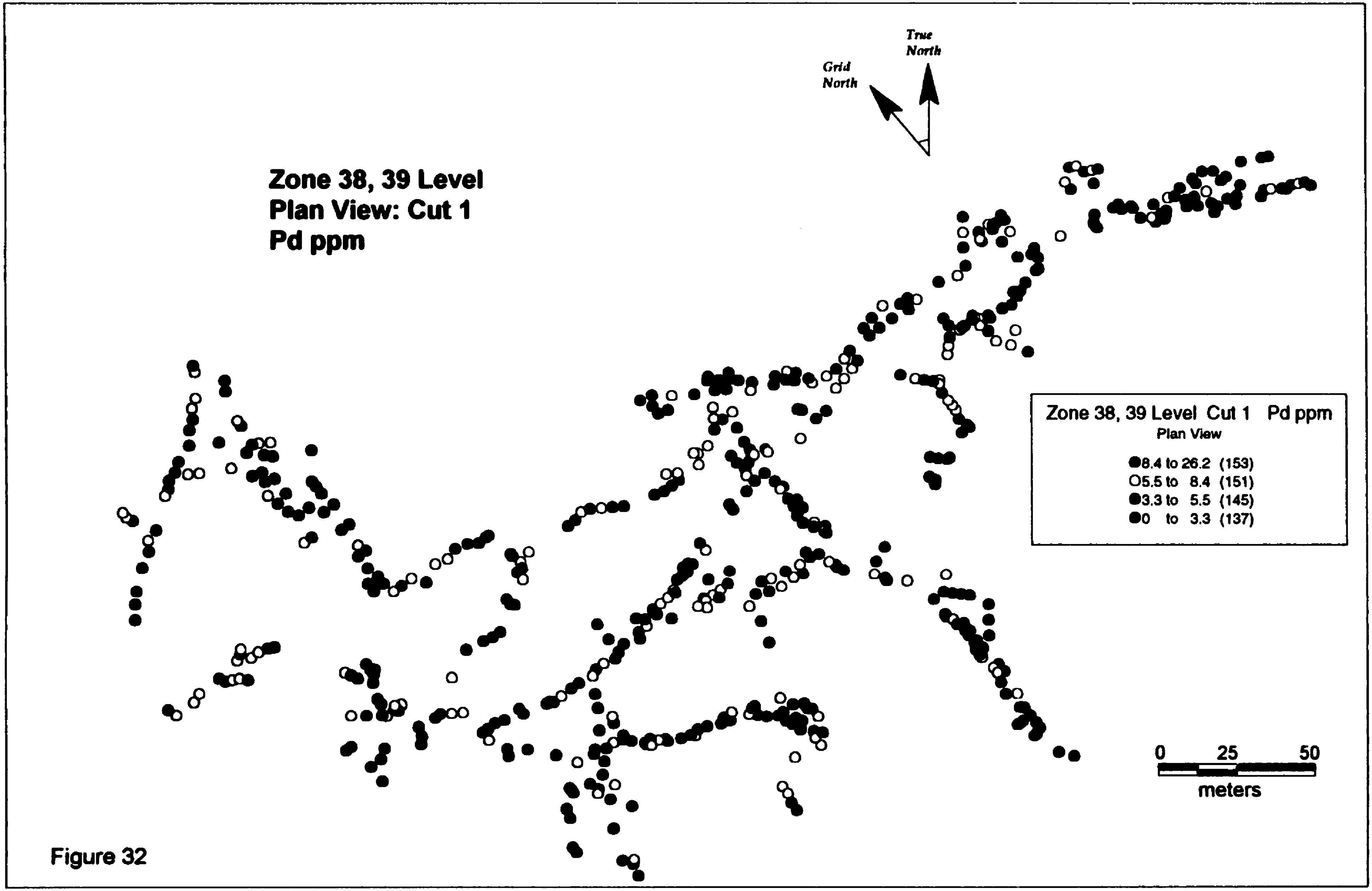

Zone 38, 39 Level
Plan View: Cut 1
Pd ppm
True North
Grid North
Zone 38, 39 Level Cut 1 Pd ppm
Plan View
●8.4 to 26.2 (153)
○5.5 to 8.4 (151)
●3.3 to 5.5 (145)
●0 to 3.3 (137)
0
25
50
meters

Figure 32

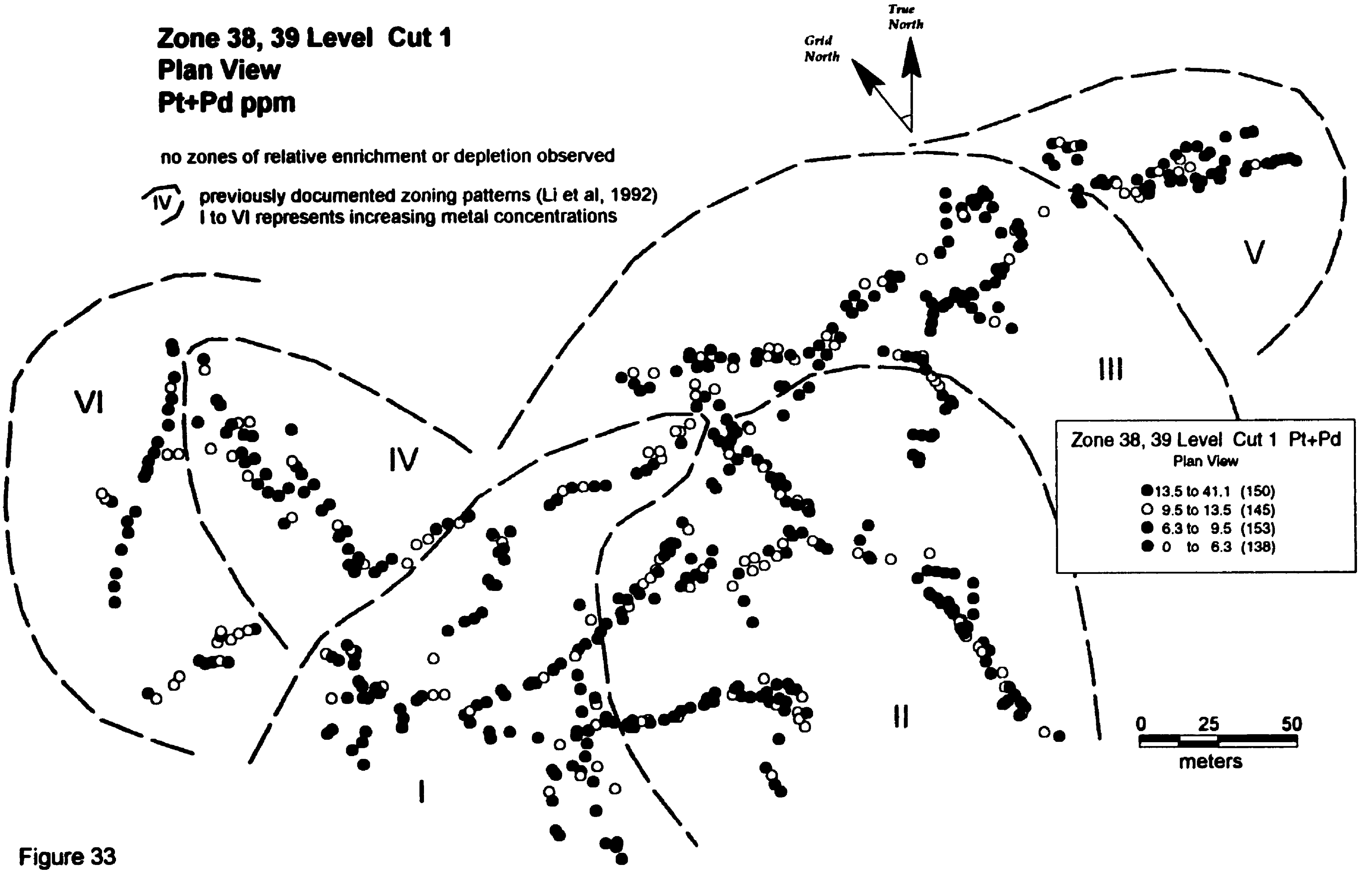

Zone 38, 39 Level Cut 1
Plan View
Pt+Pd ppm
no zones of relative enrichment or depletion observed
IV previously documented zoning patterns (Li et al, 1992)
I to VI represents increasing metal concentrations
True North
Grid North
VI
IV
I
II
III
V
Zone 38, 39 Level Cut 1 Pt+Pd
Plan View
● 13.5 to 41.1 (150)
○ 9.5 to 13.5 (145)
● 6.3 to 9.5 (153)
● 0 to 6.3 (138)
0
25
50
meters

Figure 33

Statistical Correlations

The only significant correlations recognized are a negative correlation between Ni and Cu (even though Ni+Cu show a good zoning) and a weak positive correlation between Pt and Pd. No significant correlations exist between Cu, Ni or Cu+Ni and PM's. These statistical results do not support a sulphide fractionation model where systematic lateral increases in Pt+Pd concentrations should correlate with increasing Cu and Cu+Ni.

3-D Regional Zoning

Zone 38

There is no evidence, based on lateral metal distribution patterns, of any vectors or potential pathways within Zone 38 which indicate a trend towards Zone 39. However, a change in plunge and transitional grades within level 44, along with the weakly defined increases in Cu, Pt and Pd from levels 37 to 42 are consistent with Zone 39 having formed from differentiated sulphide liquids which originated in Zone 38 (Figure 34). The plunge, as defined by the major levels (37-42) in Zone 38, is -35° to the southwest (230°). This plunge appears to turn towards the west as defined by levels 42 and 44. This plunge change may be only localized, however, as it is based on only the west end of level 44. Zone 39 plunges -25° to the south (180°). Even if the 44 level plunge is a localized change in plunge, the plunge defined by levels 37-42 and the Zone 39 plunge may converge at a deeper level.

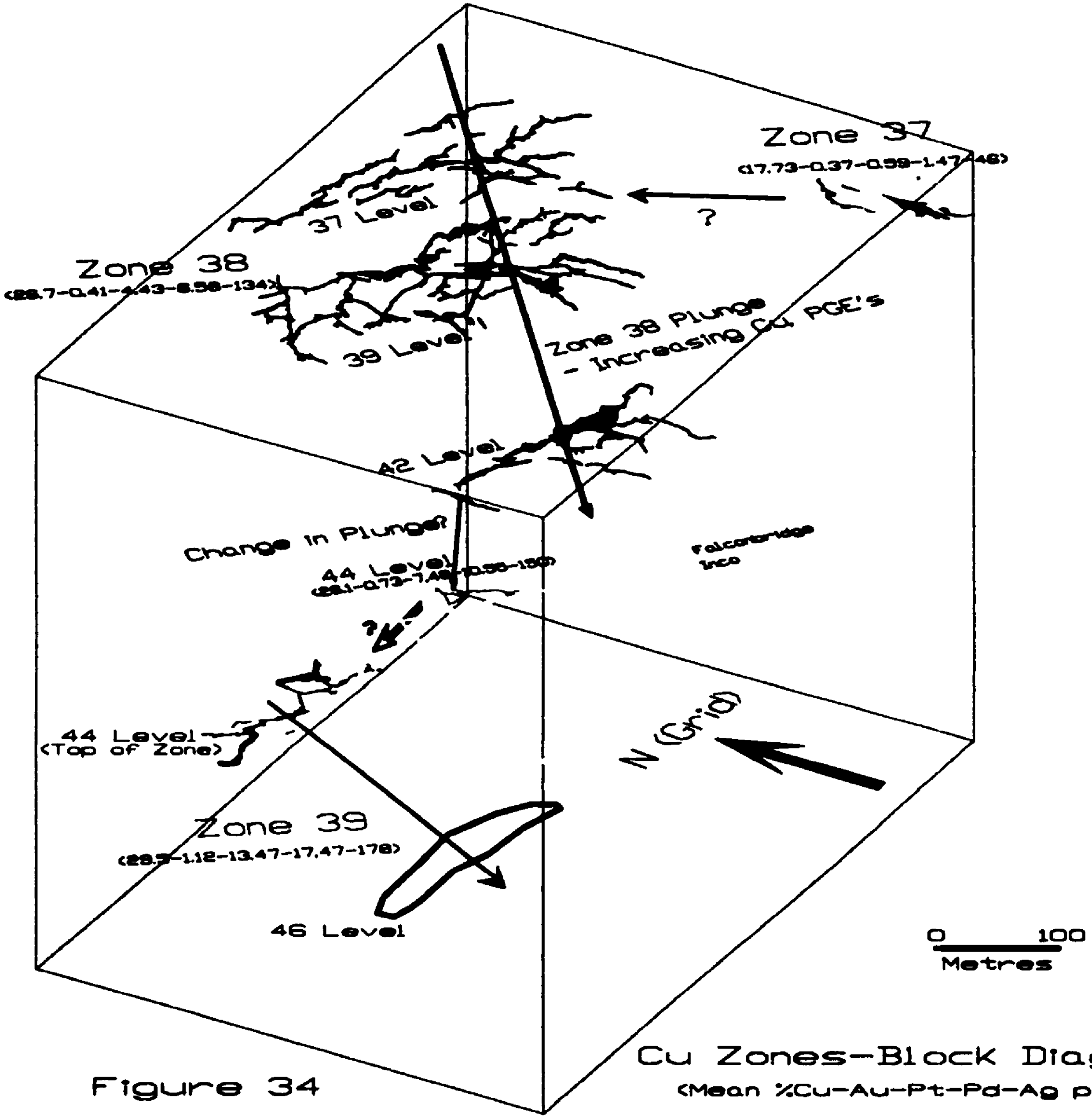
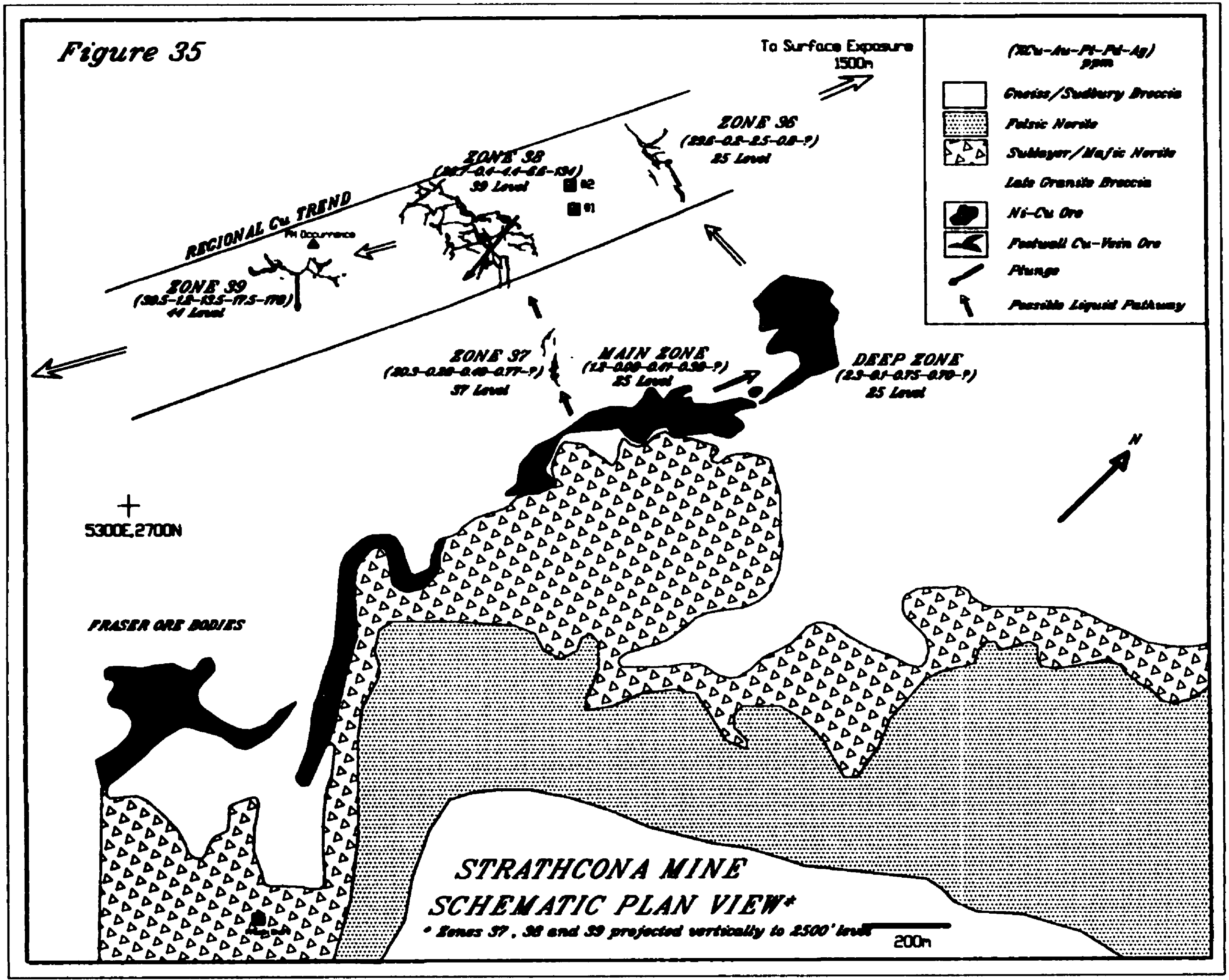


Figure 34

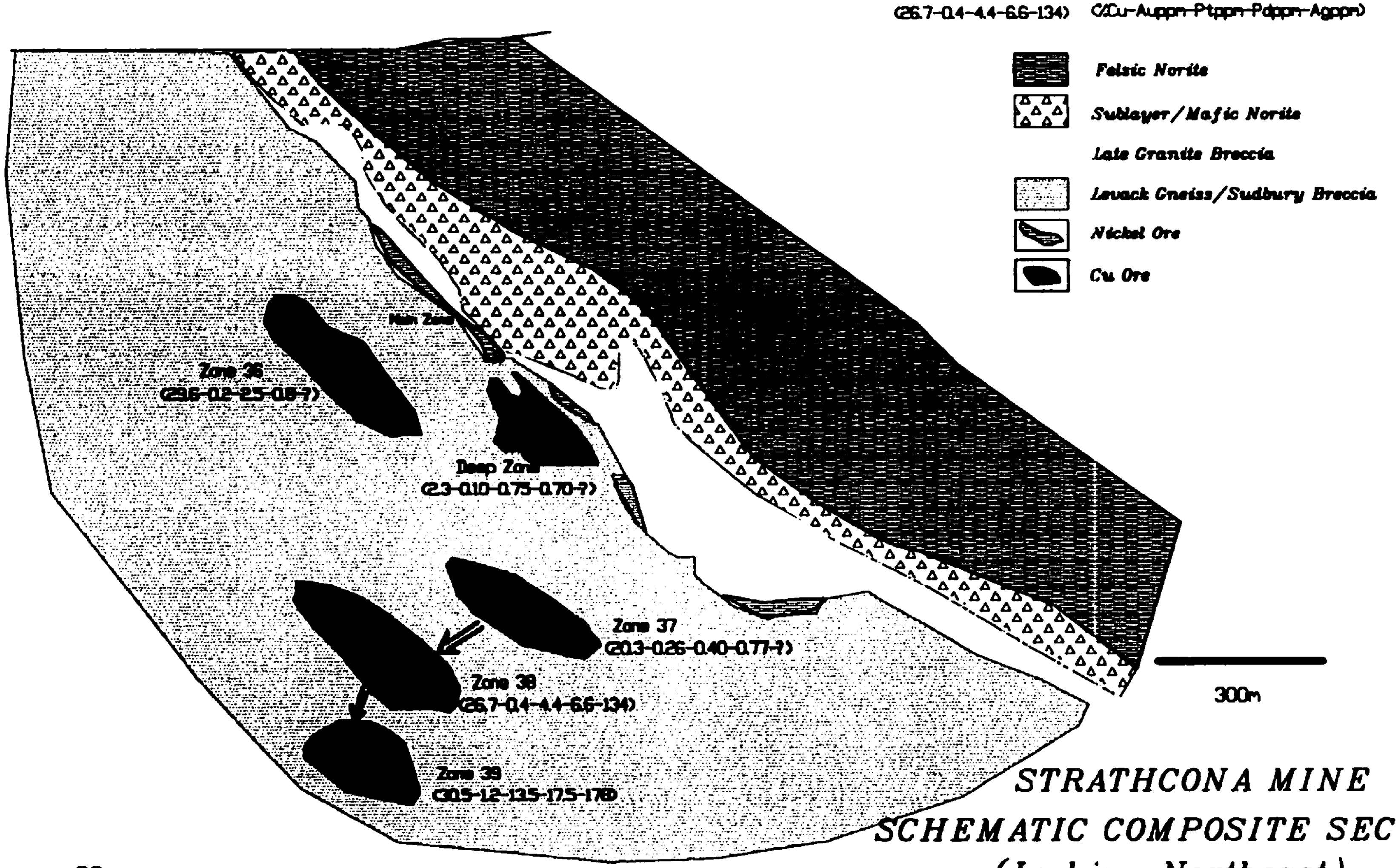
Cu Zones-Block Diagram
(Mean %Cu-Au-Pt-Pd-Ag ppm)

Figure 35



STRATHCONA MINE
SCHEMATIC PLAN VIEW*

* Zones 37, 38 and 39 projected vertically to 2500' level



STRATHCONA MINE
SCHEMATIC COMPOSITE SECTION
(Looking Northeast)

Figure 36

Regional:

The arithmetic means for all Strathcona zones are included in Table 19. Figures 35 and 36 show a composite plan and cross section with interpretive trend lines between orebodies suggesting "pathways" based on relative spatial orientation and changing overall metal concentrations. The metal content of Zone 39 is consistent with a sulphide fractionation model in that it occurs further into the footwall (further from SIC) and contains higher Cu and PM concentrations along with lower Fe (Figure 36). It also occurs down plunge and at the southwest extremity of a regional Cu trend defined by a surface exposure 1500m to the northeast, and Zones 36, 38 and 39. Possible liquid pathways suggesting physical connections between the zones and vectors defining increasing Cu and PM's occur along the southwest "Cu trend" (Figure 35). Pathways are also inferred between the Main Zone, Zone 37 and Zone 38 and between the Main zone, the Deep Zone and Zone 36. Target areas for PM enrichment are indicated further down plunge and into the footwall relative to Zone 39.

Comparing mean Ni concentrations for Zone 39 is difficult as Ni correlates with vein width (Table 20) and the data contains strongly skewed and mixed populations. Consequently , the un-weighted arithmetic mean may not be representative of the total sulphide mass. Zone 39, in Table 20, represents a Ni concentration which is weighted to vein width and does not contain a small high Ni subpopulation.

Zone	n	%Ni	%Cu	Au ppm	Pt ppm	Pd ppm	Cu/ (Cu+Ni)	Pt/ (Pt+Pd)	Dist to SIC	Host Rock
Hanging -Wall	10	3.10	0.37	0.02	0.11	0.10	0.11	0.52	0	DNBX
Main	18	3.40	1.20	0.08	0.41	0.38	0.26	0.52	0	LGBX
Deep	8	4.00	2.30	0.11	0.75	0.70	0.37	0.52	100	GNEISS
Zone 36	9	0.39	29.60	0.19	2.55	0.80	0.99	0.24	200	GNEISS
Zone 37	30	1.88	20.33	0.28	0.40	0.77	0.92	0.34	300	GNEISS
Zone 38	1850	2.28	26.74	0.41	4.23	6.58	0.92	0.40	500	SDBX
Zone 39	304	1.95	30.5	*1.12	13.47	17.47	0.90	0.44	600	SDBX

Table 20: Comparison of metal values** for Strathcona ore types

All values are arithmetic means. *Au is 4.0ppm when contact wall rock included. ** The Hanging -wall, Main and Deep Zones are from data re-calculated to 100% sulphide. This method is considered valid for comparison as there is only one Ni and Cu sulphide associated these Ni-Cu contact deposits. The Cu zones are represented by grade control sampling which consists of massive sulphide vein material and is considered to be representative of the composition of the original liquid.

%Ni	Mean	Median	Geometric Mean	Mode	Weighted Avg.
Zone 38	2.28	0.79	1.00	0.36	N/A
Zone 39	3.44	0.87	0.88	0.08	1.95

Table 21: A comparison of Ni for Zones 38 and 39

The weighted average for Ni from Zone 39 sill cut is significantly lower than the un-weighted average. The mode (most common value) and geometric mean is lower in Zone 39. These observations indicate that the overall Ni content in Zone 39 may not be greater than Zone 38. Mixed populations, different degrees of skewness and correlation with widths results in difficulty comparing Ni concentrations.

The higher Cu and much lower PM's found within Zone 36 are not consistent with relative proportions characterized by Zones 38 or 39. Cu concentrations found within Zone 36 are similar to Zone 39, but the PM values are much lower than in Zone 38. These metal ratios are not consistent with trends implied by the sulphide fractionation model.

It is not known whether some or all of the zones are connected physically by subtle conduits which have not yet been discovered. The inferred physical connections discussed above are problematic given the lack of evidence for a significant connecting conduit or driving force which explains a mechanism for how large volumes of sulphide liquid occur well out in the footwall. Physical connections between Cu-rich footwall deposits and the SIC contact zones, however, are evident at other Sudbury deposits, notably at Inco's McCreedy West deposit and Falconbridge's TL mine. These deposits, however, are much closer to the SIC than the Deep Cu zones.

3.4 Summary

Zone 38: Internal Zoning :

Local random variations of Ni and PM's are very high, and are similar in magnitude to Zone 39. This results in difficulty comparing individual samples or averaging small groups of samples to determine distribution patterns. Random local variations, especially for PM's, are greater than potential lateral or vertical variations indicated across the zone.

Weakly defined vertical zoning of Cu and PGE's occurs and is further supported by preliminary data from level 44. Subtle increases in the arithmetic mean PGE concentrations with depth however may be coincidental and related to differences in the number of samples averaged or the variability in the skewness of the data for each level. The large relative error on individual samples reduces the precision on the averages being compared. The overall increase in PGE abundance between 37 and 42 is more obvious than a progressive increase between the three levels. The difference in Cu concentrations between levels 37 and 39 is questionable. Cu is significantly higher on level 42 than the other two levels.

Average concentrations may also have been influenced by factors such as changing mining cutoffs, where narrower veins at the lateral extremities of the levels, which may be enriched in certain metals (especially Ni), may or may not have been mined (or sampled). To further investigate vertical variations more extensive sampling is required on levels 37 and 42 and 44.

Well developed concentric lateral zoning is defined by increases in Cu and Cu+Ni (decreases in Fe) from the core of Zone 38 laterally outwards. Except for a possible Pt enrichment in the east extremity, the data indicates PGE's are randomly distributed. PGE zoning as proposed by Li et al. (1992) is not obvious. No statistical correlations exist between Cu or Cu+Ni and PGE's. An apparent Au distribution pattern (higher concentrations in the west side) may be significant although it does not relate to existing models or geological features.

Evidence for internal sulphide fractionation processes within Zone 38 based on progressively increasing PGE's and Au with increasing distance from the SIC is not supported by the data. A fractionation or hydrothermal process could however explain concentric Cu, Cu+Ni and Fe zoning.

Relationship with Zone 39:

Some evidence exists to suggest that the two zones may have formed from common, but differentiating sulphide liquid. This is based on increasing PGE's and Cu with depth along with the plunge change and transitional PM concentrations in level 44 within Zone 38. A hydrothermal process could also explain metal variations based on a temperature gradient.

Regional Zoning:

When comparing differences in average metal concentrations and position relative to other Strathcona zones (down plunge and further into the footwall), Zone 39 conforms to a sulphide fractionation model. These relationships and metal variations, however, could also be explained using a hydrothermal model. The fact that similar metal zoning trends, due to sulphide fractionation, are well developed in the contact Ni-Cu orebodies suggests that a continuation of this process is more likely than a hydrothermal one.

Spatial and geometrical relationships indicate there may be at least two separate footwall liquid conduits present with possible physical connections between the Main Zone, Zone 37 and 38 (and possibly 39) and a possible connection between the Main Zone, the Deep Zone and Zone 36 (see Figure 35). The Cu zones including Zone 39 form a trend roughly parallel to the SIC contact and are spatially and possibly structurally associated with embayment structure. Zones 37, 38 and 39 also occur, when viewed in cross section, at the intersection of a line projected roughly perpendicular to SIC embayment structure.

Target areas for further enriched PM mineralization are suggested to be further into the footwall and down plunge relative to Zone 39. Locally, diamond drill intersections have already encountered this type of mineralization further into the footwall. However, because potential zones may be comprised of minimal amounts of sulphide, PGE-rich disseminations or veinlets would be difficult to visually identify and representatively sample. The delineation of such a zone therefore requires a well-constrained recognition criteria and sampling methodology.

4.0 Metal and Trace Element Distribution Within the Wallrock of Zone 39

4.1 Introduction

Discrete massive sulphide veins comprising the main ore veins within the Deep Cu Zone are locally surrounded by a halo of by disseminated and stockwork veinlet sulphide and pervasive to vein-type epidote, calcite and silicate alteration extending up to 2 m into the wall rock. The vein contacts also have an associated dark alteration selvage ranging from less than a mm to a few cm thick consisting of chlorite, epidote and actinolite. Previous studies on the wallrock halo in Zone 38 include Li et al. (1992) and Farrow (1992). Zone 39 is also characterized by a similar alteration.

It has been suggested (Abel, Farrow, 1992; Li et al., 1992) that the mineralization found in the halo zone may have been formed by hydrothermal fluids, possibly as a late product of the sulphide magma or alternatively contemporaneous with a hydrothermal event responsible for forming the massive sulphide veins. Another alternative is that a later hydrothemal event remobilized and distributed metals from the existing massive sulphide veins. Li concluded that (for Zone 38) the sulphides within the alteration zone and mineralized halo contain higher Au and PGM's (when recalculated to 100% sulphide) than the main massive sulphide veins. Li's study focussed on an area within 1-2m from the vein. Preliminary work done by Jago et al. (1994) documents an extensive Cl and F enrichment halo around the footwall veins at Inco's McCreedy East Mine and Victor deep deposit adding evidence for the involvement of an aqueous fluid in mineralization or post-mineralization processes.

Zone 39:

Disseminated mineralization in the wallrock halo in Zone 39 consists of mainly of chalcopyrite. The sulphides in secondary stockwork veining are dominantly millerite-rich with increasing distance away from the Main veins along with quartz and calcite-epidote-chlorite. Locally bornite and native Ag occurs. The stockwork sulphide and vein type alteration appears more prevalent where veins are irregular and narrow, in regions where the fracture system is not one well-developed planar fracture but rather a series of smaller (stockwork) fractures. The dark alteration selvage does not appear to become thicker with increasing vein width. In some of the widest veins the alteration selvage may be only weakly developed. Pervasive epidote alteration with disseminated chalcopyrite and millerite veinlets extending 2 to 3 metres into the wall rock occur occasionally, typically at the vein terminations.

A more subtle chemical dispersion may exist at a microscopic scale not previously recognized by observations during drill core logging or underground mapping. This dispersion may define a broader signature spatially and genetically related to the zone. There may also be pathways defined by the subtle dispersion of trace elements along extensions past the ends of the zone or individual veins. This was tested in Zone 39 where an area of highly enriched PGE+Au occurs approximately 35m further into the footwall beyond the end of the massive veins.

This mineralization may define a conduit or vector leading to an area where low sulphide and precious metal enriched mineralization may occur.

4.2 Objectives/Methodology

1. To determine whether a metal and/or trace element (Cl, F, Bi, Te, Se, As, Sn, Pt, Pd, Cu, Ni, S) halo or wallrock alteration related to the mineralization exists proximal to veins (within 18m) and how extensive it is. The emphasis was on a microscopic dispersion (replacement, or micro-veinlets and disseminations) within the wall rock, not elements hosted by obvious minor sulphide or non-sulphide veinlets (these were not sampled, although it is acknowledged that they are present and directly associated with the mineralizing fluid/magma). This study was done at two scales using a detailed underground face sample traverse extending 1.5 m from a massive sulphide vein contact, and a traverse along a drill hole (ST44-194) extending along a vertical cross section through the entire zone including areas 18 metres extending into the structural hanging wall and footwall of the zone. This study was designed to be an orientation study, to determine if a larger, more detailed investigation is warranted.
2. To test for precious metal enrichment pathways in the wallrock by sampling a cross section extending through the hanging wall to footwall veins and past the zone further into the footwall to a known precious metals occurrence located

30m further in the footwall. All material including minor sulphide veinlets and disseminations were sampled.

3. To investigate the Cu, Ni and precious metal concentrations and distribution in the wall rock within a 1m halo to the vein. To determine if lateral distribution patterns across the zone occur and determine an average concentration for planned dilution (wallrock recovered with sulphide veins). The sampling methodology differs from objective #1 in that it incorporates a larger database of systematically collected samples (240) across an entire horizon (mining cut) of the zone. It includes the same six elements analysed in the massive sulphide veins. All material, including minor sulphide veinlets and disseminations, were sampled. This sampling program is also valuble as it facilitates the investigation of lateral distribution of total sulphide PM composition. As the lateral distribution study focussing on discrete massive sulphide veins did not include secondary mineralization found in the wallrock halo, it may not have fully investigated the distribution of all sulphide material (representing the original liquid). Increases in PM concentrations towards the end of the system or in the footwall along with evidence for a fractionation model can also be further investigated.

Background values for the elements studied were obtained by sampling Sudbury Breccia from a vertical drill hole (NDR 36) located 1 km to the east of Zone 39 in an area known not to host mineralization. Other studies where background values have been established for similar elements include Jago (1994) and McCormik (ongoing Falconbridge internal research). Anaytical methods and detection limits are listed in Table 22. Further details relating to methodology is summarized in Appendix II.

Element(s)	Method	Detection Limit
Pt, Pd	Fire Assay	10, 1 ppb
F, Cl	CHM	20, 50 ppm
S	CHM	0.01%
Bi, Se	AA	0.05 ppm
As, Te	AA	0.2 ppm
Sn	XRF	5 ppm
Cu, Ni	A	0.01%

Table 22: Trace Analysis - XRAL Lab: Method and Detection Limits

(* For objective 1 only. Objective 2 and 3 used procedures from Falconbridge's lab described above).

4.3 Results

Objective 1

Proximal (1.5m) Scale:

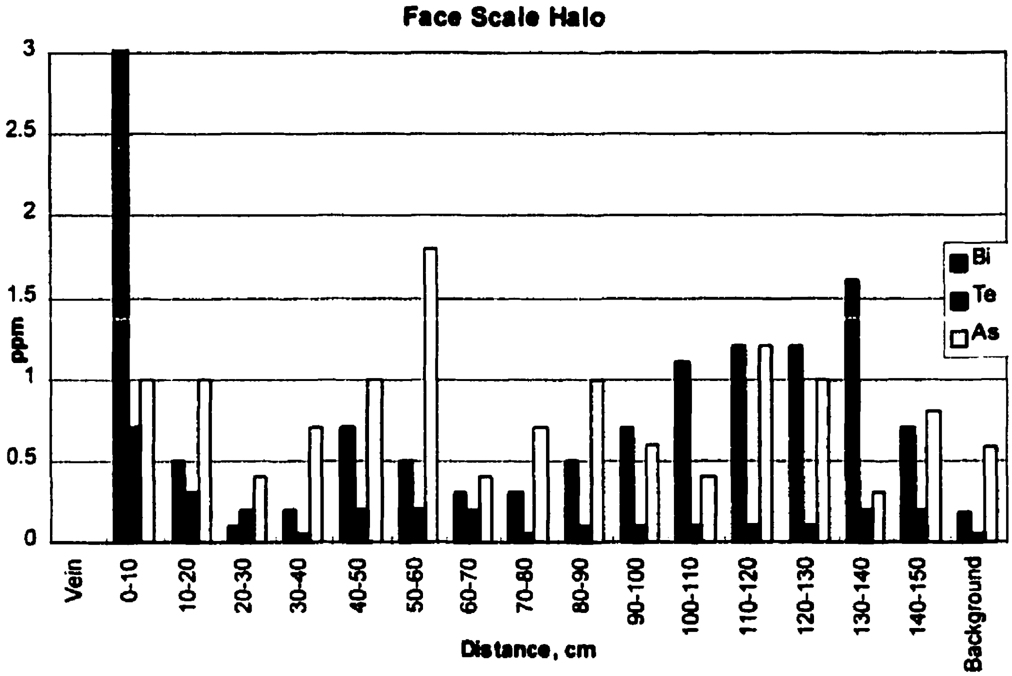
Only a few weakly defined systematic variations (Figure 37) are apparent with decreasing distance from the vein (Pt, Pd and Sn are at detection limits). Bi and Se are elevated within 10cm of the vein contact. Te shows a slight gradual increase toward the vein starting at 30cm. Bi and As values are elevated 50cm and 120 cm from the vein. Cl[2] and F do not show any significant variations. Bi, Te and Se averages for the 15 samples are elevated (5x, 4x and 5x respectively) when compared with background samples (Table 23). F is slightly elevated vs. background (1.5X). The other elements are similar to background values.

Mean (n=15)	**Pt ppb**	**Pd ppb**	**Cl ppm**	**F ppm**	**Bi ppm**	**Te ppm**	**As ppm**	**Sn ppm**	**Se ppm**
Halo (1.5m)	<10	<1	490	700	0.91	0.19	0.80	<1	0.27
Background	<10	2.4	653	472	0.18	<0.1	0.58	<1	0.05

Table 23: Comparison of proximal (within 1.5m) trace element wallrock concentrations vs. background

---

[2] Cl background is higher than the mean for the mineralization halo. It is also significantly higher than the background of 200-300 ppm documented in Jago et al. (1992). This discrepancy has not been resolved. There may have been anomalous Cl-bearing minerals contained within Sudbury Breccia assumed to represent background level. F is also suspiciously high for a background value.



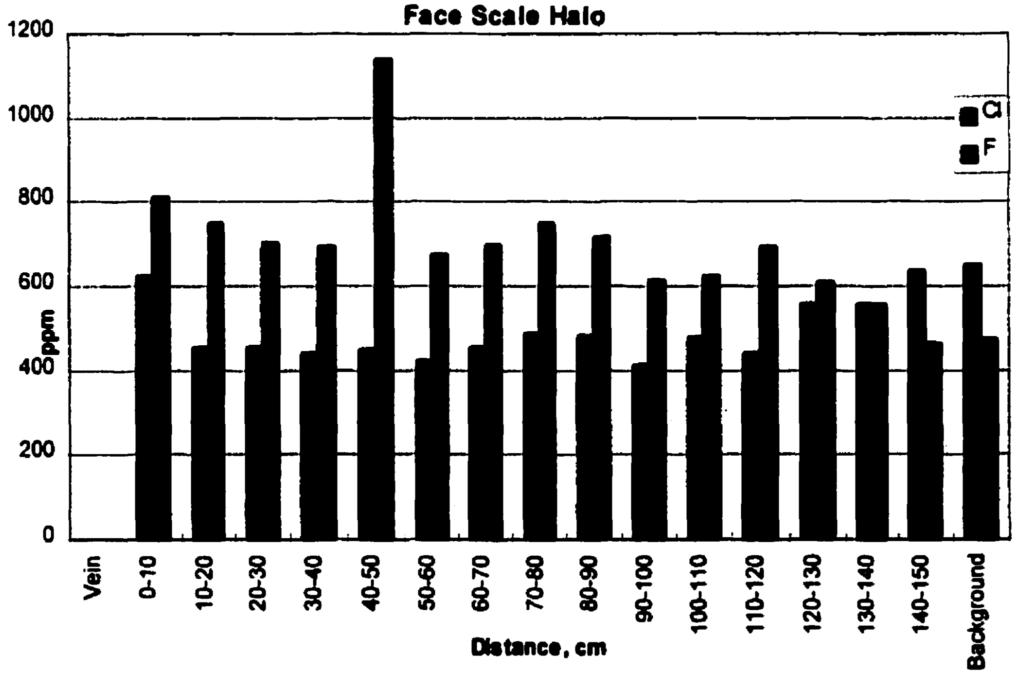


Figure 37: Trace element contents in chip channel samples taken in Sudbury Breccia up to 1.5m from a sulphide vein

15 samples were taken at 10cm intervals.

Zone Scale

Bar graphs (see Appendix IV, Figure 12) illustrate the following variations in a sample traverse taken along a vertical section perpendicular to the zone:

None of the elements show a gradual increase as the zone is approached from the Hanging wall side. Cl and F is somewhat inconclusive as the background being used as a reference may be elevated also. Platinum, Pd, Bi, Te and Se concentrations are slightly higher between the Main and Footwall vein (within the zone), and significantly higher below the Footwall vein, especially for Bi, Pt and Pd. This footwall enrichement occurs where the FW2 vein was expected but was not present in this hole. It indicates that a trace element signature occurs even when there is no significant visible sulphide mineralization. Arsenic, Bi and Te are assumed to commonly occur with Pt and Pd which further support PGE enrichment, even at a microscopic trace level. Flourine is slightly higher within the zone and footwall areas. Arsenic is generally at background levels with the exception of two isolated highs in proximity to the main vein. Tin also is at background levels with the exception of a two isolated highs in the footwall area. Copper exhibits a few isolated highs in the zone, but is distinctly elevated in proximity to the footwall vein and in the footwall to the zone.

Samples were also subdivided into groups and averaged (Figure 38). Groups included the hanging wall (structually above the zone), inter-zone (between the main and footwall vein) and footwall zones (structurally below the zone). Distinct linear increases of Pt, Pd, Te, Sn and Se occur when moving from hanging wall to footwall. Distinct increases in F and Bi are also evident but are most prominent moving from the main vein toward the footwall vein. No trends were apparent in As.

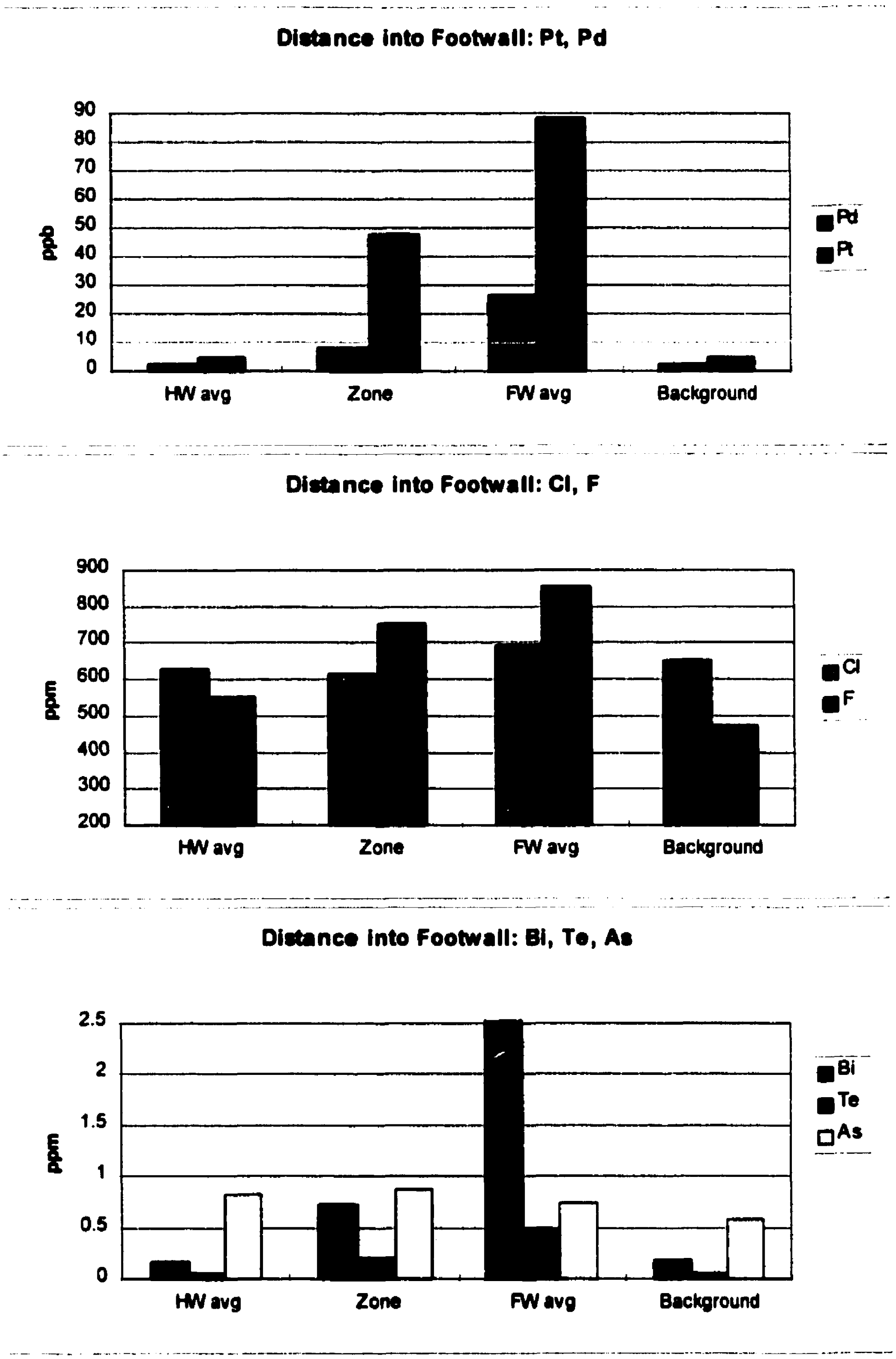
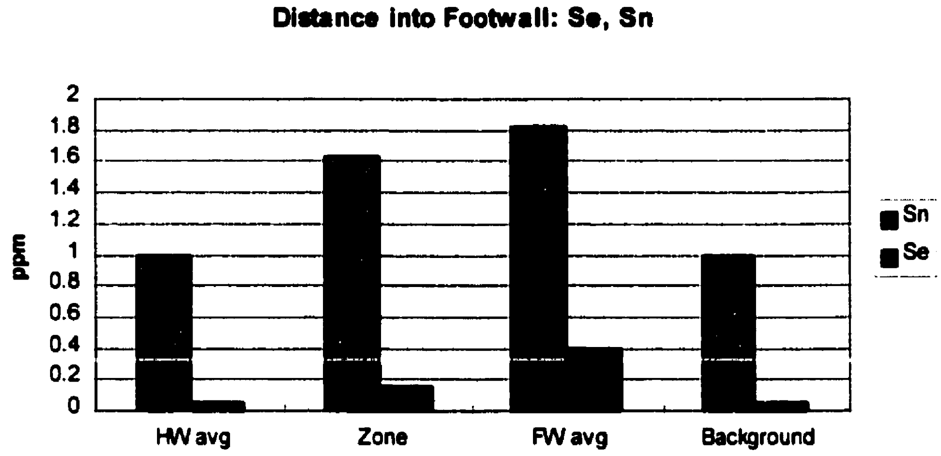


Figure 38a: Comparison of mean trace element concentrations from different structural levels

n = 11 for HW, n = 9 within zone, n = 11 for FW, n = 5 for background.



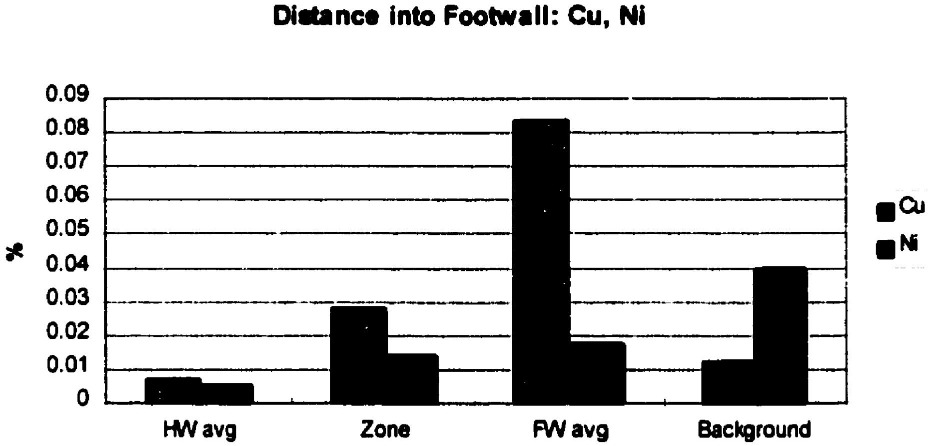


Figure 38b : Comparison of mean trace element concentrations from different structural levels

Correlations:

Platinum, Pd, Cl, F, Bi, Te, Se, Sn, Ni and Cu all have some level of positive statistical correlation with each other (see Table 24). Chlorine and F exibit no correlation. S has a moderate positive correlation with Se and Cu and a weak positive correlation with Ni. There are no correlations between As and any other elements. In general most of the elements have some inter-correlation indicating they are likely part of the same system and related to sulphide mineralization.

	Pd	***Pt***	***Cl***	***S***	***F***	***Bi***	***Te***	***Sn***	***As***	***Se***	***Cu***
Pd	1.00										
Pt	0.91	1.00									
Cl	0.35	0.37	1.00								
S	-0.09	-0.06	-0.25	1.00							
F	0.68	0.67	0.09	0.03	1.00						
Bi	0.91	0.86	0.30	0.12	0.65	1.00					
Te	0.89	0.84	0.49	0.06	0.60	0.92	1.00				
Sn	0.30	0.27	0.53	-0.21	0.38	0.24	0.46	1.00			
As	-0.04	-0.06	-0.08	-0.03	0.08	-0.03	-0.02	0.05	1.00		
Se	0.60	0.60	0.30	0.32	0.39	0.77	0.81	0.19	-0.02	1.00	
Cu	0.34	0.43	0.23	0.48	0.17	0.48	0.46	0.03	-0.11	0.51	1.00
Ni	0.14	0.12	0.32	0.24	0.22	0.37	0.45	0.37	0.06	0.70	0.19

Table 24: Correlation coefficients (r) between trace elements

Comparison of Wallrock Halo vs. Background

Table 25 compares the arithmetic means for all samples taken within 18 m structurally above and below the vein system to the average values for the 5 background samples.

Mean	**Pt ppb**	**Pd ppb**	**F ppm**	**Cl ppm**	**As ppm**	**Bi ppm**	**Te ppm**	**Se ppm**	**Sn ppm**	**Cu %**	**Ni %**
Within 18m n=30	46.8	12.7	979	648	0.80	1.28	0.24	0.20	1.46	0.04	0.12
Background	<10	2.4	472	653	0.58	0.18	<0.1	<0.1	<5	0.01	0.04
Increase (x)	4.7	5.3	2.1	-	1.4	7.2	2.5	2	-	3.0	3.0
Main Veins	13.5	17.5	-	-	0.65	78.7	68.7	?	49	30.5	1.95

Table 25: Comparison of wallrock trace element concentrations (zone scale) vs. background

There are no F and Cl analyses available for the massive veins from Zone 39.

Based on Table 25, Pt, Pd, Bi, Te and Se are significantly elevated. F, As, Sn and Cu are slightly elevated. Cl and Ni are equivalent to or less than background.

Objective 2

Precious Metal Zone

Systematic increases in precious metals or Cu-Ni were not detected in an area between the massive sulphide veins of Zone 39 and a high *PGE-Au occurrence located 30m further into the footwall (see Figure 34 and Appendix IV, Figure 13). There is no indication of an enrichment halo proximal to this zone. There is, however, a 10-15 metre wide elevated halo defined by high PM/(Cu+Ni). The overall concentration of Pt and Pd is significantly higher than background however.

*The PGE-Au occurrence is defined by 2 diamond drill hole intersections assaying 1390 ppm Pt - 505ppm Pd - 31ppm Au / 0.34m and 401 ppm Pt - 3.1 ppm Pd -0.68 ppm Au / 0.10m. PGM's are visible to the naked eye in this occurrence.

Zone Cross Section Traverse:

Observations based on a continuous PM sample traverse (including all minor veinlets and disseminations) across the zone are based on graphs and Figures located in Appendix IV-Figure 14.

PM enrichment occurs in an area between the HW vein and the Main veins and within the area between the Main veins. There is also a PM enrichment and continuous increase over 15 to 20 metres as the hanging wall vein is approached. From the Main vein outward, into the footwall, PM increases don't occur until about 10-15 m away from the first footwall (FW1) vein and then form a 5m halo on both sides. There is one elevated region between the FW1 vein and an area of minor sulphide mineralization which is enriched in PGE's (where FW2 vein is typically stratigraphically located). The FW2 area contains a 5m enrichment halo but then drops off further into the footwall.

Objective 3

The arithmetic means for 252 wallrock samples (2 per face) collected adjacent to the massive sulphide veins are summarized in Table 26. Overall concentrations are significantly higher than background. There is a significant increase in the proportions of precious metals vs. sulphide concentrations (Cu+Ni) within the wall rock (Table 27).

Point plots, similar to those used for the massive sulphide veins (see Appendix V, 1.6), illustrate vaguely defined areas with relatively higher and lower concentrations of the six elements. With the exception of an area with low PGE-Au concentrations cross cutting through the G2/P4 veins (an inverse correlation to the massive veins), patterns that correlated with the massive sulphide veins were not evident. Correlations were not found with the geological characteristics of the veins, wallrock type or structure. PM enrichment into the footwall was not observed.

Comparisons for mean values for wallrock adjacent to main vs. footwall veins were made. The footwall veins contain slightly higher Pt/Cu+Ni and lower Ag, Au, Pd and Pd/Cu+Ni. Pt is the same. Therefore there is no consistent indication within the wallrock metal content for an increase of precious metals or PGE/Cu+Ni into the footwall.

	%Ni	%Cu	Au ppm	Pt ppm	Pd ppm	Ag ppm	Pt+Pd	Cu+Ni
Mean Wallrock	0.27	0.81	1.35	1.34	1.12	10.75	2.46	1.08
Mean*	0.23	0.81	0.73	1.14	1.12	8.14	2.25	1.04
Background	0.04	0.012	-	<0.01	0.002	-	0.012	0.052
Massive Veins	1.95	30.5	1.12	13.47	17.47	168	30.94	32.45

Table 26: Mean metal values for wallrock (n=252)

Background was taken from an area of Sudbury Breccia know to contain no mineralization.
* Outliers removed. Note Au has a similar concentration to the massive sulphide veins.
Wallrock background not established for Au and Ag.

Ratios	Massive Veins (n=285)	Wallrock	% Increase
Pt/Cu+Ni	0.40	1.1	174
Pd/Cu+Ni	0.55	1.1	97
Pt+Pd/Cu+Ni	0.94	2.2	128
Au/Cu+Ni	0.95	2.2	129
Ag/Cu+Ni	5.0	7.9	57

Table 27: Comparison of precious metal ratios in wallrock vs. massive veins

4.4 Summary

- A halo of elevated wallrock trace elements occurs within the vein system and extends for at least 20 m into the structural footwall.
- While there are no systematic increases in any of the trace elements as the massive sulphide veins are approached, Pt, Pd, Bi, Te and Cu become more enriched towards the footwall and are most highly enriched in the structural footwall below the zone. F and Se are also enriched in the structural footwall. The corresponding increases in Cu, along with inter-element correlations suggest that this enrichment is related to sulphide mineralization. Overall concentrations of all elements except Cl and Sn are significantly higher than background for the wallrock within, and structurally below, the zone. It is possibe that this element enrichment could extend further into the footwall and a broader chemical signature exists. This halo indicates metal and trace element bearing fluids penetrated well into the wallrock and supports previous models suggesting hydrothermal fluids were involved (Farrow and Watkinson, 1992) in the depositional or reworking process. This information may encourage further studies defining a broader trace element signature extending beyond geophysical coverage (approx. 100m), aiding in the discovery of similar Cu vein systems.

- There is no halo around, or pathway from Zone 39 leading to a high PM zone defined by a pattern of increasing PM's, Ni or Cu. The entire area surrounding this zone however is elevated in PM's and Cu compared to background.

- The wall rock within a 1m halo of the veins contains significantly higher proportions of PM to sulphide than the massive veins themselves. Concentrations of Au in the wallrock are similar to those occurring in the massive veins. There are no indications within the wall rock for enrichment trends, pathways or any lateral distribution patterns. The lack of lateral metal zoning within the wallrock further supports the results from the massive veins suggesting zonation in PM distribution cannot be documented. High local variances are expected to be similar or higher than those occuring in the massive vein data. An alternate conclusion is that PM zoning is not detectable in the wallrock due to high local variance.

5.0 Conclusions and Recommendations

5.1 Conclusions

The following summary outlines observations starting from a regional scale followed by progressively smaller scales.

Regional Relationships and Zone 38

- Zone 39 may represent an end member with respect to a sulphide fractionation model as is supported by the following characteristics and relationships with other Strathcona orebodies (Figure 35 and 36):
    - ⇒ Occurs the greatest distance from the SIC
    - ⇒ Situated deepest and furthest down plunge
    - ⇒ Located at the west end of a strike defined by Zones 36, 38 and 39
    - ⇒ Contains the highest Cu, Cu+Ni and precious metal (Au, Pt, Pd, Ag) concentrations
    - ⇒ Contains the lowest Fe concentrations

These characterisics could also be explained using a hydrothermal model involving a thermal gradient. However, the lack of extensive pervasive wallrock alteration, along with similar trends attributable to a fractionation process in the SIC contact Ni-Cu orebodies, favours a continuation of a sulphide fractionation process in these footwall deposits.

A regional fractionation model suggests as the sulphide liquid (as an intermediate solid solution) intruded into the footwall it became progressively enriched in Cu, Cu+Ni and PM's, and depleted in Fe, as it cooled and crystallized with increasing distance from the SIC. The fact that this metal enrichment correlates with depth along a regional plunge (parallel to the embayment structure), indicates a potential gravitational component which may be related to higher densities in the PM's and PM-bearing minerals.

Problems with this model arise, however, related to the inferred physical connections between the zones and the relatively shallow plunge. There are no well defined conduits connecting the zones. Gravity, as a primary mechanism , may not explain how large volumes of sulphide liquid migrated further into the footwall, given the shallow plunge and associated lithostatic pressure and the lack of a potential connecting fracture system. Further concerns are related to timing with respect to the host rock Sudbury Breccia (SDBX) and the sulphide vein emplacement. If the veins were roughly contemporaneous with the SIC contact mineralization, as implied by a fractionation model, the SDBX would have to have been consolidated and fractured by an extensional event. As the SDBX is considered to have formed at the time of meteorite impact, there may not have been a suitable amount of time for the unit to lithify to the point where it would have been subject to brittle fracturing. This may imply the sulphides were emplaced during a later event, after the cooling and lithification of footwall rocks. This is not consistent with the sulphide fractionation model, as the sulphides would have crystallized.

- There is some evidence based on internal zoning within Zone 38 to suggest that Zones 39 formed from evolved or fractionated sulphide liquid responsible for forming Zone 38:
    - ⇒ Concentrations of Cu, Cu+Ni and PGE's are higher in Zone 38 where it becomes more proximal to Zone 39
    - ⇒ Regional spatial relationship and an apparent spatial relationship defined by level 44.
    - ⇒ Minor veins observed between the two zones may represent liquid conduits

Similar implications and problems related to a lack of significant connecting conduit described above apply for this observation. A hydrothemal process related to a thermal gradient could also explain these metal variations.

- At a more detailed scale within Zone 38 there is evidence based on Cu and Fe zoning to support a fractionation process occurring internal to the zone. This zoning forms a lateral concentric pattern however, and does not correlate with increasing distance into the footwall or form similar patterns as the regional trends. There is no strong evidence to support a similar zoning for PGE's. This implies that PGE zoning related to sulphide fractionation either doesn't exist or can't be detected with the existing data due to high local variances. This high variance may have been produced during a late hydrothermal remobilization of the igneous sulphide veins. At this more detailed scale there are no vectors defined by zoning which trend towards Zone 39.

Internal Variations within Zone 39

- At the scale of the zone, some weakly defined systematic variations in PM's include:
    - ⇒ Increasing PM's towards the structural footwall, with increasing distance from the SIC. The majority of these samples for the massive veins come from an area down-plunge. This conforms to a regional fractionation models, although similar trends for Cu, which would be expected, are not present.
    - ⇒ Increasing PGE's towards the upper and lower plunge extent of the Zone. This contradicts the regional fractionation trend which indicates a down plunge PGE enrichment.
    - ⇒ Therefore target areas where mineralization highly enriched in PM's may occur are further into the footwall and down plunge. PGE-enriched target

areas include areas extending up and down-plunge (vertical zone extremity).

  - ◊ Increasing PM's towards the footwall are supported by a known PM occurrence located ≈35m further into the footwall from Zone 39 on level 44.

- No significant lateral zoning patterns were detected.
  - ⇒ Lateral Cu, Cu+Ni, and Fe zoning, which is well defined in Zone 38, is not present. Zone 39 appears to have much less overall Fe and higher Cu, and Cu+Ni than Zone 38 suggesting modal abundances of Fe rich minerals such as pyrhhotite and cubanite were too low to facilitate further fractionation.
  - ⇒ The data does provides accurate average vein concentrations:
    - ◊ 1.95%Ni, 30.5% Cu, 1.12 ppm Au*, 13.47 ppm Pt, 17.47 ppm Pd, 168 ppm Ag.
      * 4.0 ppm Au from data containing a portion of wallrock
- Extreme random variations in Ni and precious metals (PM's) occur locally within Zone 39 due to vein heterogeneity and related random intrinsic and sampling variances.
  - ⇒ Identification of systematic variations using individual samples is not possible. This restricts the use individual assays to investigate sulphide fractionation processes within the zone. Local scale variations are similar in magnitude to those occurring across the deposit (scale independent). Individual samples similar to random numbers.
  - ⇒ Comparing average concentrations for groups of samples representing different regions of the deposit partially overcomes local variations although only to a certain extent as the local variations limit precision on the average. Therefore, metal zoning patterns, or trends defining PM-enriched target areas, if present, are difficult to identify due to the poor resolution inherent in the data

  - ⇒ Local PM or Ni grade estimates are not possible using the existing sampling regime
  - ⇒ With the exception of Pd in 3m spaced sample, no spatial correlations exist between adjacent samples. The existing data is not amenable to geostatistical methods.

This high heterogeneity within the sulphide veins is not characteristic of a fractionated igneous intrusion. While the overall metal concentrations conform to a regional fractionation model, the high random variations may be related to a later stage hydrothermal remobilization overprint. The local variances are also, in part, an artifact of the sampling and measurement processes related to sample and grain size.

- Significantly higher proportions of PM's vs sulphide occur in the wallrock adjacent to the main sulphide veins and in isolated secondary veinlets and disseminated mineralization.
  - ⇒ A large proportion of contained Au may occur outside the massive sulphide veins in the wall rock within approximately 10 cm of the vein contact or at the vein contact.

- A zone of wallrock trace element (Pt, Pd, F, Bi, Te, As and Se) enrichment occurs within the vein system and extends for a distance of at least 20 m into the structural footwall beneath the zone. These trace element concentrations, which occur with trace amounts of Cu-sulphide mineralization, are highest in the footwall.

- Features (describe in the previous two points) found within the wallrock and secondary mineralization proximal to the veins and as isolated veinlets suggest late hydrothermal remobilization of the sulphide veins, or differentiation of residual primary sulphide liquids may have occurred within Zone 39:

⇒ Penetration of PM's and trace elements well into the wallrock.
⇒ Significantly higher proportions of PM's contained in secondary mineralization away from the discrete massive sulphide veins.
⇒ Wallrock alteration
⇒ Trace element enrichment towards footwall.

- Recalulation to 100% sulphide is not justified as the samples contain variable Ni and Cu mineralogy and modal proportions. There is also a general lack of correlation between sulphide and PM's. PM's may be concentrated in the wallrock and associated with internal gange inclusions within the masive sulphide . Very high relative errors on individual samples also results in a proportion of the data containing a positive bias. The factoring up of PM concentrations to 100% sulphide may therefore create further bias or incorrect concentrations.
- The wallrock sulphide concentrations proximal to the main veins did not show any lateral distribution pattern. This implies that if the metal concentrations occurring in the wallrock halo were taken into account when evaluating zoning within the main sulphide veins, lateral zoning would still not have been documented.

5.2 Recommendations

The following recommendations summarize practical applications related to mine production and exploration.

Application of vein grade

44 Level:

As local estimates are not possible using the available data or current sampling regime, overall average grades (Table 28) should be employed on level 44:

	%Ni	%Cu	Au ppm	Pt ppm	Pd ppm	Ag ppm
Grade	1.95	30.50	1.12 (*4.0)	13.47	17.47	168
Precision	± 25%	± 1.4%	± 14%	± 5%	± 6%	± 6%

* Drill hole data

Table 28: Average grades for level 44

The drill hole average should be used for Au. The higher Au conentration is supported by mill head grade records.The sub-population of veins containing predominantly pentlandite and millerite (>20%Ni) are not included in the Ni average. Additional sampling would be required to equally represent this group and avoid bias. It is recommended that the Ni content in this locallized population of veins be visually estimated during production.

Below 44 level:

Planning for, and the economics of, mining below the 44 level will be influenced by the predicted vein grades. Basic cross-sectional polygonal methods are currently being used to predict the vein grades for the areas below 44 level.

This method results in significant proportions of the deposit being assigned a vein grade based on single or relatively very few drill hole assays. Large variations between polygons which may be due to local random variation should not be assumed to be real. The overall average grade of the deposit as defined by this ore reserve method will be close to the true value (as was shown in the predictive model comparison), however there will be very poor confidence levels associated with individual polygons. When mine planning breaks down the deposit into smaller mining units (such as sublevels, mining cuts or veins) an insufficient number of samples may be available to provide an accurate local estimate, or possibly even distinguish ore from waste. For example, relative errors due to local PM and Ni variances may significantly over-estimate or underestimate the grade of a mining unit causing it to be included when it will not be profitable or mistakenly rejected. Geostatistical methods which are commonly employed as local estimators are not recommended as the drill hole data does not contain spatial correlations and sample sizes vary significantly. The sample sizes are based on the width of the vein each individual drill hole intersects, so compositing or otherwise equalizing sample size is not possible. The spacing is also much too wide to expect spatial correlations to exist give the high local variance. Therefore, it is recommended that for mine planning and grade control an overall average grade be employed. There are only weakly supported indications for subtle systematic variations with depth.

Further grade control style sampling programs would be required to define variations with depth. If the grade control data from level 44 (Zone 39) is assumed to represent the true mean vein grade, and if relative variations with depth illustrated in Figure 38 are assumed to be exist, then predicted grades for given elevations within the deposit are as follows (Table 29):

Depth (Elevation)	Ni	Cu	Au	Pt	Pd	Ag
44 Level Grade Control	1.95	30.50	1.12	13.47	17.47	168
2676 to 2651 m	1.95	31.11	0.97	12.39	16.95	181
2650 to 2628 m	2.11	31.11	0.88	12.12	14.67	163
2627 to 2594 m	1.68	31.42	0.99	12.39	16.60	161
2593 to 2494 m	1.85	31.72	1.01	14.82	21.31	195

Table 29: Average grades corresponding to different elevations

These grades represent an approximation of the magnitude of variations expected for specific mining levels. The expected variations are within 20%.

The cost, relative benefit and type of future grade control sampling programs should be addressed based on the following:

- ⇒ Would the ability to provide local estimates and define significant grade variations, if present, increase the amount of ore recovered?
- ⇒ How much accuracy or predictiveness is required with respect to forecasting an budgeting metal production from the zone?
- ⇒ Predicting vein grade does not have as big an impact on production and planning as the predictability of vein shape and continuity. While tighter drill spacing will help improve confidence in grade prediction it quickly reaches a point of diminishing economic returns when trying to predict the shape and continuity of veins within this type of deposit. The problem of predicting shape and continuity would benefit from further studies.
- ⇒ Much larger samples at closer spacing would be the basic requirement to better define local metal variations. As was illustrated in Table 7, even by increasing

the sample density by 4x the precision remains too poor (+/-30% for Pt and +/-61% for Pd) to confidently identify systematic metal variations. Therefore it is likely economically impractical to define local metal variations within the main vein system.

⇒ Improvements to variances associated with sample preparation and analysis should be made by ensuring the entire sample is pulverizing, the final mesh size is reduced from 150 μm to <100 μm, and larger final subsamples are analysed (30g as opposed to 10g).

Mineralization

The recommendations above refer to veins classified as massive in this study. Other assays within the drill hole data are ore grade due to high proportions of PM or Ni values (mineralization subgroup) and are not discrete continuous massive veins. A sampling methodology should be determined which focuses on this more erratic and discontinuous type of mineralization and identifies which of these assays represents ore.

Exploration and delineation of a potential PM-dominated mineralized zone would also require a specific sampling strategy and would be very difficult to define by diamond drilling and the restricted sample size.

Geostatistics

The application of geostatistical methods is not applicable using the existing data due to the large range in drill core sample size, potential mixed populations (stationarity cannot be assumed), a lack of spatial correlation within the data and the very high proportion of variance due to nugget effect (as defined in a geostatistical sense related to variography). More advanced methods such as indicator kriging or conditional simulation may be applicable although consideration of this is beyond the scope of this study.

Metals and Trace Elements in Wallrock

- Further work could be done to test the extent to which trace element dispersion occurs (beyond 20 metres from the zone). In order to aid in exploration for massive sulphide veins a signature would have to extend beyond (100m) what is currently detectable using geophysical methods
- As most of the trace elements are related to sulphide dispersion (as is indicated by correlations with Cu), further analysis of all elements may be redundant
- A PM rich pathway or halo may not aid in locating isolated PM-rich zones
- PM concentrations within the wall rock adjacent to veins (within 1 metre) should continue to be monitored. Potential bias should be investigated such as a possible underestimation bias, due to high local variance or an over-estimation bias related to sample preparation and high density contrast between PM's and silicate host (ensure proper homogenization). The later test can be done using similar procedures described for the massive vein variance tests.
- The overall average grades listed in Table 26 should be used for planned waste in mining grade calculations on level 44 of Zone 39. Additional sampling programs should be carefully conducted in sill cuts on lower levels when mining commences. A methodology should be designed to ensure the sampling is representative and that samples are not contaminated with sulphide fines originating from the massive sulphide veins.
- Applying a wallrock grade to planned waste rock has a large impact on the economics of the zone by not only documenting the proper amount of metal recovered but also by allowing economically-marginal narrow veins to be recovered.

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APPENDICES

Appendix I - Assay Data

Appendix II - Detailed Methodology

Appendix III - Analyses of Local Variances

Appendix IV - Statistical Analyses and Detailed Results

Appendix V - Point Plots - Zone 39

Appendix VI - Point Plots - Zone 38

Appendix VII - Terminology

APPENDIX I

Zone 39 Assay Data

1.0 Face (Grade Control) Sampling Data

1.1 Cut 1 Assay Data

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
20847	5602	3257	0.27	29.80	0.25	9.82	15.90	48	32	G01
20859	5599	3258	0.16	26.80	0.20	8.16	5.35	79	15	G01
20873	5596	3258	0.27	26.40	5.73	13.10	15.90	259	10	G01
20900	5593	3259	0.83	33.40	0.93	27.10	30.20	179	30	G01
20959	5591	3260	0.35	34.90	0.41	17.70	39.90	70	30	G01
21531	5637	3264	0.43	32.60	9.71	8.46	15.90	400	35	G01
21542	5633	3264	0.49	32.00	1.12	28.70	17.90	208	25	G01
21601	5630	3264	2.25	29.60	1.45	13.00	19.40	130		G01
21613	5627	3264	11.00	22.20	1.17	16.90	16.20	435	25	G01
21616	5625	3264			0.81	13.80	21.40		35	G01
21667	5616	3262	13.00	24.80	0.93	13.30	11.20	148	52	G01
21676	5614	3260	11.00	24.80	0.83	11.60	13.40	129	20	G01
21688	5612	3258	4.60	25.20	1.37	9.80	13.00	96	22	G01
21694	5609	3257	5.40	27.80	0.48	13.30	12.50	133	35	G01
20707av	5607	3257	1.38	27.80	1.12	16.97	12.86	90	55	G01
20827av	5604	3258	7.18	24.07	2.05	17.27	21.00	113	35	G01
21574av	5644	3266	14.47	15.57	0.68	7.15	13.37	157	7	G01
21626av	5622	3263	0.05	31.80	1.04	19.07	24.53	209	35	G01
21645av	5618	3262	0.31	30.80	1.18	13.90	19.50	157	35	G01
20983	5591	3262	0.04	32.80	0.40	21.00	46.70	100	25	G04
20984	5591	3265	0.38	30.20	0.63	18.50	31.30	143	25	G04
20994	5591	3268	19.60	20.20	0.41	12.70	18.70	156	20	G04
20968	5595	3257	0.06	29.00	0.16	11.30	9.22	205	34	G06
21052	5597	3254	0.81	31.20	0.22	8.90	7.73	158	30	G06
21061	5599	3252	18.40	22.80	0.17	1.16	32.10	77	15	G06
20840	5735	3291	0.57	30.80	1.06	17.10	8.73	157	25	H01
20843	5733	3295	3.80	28.8	0.39	17.30	15.80	215	11	H01
20850	5735	3293	0.68	32.40	0.18	17.80	3.18	156	20	H01
20892	5735	3296	8.60	26.20	0.17	2.09	3.59	210	5	H01
21529	5729	3272	0.11	31.60	0.60	10.40	11.80	83	50	H01
21535	5729	3275	9.30	31.00	0.66	13.00	13.10	99	30	H01
21545	5730	3277	3.60	29.40	1.48	18.00	21.80	142	22	H01
21604	5730	3280	6.60	24.20	2.40	18.30	14.80	217	37	H01
21649	5733	3283	1.94	29.60	0.49	12.20	16.30	148	50	H01
21666	5732	3285	40.00	6.00	0.82	11.30	6.90	81	12	H01
21679	5734	3286	0.36	29.80	1.70	26.20	27.60	132	45	H01
21608av	5732	3282	1.12	31.47	4.03	16.03	23.07	114	38	H01
20305	5672	3270	0.26	30.60	0.87	9.99	13.60	169	80	P01
20454	5726	3269	7.50	26.40	1.59	8.20	16.00	216	60	P01
20469	5728	3268	0.17	32.80	2.14	16.80	19.60	143	40	P01
20475	5734	3263	0.23	29.80	1.56	20.60	22.40	169	100	P01
20479	5736	3261	0.07	32.00	0.80	10.20	32.10	195	90	P01
20498	5740	3258	0.55	28.60	1.50	9.37	15.50	183	60	P01
20515	5745	3254	0.93	31.60	0.54	5.95	27.20	213	60	P01
20537	5740	3250	0.11	32.20	0.50	14.10	16.00	184	45	P01

20547	5739	3247	0.13	30.60	0.66	9.63	9.75	179	16	P01
20566	5764	3248	0.34	29.20	0.26	9.67	6.66	171	15	P01
20676	5771	3247	8.20	24.60	0.85	12.60	4.15	210	21	P01
20697	5780	3245	0.11	27.00	1.12	11.10	9.00	197	10	P01
20853	5785	3241.6	2.72	28.80	0.03	17.20	4.63	170	13	P01
20966	5787	3240	1.48	29.00	0.70	10.30	2.17	260		P01
21070	5791	3232.5	0.26	31.30	0.15	7.00	5.79	203		P01
21553	5782.5	3243.5	2.86	18.40	0.68	5.21	6.74	117		P01
20301av	5674	3268	1.03	29.30	1.24	19.10	14.42	116		P01
20303av	5669.5	3270	0.31	30.10	0.89	11.48	12.20	171		P01
20337av	5681.5	3264	0.16	33.25	0.90	10.33	26.90	177	42	P01
20342av	5684	3261.5	0.30	32.60	0.69	10.87	17.27	151	60	P01
20359av	5686	3260	4.12	27.75	1.04	14.50	23.80	181	85	P01
20374av	5692	3253.6	3.42	26.38	2.12	11.50	13.77	225	20	P01
20388av	5694.8	3252.4	1.41	30.10	1.79	11.70	31.10	179	37	P01
20394av	5698	3252.4	2.06	30.63	0.82	12.57	32.53	161	67	P01
20408av	5709.5	3256.4	1.70	30.27	3.50	13.03	12.00	133	60	P01
20414av	5713.8	3260.6	0.62	31.53	0.96	22.10	9.83	194	90	P01
20421av	5716	3261.8	0.22	31.60	0.95	20.95	19.85	193	85	P01
20430av	5718.8	3263.8	0.21	29.87	1.44	12.40	31.33	268	95	P01
20436av	5721	3266	0.37	31.53	0.93	16.57	37.00	209	95	P01
20446av	5723.7	3267.3	0.36	31.80	1.29	21.80	25.95	254	120	P01
20471av	5732	3265	8.35	24.00	2.73	25.05	16.30	146	75	P01
20490av	5738.4	3259.4	1.60	30.00	0.76	21.37	24.07	185	50	P01
20508av	5742.5	3255.5	2.48	30.80	0.48	7.69	17.75	208	55	P01
20518av	5741.8	3255	0.08	32.20	0.67	18.71	24.37	196	50	P01
20523av	5746	3250	0.30	29.70	0.87	13.95	23.00	192	45	P01
20533av	5750	3251	0.08	30.52	0.96	8.78	17.21	221	60	P01
20554av	5754.8	3249	0.21	29.40	0.77	13.10	14.83	183	30	P01
20559av	5757.8	3249	0.66	30.20	0.99	15.05	25.25	239		P01
20568av	5761.3	3249	12.42	21.40	1.46	14.45	6.62	169	10	P01
20610av	5701	3254	0.20	32.13	0.82	15.10	13.68	244	55	P01
20623av	5704.5	3254.4	4.35	28.40	0.94	17.00	10.41	153	1.1	P01
20639av	5707.4	3254.5	2.16	30.33	3.09	21.60	9.43	161	80	P01
20645av	5712	3258.3	1.18	28.40	1.05	12.95	10.25	118	80	P01
20658av	5766	3247	0.20	31.00	0.55	14.93	12.33	207	35	P01
20687av	5777	3246	9.47	25.00	0.29	9.39	7.25	166	15	P01
20997av	5795	3246.6	14.42	17.60	1.39	8.94	9.77	127		P01
21072av	5792.5	3229.5	12.14	13.55	0.73	8.10	4.91	79	5	P01
21075	5794	3226	10.10	21.60	0.24	24.50	17.40	54	2	P01
21051	5798	3249	6.40	25.00	0.17	6.49	5.50	172	10	P01L
21055av	5800	3249.5	14.20	21.70	0.49	8.88	6.36	178	5	P01L
21064av	5790	3235.5	2.94	29.30	0.42	7.34	17.05	192	15	P01L
21079av	5807	3252.5	0.15	29.10	1.77	12.90	11.86	177		P01L
20351	5660	3273	0.20	31.70	0.75	13.40	23.20	214	85	P02
20357	5657.5	3274	0.14	33.10	1.12	2.82	14.70	225	55	P02
20365	5655	3275	0.16	32.10	1.53	16.40	20.60	268	100	P02

20333av	5665.5	3270.5	0.29	32.32	0.77	12.24	27.56	189	120	P02
20345av	5662.7	3272	0.19	33.77	0.66	10.24	9.86	166	45	P02
20367av	5652.7	3276	1.08	30.67	0.57	15.87	9.54	168	25	P02
20381av	5648	3276.6	2.13	31.08	1.60	7.25	25.77	176	13	P02
20670	5749.5	3259	0.18	31.60	0.52	11.90	20.60	190	20	P03
20672	5750	3261	0.08	30.80	0.44	14.20	20.60	141	16	P03
20684	5750.5	3264	0.06	31.00	0.34	1.72	16.40	157	16	P03
20694	5752	3267	0.08	31.00	0.32	4.09	32.20	153	15	P03
20820	5768.5	3281	4.60	29.20	1.01	14.90	11.30	122	20	P03
20837	5771	3282	8.20	25.60	1.55	6.27	12.90	143	10	P03
20856	5775	3285	1.29	32.60	0.34	6.33	7.63	313	10	P03
20862	5777.5	3286	9.20	26.80	0.45	15.90	33.90	104	8	P03
20879	5780	3288	2.43	26.60	4.95	3.83	3.22	55	5	P03
21653	5759	3272	3.20	28.00	0.57	5.01	22.20	127	14	P03
21657	5761	3274.5	0.46	29.20	0.20	8.31	11.40	85	9	P03
21673	5763.5	3277	0.16	30.40	0.37	12.30	31.50	77	9	P03
21690	5765	3279	0.08	30.60	0.53	8.70	53.10	83	10	P03
21632av	5757	3270	1.85	30.30	0.86	11.55	20.25	187	8	P03
20481	5628.5	3297.6	10.60	26.00	1.51	16.30	4.61	139	15	P04
20620	5640.6	3280.6	1.22	30.57	1.08	17.43	24.40	124	15	P04
20631	5638	3284.5	10.60	26.00	1.13	19.90	31.70	146	15	P04
20404av	5634.5	3288.5	2.06	29.87	1.07	18.33	14.23	171	25	P04
20424av	5631.7	3290.5	4.91	25.60	1.68	9.88	17.20	105	35	P04
20440av	5631	3292.5	2.72	31.50	0.36	7.95	10.55	102	25	P04
20462av	5629.4	3295.5	17.55	24.20	0.67	16.30	11.55	122	15	P04
20503av	5628	3300	12.70	24.30	0.65	10.24	0.67	111	15	P04
20510av	5626.5	3302.5	11.20	22.90	0.23	25.50	7.60	139	11	P04
20602av	5642	3278	0.33	30.63	0.81	14.67	20.20	192	80	P04
20643av	5636	3286.5	3.68	30.33	7.01	20.63	20.67	141	20	P04
20522	5629	3290	12.20	25.00	0.74	20.60	12.80	127	23	P04L
20545	5625	3289	5.20	29.00	1.14	13.50	14.30	189	10	P04L
20823	5740	3288.6	2.81	30.6	0.68	14.3	15.9	126	20	P05
20851	5737.5	3289.2	7.2	27.8	0.31	11.2	14.8	108	18	P05
21557	5752	3269	0.04	30.80	1.03	8.18	12.70	238	15	P05
21638	5749	3277	0.12	30.6	0.85	12.4	35.3	136	12	P05
21660	5747.5	3278.5	9	22.8	0.66	14	51.6	76	9	P05
21663	5746.5	3280.5	6.4	27.8	0.49	12.1	47.7	135	12	P05
21670	5745	3283	2.36	24.8	1.35	10.4	29.5	121	14	P05
21582av	5751.5	3274	5.51	19.50	3.12	13.35	19.10	140		P05
21682av	5744	3285	0.74	31.4	0.32	18	13.35	163	50	P05
20890	5656	3287	0.08	30.6	3.11	10.5	9.77	120	20	P06
20897	5658	3286.5	2.08	31.4	0.22	5.68	16.1	171	18	P06
20971	5660.4	3284.5	7.2	28.8	0.49	15.1	19.2	135	18	P06
20987	5662	3282	14.4	21.4	0.53	9.31	16.8	137	15	P06
21059	5662.5	3279.6	5.4	27.8	0.23	30.3	21.1	110	10	P06
21567	5652	3280	0.06	32.60	0.49	5.72	16.00	191	20	P06

21569	5651	3283	1.52	30.20	1.36	8.37	20.60	162	20	P06
21586	5651	3286	0.10	28.40	2.29	8.83	15.30	150	14	P06
20884av	5653.5	3286.5	0.095	32.4	0.715	6.565	7.94	191	25	P06
21684	5755	3264.5	0.12	32.2	0.69	11	16.7	248	13	P07
21697	5756.5	3262	1.95	29.4	1.04	8.96	8.14	235	9	P07
20868	5752.3	3280.3	0.04	33.4	0.52	12	29.1	153	13	P09
20876	5754.8	3279	0.05	31.2	13	15.4	51.5	174	20	P09
20883	5757	3277.5	5.8	27.2	0.61	4.46	13.1	154	10	P09
20865	5773	3281	1.03	32.20	1.12	10.30	15.70	224	10	P11

1.2 Cut 3 Assays

MD21400	P5	5746	3288	0.13	34.4	175	0.42	16.5	38.2	2
MD21399	P5	5749	3287	0.09	35	129	0.25	10.9	31.5	2
MD21398	P5	5751	3284	0.1	34.7	176	0.38	9.28	17.7	2
MD21397	P5L	5755	3277	0.11	35.1	157	0.25	13.6	31.2	0.1
MD21351	V1L	5815	3258	0.12	32	23	0.5	13.6	17.4	
MD21350	V1L	5818	3265	0.12	33	1	0.37	18.3	41.9	1
MD21349	V1R	5820	3249	0.63	33.6	24	0.39	10.9	4.5	0.1
MD21343	V1R	5820	3250	0.42	31	105	1.525	11.89	5.735	1
MD21342	V1R	5818	3250	2.74	31.2	178	3.55	13.6	5.47	0.2
MD21335	V1L	5815	3262	0.17	32.8	234	0.49	18.9	47.2	0.1
MD21334	V1R	5818	3250	1.85	32.2	226	0.4	15	3.5	1
MD21333	V1R	5819	3252	0.07	33	239	0.52	19.5	20.7	0.2
MD21332	V1L	5816	3260	0.1	32.8	262	0.42	11.2	28.3	0.2
MD21331	V1L	5817	3260	0.23	33	232	0.64	13.2	15.7	0.2
MD21330	V1R	5819	3253	7.4	27.4	193	1.04	14.5	7.81	0.2
MD21329	V1R	5818	3253	0.3	32.4	188	0.33	18.2	11.8	1
MD21328	V1L	5817	3257	6	27.2	177	1.05	12.9	20.1	0.2
MD21327	V1	5815	3254	9.4	27	160	0.48	12.3	14.5	2
MD21326	V1	5815	3252	0.27	33	191	0.44	7.5	2.9	0.1
MD21325	V1	5814	3255	21.6	12.8	183	0.76	25	25.4	2
MD21322	G4	5587	3286	0.94	32.7	323	0.17	12.7	3.49	0.5
MD21321	V1	5795	3253	27.1	18.7	169	0.49	9.21	14.1	0.2
MD21320	G2	5595	3259	0.02	33.3	152	0.41	7.75	8.55	0.5
MD21037	G2I	5645	3271	6	28.8	125	1.22	4.53	5.05	
MD21036	G2I	5642	3269	0.09	32.8	164	0.24	16.6	9.75	
MD21035	G2I	5642	3272	0.18	32.2	153	0.46	6.73	11.6	
MD21034	G2I	5639	3276	0.57	29.4	145	1.13	11.3	17.9	
MD21033	P2L	5676	3276	42.2	6.8	37	1.04	13.5	4.71	
MD21032	P2L	5672	3276	3.74	29.6	112	0.64	15.5	20.9	
MD21031	P2L	5669	3276	11.6	25.8	100	0.36	5.37	22.5	
MD21030	P2L	5666	3277	0.06	31.6	162	0.57	17	19.6	
MD21029	P2L	5664	3278	0.06	31.4	155	1.07	19.1	22.6	
MD21028	P5	5732	3254	0.11	31.8	187	0.7	13.5	14.2	
MD21027	P5	5740	3293	4.06	29	142	1.02	8.99	10.1	
MD21024	P7	5780	3253	0.7	34.8	206	0.7	6.98	2.63	
MD21023	P7	5780	3256	2.83	32.2	169	1.33	2.93	5.78	
MD21019	P2L	5663	3281	0.64	32.5	247	0.62	4.35	15.3	
MD21018	P4	5635	3289	0.15	35.3	176	1.32	11.1	26	
MD21017	P4	5638	3287	0.05	35.1	182	1.84	22.1	28.7	
MD21016	P7r	5780	3259	0.04	34.4	151	0.96	16.7	24.2	
MD21015	P2L	5659	3284	0.09	34.8	167	0.71	7.88	23.8	
MD21014	P2L	5657	3284	0.81	34	164	0.78	12.6	12.9	
MD21013	P2L	5655	3286	5.37	29.5	111	1.18	8.36	17.9	

MD21012	P5	5751	3288	6.45	30.1	103	3.01	9.01	4.92	
MD21011	P7r	5782	3261	1.52	30.9	152	2.02	23.2	10.4	
MD21009	P5	5754	3285	1.69	31.9	122	3.86	14.3	22.9	
MD21008	P7r	5780	3259	0.1	31	169	4.13	25.6	27.6	
MD21002	P5	5740	3292	0.12	34	209	0.41	16.2	35.4	2
MD21001	P5	5743	3290	0.22	32.4	198	0.39	13.8	21.1	2
MD021338a	H1	5708	3286	6.26	30	186	1.65	13.88	15.95	0.2
MD021317	G4B	5592	3278	0.22	28.10	1255	0.34	3.28	0.54	1
MD021316	V1	5790	3256	0.23	32.60	210	0.50	13.70	20.00	2
MD021315	G4	5595	3277	8.40	27.20	318	3.60	7.49	1.08	1
MD021314	G4	5595	3277	9.20	27.60	338	0.16	17.10	0.71	1.5
MD021313	V1	5793	3255	0.88	32.00	199	3.00	11.90	25.80	0.2
MD021311	G4	5595	3274	4.20	28.60	268	0.79	15.80	1.54	1
MD021310	P7	5768	3271	0.32	26.40	157	0.21	9.11	4.09	1
MD021309	G4	5597	3268	0.06	31.80	211	0.82	10.10	6.99	1
MD021306a	G4	5596	3271	29.40	15.00	254	1.07	12.45	5.66	1
MD021305	P7	5771	3268	0.81	31.40	111	0.24	17.60	9.33	1
MD021304	G2	5596	3262	0.17	31.60	142	0.22	16.00	18.50	1
MD021303	G4	5598	3264	0.04	31.80	112	0.40	16.10	35.50	3
MD021302	G6	5598	3260	0.08	30.00	121	0.69	15.00	47.60	1
MD021301	H1L	5692	3294	2.79	31.00	126	0.21	12.70	31.30	2.5
MD021300	H1L	5695	3292	3.80	30.00	118	1.25	18.80	8.70	1.5
MD021299	P7	5774	3266	29.40	15.00	65	1.74	7.54	6.87	1.5
MD021298	P7	5775	3263	27.80	3.60	112	5.22	5.73	5.69	1
MD021297	V1	5787	3256	0.13	32.40	197	0.62	9.29	14.70	2
MD021296	H1L	5698	3290	0.86	30.00	81	0.54	13.60	8.39	0.2
MD021295	H1L	5701	3287	6.40	28.60	135	0.46	10.00	13.30	0.2
MD021294	G2	5607	3265	0.46	32.60	217	0.43	14.70	19.90	2
MD021293	G2	5609	3266	9.00	27.40	121	0.46	18.10	23.50	1
MD021292	V1	5785	3256	1.35	30.60	182	0.91	9.27	24.90	5
MD021291	H1L	5707	3282	0.25	31.40	69	1.29	11.40	16.00	0.2
MD021290	H1L	5704	3285	1.09	31.80	104	0.14	11.40	5.81	0.5
MD021289	H1L	5711	3282	1.35	31.80	54	0.30	9.57	11.10	0.2
MD021288	V1	5781	3258	0.58	32.60	240	1.33	19.30	14.60	3
MD021286	V1	5778	3258	0.19	31.40	194	0.55	12.20	10.40	0.5
MD021285	P7	5775	3259	0.95	32.60	295	0.73	7.81	7.63	1
MD021284	H1	5725	3299	9.40	26.60	212	1.11	12.70	19.70	0.2
MD021283	P5	5756	3269	0.22	32.80	210	0.46	11.00	17.20	0.5
MD021282	G2	5614	3268	0.70	32.60	143	1.00	8.58	10.00	0.5
MD021281	H1	5724	3297	0.18	32.80	242	0.73	13.20	11.20	0.5
MD021280	G2	5617	3268	0.11	32.60	163	0.39	13.70	12.10	3
MD021279	P1	5776	3256	0.09	31.60	177	3.20	13.30	11.70	1
MD021278	P4	5626	3304	14.40	26.00	132	0.43	17.10	4.88	1
MD021277	G2	5621	3269	2.32	31.80	146	1.59	13.90	17.00	1

MD021276	P1	5777	3255	0.12	32.00	183	1.36	22.70	16.30	6
MD021275	H1(L)	5707	3284	0.89	33.20	90	3.51	19.70	12.00	0.5
MD021274	G2	5627	3270	0.10	34.20	163	1.68	16.80	19.00	0.5
MD021273	P5	5754	3267	0.08	34.40	255	0.50	9.31	16.10	0.5
MD021272	P1	5767	3254	3.60	31.00	193	0.62	9.39	6.75	1
MD021271	P4	5627	3301	0.54	34.00	140	0.78	10.20	1.17	2
MD021270	G2	5629	3270	1.60	32.60	181	2.22	16.70	16.60	1.5
MD021269	G2	5632	3268	2.51	32.80	144	1.73	17.40	26.80	1
MD021268	P1	5764	3255	0.13	34.20	215	0.86	9.46	10.10	0.5
MD021267	P4	5627	3299	0.27	32.40	106	0.43	22.00	41.20	1
MD021266	H1	5722	3294	1.98	31.00	243	0.69	12.70	20.90	1
MD021265	P5	5752	3264	2.01	31.20	189	0.72	14.60	20.40	4
MD021264	H1	5713	3293	1.42	32.40	114	0.39	10.70	38.80	1
MD021263	P1	5761	3257	0.06	33.20	234	0.85	9.02	14.70	1
MD021262	P1	5757	3259	0.21	32.80	194	0.91	15.50	34.10	1
MD021261	G2	5634	3269	1.23	32.40	176	1.14	16.20	26.80	2
MD021260	G2	5637	3270	0.44	33.00	136	0.78	17.80	22.20	1
MD021259	P4	5628	3297	1.59	31.60	152	1.11	29.10	29.20	3
MD021258	G2	5639	3270	0.25	33.40	236	1.00	13.50	17.80	1
MD021257	P4	5629	3295	2.28	31.80	130	0.97	14.80	28.80	1
MD021256	H1	5719	3292	3.45	30.60	121	1.45	24.10	20.30	1
MD021255	P1	5753	3260	0.17	32.80	174	0.87	19.40	26.80	1
MD021254	G2	5642	3270	0.29	32.40	126	0.69	19.30	19.80	1
MD021253	P4	5631	3293	0.80	32.40	120	0.85	19.30	32.60	1
MD021252	P4	5632	3291	1.30	32.20	149	0.83	7.46	29.00	2
MD021251	P5	5751	3262	0.90	31.80	239	1.01	7.43	11.40	1
MD021250	H1	5715	3291	4.30	30.00	108	4.76	17.80	21.80	1
MD021249	P4	5633	3289	0.45	31.60	145	9.28	17.90	22.00	1
MD021248	P1	5747	3259	0.08	30.40	199	0.58	13.60	15.80	3.5
MD021247	H1	5715	3288	2.39	32.00	70	0.23	11.20	22.10	1
MD021246	G2	5645	3273	0.16	31.80	154	0.30	27.60	12.20	
MD021245	P4	5635	3286	0.27	33.00	137	0.81	24.20	27.60	1
MD021244	P1	5742	3260	0.14	33.20	236	1.13	10.60	33.10	2
MD021243	P1	5737	3268	0.10	32.80	217	1.64	10.20	36.80	3.5
MD021242	P4	5637	3281	0.09	30.60	161	0.73	39.30	25.50	3
MD021241	P1	5733	3266	1.81	30.80	235	2.42	12.30	13.20	2
MD021240	P1	5728	3270	3.30	30.00	132	0.81	16.40	17.40	1
MD021239	P4	5640	3278	1.92	31.40	109	1.03	17.80	31.40	2
MD021238	H1	5715	3285	6.00	28.40	75	1.23	18.90	18.90	1.5
MD021237	P1	5723	3273	2.18	30.20	139	0.96	32.50	11.80	1.5
MD021233	P2(1)	5645	3281	0.95	31.80	268	0.85	22.78	12.40	2
MD021232	P2	5651	3280	3.45	30.20	143	1.25	7.83	8.80	2.5
MD021231	H1	5714	3282	2.00	31.00	59	0.87	13.10	11.00	1
MD021230	P1	5719	3276	4.20	30.20	124	0.80	16.20	16.00	1

1.3 Wall Rock Assays - Level 44 - Cut 1

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
21573	5644	3266	G1	0.25	1.48	0.08	0.90	0.42	6.0	3.16
20714A	5607	3257	G1	0.18	0.60	1.23	0.85	0.76	16.8	2.71
20834A	5604	3258	G1	0.37	1.01	1.28	2.56	2.54	22.0	5.27
20849A	5602	3257	G1	0.13	0.40	0.06	0.27	0.18	1.5	1.15
20861A	5599	3258	G1	0.15	0.41	0.13	0.74	0.61	8.0	1.68
20875A	5596	3258	G1	0.20	0.55	2.59	0.94	0.53	19.5	3.47
20952A	5593	3259	G1	0.03	0.22	1.11	2.92	0.52	9.5	2.74
20961A	5591	3260	G1	0.02	0.36	0.44	0.16	0.39	5.0	0.87
21533A	5637	3264	G1	0.02	0.30	0.06	0.20	0.16	3.0	0.58
21543A	5633	3264	G1	0.02	0.22	0.01	0.12	0.14	2.5	0.42
21603A	5630	3264	G1	0.03	0.24	0.02	0.09	0.17	1.8	0.47
21614A	5627	3264	G1	0.05	0.18	1.81	0.54	0.27		1.68
21618A	5625	3264	G1	0.03	0.60	0.07	0.49	0.30	4.5	1.13
21630A	5622	3263	G1	0.01	0.22	0.04	0.25	0.23	2.3	0.48
21648A	5618	3262	G1	0.08	1.95	0.22	1.43	1.13	14.1	3.52
21669A	5616	3262	G1	1.51	0.86	4.01	1.35	1.35	11.0	10.11
21678A	5614	3260	G1	0.32	0.51	0.09	0.93	0.41	4.0	2.48
21689a	5612	3258	G1	0.23	2.62	0.81	1.06	1.65	15.5	5.00
21696a	5609	3257	G1	0.19	1.61	0.20	0.89	0.83	8.0	3.20
20339	5682	3264	P1	1.65	0.99	5.38	3.81	5.55	11.0	13.72
20390	5695	3252	P1	0.17	0.76	0.23	0.69	0.51	4.0	2.08
20401	5712	3258	P1	0.52	0.52	0.11	0.23	0.21	6.0	2.88
20967	5787	3240	P1	1.54	0.64	0.26	1.28	0.99	11.6	7.95
20999	5795	3247	P1	0.42	0.39	0.27	1.40	0.51	5.0	3.14
21069	5791	3233	P1	0.49	0.79	0.09	0.78	0.30	11.0	3.38
21071	5793	3230	P1	0.11	0.94	0.41	0.39	0.33	8.0	1.94
21074	5794	3226	P1	0.12	0.38	0.07	0.26	0.26	2.0	1.11
20362a	5686	3260	P1	0.13	0.88	0.21	0.55	4.05	9.5	2.69
20379a	5692	3254	P1	0.16	0.85	0.21	0.60	0.18	9.0	2.04
20400a	5698	3252	P1	0.64	2.44	5.27	2.55	3.88	4.7	9.98
20412a	5710	3256	P1	0.02	0.23	0.11	0.21	0.14	1.3	0.52
20417a	5714	3261	P1	0.03	0.40	0.02	0.17	8.04	3.3	2.23
20420a	5716	3262	P1	0.02	0.08	0.01	0.16	0.03	0.7	0.27
20434a	5719	3264	P1	0.03	0.58	0.04	0.30	0.32	1.0	0.96
20439a	5721	3266	P1	0.02	0.42	0.07	0.60	0.78	2.0	1.04
20449a	5724	3267	P1	0.03	0.76	0.09	0.74	0.40	10.5	1.50
20457a	5726	3269	P1	0.32	0.25	0.59	0.67	0.68	2.0	2.37
20468a	5728	3268	P1	0.06	0.07	0.06	0.15	0.10	1.0	0.45
20473a	5732	3265	P1	0.11	0.22	0.04	0.19	0.21	2.5	0.85
20476a	5734	3263	P1	0.06	0.33	0.07	0.28	0.22	6.0	0.85
20480a	5736	3261	P1	0.04	1.16	10.20	6.61	6.52	34.5	11.88
20493a	5738	3259	P1	0.39	0.84	0.31	1.09	0.68	12.5	3.41

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
20500a	5740	3258	P1	0.07	0.73	0.07	0.30	0.41	7.3	1.35
20507a	5743	3256	P1	0.44	0.65	0.18	0.61	0.60	1.5	2.98
20514a	5745	3254	P1	0.20	0.58	1.31	2.92	1.78	9.0	4.13
20520A	5742	3255	P1	0.23	3.05	1.65	7.61	2.02	22.7	9.69
20528A	5746	3250	P1	0.17	1.11	0.23	0.87	0.60	10.7	2.60
20532A	5750	3251	P1	0.03	0.61	0.07	0.40	0.54	3.0	1.12
20543A	5740	3250	P1	0.42	0.60	0.12	0.72	0.56	6.6	2.91
20552A	5739	3247	P1	0.38	0.39	0.85	0.44	0.41	3.5	2.71
20558A	5755	3249	P1	0.04	0.53	0.33	0.51	0.55	3.7	1.28
20562A	5758	3249	P1	0.05	0.79	0.16	0.51	0.57	6.5	1.52
20573A	5764	3248	P1	0.05	0.28	8.34	1.38	2.94	3.5	6.19
20615A	5701	3254	P1	0.05	1.71	1.09	2.67	7.73	16.5	5.63
20629A	5705	3254	P1	0.06	0.30	0.22	0.24	0.27	1.6	0.86
20637A	5707	3255	P1	0.17	0.32	0.23	0.47	0.41	1.1	1.48
20650A	5712	3258	P1	0.06	0.36	0.11	0.18	0.15	4.3	0.82
20662A	5766	3247	P1	0.09	3.66	0.48	2.91	2.51		6.41
20677A	5771	3247	P1	0.29	0.71	0.54	2.86	1.09	10.3	4.06
20683A	5774	3246	P1	0.12	0.52	0.36	1.06	0.86	9.5	2.03
20696A	5777	3246	P1	0.47	1.58	0.54	2.70	1.40	18.8	5.68
20699A	5780	3245	P1	0.07	0.99	0.55	2.58	0.99	37.0	3.48
20955A	5785	3242	P1	1.96	0.36	0.25	0.58	1.03	4.5	8.91
21552A	5783	3244	P1	0.04	0.80	0.20	0.66	0.28	5.5	1.53
20354	5658	3274	P2	0.15	0.48	0.12	0.17	0.21	4.0	1.31
20350a	5660	3273	P2	0.28	0.22	0.16	0.42	0.43	2.0	1.76
20364a	5655	3275	p2	0.05	2.00	78.03	0.89	1.82	158.0	44.71
20384a	5648	3277	P2	0.91	3.15	4.05	3.09	4.41	13.0	11.61
20621A	5641	3281	P2	0.50	1.11	0.33	1.32	0.81	90.1	4.85
20982A	5591	3262	G4	0.02	0.06	0.02	0.07	0.03	0.5	0.20
20996A	5591	3268	G4	0.75	0.69	0.04	0.57	0.83	6.5	4.25
21650	5733	3283	H1	0.19	4.00	0.04	1.31	1.65	11.0	5.93
20702A	5734	3289	H1	0.28	0.32	0.08	0.17	0.24	3.0	1.65
20842A	5735	3291	H1	0.07	1.13	0.32	2.85	1.72	10.0	3.60
20846A	5733	3295	H1	0.34	0.83	2.47	1.02	0.64	8.0	4.24
20855A	5735	3293	H1	0.15	0.38	1.12	4.04	1.99	13.0	4.33
20894A	5735	3296	H1	0.31	0.87	0.68	4.76	1.37	47.0	5.77
21528A	5729	3272	H1	0.08	0.23	0.74	0.88	0.39	5.5	1.55
21537A	5729	3275	H1	0.02	0.31	0.06	0.37	0.30	8.0	0.75
21547A	5730	3277	H1	0.03	0.21	0.10	0.16	0.19	2.3	0.53
21606A	5730	3280	H1	0.08	0.19	0.83	0.13	0.16	3.0	1.07
21611A	5732	3282	H1	0.26	0.53	1.47	0.94	1.82	4.5	3.26
21656A	5734	3285	H1	1.34	4.40	0.22	1.63	2.57	36.5	11.58
21681a	5734	3286	H1	0.14	0.36	0.97	1.38	0.82	9.0	2.43
20669	5750	3259	P3	5.40	1.09	2.79	7.16	5.36	27.0	29.49
20673	5750	3261	P3	0.41	1.98	2.03	1.46	1.37	18.0	5.90

20685	5751	3264	P3	0.02	0.81	0.01	0.07	0.31	6.0	1.04
20864	5778	3286	P3	0.06	0.42	0.80	0.36	0.82	14.5	1.55
21693	5765	3279	P3	0.24	0.32	1.09	1.07	1.40	5.5	2.77
20822A	5769	3281	P3	0.05	0.27	0.24	0.15	0.18	4.0	0.74
20839A	5771	3282	P3	0.30	1.13	0.50	0.29	0.57	14.5	2.97
20858A	5775	3285	P3	0.02	0.24	0.03	0.11	0.07	2.0	0.43
20881A	5780	3288	P3	0.13	0.57	0.42	0.81	0.88	6.0	1.98
21652A	5759	3272	P3	0.05	0.51	0.17	1.20	0.77	3.5	1.65
21662A	5761	3275	P3	0.62	2.01	0.30	2.51	2.81	14.0	6.73
21675A	5764	3277	P3	0.06	0.43	0.17	2.23	1.32	16.5	2.40
20511	5627	3303	P4	0.10	0.34	0.01	0.19	0.13	0.5	0.88
20641	5636	3287	P4	0.26	1.00	0.19	0.67	0.38	4.0	2.62
20406a	5635	3289	P4	0.07	0.70	0.07	0.38	0.62	2.5	1.37
20427a	5632	3291	P4	0.12	0.36	0.16	0.31	0.19	1.0	1.14
20445a	5631	3293	P4	0.07	0.50	0.05	0.33	0.31	2.8	1.07
20465a	5629	3296	P4	0.54	2.45	3.80	2.49	1.34	100.5	8.99
20483a	5629	3298	P4	0.06	0.23	0.08	0.26	0.10	0.8	0.68
20504a	5628	3300	P4	0.22	0.50	0.12	0.46	0.14	2.3	1.75
20632A	5638	3285	P4	0.08	0.18	0.05	0.17	0.22	1.8	0.68
20546A	5625	3289	P4L	0.06	0.20	0.06	0.33	0.15	2.5	0.71
21560A	5752	3269	P5	0.05	1.26	0.43	1.42	1.37	11.3	2.84
21564A	5752	3272	P5	0.39	0.77	0.56	2.22	1.70	8.0	4.27
21585A	5752	3274	P5	0.56	1.69	2.24	2.78	2.33	16.5	7.25
21642A	5749	3277	P5	0.17	1.12	0.79	2.15	1.42	12.3	3.80
21665A	5747	3281	P5	0.11	1.18	0.13	0.64	1.95	4.5	2.47
21071	5651	3283	P6	0.02	0.10	0.03	0.11	0.10	2.0	0.29
21570	5651	3283	P6	0.09	0.80	0.06	0.24	0.57	5.0	1.48
20887A	5654	3287	P6	0.02	0.22	0.09	0.38	0.26	2.5	0.63
20889A	5656	3287	P6	0.05	0.11	0.12	0.92	0.55	1.8	1.01
20899A	5658	3287	P6	0.02	0.13	0.02	0.03	0.26	2.0	0.30
21588A	5651	3286	P6	0.02	0.41	0.09	0.24	0.30	2.5	0.75
20970A	5595	3257	G6	0.08	0.55	0.56	2.58	6.15	15.0	3.94
21054A	5597	3254	G6	0.10	0.45	0.19	0.64	0.66	2.8	1.46
21063A	5599	3252	G6	0.72	0.74	0.53	0.15	0.33	6.5	4.10
21000	5798	3249	P1L	0.15	2.00	0.45	1.38	2.93	7.0	4.24
21081	5807	3253	P1L	0.03	0.56	0.27	0.23	0.18	7.0	1.04
21058A	5800	3250	P1L	0.32	0.70	0.91	26.88	0.98	15.5	17.95
21067A	5790	3236	P1L	0.20	0.54	0.64	2.50	2.08	11.0	3.58
20867A	5752	3280	P9	0.05	0.28	0.10	0.63	0.12	3.5	0.94
20986A	5591	3265		0.03	0.25	0.02	0.13	0.13	11.0	0.56

2.0 Diamond Drill Assays

2.1 Drill Hole Assays: Massive Veins

FR34223	5000	M	0.04	27.0		124	0.72	15.60	26.50	3047	2588	5680
FR36374	4003	F1	1.57	28.9	29.0	141	3.10	21.50	28.20	3169	2566	5580
ST42266	5001	M	0.44	21.1	20.7	107	0.09	5.60	4.29	3244	2698	5840
ST42267	5002	M	0.46	25.1	26.2	128	2.24	13.44	12.50	3222	2669	5840
ST42267	5003	M	1.06	27.8	29.9	119	0.28	3.73	6.72	3221	2671	5840
ST42268	5004	M	1.06	20.8	22.0	103	0.84	5.97	8.02	3194	2644	5840
ST42268	5005	M	0.14	24.4	24.8	140	0.37	6.53	3.55	3194	2649	5840
ST42269	5006	M	0.76	22.8	24.3	88	4.11	12.88	10.26	3149	2613	5840
ST42269	5007	M	0.42	26.2	27.5	123	0.28	12.88	19.59	3148	2611	5840
ST42269	5008	M	0.10	24.6	24.0	167	1.12	4.85	2.43	3160	2642	5840
ST44007	DC023678	M	0.82	31.5	32.0	229	2.23	9.86	19.00	3238	2663	5780
ST44007	DC023686	M	0.97	32.0	33.6	224	0.96	7.19	6.42	3244	2658	5780
ST44008	DC023813	M	7.20	22.8	29.8	161	5.07	17.70	12.10	3246	2674	5780
ST44008	DC023818	M	3.80	27.0	30.0	120	4.47	17.20	18.70	3256	2668	5780
ST44009	DC023849	M	3.08	21.4	23.2	115	0.35	11.40	23.20	3272	2679	5780
ST44009	DC023831	M	0.09	21.8	22.2	133	0.20	8.08	12.40	3247	2688	5780
ST44009	DC023842	M	0.28	29.2	29.8	234	1.99	9.96	23.70	3255	2685	5780
ST44010	DC023860	H	22.60	1.0		99	0.58	0.55	0.42	3240	2702	5780
ST44010	DC023871	M	0.18	20.1	19.7	95	2.21	11.80	36.80	3261	2698	5780
ST44011	DC024010	M	0.72	30.0	32.8	287	7.14	9.90	11.40	3224	2649	5780
ST44013	DC024077	M	0.12	25.6	25.4	152	5.62	14.80	28.40	3254	2674	5800
ST44013	DC024069	M	16.50	19.4	29.9	156	14.59	0.78	18.10	3247	2677	5800
ST44014	DC024088	H	0.20	29.6	30.1	169	5.05	18.60	32.10	3223	2678	5800
ST44014	DC024095	M	0.30	26.0	25.8	227	10.40	9.80	15.00	3233	2668	5800
ST44015	DC024133	M	12.40	15.6	21.2	51	0.42	19.80	6.85	3254	2706	5800
ST44016	DC024181	F	0.38	32.0	17.2	180	34.90	3.10	24.30	3257	2597	5800
ST44016	DC024143	M	0.84	31.8	32.9	196	0.89	15.70	24.00	3224	2653	5800
ST44016	DC024142	M	0.99	24.0	25.2	130	6.94	10.50	6.89	3223	2654	5800
ST44016	DC024148	M	0.27	30.0	29.7	101	0.28	6.18	20.20	3226	2650	5800
ST44016	DC024152	M	23.80	0.8		23	1.83	4.89	1.40	3228	2646	5800
ST44017	DC024194	M	1.02	25.1	27.9	28	1.01	16.40	10.70	3208	2638	5800
ST44017	DC024196	M	1.72	26.4	30.3	71	0.93	10.40	13.40	3209	2637	5800
ST44018	DC024236	M	1.48	27.0	28.7	210	14.60	18.30	23.80	3198	2631	5760
ST44018	DC024231	M	0.43	29.6	29.9	205	3.24	9.42	26.90	3188	2651	5760
ST44019	DC024261	F	16.40	10.2	25.0	90	0.36	18.60	9.83	3191	2605	5760
ST44020	DC024297	M	3.70	24.4	28.9	216	1.59	23.90	7.71	3218	2641	5760
ST44021	DC024308	M	0.53	28.8	30.7	19	1.69	16.40	27.10	3224	2659	5760
ST44021	DC024311	M	0.23	29.6	30.5	226	0.90	9.49	22.50	3239	2649	5760
ST44022	DC024335	F1	0.23	30.0	29.2	232	10.10	10.70	19.20	3262	2689	5740
ST44023	DC024387	M	0.30	28.6	28.4	82	2.23	7.20	1.20	3235	2676	5740
ST44024	DC024427	F1	0.68	26.7	26.9	111	0.96	13.10	4.97	3237	2648	5740
ST44024	DC024422	M	5.31	27.2	30.0	186	4.02	12.30	37.70	3225	2673	5740
ST44025	DC024447	M	3.35	26.7	28.2	156	1.56	15.90	12.10	3256	2676	5740

ST44025	DC024442	M	0.18	24.8	23.7	117	0.67	12.50	13.00	3249	2679	5740
ST44026	DC024471	F1	0.14	31.5	30.5	104	0.39	17.90	36.00	3295	2698	5740
ST44027	DC024480	M	4.30	25.9	30.1	146	0.89	9.90	22.10	3218	2667	5740
ST44028	DC024567	M	2.00	19.0	21.5	129	0.96	10.60	8.41	3256	2660	5760
ST44029	DC024519	M	4.35	25.7	27.9	196	2.02	18.60	7.31	3277	2685	5720
ST44029	DC024518	M	0.07	32.7	32.9	73	0.20	3.32	14.80	3276	2686	5720
ST44030	DC024543	M	5.22	24.3	27.6	135	1.64	14.90	13.90	3250	2676	5720
ST44031	DC024578	M	0.52	30.2	30.9	165	3.89	17.30	21.70	3282	2700	5720
ST44032	DC024614	M	0.86	21.1	20.8	122	0.67	51.90	6.13	3279	2671	5760
ST44032	DC024596	M	0.22	30.7	31.2	255	7.31	7.86	14.30	3251	2681	5760
ST44032	DC024610	M	2.98	23.2	24.6	72	0.52	2.61	4.11	3274	2673	5760
ST44033	DC024640	M	0.14	27.0	27.7	178	1.82	11.20	17.60	3279	2697	5760
ST44033	DC024636	M	0.10	28.2	29.1	176	0.99	11.40	15.50	3274	2697	5760
ST44034	DC024670	M	0.19	30.8	31.5	186	3.16	12.60	19.90	3296	2713	5760
ST44035	DC024673	H	1.85	20.4	20.4	159	1.31	9.50	8.98	3244	2684	5660
ST44035	DC024682	M	0.36	27.1	27.7	188	1.96	21.80	19.90	3270	2680	5660
ST44035	DC024690	M	1.31	22.5	24.6	132	4.82	11.50	7.98	3281	2678	5660
ST44036	DC024702	M	1.45	28.9	29.5	175	2.01	12.30	14.80	3278	2694	5660
ST44037	DC024721	M	0.17	29.9	30.1	205	1.10	18.60	3.55	3250	2669	5660
ST44038	DC024766	M	0.11	25.2	27.1	174	3.01	15.70	17.50	3235	2662	5660
ST44038	DC024784	M	5.20	24.4	29.4	267	0.25	14.80	26.20	3246	2645	5660
ST44038	DC024775	M	0.04	29.4	31.5	159	0.74	5.04	6.14	3240	2654	5660
ST44039	DC024737	M	0.25	21.6	26.6	119	2.57	9.40	10.40	3223	2651	5660
ST44039	DC024749	M	0.17	27.4	28.6	230	4.75	5.44	3.74	3225	2640	5660
ST44040	DC024791	H	0.87	21.8	23.6	112	1.22	8.80	5.30	3262	2700	5660
ST44040	DC024799	M	2.39	18.8	22.1	120	9.37	13.90	16.70	3303	2712	5660
ST44042	DC024832	M	5.26	17.4	22.1	68	5.86	19.80	2.64	3277	2687	5680
ST44042	DC024834	M	0.92	22.3	24.3	112	4.55	16.80	10.50	3278	2687	5680
ST44042	DC024837	M	1.34	28.4	32.1	183	4.67	10.30	11.80	3280	2687	5680
ST44043	DC024847	M	3.10	26.2	30.1	136	2.99	15.50	15.00	3253	2675	5680
ST44044	DC024881	M	0.16	29.6	30.3	193	1.87	8.04	9.46	3232	2665	5680
ST44045	DC024919	M	0.11	28.8	29.8	153	0.61	14.10	19.30	3215	2640	5680
ST44045	DC024905	M	0.06	24.2	24.4	250	6.01	10.80	21.50	3214	2658	5680
ST44045	DC024910	M	0.10	29.5	30.7	229	1.65	12.80	26.00	3215	2652	5680
ST44045	DC024902	M	6.80	16.8	21.1	141	2.01	4.63	2.59	3214	2661	5680
ST44046	DC024862	M	0.09	31.9	33.6	236	0.77	10.90	19.00	3292	2705	5680
ST44046	DC024856	M	5.00	25.5	30.2	129	0.63	7.96	12.20	3285	2704	5680
ST44048	DC024939	M	2.26	24.0	26.5	103	0.81	9.56	12.60	3199	2631	5680
ST44049	DC024952	M	3.60	26.0	29.0	215	64.70	13.20	15.60	3268	2689	5700
ST44049	DC024951	M	0.09	31.6	32.9	176	1.09	12.80	17.70	3267	2689	5700
ST44051	DC024983	M	0.11	23.2	22.8	119	1.83	13.90	23.70	3235	2677	5700
ST44051	DC024988	M	20.30	10.0	26.0	103	0.73	5.80	7.79	3240	2674	5700
ST44052	DC024993	H	0.20	21.4	20.5	139	0.57	7.92	14.40	3221	2676	5700
ST44052	DC025002	M	0.32	28.9	29.2	200	3.79	14.70	25.70	3230	2664	5700
ST44053	DC025021	M	2.15	22.5	25.2	130	0.80	14.50	5.14	3218	2656	5700

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ST44053	DC025030	M	3.31	25.4	29.3	143	0.60	7.21	5.17	3221	2645	5700
ST44054	DC025039	H	0.16	20.3	20.1	22	0.16	0.41	0.59	3240	2694	5700
ST44054	DC025056	M	0.30	28.6	28.9	212	22.20	16.80	16.60	3280	2697	5700
ST44054	DC025062	M	12.00	10.3	21.9	45	0.53	1.71	4.32	3283	2697	5700
ST44055	DC025086	M	3.80	17.0	20.2	104	15.00	15.20	18.80	3290	2709	5700
ST44056	DC025102	M	0.82	27.0	27.5	86	2.33	16.00	10.30	3318	2738	5700
ST44057	DC025117	M	0.10	29.4	30.2	152	3.73	11.20	22.00	3235	2668	5720
ST44057	DC025110	M	0.20	30.4	30.5	230	3.26	10.30	26.30	3230	2673	5720
ST44057	DC025113	M	2.96	24.5	26.8	123	14.70	9.04	8.22	3232	2671	5720
ST44058	DC025129	M	0.18	30.6	31.7	188	2.61	8.68	23.40	3218	2665	5720
ST44058	DC025121	M	0.19	21.6	22.0	130	0.53	4.37	9.88	3214	2674	5720
ST44059	DC025157	F1	3.37	23.1	25.6	138	0.94	10.40	14.60	3207	2629	5720
ST44059	DC025154	M	0.17	23.2	24.8	127	0.85	5.41	7.38	3206	2659	5720
ST44060	DC025171	M	2.17	27.8	30.2	128	17.00	21.90	13.80	3289	2716	5720
ST44061	DC025176	M	0.32	30.6	30.7	171	11.00	15.40	12.90	3312	2748	5720
ST44062	DC025187	M	0.05	25.2	25.7	110	2.44	9.20	11.20	3184	2631	5720
ST44062	DC025184	M	0.04	24.6	25.4	82	1.13	8.78	17.20	3188	2644	5720
ST44062	DC025179	M	5.20	27.2	30.0	209	2.15	7.88	12.60	3190	2652	5720
ST44064	6000	M	0.20	28.2		151	2.21	36.80	21.80	3269	2682	5680
ST44065	DC025230	M	0.16	31.0	31.4	170	1.32	14.30	22.60	3281	2713	5740
ST44066	DC025246	M	3.02	17.8	21.0	92	10.20	9.37	6.98	3201	2658	5740
ST44067	DC025260	M	1.33	20.1	20.0	99	0.96	9.12	12.70	3298	2732	5740
ST44068	DC025275	M	0.32	26.7	27.5	101	0.71	19.30	11.70	3203	2648	5620
ST44068	DC025273	M	0.16	24.1	25.1	148	0.71	15.60	30.70	3201	2649	5620
ST44068	DC025282	M	0.30	25.4	26.9	9	4.74	12.40	25.90	3213	2643	5620
ST44068	DC025280	M	0.08	23.4	24.4	0.5	3.90	10.80	14.60	3211	2644	5620
ST44071	DC025333	M	6.17	27.8	31.9	196	16.30	17.10	18.90	3234	2654	5620
ST44071	DC025332	M	6.09	29.5	33.3	160	0.67	7.85	14.00	3232	2654	5620
ST44074	DC025371	M	0.10	21.4	22.1	121	3.01	11.60	23.40	3282	2673	5620
ST44074	DC025368	M	1.80	24.8	26.4	421	8.50	13.80	14.00	3257	2674	5620
ST44075	DC025375	M	0.05	29.6	32.1	220	2.23	13.30	24.60	3262	2682	5620
ST44078	DC025402	M	4.35	25.6	29.4	161	2.30	9.73	21.60	3187	2647	5660
ST44078	DC025405	M	0.09	28.0	30.3	188	3.96	9.45	13.10	3190	2644	5660
ST44082	DC025483	M	1.20	28.8	31.0	131	0.92	9.28	14.90	3182	2641	5700
ST44083	DC025507	M	0.11	30.4	32.1	147	0.54	14.00	14.20	3170	2641	5700
ST44084	DC025516	M	0.12	27.6	29.1	143	0.75	13.60	10.60	3150	2636	5700
ST44085	DC025525	M	0.06	24.2	24.8	103	3.80	6.33	24.40	3134	2628	5700
ST44095	6001	M	0.08	26.0	27.0	191	0.81	6.06	20.20	3281	2679	5660
ST44096	DC025607	F2	2.32	28.0	28.9	142	1.80	20.00	36.00	3148	2530	5560
ST44099	DC025637	F2	1.56	21.4	23.5	280	6.93	65.80	30.30	3121	2536	5560
ST44099	DC025627	M	0.16	27.4	14.2	200	42.20	6.37	9.55	3129	2598	5560
ST44100	DC025650	F1	0.07	20.9	20.9	337	2.59	6.52	7.57	3093	2553	5560
ST44107	6002	M	1.04	28.6	29.1	173	1.24	10.40	18.30	3275	2694	5640
ST44110	6003	M	1.78	28.6	31.7	189	1.26	14.70	21.50	3257	2681	5600
ST44123	DC025854	F1	1.79	21.8	11.1	66	10.80	6.31	23.30	3198	2593	5580

ST44124	DC025808	M	0.06	31.2	32.4	66	0.67	9.71	19.90	3148	2598	5580
ST44125	DC025742	M	0.78	30.2	32.4	34	16.20	14.10	7.84	3226	2636	5580
ST44127	DC025744	H	0.63	23.6	23,8	101	0.27	14.40	1.11	3156	2657	5580
ST44127	DC025756	M	0.06	30.6	31.8	93	0.95	13.90	25.00	3209	2615	5580
ST44127	DC025750	M	6.80	26.8	31.4	96	0.26	5.24	7.28	3184	2635	5580
ST44128	DC025879	M	17.60	13.6	23.4	73	0.92	10.20	10.50	3239	2652	5580
ST44129	DC025899	M	0.08	30.0	32.0	129	0.19	21.00	31.90	3160	2618	5580
ST44129	DC025907	M	0.16	27.4	28.9	68	1.57	14.60	21.70	3168	2601	5580
ST44130	DC025928	M	0.10	28.6	29.4	112	0.64	16.10	15.40	3136	2591	5580
ST44131	DC025954	H	0.05	23.1	24.3	109	0.29	10.70	6.89	3200	2676	5580
ST44135	DC025978	M	0.50	29.4	30.5	280	1.34	21.30	12.70	3149	2592	5540
ST44138	DC026580	M	0.24	30.0	31.3	314	1.20	18.60	30.40	3135	2578	5540
ST44139A	DC026592	F1	0.07	30.1	31.2	144	4.78	11.50	35.00	3117	2547	5540
ST44139A	DC026595	F2	4.06	30.0	32.8	177	17.50	21.90	16.70	3115	2528	5540
ST44140	DC026602	M	0.98	27.9	29.2	240	1.61	20.10	12.30	3098	2567	5540
ST44145	DC026806	F2	0.14	31.3	31.1	137	1.27	13.80	25.10	3053	2514	5540
ST44145	DC026803	M	0.16	32.0	32.0	301	2.80	19.50	30.00	3074	2555	5540
ST44145	DC026801	M	29.30	2.3	19.1	123	9.58	5.62	2.58	3077	2559	5540
ST44149	4000	F	0.57	27.9	27.9	78	0.50	0.80	9.50	3195	2611	5640
ST44149	DC026813	M	0.47	22.3	23.2	40	2.86	10.90	21.60	3175	2635	5640
ST44149	DC026815	M	2.78	28.0	30.4	140	0.68	10.10	10.90	3177	2633	5640
ST44160	DC026569	H	1.94	23.6	24.4	165	0.30	5.56	2.65	3199	2682	5800
ST44160	DC026568	H	42.30	1.5		43	0.28	9.12	0.79	3218	2682	5800
ST44167	DC026845	M	9.00	14.0	21.2	98	4.02	15.10	7.37	3190	2639	5640
ST44170	DC026864	M	1.64	27.0	29.4	84	0.51	9.23	15.90	3135	2619	5600
ST44172	DC026878	H	0.19	25.6	25.3	186	4.31	12.70	15.20	3162	2651	5600
ST44172	DC026890	M	0.08	27.0	27.2	134	2.08	14.90	15.70	3194	2620	5600
ST44174	DC026310	M	0.10	27.0	28.3	181	2.08	18.70	19.50	3144	2629	5600
ST44174	DC026313	M	0.18	30.8	32.6	126	1.04	15.10	32.20	3147	2620	5600
ST44175	DC026329	H	0.18	26.0	25.2	84	3.46	6.31	15.80	3155	2648	5600
ST44175	7000	M	0.21	24.0	25.4	156	6.82	11.60	29.90	3175	2618	5600
ST44176	7001	M	0.13	21.7	23.8	178	2.35	9.95	9.54	3210	2630	5600
ST44178	DC026363	M	0.21	32.2	32.1	284	1.40	15.30	35.60	3132	2566	5520
ST44179	DC026372	M	0.63	21.8	21.7	331	5.29	8.99	0.18	3046	2547	5520
ST44180	DC026382	F1	0.18	26.0	26.2	54	3.14	19.40	21.60	3056	2531	5520
ST44180	DC026385	F2	5.07	22.6	25.6	46	22.50	17.90	40.90	3043	2509	5520
ST44180	DC026378	M	5.89	25.1	28.5	200	0.97	12.20	53.70	3065	2546	5520
ST44180	DC026388	M	15.40	16.6	25.6	35	0.86	10.50	18.20	3034	2494	5520
ST44181	DC026391	M	0.56	28.5	28.6	254	1.39	21.60	26.70	3089	2548	5520
ST44182	DC026398	M	1.04	27.0	29.9	242	1.62	17.70	12.50	3109	2552	5520
ST44187	DC026688	M	0.37	29.9	31.5	205	2.21	12.30	27.60	3164	2619	5740
ST44188	DC026699	M	3.30	23.7	29.2	322	1.94	21.60	5.01	3145	2614	5740
ST44188	DC026696	M	0.62	23.5	25.3	280	23.40	10.60	12.30	3140	2628	5740
ST44188	DC026694	M	0.15	26.1	27.7	431	21.60	6.74	6.78	3139	2631	5740
ST44189	DC026655	M	11.20	21.0	25.7	183	3.10	26.00	18.30	3130	2610	5740

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ST44190	DC026484	F1	0.10	21.2	21.4	156	1.94	2.09	36.70	3114	2564	5740
ST44217	217-011	F2	0.19	31.6	29.7	177	2.45	13.00	18.10	3114	2535	5580
ST44217	217-013	F2	2.93	26.0	25.5	106	0.28	10.30	16.50	3115	2534	5580
ST44217	217-002	H	1.54	31.0	31.5	101	0.36	17.90	6.77	3068	2605	5580
ST44218	218-006	H	2.99	31.0	32.2	102	0.22	19.30	3.56	3057	2607	5580
ST44219	219-003	H	4.40	26.6	29.2	89	0.09	11.00	7.95	3045	2606	5580
ST44219	219-006	M	4.40	27.0	30.1	140	1.49	10.10	11.00	3054	2576	5580
ST44245	900	M	5.80	23.6	28.0	97	1.20	12.10	18.60	3045	2576	5700
ST44246	4002	F	0.98	25.8	24.3	129	0.95	4.90	8.12	3061	2570	5700
ST44246	901	M	0.05	28.9	30.0	173	0.44	32.50	35.10	3056	2590	5700
ST44247	902	M	0.10	22.2	23.1	148	2.44	10.10	2.41	3067	2605	5700
ST44247	903	M	0.12	27.4	28.0	206	0.87	6.82	3.34	3073	2593	5700
ST44247	904	M	2.00	23.7	25.3	114	2.41	5.34	5.70	3070	2598	5700
ST44247	905	M	0.80	21.5	22.3	112	2.09	3.35	4.38	3076	2589	5700
ST44248	906	M	3.20	23.0	24.7	144	2.02	8.33	7.70	3085	2605	5700
ST44249	907	M	0.80	28.0	29.1	214	14.30	15.60	8.89	3100	2609	5700
ST44250	250-004	M	0.17	29.7	28.2	223	1.01	25.70	20.60	3077	2596	5660
ST44251	251-010	M	0.04	26.4	26.8	157	22.00	24.70	24.90	3061	2591	5660
ST44251	251-003	M	0.84	24.5	26.0	73.00	0.09	5.32	7.00	3051	2611	5660
ST44251	251-014	M	0.21	25.6	25.7	112	0.98	4.49	6.53	3065	2584	5660
ST44252	252-003	M	0.09	30.4	31.5	184	0.31	8.32	11.80	3044	2591	5660
ST44253	253-004	M	0.34	26.2	27.4	121	0.39	14.90	15.50	3028	2585	5660
ST44254	254-004	M	2.29	30.0	32.1	115	1.02	12.70	20.90	3011	2577	5660
ST44254	254-007	M	2.12	20.2	22.1	112	2.39	7.50	9.80	3008	2599	5660
ST44255	255-019	M	0.06	31.1	31.6	195	0.95	5.42	17.30	2993	2561	5660

2.2 Drill Hole Assays - Semi-Massive Veins

ST44068	DC025286	F	0.1	15.6	15.7	127	7.21	6.6	9.11	3249	2624	5620
ST44069	DC025312	F	7.15	12.3	15.8	90	1.85	10.4	12.9	3211	2616	5620
ST44153	DC026826	F	0.11	12	12.1	47	0.32	1.76	0.61	3150	2600	5640
ST44079	DC025438	F	4.7	11.2	13.8	18	0.47	2.97	321	3198	2607	5660
ST44248	248-1	F	0.08	11.3	12.2	61	2.39	0.54	1.57	3098	2590	5700
ST44246	246-1	F	1.5	18.9	20.5	122	9.02	10.4	25	3061	2565	5700
ST44022	DC024342	F	5.93	14.1	16.4	114	3.02	8.67	10.3	3287	2683	5740
ST44011	DC024016	F	2.98	10.6	12.8	70	0.72	14.7	8.04	3231	2637	5780
ST44178	DC026367	F1	0.09	12.3	11.8	79	0.89	7.78	10.8	3132	2543	5520
ST44182	DC026403	F1	0.05	12.6	13.4	102	0.24	8.63	16.8	3106	2540	5520
ST44134	DC025975	F1	0.03	16.7	14.5	115	3.16	2.39	19.7	3194	2569	5540
ST44140	DC026614	F1	0.32	19.7	19.9	113	0.19	13.6	36.4	3085	2528	5540
ST44088	DC025556	F1	0.33	15.4	15.8	67	0.92	15.9	10.4	3257	2648	5560
ST44089	DC025565	F1	0.15	11	10.9	70	0.85	0.81	2.2	3188	2593	5560
ST44096	DC025594	F1	1.16	17.4	17.5	47	1.08	7.78	1.47	3145	2581	5560
ST44097	DC025613	F1	3.5	11.6	13.8	141	1.95	8.17	15.5	3239	2634	5560
ST44099	DC025634	F1	6.4	15	19.5	143	2.43	4.05	13.1	3125	2565	5560
ST44212	DC027790	F1	0.1	14	14.5	166	0.47	2.63	3.43	3092	2544	5560
ST44213	DC028515	F1	8.4	18.8	24	272	7.47	6.53	2.84	3061	2538	5560
ST44124	DC025820	F1	0.85	18	18.9	115	2.6	11.1	20.8	3151	2582	5580
ST44124	DC025823	F1	2.27	13.4	14	10	0.48	4.07	10.8	3154	2560	5580
ST44129	DC025911	F1	0.03	16.9	17.2	30	0.14	5.32	5.27	3177	2579	5580
ST44130	DC025935	F1	2	18.8	20.3	46	8.09	34.4	23	3137	2575	5580
ST44172	DC026894	F1	10.2	6.4	11.9	46	1.54	4.12	2.83	3202	2613	5600
ST44058	DC025143	F1	0.12	17.3	17.4	223	4.9	11.2	25.5	3229	2639	5720
ST44059	059-1	F1	9.06	2.11		36	4.03	3.57	3.18	3207	2624	5720
ST44201	DC028504	F1	0.34	17.6	18.9	49	0.45	13.6	14.5	3110	2575	5720
ST44201	DC028502	F1	11.7	2.5	9	23	0.5	1.44	0.18	3112	2587	5720
ST44022	DC024350	F1	0.4	11.6	11.1	66	0.55	1.24	4.29	3298	2681	5740
ST44023	DC024398	F1	10.4	7.5		82	62.9	4.65	6.79	3255	2654	5740
ST44027	DC024486	F1	0.19	10.6	10.6	57.3	2.19	3.86	4.05	3224	2635	5740
ST44185	DC028122	F1	3.07	12.9	15.4	104	0.4	15.2	12.1	3096	2572	5740
ST44142	DC025992	F1	0.1	16	16.6	240	5.05	15.7	1.73	3297	2682	5780
ST44142	DC025990	F1	0.09	13.5	14.5	223	1.69	1.22	18.1	3293	2682	5780
ST44192	DC028540	F1	0.7	10.6	9.6	53	1.62	18.9	14.5	3239	2606	5780
ST44181	DC026395	F2	17.5	15	23.8	123	0.72	22.8	42.3	3074	2508	5520
ST44182	DC026407	F2	0.26	14.3	14.6	145	0.36	6.24	18.2	3098	2508	5520
ST44139A	DC026597	F2	0.12	11.6	11.3	78	5.02	0.24	0.11	3114	2524	5540
ST44089	DC025567	F2	7.5	8.2		84	0.36	5.31	10.6	3208	2562	5560
ST44100	DC025653	F2	3.4	17.1	20.2	144	2.19	9.14	17.3	3085	2532	5560
ST44100	DC025661	F2	6.4	11.2	13.6	72	1.75	18.7	15.5	3081	2522	5560
ST44212	DC027793	F2	12.4	1.9		20	0.28	0.88	1.11	3102	2522	5560
ST44217	217-010	F2	0.36	15.2	15	80	1.89	7.04	18.2	3114	2536	5580

ST44217	217-008	F2	0.32	12.4	10	125	40.5	16.4	9.73	3113	2536	5580
ST44219	219-011	F2	0.09	10.4	9.8	16	0.3	2.25	0.96	3068	2524	5580
ST44203	203-015	F2	0.22	11.9	12.2	135	1.35	3.68	1.00	3156	2572	5720
ST44187	DC026691	F2	0.29	12.8	5.2	594	0.2	19.5	31.5	3194	2575	5740
ST44192	DC028539	F2	0.03	10	8.7	174	0.46	10.6	37.9	3237	2609	5780
ST44192	DC028538	F2	0.06	18.6	8.1	2960	0.98	7.78	1.17	3232	2615	5780
ST44098	DC025616	H	0.1	10	10.8	58	0.39	4.51	0.46	3211	2677	5560
ST44215	DC028522	H	0.81	17.8	12.4	82	0.23	0.56	0.36	3023	2592	5560
ST44215	DC028523	H	0.15	16.7	7.8	76	0.35	0.43	0.05	3023	2591	5560
ST44123	DC025831	H	0.2	14.1	13.1	58	0.32	7.39	4.23	3154	2650	5580
ST44131	DC025961	H	0.07	18.6	18.8	97	0.3	10.8	8.61	3219	2677	5580
ST44131	DC025964	H	0.05	16.4	16.5	71	0.7	5.15	17.4	3243	2678	5580
ST44171	DC026869	H	1.84	12.8	13.8	60	0.74	3.82	7.76	3152	2641	5600
ST44176	176-1	H	9	2.18	7.4	36	0.16	3.6	3.52	3178	2650	5600
ST44177	177-1	H	0.16	15.6	16.7	95	0.67	7	12.2	3193	2667	5600
ST44177	177-2	H	0.48	10.3	11	88	4.97	5.21	5.88	3194	2667	5600
ST44069	069-1	H	6.53	8.24		3	0.97	9	8.4	3176	2647	5620
ST44150	DC026725	H	0.12	10.4	10.5	119	0.97	9.41	4.8	3154	2637	5640
ST44153	DC026820	H	4.49	13.8	18	59	0.15	5.82	2.54	3143	2634	5640
ST44038	DC024761	H	0.07	12.1	12.6	60	0.5	6.17	13.3	3231	2667	5660
ST44251	251-001	H	0.55	11.3	11.9	49	0.57	13.1	20.9	3041	2632	5660
ST44051	DC024978	H	0.15	10.8	10.6	80	1.16	2.33	2.87	3228	2681	5700
ST44055	055-1	H	7.35	4.55		63	0.64	2.23	11.1	3244	2700	5700
ST44083	DC025495	H	0.77	11.3	14.1	79	0.35	6.58	0.42	3154	2663	5700
ST44199	199-005	H	0.12	14.6	13.9	81	1.35	6.93	3.59	3096	2631	5720
ST44200	200-002	H	0.14	12.3	12.4	67	0.22	2.85	3.89	3112	2650	5720
ST44024	DC024415	H	0.23	11.5	11.5	68	0.36	1.54	0.84	3218	2688	5740
ST44187	DC026678	H	1.91	17.9	18.4	32	0.71	1.16	0.08	3136	2662	5740
ST44018	DC024228	H	0.81	14.3	14.8	213	1.34	2.24	0.6	3177	2672	5760
ST44034	DC024660	H	0.07	15.3	14.8	365	0.19	0.88	0.27	3261	2709	5760
ST44009	DC023825	H	0.11	10	10.2	4	4.41	1.59	3.64	3217	2699	5780
ST44012	DC024029	H	1.59	10.8	12	514	0.26	3.21	5.96	3232	2697	5800
ST44013	DC024039	H	0.04	14.3	13.5	249	0.72	9.18	5.55	3205	2700	5800
ST44113	DC025719	M	0.07	18.1	18.4	118	0.33	7.98	23.1	3166	2590	5520
ST44179	DC026375	M	0.25	16.5	16.6	284	1.21	11.7	10.8	3039	2537	5520
ST44134	DC025972	M	0.13	11.1	11.1	96	0.54	5.26	18.8	3168	2613	5540
ST44140	DC026604	M	12.2	9.78	16.2	36	1.54	2.35	3.39	3097	2565	5540
ST44100	DC025642	M	0.5	16.6	17.1	111	2.83	4.7	5.56	3112	2602	5560
ST44213	DC028506	M	0.14	11.2	11.8	40	0.86	4.23	3.78	3057	2559	5560
ST44214	214-014	M	4.8	17.6	24.2	89	2.99	22.5	14.2	3032	2558	5560
ST44123	DC025841	M	1.66	11.5	12.4	49	3.61	8.82	2.08	3171	2627	5580
ST44124	DC025814	M	3.5	13.5	15.8	40	5.45	12.4	9.59	3149	2591	5580
ST44125	DC025739	M	2.61	13.4	16.4	14	9.35	1.9	3.13	3206	2644	5580
ST44127	DC025754	M	0.35	17.4	17.7	93	0.21	3.66	0.82	3200	2622	5580
ST44130	DC025925	M	0.31	13.6	14.2	148	1.35	2.91	13.1	3136	2604	5580

ST44131	DC025966	M	0.2	15.8	10.1	109	0.38	2.51	0.09	3286	2680	5580
ST44217	217-004	M	1.66	12.8	14.5	62	0.44	15.4	9.16	3079	2588	5580
ST44218	218-009	M	1.64	10	10.6	37	1.52	6.27	8.43	3070	2582	5580
ST44222	222-002	M	0.07	13.8	14.5	91	6.94	8.73	7.86	3008	2566	5580
ST44171	DC026872	M	1.35	11.9	12.3	77	2.02	9.68	6.91	3165	2612	5600
ST44173	DC026304	M	0.04	10.1	10.1	51	1.12	3.22	5.89	3212	2645	5600
ST44173	DC026307	M	1.58	10.8	12.4	1046	12	47.9	36.6	3222	2642	5600
ST44177	177-3	M	10.5	8.6	15.7	77	5.07	29.9	24.7	3226	2660	5600
ST44177	177-4	M	1.01	14.3	13.2	9	0.06	0.26	0.13	3226	2659	5600
ST44068	DC025269	M	8.08	11.7	16.2	72	0.85	5.34	10.2	3199	2650	5620
ST44068	068-1	M	11.3	4.19		24	0.4	2.52	2.8	3200	2650	5620
ST44069	DC025296	M	0.1	13	13.3	98	6.37	3.74	10.6	3193	2632	5620
ST44070	DC025320	M	0.22	13.3	14.2	61	0.19	4.72	9.51	3171	2625	5620
ST44071	DC025335	M	0.34	16.9	17.5	38	0.2	8.24	27.2	3237	2653	5620
ST44073	DC025363	M	0.2	19.3	20	89	0.63	8.08	7.65	3267	2662	5620
ST44073	DC025358	M	0.59	13.4	14	88	5.7	6.37	5.1	3248	2665	5620
ST44073	DC025353	M	1.65	11.8	12.8	57	0.51	4.16	5.65	3236	2667	5620
ST44075	DC025378	M	6.6	15	17.9	253	13.5	8.89	10.2	3292	2683	5620
ST44077	DC025396	M	3.1	14.3	13.2	119	19.8	8.31	5.92	3277	2693	5620
ST44149	DC026811	M	0.2	18.3	18.9	97	0.47	14.2	28.8	3174	2637	5640
ST44150	DC026737	M	0.39	16.6	17.3	61	0.89	8.74	23	3159	2624	5640
ST44036	DC024712	M	0.17	18.6	18.5	88	0.52	4.86	12.1	3298	2696	5660
ST44036	DC024707	M	0.31	10.6	11.8	74	0.27	4.35	11.4	3289	2695	5660
ST44038	DC024772	M	0.31	10.2	11.1	148	16.5	7.04	2.56	3239	2656	5660
ST44039	DC024754	M	0.09	18.1	19.4	115	0.77	10.1	23.1	3227	2634	5660
ST44039	DC024747	M	1.31	17.1	18.1	73	0.33	6.47	2.28	3225	2641	5660
ST44039	DC024745	M	0.63	14.3	15.2	72	3.53	7.68	3.93	3225	2643	5660
ST44039	DC024734	M	9.3	2.4		28	1.42	3.87	6.06	3223	2654	5660
ST44079	DC025421	M	0.4	17.6	17.7	139	17.4	4.66	14.7	3168	2644	5660
ST44079	DC025427	M	4.2	9.51		89	0.59	3.17	6.86	3176	2634	5660
ST44080	DC025449	M	1.18	14.6	16.1	111	0.71	6.84	3.2	3156	2633	5660
ST44251	251-006	M	5.6	11.6	14.6	34	0.28	10	3.66	3057	2600	5660
ST44253	253-007	M	2.68	18.2	20.1	63	0.56	12.2	12.8	3028	2583	5660
ST44254	254-010	M	0.06	16.8	17.4	72	2.08	1.29	10.1	3007	2557	5660
ST44255	255-017	M	0.17	18.1	17.8	93	1.19	3.18	5.18	2993	2561	5660
ST44044	DC024889	M	0.17	17	17.3	139	0.34	5.49	1.89	3238	2657	5680
ST44044	DC024873	M	7.63	12.4	16.7	104	2.24	11.5	7.19	3225	2673	5680
ST44044	DC024891	M	0.34	11.9	12.3	59	2.48	13.1	2.69	3239	2656	5680
ST44044	044-1	M	7.9	8.3		394	0.65	9.8	4.44	3242	2651	5680
ST44045	DC024907	M	0.23	18.6	18.8	103	1.41	8.05	16.2	3215	2656	5680
ST44046	DC024858	M	0.22	11.2	12	46	1.93	19.6	7.3	3287	2704	5680
FR34237	fr237-1	M	1.14	19.2			2.3	3.58	3.13	3154	2639	5680
FR34237	fr237-2	M	0.87	14.8			0.3	1.51	0.37	3158	2627	5680
FR34236	fr236-1	M	0.49	14.7		43	0.01	0.13	0.03	3095	2632	5680
FR34236	fr236-2	M	7.9	12		84	0.34	1.38	5.66	3099	2614	5680

FR34236	fr236-3	M	0.06	12.6		48	0.28	2.83	11.7	3100	2607	5680
ST44050	DC024969	M	0.18	18.5	19.4	149	2.08	8.96	12.3	3250	2681	5700
ST44050	DC024972	M	0.83	15.2	16.8	149	12.5	10.5	18.7	3254	2680	5700
ST44051	051-1	M	15.6	0.74		11	0.12	5.44	2.12	3238	2674	5700
ST44052	DC024997	M	3.38	17.2	19.4	6	0.63	8.29	6.07	3226	2669	5700
ST44052	DC025007	M	1.1	13.8	14	66	0.47	1.07	0.69	3233	2661	5700
ST44053	DC025019	M	0.06	17.7	18.3	114	2.27	15.3	6.83	3218	2658	5700
ST44054	054-1	M	8.9	3.8		46	5.98	5.81	3.53	3278	2696	5700
ST44055	DC025087	M	0.77	18.1	18.9	114	14.7	12	15.6	3291	2709	5700
ST44083	DC025502	M	0.16	12.7	12.9	99	3.59	4.02	14.8	3166	2648	5700
ST44249	249-1	M	0.09	17.3	17.4	85	0.42	5.94	2.27	3116	2598	5700
ST44248	248-2	M	3.6	15.8	18	113	0.57	8.07	5.38	3080	2609	5700
ST44246	246-2	M	0.62	17	18.2	47	0.28	7.31	5.92	3056	2591	5700
ST44246	246-3	M	0.41	10.3	10.9	47	0.26	6.38	9.08	3057	2593	5700
ST44029	DC024515	M	15.7	6.64		167	2.35	10.2	3.85	3273	2686	5720
ST44031	031-1	M	11.6	2.2		16	0.16	0.54	0.65	3276	2700	5720
ST44057	DC025114	M	1.22	11.5	12	42	13.4	7.68	7.54	3233	2670	5720
ST44059	DC025148	M	1.61	14.8	15.5	143	1.12	8.45	20.3	3205	2668	5720
ST44199	199-024	M	0.59	17.3	18.2	117	2.18	7.01	4.16	3080	2595	5720
ST44199	199-017	M	0.9	11.2	10.7	167	15.1	5.06	6.15	3085	2605	5720
ST44200	200-012	M	3.8	18.1	20.6	198	1.3	9.36	7.36	3098	2595	5720
ST44201	DC027795	M	0.22	12.2	12.9	55	0.52	6.96	0.56	3116	2623	5720
ST44202	202-015	M	6.21	14.8	18.6	72	0.44	10.9	15.8	3169	2620	5720
ST44202	202-007	M	0.38	17.2	17.4	139	6.61	6.87	9.19	3162	2632	5720
ST44202	202-011	M	2.76	15.5	16.5	85	8.02	8.35	10.7	3168	2623	5720
ST44203	203-004	M	15.6	3.4	12	12	0.15	0.54	0.28	3142	2630	5720
ST44203	203-011	M	4.6	7.6	10.7	56	2.4	0.78	1.01	3144	2619	5720
ST44204	204-013	M	8.5	5.8	9.8	20	1.68	8.16	3.39	3131	2606	5720
ST44025	DC024449	M	2.7	11.6	13.3	54	1.59	3.86	2.39	3258	2674	5740
ST44026	DC024465	M	3.31	15.8	17.1	89	2.39	22.1	11.2	3270	2699	5740
ST44027	DC024477	M	10.4	15.4	21.2	99	0.33	7.1	6.07	3217	2670	5740
ST44066	DC025244	M	12.8	2.44		11	0.62	2.26	2.2	3203	2660	5740
ST44185	DC028119	M	1.1	18.2	21.2	166	3.42	9.48	14.1	3099	2604	5740
ST44187	DC026684	M	14.6	11	19.9	92	1.69	8.02	4.74	3156	2631	5740
ST44187	DC026683	M	5.9	12.8		64	0.47	9.26	4.96	3154	2634	5740
ST44020	020-1	M	17.2	2.82		50	0.78	19.3	7.24	3205	2655	5760
ST44028	DC024555	M	0.11	10.4	10.4	70	3.02	9.59	6.47	3240	2669	5760
ST44034	DC024665	M	0.45	17	16.8	90	1.08	3.54	1.85	3280	2711	5760
ST44009	DC023836	M	0.2	17	17.1	84	1.75	21.4	13.3	3249	2687	5780
ST44010	DC023877	M	0.18	17.4	16.6	113	3.03	7.84	13.7	3266	2697	5780
ST44011	DC024004	M	0.27	11.7	12	79	0.37	6.39	5.51	3222	2654	5780
ST44193	DC028545	M	0.03	13.9	14	129	0.71	15.2	24.6	3195	2630	5780
ST44012	DC024036	M	9.55	8.75		45	2.38	2.62	0.92	3252	2692	5800
ST44015	015-1	M	12.4	15.6		51	0.42	19.8	6.85	3254	2706	5800

2.3 Drill Hole Assays - Mineralization

ST44182	DC026404	F1	1.69	2.84	25	0.91	4.71	3.98	3105	2538	5520
ST44178	DC026368	F2	0.09	0.95	12	1.10	7.70	3.30	3131	2509	5520
ST44180	DC026386	F2	0.49	4.27	2	48.30	6.94	16.40	3042	2507	5520
ST44180	DC026384	F2	0.33	5.94	60	20.00	2.21	9.06	3055	2529	5520
ST44181	DC026396	F2	1.20	1.37	7	0.96	3.97	4.00	3074	2508	5520
ST44181	DC026393	F2	4.00	4.29	18	0.11	7.17	12.90	3075	2510	5520
ST44113	DC025714	M	0.13	2.38	17	0.19	3.76	5.55	3164	2596	5520
ST44178	DC026361	M	1.03	3.40	18	0.44	0.06	0.20	3133	2567	5520
ST44179	DC026376	M	0.19	4.30	26	0.38	2.01	1.16	3039	2537	5520
ST44113	DC025708	M	0.09	3.20	27	0.91	9.42	2.10	3163	2600	5520
ST44180	DC026381	M	0.95	2.47	29	0.79	6.00	4.27	3056	2531	5520
ST44138	DC026582	F1	1.00	1.36	17	0.51	2.95	1.19	3136	2555	5540
ST44140	DC026612	F1	0.93	2.02	49	0.40	0.87	1.16	3087	2533	5540
ST44140	DC026611	F1	0.08	4.50	21	0.32	4.24	3.27	3089	2540	5540
ST44145	DC026805	F2	1.36	0.18	3	0.49	0.97	2.08	3054	2515	5540
ST44135	DC025985	F2	2.89	1.87	24	1.65	12.90	9.58	3162	2524	5540
ST44139A	DC026596	F2	0.22	1.37	158	22.20	2.03	1.29	3112	2528	5540
ST44139A	DC026598	F2	0.22	2.16	46	18.90	2.64	0.86	3112	2521	5540
ST44140	DC026616	F2	0.26	5.08	112	3.43	1.90	0.38	3082	2519	5540
ST44140	DC026599	H	2.61	4.63	17	0.12	1.65	2.47	3114	2614	5540
ST44139A	DC026588	M	0.22	0.74	9	3.84	3.52	4.37	3118	2569	5540
ST44134	DC025970	M	0.82	6.50	34	0.51	1.82	2.57	3167	2614	5540
ST44136	DC025988	M	0.34	7.45	40	0.30	11.80	2.71	3180	2625	5540
ST44139A	DC026583	M	1.38	2.57	39	5.39	1.65	0.43	3119	2577	5540
ST44139A	DC026584	M	0.34	8.83	131	5.34	3.18	3.28	3119	2576	5540
ST44139A	DC026589	M	6.73	5.11	48	2.06	11.80	11.10	3118	2568	5540
ST44140	DC026606	M	0.39	1.53	12	8.03	4.61	2.47	3097	2564	5540
ST44140	DC026608	M	0.14	1.72	10	1.21	6.99	6.75	3096	2562	5540
ST44145	DC026802	M	2.80	0.44	8	0.89	1.37	0.42	3075	2557	5540
ST44087	DC025545	F1	0.10	7.10	47	0.38	4.05	8.63	3207	2610	5560
ST44086	DC025540	F1	6.50	5.90	48	0.45	2.82	7.13	3235	2620	5560
ST44087	DC025547	F1	0.14	7.30	26	0.98	1.58	0.59	3217	2602	5560
ST44087	DC025551	F1	1.42	5.90	60	1.19	2.59	1.96	3220	2599	5560
ST44090	DC025579	F1	0.26	8.30	48	1.79	3.99	9.61	3164	2588	5560
ST44099	DC025631	F1	0.33	0.60	6	5.42	9.11	9.68	3122	2576	5560
ST44212	DC027789	F1	0.38	5.05	48	4.10	7.07	8.44	3084	2561	5560
ST44212	DC027792	F1	0.92	4.10	40	3.04	1.53	4.63	3092	2544	5560
ST44213	DC028508	F1	0.21	9.80	70	0.46	1.12	4.49	3060	2546	5560
ST44213	DC028510	F1	4.10	2.40	21	0.09	4.74	0.36	3061	2539	5560
ST44213	DC028513	F1	0.50	5.45	81	1.76	2.17	3.64	3061	2539	5560
ST44087	087-1	F1	0.10	7.10					3207	2610	5560
ST44087	DC025573	F2	0.03	8.60	33	0.02	0.47	0.00	3235	2585	5560

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ST44096	DC025603	F2	0.30	3.65	40	0.77	4.59	4.52	3147	2549	5560
ST44096	DC025604	F2	0.26	0.77	26	2.76	7.12	2.15	3147	2540	5560
ST44099	DC025639	F2	0.04	6.60	107	1.86	3.42	4.55	3115	2532	5560
ST44100	DC025658	F2	0.03	0.22	25	3.45	26.40	4.14	3078	2535	5560
ST44213	DC028618	F2	3.15	1.61	55	13.20	3.16	0.34	3063	2530	5560
ST44093	DC025584	H	0.15	0.66	30	9.77	0.94	0.30	3203	2669	5560
ST44097	DC025609	H	0.29	3.70	64	1.03	1.07	1.87	3188	2654	5560
ST44086	DC025538	M	0.29	4.45	76	5.74	5.04	5.46	3200	2639	5560
ST44087	DC025543	M	1.07	3.40	27	1.61	0.39	0.36	3185	2631	5560
ST44089	DC025561	M	0.22	9.25	115	0.66	2.63	6.53	3177	2610	5560
ST44090	DC025575	M	0.71	7.50	86	0.71	4.94	10.70	3156	2613	5560
ST44093	DC025586	M	3.50	3.06	82	21.00	13.40	9.60	3243	2667	5560
ST44096	DC025588	M	0.07	9.70	78	1.12	5.36	7.04	3144	2607	5560
ST44096	DC025602	M	2.20	4.10	33	0.34	1.55	2.03	3146	2569	5560
ST44098	DC025623	M	1.52	4.35	58	4.08	2.34	4.73	3274	2682	5560
ST44099	DC025628	M	0.02	0.59	105	41.40	0.20	0.37	3125	2596	5560
ST44099	DC025629	M	0.03	3.37	65	47.90	0.92	1.43	3123	2585	5560
ST44100	DC025646	M	0.39	4.35	59	0.53	3.54	4.77	3100	2584	5560
ST44212	DC027788	M	1.75	4.20	58	8.21	8.85	0.27	3082	2567	5560
ST44215	DC028524	M	0.95	6.05	29	0.46	4.01	6.89	3018	2552	5560
ST44214	214-007	M	6.00	5.90	29				3033	2563	5560
ST44123	DC025856	F1	0.24	2.92	39	0.48	1.23	8.21	3210	2578	5580
ST44127	DC025871	F1	0.77	4.80	59	0.46	3.93	6.61	3224	2655	5580
ST44127	DC025878	F1	2.65	2.50	51	0.81	6.54	5.58	3239	2652	5580
ST44123	DC025852	F1	0.85	3.14	37	0.80	3.38	5.04	3196	2596	5580
ST44216	216-008	F1	0.29	3.75	47	0.71	2.44	4.40	3137	2552	5580
ST44216	216-007	F1	6.75	1.57	51	0.13	3.72	1.68	3134	2555	5580
ST44130	DC025937	F2	4.55	2.20	26	0.76	2.81	3.80	3139	2537	5580
ST44222	222-009	F2	0.01	3.00	26	10.00	3.13	0.61	2999	2498	5580
ST44132	DC025952	H	0.78	2.20	20	0.24	2.10	3.30	3267	2699	5580
ST44218	218-001	H	0.40	3.85	144	0.57	0.33	0.93	3055	2610	5580
ST44123	DC025826	H	3.00	7.20	66	0.60	0.74	0.23	3151	2653	5580
ST44219	219-001	H	0.07	6.70	1,370	0.89	0.02	0.13	3038	2630	5580
ST44123	DC025850	M	0.05	6.10	43	0.17	1.54	0.22	3189	2605	5580
ST44123	DC025847	M	0.16	4.10	43	0.51	10.10	1.14	3184	2611	5580
ST44123	DC025844	M	0.11	5.30	35	0.67	10.40	0.76	3182	2614	5580
ST44124	DC025805	M	8.40	2.51	41	2.79	3.99	3.65	3146	2610	5580
ST44124	DC025813	M	0.21	0.52	10	5.80	3.74	5.58	3149	2592	5580
ST44125	DC025737	M	0.03	5.25	44	1.79	3.82	1.59	3187	2652	5580
ST44125	DC025738	M	0.09	0.49	22	13.70	0.94	0.90	3205	2644	5580
ST44127	DC025751	M	0.34	3.45	53	0.66	15.20	9.25	3184	2635	5580
ST44127	DC025757	M	0.09	5.70	33	0.15	2.95	3.95	3209	2615	5580
ST44129	DC025904	M	0.39	3.80	23	2.32	5.66	3.88	3165	2607	5580
ST44130	DC025932	M	1.92	2.32	11	0.18	1.97	1.34	3136	2587	5580
ST44220	220-003	M	0.69	5.65	145	20.00	4.86	4.37	3040	2572	5580

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ST44221	221-002	M	0.16	6.00	37	11.30	2.10	0.20	3029	2571	5580
ST44222	222-005	M	0.49	9.40	126	0.49	13.80	5.18	3008	2562	5580
ST44171	DC026875	F1	0.13	5.75	89	5.41	3.28	3.76	3175	2591	5600
ST44171	171-1	F1	0.07	3.30	87	6.25	1.91	2.99	3176	2590	5600
ST44171	171-2	F1	0.60	4.40	38	1.53	5.63	4.81	3166	2612	5600
ST44173	173-1	H	1.98	2.30	25	1.61	1.02	2.76	3190	2655	5600
ST44176	176-1	H	0.36	9.80	78	0.53	4.42	6.17	3177	2651	5600
ST44170	DC026865	M	2.13	6.10	42	3.00	3.51	4.94	3134	2617	5600
ST44172	DC026886	M	0.29	8.60	58	0.53	2.60	3.67	3178	2637	5600
ST44173	173-2	M	0.79	1.05	28	6.57	8.20	6.54	3221	2642	5600
ST44173	173-3	M	5.85	0.70	73	12.70	2.84	2.72	3223	2641	5600
ST44174	174-1	M	0.39	7.15	102	14.70	3.24	8.82	3146	2621	5600
ST44176	176-2	M	0.38	0.80	12	0.56	15.50	1.10	3208	2632	5600
ST44069	069-2	F	1.19	8.84	66	4.75	3.61	8.49	3205	2623	5620
ST44071	071-3	F	1.35	8.36	74	0.77	9.47	3.72	3271	2643	5620
ST44072	072-1	F	0.44	2.05	113	0.89	5.28	4.62	3155	2695	5620
ST44076	DC025390	F	0.41	8.24	23	3.55	3.10	1.91	3111	2574	5620
ST44072	072-2	H	2.87	2.61	21	0.62	0.20	0.12	3145	2646	5620
ST44069	069-1	M	1.73	6.53	26	0.94	2.02	1.97	3197	2629	5620
ST44070	070-1	M	2.57	3.24	23	0.32	2.26	1.62	3173	2621	5620
ST44073	073-4	M	0.18	8.52	4	0.30	0.86	0.74	3250	2665	5620
ST44167	167-1	F	0.25	1.75	60	3.29	3.84	0.89	3205	2629	5640
ST44104	104-1	M	3.50	0.87	21	4.34	12.30	7.59	3283	2679	5640
ST44150	150-1	M	1.29	1.69	12	0.37	1.56	1.95	3159	2624	5640
ST44150	150-2	M	0.43	3.70	24	1.43	3.06	2.22	3160	2623	5640
ST44154	154-1	M	0.25	4.48	33	0.92	3.14	9.48	3128	2606	5640
ST44155	155-1	M	1.20	3.82	59	8.72	3.64	9.18	3108	2607	5640
ST44156	156-1	M	1.05	5.38	94	25.50	5.64	10.80	3083	2593	5640
ST44156	156-2	M	0.12	0.62	11	1.43	10.10	5.78	3086	2599	5640
ST44254	254-014	F	0.01	2.28	88	0.90	25.40	8.09	3003	2539	5660
ST44250	250-001	H	2.90	3.45	14	0.16	2.25	4.71	3040	2642	5660
ST44253	253-001	H	0.17	1.70	305	10.60	0.42	0.17	3028	2622	5660
ST44254	254-001	H	0.13	9.70	27	0.75	5.00	0.13	3019	2615	5660
ST44036	036-1	M	0.55	0.35	10	0.60	9.66	6.88	3290	2696	5660
ST44036	036-2	M	1.70	6.31	74	0.27	2.70	1.00	3280	2695	5660
ST44038	038-1	M	0.41	0.84	23	15.40	2.65	2.34	3232	2664	5660
ST44038	038-2	M	3.45	3.25	43	8.62	3.36	2.70	3235	2660	5660
ST44038	038-3	M	0.25	6.89	23	0.50	3.01	1.75	3242	2651	5660
ST44038	038-4	M	0.40	3.62	68	0.33	5.86	4.59	3247	2645	5660
ST44039	039-1	M	0.18	4.20	33	0.55	1.89	0.32	3226	2638	5660
ST44039	039-2	M		2.40	28	1.42	3.87	6.06	3223	2654	5660
ST44080	080-1	M	0.57	4.60	14	0.15	3.87	4.18	3152	2641	5660
ST44080	DC025443	M	0.65	8.19	13	0.26	1.52	1.16	3153	2641	5660
ST44080	DC025456	M	0.38	5.17	62	0.61	6.36	3.65	3160	2622	5660
ST44252	252-005	M	2.25	3.75	26	0.50	5.99	2.17	3045	2590	5660

ST44253	253-013	M	0.72	6.30	181	5.02	70.20	22.00	3028	2563	5660
ST44253	253-011	M	0.18	1.71	34	2.05	12.90	4.01	3028	2565	5660
ST44255	255-008	M	0.79	4.30	38	3.54	40.20	4.57	2997	2572	5660
ST44255	255-005	M	3.80	6.40	122	10.50	2.62	15.90	2999	2577	5660
ST44255	255-010	M	0.04	9.80	57	0.37	0.86	7.33	2995	2567	5660
ST44255	255-003	M	0.19	1.83	84	3.29	19.30	6.57	3000	2581	5660
ST44046	046-1	H	1.65	7.84	157	0.47	2.43	1.61	3240	2689	5680
FR34223	34223-1	M	6.25	0.88	24	0.79	2.63	0.77	3047	2694	5680
FR34223	34223-2	M	0.12	0.50	29	12.70	8.34	3.00	3048	2684	5680
FR34223	34223-3	M	0.11	7.20	33	0.24	1.86	4.90	3048	2681	5680
ST44042	042-1	M	0.19	1.85	40	0.49	28.90	45.30	3276	2686	5680
ST44042	042-2	M	0.69	4.58	42	26.20	13.10	10.80	3277	2686	5680
ST44042	042-3	M	2.93	1.34	7	1.67	1.92	1.77	3279	2686	5680
ST44043	043-1	M	0.34	1.10	19	6.82	9.16	4.69	3251	2675	5680
ST44043	043-2	M	7.34	0.82	15	2.50	7.07	4.47	3256	2673	5680
ST44044	044-1	M	5.00	3.10	29	2.62	1.89	0.60	3229	2668	5680
ST44044	044-2	M	0.43	0.50	44	1.42	13.30	2.33	3230	2667	5680
ST44044	044-3	M	5.10	1.49	16	0.31	2.23	0.73	3233	2663	5680
ST44045	045-1	M	0.41	1.29	21	1.31	8.61	1.13	3214	2659	5680
ST44045	045-2	M	2.00	8.14	30	0.85	6.66	2.71	3215	2644	5680
ST44045	045-3	M	4.80	0.96	8	0.06	0.70	0.31	3215	2646	5680
ST44046	046-2	M	0.46	8.40	59	4.19	5.30	10.00	3293	2706	5680
ST44046	046-3	M	3.76	1.07	8	0.28	2.18	0.91	3295	2706	5680
ST44046	046-4	M	1.71	2.79	41	2.33	3.43	3.90	3304	2707	5680
ST44048	048-1	M	0.21	7.30	44	1.73	4.44	2.97	3204	2652	5680
ST44048	048-2	M	3.05	3.80	60	8.56	3.51	2.42	3202	2641	5680
ST44048	048-3	M	1.46	2.47	28	1.45	1.31	1.39	3201	2638	5680
ST44048	048-4	M	5.85	3.05	27	0.55	3.53	4.61	3199	2629	5680
FR34237	fr237-1	M	0.53	5.40		3.98	1.53	0.24	3152	2644	5680
ST44205	205-1	F	0.78	3.35	84	0.11	0.89	1.86	3230	2641	5700
ST44246	246-1	F	0.14	2.94	46	1.27	14.80	3.56	3062	2563	5700
ST44249	249-3	F	0.04	1.02	66	1.23	17.50	5.69	3133	2588	5700
ST44031	031-1	H	0.15	4.73	44	0.53	3.11	1.84	3254	2699	5700
ST44056	DC025094	H	0.24	5.20	19	1.45	3.78	4.93	3254	2712	5700
ST44056	DC025096	H	1.33	5.35	6	0.52	7.64	8.59	3255	2712	5700
ST44083	DC025498	H	0.07	9.50	103	1.14	5.06	8.14	3158	2658	5700
ST44247	247-2	H	2.44	3.06	13	0.09	1.27	0.22	3055	2626	5700
ST44248	248-1	H	1.60	7.10	90	0.78	5.32	6.36	3059	2631	5700
ST44049	049-1	M	0.04	0.20	60	16.30	0.46	0.18	3272	2689	5700
ST44049	049-2	M	0.26	0.32	103	30.00	0.43	0.45	3270	2689	5700
ST44049	049-3	M	5.65	2.80	129	68.40	5.67	5.03	3269	2689	5700
ST44050	050-1	M	0.38	3.50	31	3.64	6.50	5.58	3256	2679	5700
ST44050	050-2	M	0.59	4.60	54	12.80	7.61	6.60	3254	2679	5700
ST44051	051-1	M	0.73	1.79	100	2.98	17.50	6.16	3240	2673	5700
ST44052	052-1	M	4.62	1.85	19	1.42	4.69	3.99	3229	2665	5700

ST44052	052-2	M	1.10	3.16	25	0.94	2.73	3.91	3233	2660	5700
ST44052	052-3	M	2.36	1.93	22	3.45	1.17	1.32	3235	2658	5700
ST44052	052-4	M	0.25	3.20	31	5.07	15.70	2.54	3229	2665	5700
ST44053	DC025022	M	0.19	3.90	20	1.76	2.80	3.38	3219	2655	5700
ST44054	DC025051	M	0.92	5.15	46	1.69	4.75	1.45	3272	2696	5700
ST44054	DC025054	M	8.90	3.80	46	5.98	5.81	3.53	3278	2697	5700
ST44055	055-1	M	0.24	5.70	66	3.01	1.56	0.57	3273	2705	5700
ST44055	055-2	M	0.13	6.00	40	1.64	7.45	1.43	3269	2704	5700
ST44055	055-3	M	0.17	3.60	19	1.80	9.25	3.22	3265	2703	5700
ST44082	DC025479	M	0.33	5.92	40	0.40	3.07	4.69	3174	2650	5700
ST44085	DC025529	M	0.06	7.25	55	2.08	4.06	4.36	3134	2622	5700
ST44205	205-2	M	3.00	1.62	12	0.47	1.91	1.80	3212	2651	5700
ST44205	205-3	M	3.45	2.58	20	1.30	2.34	4.67	3202	2656	5700
ST44246	246-2	M	0.22	9.30	48	0.37	3.99	0.79	3059	2576	5700
ST44246	246-3	M	0.43	5.80	63	1.12	15.60	0.96	3059	2578	5700
ST44246	246-4	M	1.20	7.00	56	2.40	6.87	3.47	3056	2582	5700
ST44247	247-1	M	4.25	0.87	20	0.57	2.67	1.48	3076	2588	5700
ST44249	249-1	M	1.20	2.65	27	3.94	2.57	1.42	3102	2609	5700
ST44249	249-2	M	0.13	1.43	137	1.59	0.11	17.10	3088	2617	5700
ST44058	058-1	F1	0.38	3.45	27	0.77	3.55	6.47	3227	2645	5720
ST44199	199-032	F1	0.24	6.90	55	0.38	3.98	7.65	3068	2563	5720
ST44199	199-1	F1	1.48	2.49	15	1.26	1.52	2.36	3068	2564	5720
ST44201	DC028505	F1	0.93	3.00	73	1.71	8.57	8.34	3110	2574	5720
ST44199	199-037	F2	0.10	1.79	26	9.01	47.40	25.90	3058	2539	5720
ST44029	029-1	H	0.36	5.10	50	1.94	1.20	4.85	3231	2691	5720
ST44201	DC027794	H	0.16	6.00	44	0.88	71.00	7.28	3119	2647	5720
ST44029	029-2	M	0.26	0.71	13	4.27	8.27	4.01	3279	2685	5720
ST44031	DC024582	M	1.86	7.89	15	0.32	3.07	3.23	3309	2701	5720
ST44057	DC025112	M	0.38	8.10	47	5.32	2.99	4.33	3231	2671	5720
ST44058	DC025127	M	4.80	6.30	35	0.86	2.91	4.55	3217	2666	5720
ST44199	199-015	M	0.08	1.57	225	73.50	0.69	1.29	3087	2611	5720
ST44199	199-014	M	0.07	8.21	18	0.14	1.23	1.01	3087	2612	5720
ST44199	199-2	M	1.73	1.87	47	2.26	3.42	2.33	3081	2595	5720
ST44203	203-012	M	5.60	4.30	41	6.71	4.73	5.75	3144	2619	5720
ST44204	204-012	M	0.42	7.70	20	0.29	4.47	4.39	3131	2608	5720
ST44204	204-002	M	0.63	5.40	10	0.11	0.76	0.64	3130	2633	5720
ST44204	204-004	M	2.88	8.00	90	4.64	4.10	4.09	3130	2628	5720
ST44204	204-005	M	0.48	9.10	39	0.36	2.44	6.10	3130	2628	5720
ST44186	186-1	F	1.80	4.90	100	1.23	4.08	0.44	3211	2604	5740
ST44186	186-2	F	1.00	1.81	84	0.38	2.73	0.47	3202	2611	5740
ST44188	188-2	F	0.05	0.54	104	1.35	12.40	3.77	3162	2571	5740
ST44022	022-1	F1	1.14	1.29	58	0.60	3.48	0.46	3295	2681	5740
ST44023	DC024396	F1	1.80	9.30	99	0.63	0.90	0.84	3253	2656	5740
ST44023	023-1	F1	9.45	1.33	23	0.70	5.14	5.65	3256	2652	5740
ST44027	027-2	F1	1.97	1.14	46.6	3.10	22.60	1.92	3226	2631	5740

ST44188	DC026412	F1	0.18	2.10	177	6.54	50.00	17.60	3161	2572	5740
ST44023	023-2	F2	0.10	1.38	89	2.02	21.60	8.68	3263	2644	5740
ST44027	027-1	F2	0.07	4.30	69.1	0.73	3.37	3.09	3230	2610	5740
ST44186	DC026671	F2	0.07	9.05	59	0.27	1.53	1.08	3223	2595	5740
ST44186	DC026669	F2	0.20	2.12	119	3.46	28.40	8.03	3220	2597	5740
ST44188	188-1	F2	0.15	0.90	101	3.65	18.90	7.52	3169	2653	5740
ST44190	DC027708	F2	0.03	0.29	8	3.41	13.10	5.53	3114	2531	5740
ST44190	DC027723	F2	0.13	1.82	110	9.31	31.60	24.50	3114	2508	5740
ST44023	DC024381	H	0.29	7.25	88	0.94	1.84	4.94	3221	2691	5740
ST44026	026-1	H	1.00	3.40	34	0.21	1.29	1.89	3230	2700	5740
ST44027	DC024474	H	1.05	5.13	42	1.26	2.19	6.71	3214	2684	5740
ST44186	DC026648	H	0.01	9.95	608	0.71	0.08	0.05	3145	2666	5740
ST44186	186-4	H	0.01	1.06	1628	8.31	0.12	0.03	3144	2666	5740
ST44188	DC026692	H	0.09	2.40	2025	26.30	1.25	1.04	3127	2662	5740
ST44023	DC024388	M	1.06	5.10	60	0.36	2.29	1.62	3235	2675	5740
ST44023	023-3	M	0.08	1.30	20	3.37	4.76	9.59	3242	2668	5740
ST44023	023-4	M	0.90	2.94	96	0.86	6.27	4.87	3236	2674	5740
ST44024	024-1	M	2.67	1.76	4	1.97	1.69	1.24	3224	2673	5740
ST44024	DC024424	M	0.46	7.00	21	0.36	2.90	5.79	3226	2670	5740
ST44026	DC024461	M	2.00	6.31	20	2.05	8.31	5.23	3266	2699	5740
ST44026	DC024463	M	2.78	6.71	51	4.12	7.39	4.14	3268	2699	5740
ST44065	DC025229	M	0.88	0.78	31	5.99	8.18	5.07	3279	2713	5740
ST44065	DC025232	M	1.34	9.69	78	11.80	2.41	3.23	3282	2714	5740
ST44066	066-1	M	0.86	0.40	13	8.79	19.00	10.50	3202	2659	5740
ST44067	DC025253	M	4.87	7.42	227	1.02	2.37	2.59	3278	2725	5740
ST44067	DC025257	M	2.47	3.78	20	1.35	4.66	2.39	3294	2730	5740
ST44067	DC025261	M	1.50	4.49	35	2.14	3.72	4.09	3299	2732	5740
ST44186	186-3	M	0.34	5.30	48	0.44	4.61	6.46	3189	2623	5740
ST44187	187-1	M	2.01	0.73	10	2.02	3.33	1.79	3161	2622	5740
ST44188	188-3	M	0.67	0.58	288	23.20	1.01	1.49	3146	2615	5740
ST44188	188-4	M	0.04	0.36	247	16.10	0.31	0.26	3139	2629	5740
ST44188	188-5	M	0.03	0.44	591	20.70	0.51	0.41	3138	2632	5740
ST44189	DC026651	M	4.95	0.75	30	5.53	16.90	4.12	3129	2614	5740
ST44190	DC026438	M	3.90	4.35	29	0.90	3.03	3.05	3114	2623	5740
ST44190	DC026434	M	1.70	7.30	27	2.97	2.73	1.03	3114	2626	5740
ST44018	018-1	F	0.10	0.76	91	1.78	9.82	3.51	3217	2694	5760
ST44018	018-2	F	0.13	1.62	271	1.23	18.00	9.09	3215	2600	5760
ST44018	018-3	F	0.11	2.03	145	6.04	11.50	2.90	3213	2602	5760
ST44018	018-4	F	0.33	3.59	120	0.74	35.30	4.79	3210	2610	5760
ST44019	019-1	F	2.81	3.47	44	0.51	1.45	3.86	3194	2594	5760
ST44019	019-2	F	6.87	5.27	70	12.40	13.80	2.56	3192	2598	5760
ST44019	019-3	F	2.10	1.63	20	0.45	3.49	1.48	3192	2599	5760
ST44019	019-4	F	2.90	0.40	2	0.03	0.17	0.06	3190	2608	5760
ST44021	021-1	F	0.02	0.30	18	0.49	30.40	7.20	3254	2639	5760
ST44032	032-1	F	1.46	1.40	24	0.68	8.80	4.14	3280	2671	5760

ST44033	033-1	F	0.31	0.58	10	45.30	1.05	0.35	3292	2696	5760
ST44196	DC027761	F	0.20	5.60	42	2.62	3.09	5.69	3176	2601	5760
ST44196	DC027764	F	0.09	7.20	69	7.63	6.81	13.20	3177	2598	5760
ST44196	196-1	F	1.53	2.27	13	0.40	2.11	1.48	3177	2596	5760
ST44197	DC027813	F	0.17	3.40	201	4.99	15.80	5.84	3153	2586	5760
ST44198	198-1	F	1.02	5.50	1	2.40	14.60	10.60	3135	2583	5760
ST44018	018-5	H	1.47	5.29	15	0.10	0.99	0.23	3173	2680	5760
ST44019	019-6	H	0.43	7.30	66	1.20	6.12	3.91	3175	2656	5760
ST44019	019-7	H	0.02	4.86	420	1.18	0.19	0.09	3165	2686	5760
ST44020	020-2	H	1.27	4.40	25	0.32	0.84	0.27	3191	2670	5760
ST44021	021-2	H	0.17	8.80	51	3.60	0.83	0.35	3200	2675	5760
ST44032	032-4	H	0.19	2.16	780	9.22	3.20	0.66	3219	2693	5760
ST44032	032-5	H		8.95	100	11.00	1.77	0.20	3219	2694	5760
ST44032	032-6	H	0.09	1.00	1340	0.24	0.13	0.61	3218	2694	5760
ST44033	033-4	H	0.30	3.01	608	2.67	0.55	0.40	3224	2700	5760
ST44019	019-5	M	0.26	7.36	38	0.50	0.53	1.86	3178	2647	5760
ST44020	020-1	M	8.50	1.74	33	34.70	1.52	4.85	3217	2642	5760
ST44028	028-1	M	1.51	1.64	33	4.96	3.22	1.96	3249	2664	5760
ST44028	028-2	M	2.49	1.74	26	0.58	6.92	6.80	3245	2667	5760
ST44028	028-3	M	0.31	2.26	41	8.60	2.64	2.51	3241	2669	5760
ST44032	032-2	M	0.54	7.44	57	0.65	5.20	3.92	3261	2678	5760
ST44032	032-3	M	0.10	9.58	83	0.50	3.81	3.29	3258	2679	5760
ST44033	033-2	M	0.22	4.83	158	55.40	4.77	4.57	3278	2697	5760
ST44033	033-3	M	2.00	4.80	11	0.16	0.12	0.21	3270	2698	5760
ST44034	034-1	M	0.49	2.32	24	3.44	2.73	1.26	3283	2711	5760
ST44007	DC023695	F	1.35	2.46	96	0.54	6.04	1.24	3251	2650	5780
ST44010	DC023884	F	0.16	2.58	115	2.25	3.23	9.73	3288	2695	5780
ST44142	DC026507	F	0.06	0.44	25	1.34	13.00	4.83	3333	2682	5780
ST44142	DC026506	F	0.08	1.74	84	1.26	44.40	17.70	3333	2682	5780
ST44142	DC025994	F	0.19	3.80	62	1.28	1.06	4.54	3297	2682	5780
ST44142	DC025995	F	0.09	1.64	71	5.27	3.04	2.38	3298	2682	5780
ST44142	DC025997	F	0.12	2.09	109	3.88	24.40	6.08	3299	2682	5780
ST44142	DC026503	F	0.05	0.23	20	1.78	11.10	3.09	3330	2682	5780
ST44143	DC026009	F	0.10	1.40	25	1.06	7.25	4.58	3290	2682	5780
ST44144	DC026513	F	0.04	1.62		0.80	8.34	1.77	3299	2680	5780
ST44144	DC026515	F	0.06	1.10	8	0.69	12.30	4.22	3322	2675	5780
ST44144	DC026517	F	0.06	0.63	6	1.35	23.30	4.26	3322	2675	5780
ST44144	DC026518	F	0.03	0.26	6	1.07	10.90	2.40	3323	2675	5780
ST44144	DC026519	F	0.28	1.12	58	2.23	36.60	7.44	3323	2675	5780
ST44146	DC026522	F	0.88	8.33	60	0.65	5.15	11.66	3283	2686	5780
ST44147	DC026524	F	0.35	4.30	30	0.59	6.50	4.29	3282	2684	5780
ST44147	DC026526	F	0.53	2.09	108	0.65	11.10	4.10	3281	2685	5780
ST44147	DC026528	F	2.06	1.94	24	0.90	4.59	0.77	3277	2686	5780
ST44151	DC026829	F	0.11	1.57	24	0.50	4.95	6.60	3290	2683	5780
ST44192	DC028537	F	0.08	3.90	218	1.23	6.44	2.88	3231	2617	5780

ST44011	DC024021	F1	0.06	1.79	98	1.54	12.20	5.15	3232	2634	5780
ST44011	DC024022	F1	0.05	0.73	15	1.36	12.20	4.63	3233	2633	5780
ST44192	DC028541	F2	0.13	1.04	55	3.11	19.30	8.69	3256	2586	5780
ST44192	DC028542	H	0.10	5.45	100	0.06	0.91	4.30	3179	2674	5780
ST44192	DC028529	H	0.54	6.45	56	0.79	1.14	0.94	3189	2672	5780
ST44194	DC028547	H	0.45	9.56	698	42.50	21.40	25.20	3173	2653	5780
ST44007	DC023690	M	1.41	1.09	5	0.34	0.15	0.04	3248	2654	5780
ST44011	DC024007	M	1.44	0.77	7	0.19	1.23	0.92	3224	2651	5780
ST44008	DC023808	M	0.17	0.71	53	2.73	10.10	3.46	3241	2678	5780
ST44009	DC023833	M	0.25	4.29	34	7.67	5.00	5.96	3247	2688	5780
ST44009	DC023834	M	1.82	0.57	53	1.07	22.60	3.15	3248	2688	5780
ST44009	DC023835	M	0.23	0.68	48	3.13	56.40	7.70	3249	2688	5780
ST44010	DC023881	M	7.07	4.12	35	0.07	6.68	7.16	3270	2698	5780
ST44192	DC028535	M	1.21	2.13	21	1.31	5.03	1.88	3222	2629	5780
ST44192	DC028536	M	0.91	5.15	53	4.66	32.60	23.00	3222	2628	5780
ST44192	DC028533	M	0.15	1.06	202	80.60	2.41	6.37	3207	2648	5780
ST44194	DC028548	M	0.14	5.40	57	8.46	4.94	4.53	3177	2608	5780
ST44194	DC028557	M	2.66	6.80	175	9.09	24.40	12.90	3177	2604	5780
ST44195	DC028559	M	0.63	5.10	39	5.13	8.35	8.16	3159	2601	5780
ST44014	DC024113	F1	2.25	2.50	61	0.80	4.20	7.01	3253	2649	5800
ST44014	DC024114	F1	0.29	2.20	50	1.43	7.55	5.24	3263	2640	5800
ST44016	DC024154	F1	4.70	0.71	14	0.98	1.06	0.60	3233	2638	5800
ST44017	DC024200	F1	0.95	1.78	21	2.88	6.44	1.34	3213	2622	5800
ST44191	DC027751	F1	0.09	2.18	56	3.94	3.02	1.22	3198	2620	5800
ST44191	DC027752	F1	0.32	0.79	55	1.34	4.58	4.54	3199	2611	5800
ST44191	DC027753	F1	0.68	1.47	101	1.37	3.68	0.77	3200	2606	5800
ST44016	DC024182	F2	0.11	1.51	20	2.53	8.64	5.20	3259	2598	5800
ST44016	DC024184	F2	0.04	0.71	40	1.14	10.50	5.80	3261	2596	5800
ST44017	DC024204	F2	0.12	0.52	42	1.71	10.90	4.59	3223	2578	5800
ST44017	DC024207	F2	0.09	1.95	11	0.56	11.20	4.58	3225	2572	5800
ST44017	DC024208	F2	0.08	0.72	41	0.20	34.80	12.10	3225	2571	5800
ST44012	DC024024	H	0.15	2.89	77	0.29	3.86	0.87	3214	2702	5800
ST44013	DC024043	H	0.17	6.80	64	0.21	2.19	0.47	3209	2698	5800
ST44013	DC024048	H	0.49	0.78	91	39.60	0.54	0.34	3221	2692	5800
ST44015	DC024122	H	0.31	9.65	116	0.45	0.56	0.17	3222	2707	5800
ST44015	DC024125	H	0.18	6.60	38	0.08	1.70	0.30	3227	2707	5800
ST44016	DC024138	H	0.95	5.55	114	8.54	2.37	6.90	3202	2689	5800
ST44017	DC024188	H	0.08	3.60	34	1.40	1.91	2.58	3197	2683	5800
ST44013	DC024066	M	2.45	4.75	38	0.12	3.13	5.28	3245	2679	5800
ST44013	DC024070	M	8.40	5.40	99	17.70	3.97	5.49	3247	2677	5800
ST44013	DC024076	M	0.48	2.57	40	0.48	2.19	1.93	3254	2674	5800
ST44013	DC024078	M	0.91	5.30	27	0.93	5.68	9.60	3254	2673	5800
ST44013	DC024080	M	0.38	5.30	31	1.82	3.86	2.39	3256	2673	5800
ST44013	DC024082	M	0.54	2.55	64	2.95	4.75	1.62	3258	2671	5800

ST44013	DC024084	M	1.18	2.54	41	1.09	4.38	1.24	3260	2670	5800
ST44014	DC024099	M	0.41	9.40	58	0.73	3.23	8.84	3241	2660	5800
ST44014	DC024102	M	0.08	6.40	41	0.42	5.82	5.47	3243	2659	5800
ST44014	DC024104	M	0.70	7.60	74	1.09	4.16	6.03	3244	2658	5800
ST44014	DC024106	M	0.81	1.01	32	12.00	1.18	1.22	3245	2657	5800
ST44016	DC024153	M	1.52	0.16	5	0.47	1.11	0.37	3228	2647	5800
ST44017	DC024195	M	2.72	5.70	47	10.90	6.00	5.80	3208	2638	5800
ST44191	DC027742	M	0.06	0.84	18	5.32	8.80	10.60	3197	2631	5800

3.0 Trace Element Data

3.1 Trace Element Data:Face Traverse

Zone 39 - Trace Element Data Face Traverse

Sample	*Dist to Vein (cm)*	*Pd ppb*	*Pt ppb*	*Cl ppm*	*%S*	*F ppm*	*Bi ppm*	*Te ppm*	*Sn ppm*	*As ppm*	*Se ppm*	*%Cu*	*%Ni*
MD21802	0-10	0.5	5	625	0.20	813	4.10	0.70	1	1.0	1.50	0.07	0.24
MD21803	10-20	0.5	5	454	0.08	749	0.50	0.30	1	1.0	0.05	0.04	0.01
MD21804	20-30	0.5	5	454	0.15	704	0.10	0.20	1	0.4	0.20	0.02	0.01
MD21805	30-40	0.5	5	439	0.12	693	0.20	0.05	1	0.7	0.20	0.03	0.01
MD21806	40-50	0.5	5	451	0.16	1140	0.70	0.20	1	1.0	0.20	0.02	0.01
MD21807	50-60	0.5	5	420	0.15	673	0.50	0.20	1	1.8	0.20	0.07	0.01
MD21808	60-70	0.5	5	455	0.16	699	0.30	0.20	1	0.4	0.20	0.04	0.01
MD21809	70-80	0.5	5	488	0.11	748	0.30	0.05	1	0.7	0.10	0.02	0.01
MD21810	80-90	0.5	5	483	0.12	719	0.50	0.10	1	1.0	0.20	0.02	0.01
MD21811	90-100	0.5	5	414	0.16	615	0.70	0.10	1	0.6	0.20	0.09	0.01
MD21812	100-110	0.5	5	476	0.12	624	1.10	0.10	1	0.4	0.30	0.04	0.01
MD21813	110-120	0.5	5	441	0.11	693	1.20	0.10	1	1.2	0.20	0.04	0.01
MD21814	120-130	0.5	5	559	0.10	611	1.20	0.10	1	1.0	0.30	0.07	0.01
MD21815	130-140	0.5	5	560	0.20	559	1.60	0.20	1	0.3	0.20	0.2	0.01
MD21816	140-150	0.5	5	636	0.05	464	0.70	0.20	1	0.8	0.05	0.06	0.01

3.2 Trace Element Data - Drill hole Traverse

Zone 39 - Trace Element Data

Drill hole Traverse													
	Distance Down Hole (m)	***Pd***	***Pt***	***Cl***	***%S***	***F***	***Bi***	***Te***	***Sn***	***As***	***Se***	***%Cu***	***%Ni***
		ppb	***ppb***	***ppm***		***ppm***	***ppm***	***ppm***	***ppm***	***ppm***	***ppm***		
MD21834	50.8	1	5	612	0.1	412	0.1	0.05	1	0.7	0.1	0.01	0.01
MD21835	53.8	1	5	544	0.1	445	0.2	0.05	1	0.7	0.1	0.01	0.01
MD21836	56.8	2	5	699	0.1	477	0.2	0.05	1	0.3	0.1	0.01	0.01
MD21837	59.8	8	5	620	0.1	705	0.2	0.05	1	0.3	0.1	0.01	0.01
MD21838	62.8	12	5	683	0.1	599	0.2	0.05	1	0.7	0.1	0.01	0.01
MD21839	65.8	0.5	5	611	0.1	960	0.05	0.05	1	0.5	0.1	0.01	0.01
MD21840	68.9	0.5	5	615	0.1	537	0.3	0.05	1	0.7	0.1	0.01	0.01
MD21841	69.1	0.5	5	653	0.1	445	0.1	0.05	1	0.6	0.1	0.01	0.01
MD21842	69.3	0.5	5	741	0.1	411	0.2	0.05	1	0.4	0.1	0.01	0.01
MD21843	69.5	0.5	5	581	0.1	505	0.1	0.05	1	0.6	0.1	0.02	0.01
MD21844	69.7	0.5	5	539	0.1	536	0.2	0.05	1	3.5	0.1	0.01	0.01
	MASS												
MD21845	72	13	166	731	0.1	586	2.7	0.4	1	0.3	0.2	0.02	0.01
MD21846	82	0.5	5	552	0.1	1170	0.1	0.05	1	0.5	0.1	0.04	0.01
MD21847	92	0.5	5	640	0.2	420	0.1	0.05	1	0.9	0.1	0.01	0.01
MD21827	102	0.5	5	586	0.1	716	0.05	0.05	1	2.8	0.1	0.01	0.01
MD21826	112	0.5	5	418	0.2	952	0.2	0.1	1	0.4	0.2	0.01	0.01
MD21825	122	0.5	15	540	0.1	847	0.1	0.05	1	0.7	0.1	0.02	0.02
MD21824	132	21	84	821	0.1	667	0.5	0.3	1	0.7	0.2	0.08	0.03
MD21848	142	30	95	637	0.1	679	2	0.6	6	0.7	0.3	0.05	0.03
	MASS												
MD21823	158	1	72	703	0.2	688	2.9	0.2	1	0.7	0.3	0.19	0.03
MD21822	158.2	0.5	5	532	0.2	706	0.3	0.1	1	0.7	0.1	0.14	0.03
MD21821	158.4	0.5	5	579	0	594	0.1	0.05	5	0.8	0.1	0.01	0.01
MD21820	158.6	0.5	5	559	0	792	0.2	0.05	1	0.7	0.1	0.01	0.01
MD21819	158.8	6	40	570	0	929	0.05	0.05	1	0.3	0.1	0.01	0.01
MD21818	162	39	201	851	0.1	911	3.3	0.9	1	0.7	1.1	0.19	0.01
MD21817	165	102	316	690	0.1	8763	9.7	1.5	6	1.2	0.9	0.09	0.07
MD21828	168	94	196	748	0.1	950	9.2	1.4	1	0.4	0.9	0.09	0.02
MD21829	171	0.5	5	781	0.1	1370	0.4	0.2	1	0.7	0.2	0.06	0.01
MD21849	174	45	120	879	0.1	1240	4.7	0.8	1	0.8	0.6	0.12	0.01
MD21830	177	0.5	5	713	0.1	356	0.2	0.05	1	1.1	0.1	0.01	0.01
	Background	**0.5**	**5**	**652**	**0**	**472**	**0.2**	**0.1**	**1**	**0.6**	**0.1**	**0**	**0**

Appendix II

Detailed Methodology

1.0 Metal Distribution - Zone 39

1.1 Sample Preparation and Analysis

Samples used in this study were analysed for Ni, Cu, S, Co, Au, Pt, Pd and Ag at the Falconbridge Metallurgical and Technology Centre using Falconbridge's standard procedures.

Underground face samples taken in Zone 39 containing approximately 1kg were crushed in a four inch jaw crusher to minus one quarter inch. This material was then riffled and 200g separated. The reject portion is stored. The 200 g subsample is pulverized to 100 mesh (<149 microns) and assayed with the remaining pulp stored.

The procedure for Cu and Ni involves the digestion of a 0.2 g sample in heated aqua regia with the residue dissolved in perchloric acid followed by dilution in water and analysis by ICP. Au, Pt and Pd were determined by fire assay of a 10g subsample. Ag was analysed by atomic absorption following the digestion of a 1.0 g sample in perchloric and hydroflouric acids, evaporation and dilution with 20% HCL.

Data used from Zone 38 came from underground grade control sampling where sample size may have varied.

1.2 Local Scale Variances

In order to measure variations in metal distribution over larger areas it is necessary to quantify the variation at a local scale. This is analogous to the error on an individual sample assumed to represent the metal concentration for a designated area or volume of influence. If local variations are greater than the potential variations across regions of the deposit then detecting regional variations will be difficult.

The local scale is defined for this study by approximately a 3x3x3m volume representing a single mining round advance, which also represents the sampling interval for the lateral distribution study. In the case where sampling variance is considered, the scale is equivalent to a chip-channel sample across the width of the vein (a sampling area representing a 20cm band across a vein 10 to 200cm wide). Figure 8 illustrates the face sampling procedure. The extent over which the metal distribution was being studied (the deposit as delineated to date by diamond drilling) represents a dimension of approximately 100x220x350 metres. Multiple samples taken on the same mining face are considered to be taken at the same location in space when evaluating the metal distribution at the scale of the deposit.

Local variation can be partitioned into the following components: Total Variance = intrinsic or natural + sampling (sum of distribution and composition variance) + sample preparation + analytical (Nichol et al. 1989). The total variance at the scale of a mining face is analogous to repeatability of a face sample. In other words, it is the amount of variance which would occur if a second sampled was taken at a different location on the same face. The intrinsic variance is the true spatial variation in the metal concentration of the sulphide. It may be ordered or random depending on whether small scale systematic variations are present (also indicating a spatial correlation exists). If there is a spatial correlation then the total variance will be overstated using a standard variance formula (based on rules of classical statistics which assumes independent sample points) and a variance formula for serial correlations should be used. Sampling variance relates to the repeatability of a sample (function of sample size, grain size and distribution within sample area) within the same location on the face. Intrinsic and sampling variance are commonly related to the nugget effect where local heterogeneity in the rock results in difficulty collecting a representative sample (given the constraints of grain size and concentration, sample and size of subsample analysed). Sample preparation variance is a function of failure to perfectly homogenize a sample resulting in the sub-sample not being representative of the whole sample. The analytical variance is the precision of the analytical technique (and may also be attributed in part to less than perfect homogenization of the final sub sample). The sampling, analytical and sample preparation variances are artifacts of the measuring system and are not inherent in the veins themselves but make up a component of the total variations within the data being studied. Preliminary tests on spatial correlations (F test, variograms, see Appendix VII for definitions) were done to evaluate the potential for geostatistical methods.

Several different tests were completed by taking multiple samples on faces and splitting samples in order to quantify and partition sources of these local variations (See Appendix III for detailed methodology). Most of these tests are based on underground sampling where sample size is constant. Variances between drill core assays will fluctuate due to variation in sample size (the entire width of a vein is sampled and veins thicknesses vary resulting in a wide range of gross sample sizes).

Fifty polished thin sections were made from samples collected in drill core (from lower part of deposit) and face samples collected where mining is active (in the top of the deposit). Optical mineralogy along with microprobe and SEM work was completed in order to describe the basic mineralogy and investigate the nature of the PGE and Au mineralogy and its relationship to local variances.

1.3 Lateral Distribution

Back (roof) mapping of sulphide veins, rock units and structures at a 1:250 scale was completed for the first five mining cuts. Samples were collected, and the corresponding mine grid coordinates recorded, from mining faces approximately every 3m (laterally) on cut 1 and every 6m on cut 3. Cut 3 was sampled so that if any zoning was established from the sill cut data, the cut 3 data could be used to test the results, especially if the zoning is subtle or if the patterns could be coincidental. It also added to the data base resulting in 285 samples taken at roughly the same horizon (6m apart in a 300m+ dip extent) and when plotted together may better define potential lateral zones (given the high local variation). A comparison of the overall grade and precision could also be obtained for the two different sample spacings.

Samples were taken as chip-channel samples perpendicular to the vein dip (figure 8) with several small pieces taken across the vein resulting in approximately a 1 kg sample. Due to the friable nature of the sulphide a good representative cross section sample (similar to a sawn channel sample) could be obtained. In cut 3 visual modal mineralogy percentage estimates for sulphide and gangue were recorded for each sample. The true thickness of the vein corresponding with each sample was determined.

Samples are assumed to represent the composition of the original sulphide liquid composition and are not recalculated to 100% sulphide (magnetite and other gangue minerals account for approximately 5-20%).

Metal values and calculated ratios from the 2 cuts were imported into Mapinfo® and plotted (separately and together) on point plots on 1:250 scale plan maps. The geometry of the veins and resulting distribution of samples points along with high local variance, discouraged the use of contouring. The data was quartiled for each element and ratio and ranges were color coded. As the element assay data usually did not always represent a normal distribution, quartiling the data provided a non-parametric division of the data. Distribution patterns were initially investigated by visual observation and any apparent trends were compared to geological and structural features from underground mapping.

A statistical analysis was done to evaluate distribution and population characteristics along with correlation and regression analysis of relationships between the metals, their spatial position and geological features.

Using the four metal ranges, regions were split into enriched, average and depleted. An enriched zone would contain more than 90% of the highest 2 classes, a depleted zone 90% of the lower 2 classes and any remaining regions would be considered average. When the two cuts are looked at separately, the regions are relative to that particular cut (the ranges used for the point plots are different for each cut). When the cuts were plotted together the same scale was used so a particular area may or may not stand out when looked at individually or together with the other cut. As opposed to linear trends, samples formed inconsistent, isolated apparent zones. The samples in these groups were then averaged and classified. Each group was then tested statistically against the whole population to see if, within a 95% confidence range, the mean was distinct from the mean of the whole population (all samples in the cut)using a students T test. Those zones not statistically significant from the whole population were disregarded, and considered average. The assays were also randomized with respect to their location and replotted. Several apparent "zones" were generated containing up to 10 adjacent samples forming an enriched or depleted region.

Some of the originally defined zones were rejected or questioned as being possibly coincidental as a result of this observation . The remaining zones were then again compared with the geology and structural mapping for potential correlations along with compatibility with current genetic models. Finally the patterns found on each cut were compared to see if they were compatible. As the distance between cut 1 and 3 is only 6m they were considered to be essentially at the same vertical horizon within the vertical scale of the deposit. If results from the two cuts did not agree then the proposed lateral distribution patterns were deemed less supportive. Also, if these zones, which are to some extent subjective and interpretive, do not correlate in some logical way with the geology/structure or a potential hypothetical or established model then they were also considered less conclusive.

* The data from each cut was quartiled and plotted. The four metal ranges are slightly different for the two cuts. The two cuts were also plotted together with quartiled data using the same ranges. Therefore trends are described for each cut and for the two cuts plotted together.

The average metal content for each vein (designated during mining process based on orientation and location of vein) was also compared. Profiles vs. easting and trend analysis (moving averages) were evaluated. Trends were compared with values from ddh drilling on section in the area to see if a predictive model is possible using the diamond drill hole assay data. The veins were also broken down into the main (east-west) veins and footwall (northeast) veins and compared.

Correlations and binary plots for metal values were calculated and interpreted. Preliminary geostatistics (semivariagrams) was completed to test for spatial dependency . If zoning or distribution patterns exist then there must be some degree of spatial dependency between the samples. If all samples are consistently spatially independent at all spacings then zoning either does not exist or is not recognizable using the data available. In order to analyse for spatial dependency the measurement variance must be removed first. In order to do this split samples should have been taken. An approximation was used from the fourth test done on local variance. To confirm variogram results Fisher's F test was done using the ratio of the variance for the random set divided by the variance for the ordered set. If the resulting ratio does not exceed the tabulated value obtained using the given degrees of freedom for the sets, then spatial dependency and the range given by the sill on the variagram are inconclusive.

1.4 3-D Distribution

Approximately 850 assays were utilized from definition drilling. Whole core samples were analysed using the same method as the underground face samples. The assays represent massive sulphide veins ranging from about 10cm to 2m but also include zones of finer stockwork veinlets and disseminations. Due to the nature of the vein contacts (variable core angles), irregular stockwork veining and the fact that the edges of the samples were broken with a hammer and not cut along the contact, variable proportions of silicate wall rock are assumed to be included with these drill core assays (as opposed to the face samples which contained only massive sulphide vein material). This creates a problem when looking for variations in metal content within the sulphide. To look for intrinsic variations in metal content within the sulphide veins, the assays were subdivided based on the metal content. Three categories were created including massive (Cu+Ni >20%), semimassive (Cu+Ni = 10-20%), and mineralized (Cu+Ni<10% or *CuEq >6.65%). Negligible amounts of non-Cu and Ni bearing sulphide occur in the veins. The assays from mineralized and semi massive samples may represent distinct independent veins or secondary veinlets branching off veins included in the massive category. Many of the mineralized samples have low Cu and Ni but contain ore grade economic metal equivalents because of enriched PGE's or Au.

In order to equalize variable and unknown proportions of the silicate host rock methods to recalculate assays to 100% sulphide (Naldrett, 1967) were evaluated. It was concluded that recalculating would not be valid due to a lack of correlations between the amount of sulphides and PM's and a variability in the proportions of Ni and Cu bearing sulphides.

The metal values for each subdivision were then subdivided into combinations of ranges (2-5) based on metal content. Subdivisions were made by division into equal numbers of samples. The main division for interpretation was quartiling as was used in the lateral zoning plots. The samples in the top 10% of each metal were isolated and plotted also. Point plots were then produced and contoured on vertical cross sections and a projected horizontal plan (the dip of the vein system is approximately 30°). The geology and structure were also plotted to evaluate possible correlations with metal distribution trends. The geological interpretation was better defined for the top of the zone where some underground mapping and interpretation has been done (where mining has been completed).

The veins were also subdivided into hanging wall (HW), main (M), footwall (FW1, FW2) veins based their relative perpendicular distance from the SIC contact. The terms footwall and hanging wall as used in this study refers to stratigraphic position relative to the SIC (see Figure 5). The resulting breakdown consists of 4 apparently spatially separate zones when viewed on cross section. In reality they probably occur as an interconnected stockwork vein system (as is seen in the top part of the zone).

Statistical analysis of the metal concentrations for the 4 zones, along with spatial correlations (vs. depth, distance into footwall from SIC contact and easting) was completed. Binary diagrams were used in conjunction with correlation coefficients in order to determine the influence of outliers (obvious isolated outliers are not included in coefficients). Correlations were checked for statistical significance.

A predictive model was tested by comparing distribution patterns apparent from the face sample data with the diamond drill data. If coincident trends occur within the drill hole data then it can be concluded that distribution can be detected with the available drill hole/sample density (The majority of the deposit has only drill hole assay data available). The sample spacing for drill data is approximately 15-40 metres vs. 3m available for the top of the deposit.

Averages of areas from drill core will have different confidences as averages may contain different proportions of sample sizes.

* Cu Eq = Cu equivalent. As 6 elements are recovered, samples are categorized for economic mining cutoff based on CuEq. which expresses the overall metal content as an equivalent Cu value using current forecasts for metal prices (The corresponding CuEq for each assay fluctuates with metal prices).

Data Interpretation:

The contours were constructed by computer software (Surfer®) using linear kriging but with 100% nugget effect which is equivalent to a simple moving average. This was done as assays are not assumed to have any spatial dependency at the given sampling density. The moving average was used to attempt to reduce the influence of extreme local variations by smoothing the data in order to illustrate potential distribution patterns.

Due to the occurrence of veins at more than one stratigraphic horizon, looking at a projected plan results in HW, M and FW assays being superimposed. In order to isolate distribution patterns within a vein, the three types of veins were plotted separately. In cross section, as there were relatively few samples on each section, and because of the significant local heterogeneity, composite sections were constructed to inspect for distribution trends (the strike of deposit is essentially perpendicular to the section orientation, allowing a view of a true perpendicular slice of the deposit to inspect for distribution trends from hanging wall to footwall).

2.0 Regional Zoning and Relationship between Zones 38 and 39

2.1 Metal Distribution Within Zone 38

A large number of assays from diamond drill core also were available but not used as they do not represent exclusively massive sulphide. The samples were assayed at the Falconbridge lab for Ni, Cu, Au, Pt, Pd and Ag using the same method described above for Zone 39.

The means for each level were tested statistically (Appendix VI) to see if differences in their means could be shown to be significant within a 95% confidence level.

3.0 Metal and Trace Element Distribution within Wallrock

*3.1 Analytical Methods**

[illegible]	[illegible]	[illegible]
Pt, Pd	Fire Assay	10, 1 ppb
F, Cl	CHM	20, 50 ppm
S	CHM	0.01%
Bi, Se	AA	0.05 ppm
As, Te	AA	0.2 ppm
Sn	XRF	5 ppm
Cu, Ni	A	0.01%

Table 1 - Trace Analysis - XRAL Lab: Method and Detection Limits (* For objective 1 only. Objective 2 and 3 used procedures from Falconbridge's lab described above).

3.2 Detailed Methodology

1) Analyses of metals and selected trace elements were done (Cl, F, Bi, Te, Se, As, Sn, Pt, Pd, Cu, Ni, S) at XRAL Labs using samples from 3 areas to determine whether a halo is present:

    i) At the scale of the individual vein/mining face, by taking 10 cm chip-channel samples covering a 1.5 m traverse into the wall rock perpendicular to a massive vein;

    ii) Areas extending on both sides of the vein system up to 20 m away from the zone (past fw and hw intersections) and;

    iii) Within the zone (the wallrock in an area between the hanging wall and footwall veins).

    Samples were collected at the face for i) and drill core (Hole ST44-194) was used for ii) and iii). A total of 50 samples were analysed for the above elements. Table 1 outlines analytical methods and detection limits.

2) Two assay traverses taken from diamond drill core were evaluated for Pt, Pd, Au and Ag distribution. In both cases continuous sampling traverses were done (all rock sampled). In the first case (Hole ST44?, an area that extends from a footwall vein (P5 vein) to an extremely PGE-Au enriched area 30 m away and beyond was examined. A total of 38 assays were used. The

second case (Hole ST44190) involved a continuous sample from the hanging wall vein across the main and beyond the footwall veins using 115 approximately evenly spaced samples. Unlike Objective 1, assays in this study included any visible minor veinlets and disseminations of sulphides present.

3) The wall rock from each face of one entire cut was sampled. A chip sample extending approximately 1 metre from each side of the vein was collected. The wall rock samples did not necessarily represent a linear traverse, but typically contained a collection of chip samples within a 1m halo to the vein, attempting to best represent the sulphide content within the halo (fig 8). For each sample site the average of the 2 assays were used.

The wallrock sampled consists of felsic to mafic gneiss, Sudbury Breccia and diabase. For objective 1, macroscopic scale sulphide and non-sulphide veinlets were avoided (A more extensive sampling program would have to be done to evaluate the chemical halo represented by veinlets). It was not practical to separate gneiss from Sudbury Breccia as the two rock types form a continuum from a breccia narrow Sudbury Breccia veinlets surrounding metre scale gneiss fragments to a predominatly Sudbury Breccia matrix with a range of fine to coarse gneiss fragments. (The Sudbury Breccia matrix is similar in composition to the fragments it hosts although it is metamorphically altered)

This data was plotted and correlated spatially with respect to the distance to massive sulphide veins, distance from the SIC contact (distance into the footwall) and lateral distribution.

Appendix III
Analysis of Local Variances

Tables

Figures

1.0 Analytical Precision

The analytical precision based on samples from Zone 38 has been estimated (Austreng and Sweileh, 1990). Using a 95% confidence level the results were +/- 0.07% Ni, +/-0.31% Cu, +/- 0.76 ppm Au, +/- 0.44 ppm Pt, +/- 0.65 ppm Pd and +/- 4.0 ppm Ag. Using the overall average grades for Zone 38 this translates into the following relative percentages: +/- 3% Ni, +/-1% Cu, +/-185% Au, +/-10% Pt, +/-9% Pd, +/-3% Ag.

2.0 Determination and Partitioning of Sources of Local Variances within Zone 39.

2:1 Methodology

Test 1 - Determination of Total Variance (Face Scale):

Multiple samples (3-6 samples per face) were taken on 17 mining faces. This does not allow for the partitioning of different components of variance but estimates a range and average total variance (including intrinsic) across the area where single samples and associated metal concentration are being used to detect variations in larger scale distribution studies.

Test 2 - Determination of Total Variance and precision (at a scale of 10m strike length):

Pt and Pd assays from multiple face samples taken from four consecutive faces were used for a preliminary test to partition the sample preparation+analysis components of total variance. This data also illustrates the total variance at a scale slightly greater than a face scale (representing an area covering 10 lateral metres along the strike of a vein and 3 vertical metres dip extent). The precision of the estimate for the metal concentration in this area of the vein could also be determined from this data. The sample density which the calculated precision is based was 4 times greater than the spacing used for the lateral distribution study. The statistical analysis for this test was completed by a chemist at the Falconbridge assay lab.

Test 3 - Sample Preparation Variance of Drill Core Assays:

Rejects were assayed from diamond drill samples. The results approximate sample preparation+analytical variance for diamond drill samples. These samples differ from the face samples tasted in that they include variable proportions of silicate wall rock material (which contains precious metals). These results are more indicative of variances inherent in the drill assays which were used for the 3D distribution study.

Test 4 - Determination and Partitioning of Sampling Variance:

In order to estimate an representative measurement variance and partition the sampling, preparation and analysis components, ten faces were sampled at different places across one cut of the zone. One 2 kg sample was taken from each face. The sample was then split by coning into equal 1 kg sized samples. The reject portion was analysed for each of the 20 samples. All six elements were analysed. The variance between rejects could then be subtracted from the variance between split samples to give the sampling variance. Fishers (F) test was used to verify the statistical significance of the variances compared. The procedures used for this test are similar, minus the final split, to test 5 which is also illustrated using the flow chart shown below.

Test 5 - Partitioning of all Sources of Variances at a Face Scale:

This test attempted to partition all components of variance including intrinsic. The results are an example of the contribution from each of the components for one particular area of the deposit. This is the only test completed where all components of total variance can be proportioned. The relative proportions of components of variance may vary across the deposit.

A mining face was sampled at 30cm intervals along a vein (9, 2 kg samples). Each sample was then split into 2 samples, 1 kg each. The standard procedures were repeated twice for the subsequent subsample reductions resulting in a total of 72 assays. All six elements were analysed.

The procedures are illustrated in the diagram below (Figure. 1). Before components were partitioned Fishers F test was used to verify the significance of the variances (at a 95% confidence level)

The variance for an ordered set across the face was compared to the random variance. If there is a systematic intrinsic variation along the vein at a face scale then the ordered variance should be lower. The difference in variances between an ordered and a random was tested statistically using Fisher's test. Variance for the random set is derived using the standard variance formula. The variance for an ordered (first series in a space correlation) is derived by summing the squared differences between adjacent samples and then dividing by the degrees of freedom (2n-1).

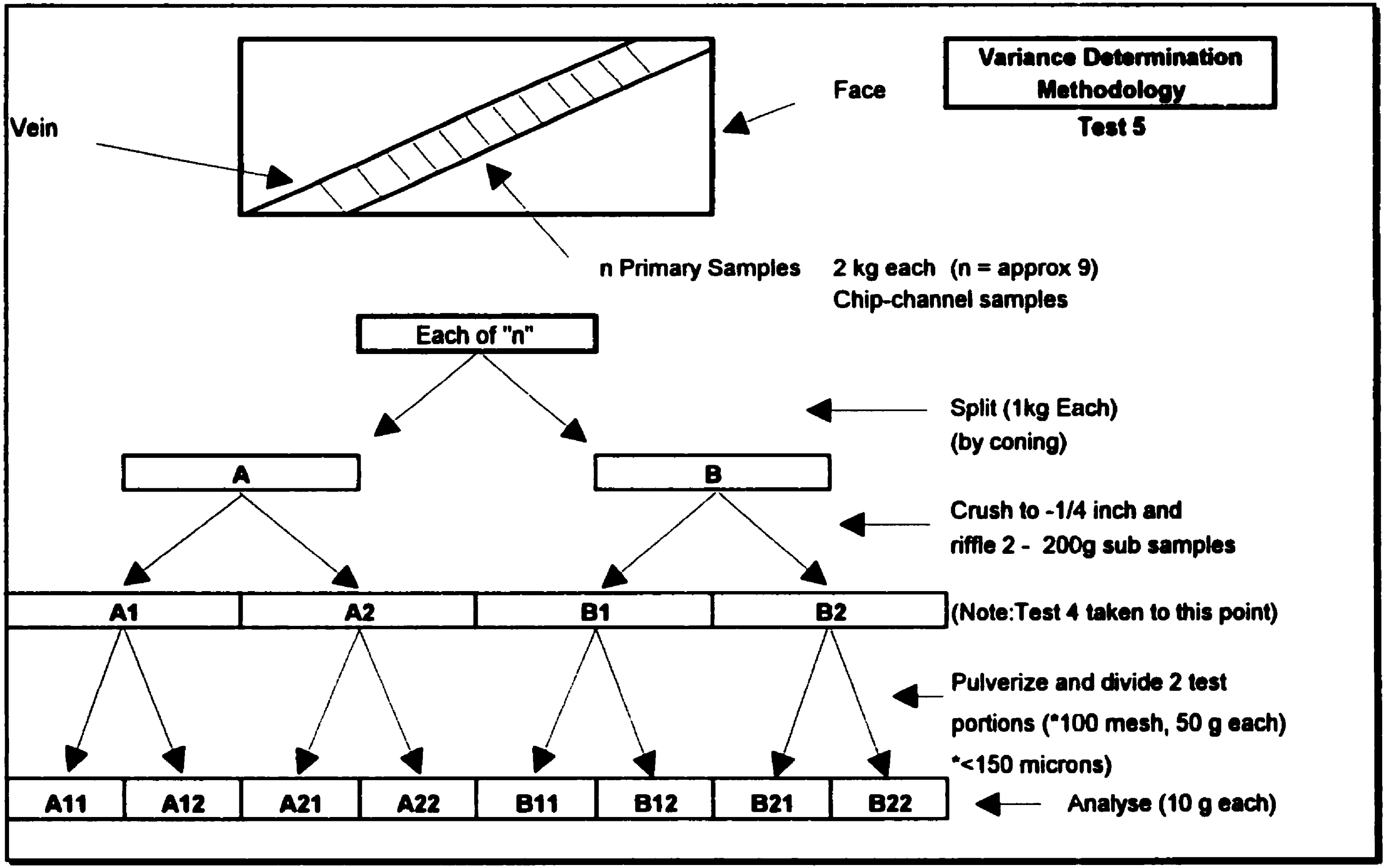


Figure 1 - Variance Partitioning Regime

2.2 *Results*

Terminology:

The following abbreviations used to describe the components of variance are defined as follows:

var (t) = total variance (intrinsic+sampling+sample preparation+analysis)

var (i) = intrinsic variance (random or ordered natural variation along the length of vein sampled)

var (s) = sampling variance (composition + distribution variance, related to variations due to sample size, mineral grain size and shape)

var (p) = sample preparation variance (variations caused by reducing the size of the sample, crushing and homogenizing)

var (a) = analytical variance (variations due to precision of analytical method and inhomogeneities the final subsample)

var (spa) = sampling+sample prep.+analysis (equivalent to variations related to the measurement process and not inherent in the veins themselves).

Statistical tests for significance

Statistical tests used to confirm the significance of partitioning of components of variance are based on a null hypothesis. If statistically significant using Fisher's test then it can be concluded at a 95% confidence level (19 times out of 20) that the variances can be partitioned and quantified as a relative proportion of the variance. If the F- test is not satisfied it implies either that the variances cannot be partitioned or that there are not enough primary samples to show a statistical significance.

The fact that the intrinsic variance could not be broken out in many cases indicates that not enough primary samples were taken. It can be implied by comparing tests 1 and 4 that the intrinsic variation probably is more significant than the var (spa).

Results

Test 1:

Table 1 illustrates the results compiled from 17 sites where several samples (3 to 6) were taken on each face at approximately 1 m intervals across the length of vein exposed. This test quantifies the sum of all sources of local variation at the scale of a single mining face. (The data utilized to test for lateral distribution patterns is based on one sample per mining face.) The variations observed in this test illustrate the problem inherent in looking for lateral or 3 dimensional metal distribution patterns by comparing individual samples. The variability includes all components and represents var (t). This test does not allow for partitioning of variances into components.

With the exception of Cu all elements have extreme variability at a face scale (approx. 3x3m) close to or exceeding the face mean.

	n	*%Ni*	*%Cu*	*Au ppm*	*Pt ppm*	*Pd ppm*	*Ag ppm*
Avg. Face Mean	17	1.19	31.38	1.34	15.89	19.98	178
Avg. Face Range	17	2.38	3.28	1.78	13.06	15.35	63
Avg. Face Low	17	0.37	29.41	0.68	9.94	12.57	158
Avg. Face High	17	2.95	32.69	2.51	22.99	27.90	207
Avg. Sample Repeatability	17	556%	7%	122%	69%	57%	64%
Avg 95% Conf. Interval:	3-6	1.34	2.19	1.06	9.92	11.06	53
95% CI as % of mean	3-6	113	7	79	62	55	30

Table 1 - Statistical results from faces where multiple samples were taken. Each of the 17 faces represents 3-6 samples. 95% confidence interval represents the average confidence level on the mean value given by the sets of 3 to 6 samples. Average repeatability is the % change between a single face sample and the following 2 to 5 additional samples (Equivalent to a relative error assuming variations across the face are random).

The variability at a face scale is similar to the variability across the deposit (the magnitude of variation is constant at different scales or scale independent or fractal). The precision (or error) on the data used for the metal distribution study is assumed to be poorer than the confidence intervals listed for these face samples as the majority of sample points used in the following distribution study represent only a single assay (as opposed to 3 to 6 samples used for the above results).

Systematic metal distribution trends may still be detectable assuming the local variation (relative error) is constant throughout the deposit and the magnitude of the potential trends are large enough.

Test 2:

The results of this test (Table 2) allowed for a break down for Pt and Pd only, of var (isp) and var (a) and a determination of var (t) and associated precision of the sampling regime over an area slightly larger than a face scale (a portion of the vein encompassing 10m strike length by 3 m dip length, an area similar to apparent enriched and depleted zones observed on point plots). For Pt only 10% of the variance was from analysis. Only 1% was due to analysis for Pd.

The precision of the estimated mean metal concentrations for this portion of the vein is as follows :

	Pt g/t	*Pd g/t*
Mean	13.7	20.8
95% Confidence Interval	4.14	12.66
95% Confidence Range		
Lower Limit	9.5	8.1
. **Upper Limit**	17.8	33.4
95% Asymmetrical Lower Limit	10.4	10.6

Table 2 - Precision of Pt and Pd form detail sampling of a 10m traverse.

The results show that over a given 10m strike length along a vein it is not possible, using the given sampling regime, to determine a very precise estimate for the mean PGE concentration even by averaging 16 samples. The majority of the area covered for the lateral distribution study only contains 2-3 samples per 10m resulting in even poorer estimate of the mean metal abundance. Averaging 4 times the number of samples within an area in order to minimize local variation at a face scale still does not appear to produce precise enough estimates for Pt and Pd to conclude that specific regions have differing mean concentrations.

Test 3:

A total of seven rejects, taken from drill core samples that were analysed for Au, Pt and Pd resulted in an average deviation from the original value of 20% for Au, 31% for Pt and 36% for Pd. These values, which represent variance due to sample preparation+analysis, are higher (except for Au) than those determined in test 4 for face samples. This increased variability may be in part due to irregular PGM's distribution within the wall rock (a certain proportion of which is included in drill core assays) and increased difficulty homogenizing silicates, sulphides and PGM's (ie. which have a much higher density than silicate wall rock resulting in difficulty homogenizing subsample).

The results indicate (see Table 3) , for example, that if 2 individual drill core samples taken from different parts of the deposit differed in Pd by 36% this could be due to variations caused by sample preparation and analysis alone and the samples may contain identical metal concentrations.

Drill Core : Reject Samples

DC26431	17.1	13.5	21	4.04	3.09	24	4.98	4.99	0
DC27724	0.72	1.02	42	3.26	6.44	98	1.3	3.09	138
DC27742	8.38	5.32	37	5.5	8.8	60	11.6	10.6	9
DC27752	1.08	1.34	24	4.94	4.58	7	2.82	4.54	61
ST027723	9.88	9.31	6	27	31.6	17	20.7	24.5	18
ST44199-40	0.33	0.33	0	5.82	6.22	7	1.75	1.96	12
ST44264-7	7.66	7.44	3	22.4	21.4	4	12.4	14.2	15
Avg	**6.45**	**5.47**	**19**	**10.42**	**11.73**	**31**	**7.94**	**9.13**	**36**

Table 3 - Repeatability of drill core rejects. (Var sp). % Var is the relative change in percentage between the original and the reject.

Test 4:

This test was done to determine sampling variance vs. the lab associated variances (sample preparation+analysis). The repeatability, or deviation of a duplicate sample taken in exactly the same location, was also quantified.

The results indicate the lab associated variance (pa) is significant for Au, Pt and Ag. Therefore a large proportion of the variance (spa) in the data for these elements is an artifact of measurement processes and not natural variations of metal concentrations within the veins or related to sampling parameters. It should also be noted the results are based on averages from 10 faces, and for all elements except Cu, the average is (positively) influenced by one or two faces (outliers).

However the overall repeatability is significantly better than for multiple face samples (test 1) indicating that local intrinsic variability is more significant than variations caused by the measurement methods. These intrinsic variations could also be interpreted to be sampling variance or "nugget effect" (depending on the scale under consideration).

Variance	***Ni***	***Cu***	***Au***	*****Pt***	***Pd***	***Ag***
% Sampling	94	65	70	56	90	60
%Prep+Analysis	6	35	30	44	10	40
Repeatability*						
Test 4: var (spa)	47%	2%	78%	16%	22%	22%
Test 1: var (t)	556%	7%	122%	69%	57%	64%

Table 4 - This table illustrates the partitioning of measurement variances. The bottom line contains the average repeatability from the multiple face samples from Test 1 which is Var (t).

* Repeatability is given as the average (of 10 faces) difference between 2 samples taken at the same location expressed as a relative percent.
** The partitioning of the variances for Pt are less statistically conclusive as the F ratios for the total measurement variance/sample prep. +analytical variance did not exceed the tabulated value (95% confidence level).

Test 5:

This test attempted to partition all components of variance. This was achieved by taking a detailed sample of a face including 9 primary 2 kg samples. Sample repeatability and precision was tested for each source of variance (intrinsic, sampling, sample prep and analysis). The 9 primary samples were split into 2 1 kg samples (var (spa), the subsample and pulps were assayed in duplicate. The methodology is summarized in Figure 1. The data is included in Table IIIc.

Ni

Var (i) accounted for 88% of the total variance with var (spa) contributing the remaining 12%, supporting visual observations made relating to variable distribution of Ni-sulphides. Partitioning the components of var (spa) was not possible. The total Ni content for this face was very low ranging from 0.04-0.11%.

Table 5a - Assay data used for variance test # 4

Face	Sample	%Ni		%Cu		Au ppm		Pt ppm		Pd ppm		Ag ppm	
		A	B	A	B	A	B	A	B	A	B	A	B
1	MD21851	0.29	0.30	34.50	34.70	0.32	0.32	9.58	10.50	23.10	22.90	122	125
	MD21852	0.77	0.78	33.70	34.30	0.86	0.79	8.65	8.53	8.43	7.91	100	88
2	MD21853	0.15	0.11	36.70	36.70	1.27	1.52	6.14	7.48	18.50	20.00	217	261
	MD21854	0.09	0.09	36.00	36.40	1.71	2.06	6.04	5.85	16.70	15.10	196	220
3	MD21855	0.12	0.11	35.30	36.30	1.16	0.91	11.50	15.50	18.80	17.40	189	213
	MD21856	0.14	0.14	35.10	35.00	0.83	0.73	11.90	18.60	17.30	17.10	220	193
4	MD21857	0.44	0.44	36.40	36.40	1.12	1.39	12.90	12.40	24.90	25.40	154	158
	MD21858	0.81	0.93	35.90	36.10	1.53	1.63	22.00	17.10	27.50	23.00	145	176
5	MD21859	0.54	0.51	36.10	36.80	0.97	0.66	11.30	10.80	37.40	39.70	110	92
	MD21860	0.86	0.82	35.40	36.30	0.65	0.78	13.80	11.70	42.30	36.70	177	103
6	MD21861	0.11	0.11	34.40	34.80	1.01	0.98	5.14	4.22	23.40	23.80	226	226
	MD21862	0.10	0.10	34.30	34.80	0.87	0.86	4.91	5.23	18.90	16.80	196	196
7	MD21863	0.07	0.08	34.60	34.60	0.32	0.53	6.90	6.87	10.00	10.30	214	171
	MD21864	0.06	0.07	35.20	35.50	0.25	0.25	7.26	7.25	8.87	9.49	230	248
8	MD21865	0.05	0.05	35.90	35.30	0.53	0.74	9.75	9.02	11.30	10.00	238	245
	MD21866	0.07	0.06	34.00	34.80	1.29	1.63	8.91	9.30	16.00	15.70	164	173
9	MD21867	1.25	1.58	33.20	34.50	0.69	0.71	14.50	14.70	9.52	13.00	120	142
	MD21868	1.66	1.58	34.30	34.50	0.32	0.28	17.20	14.60	7.13	7.38	170	159
10	MD21869	2.03	2.04	31.80	31.20	0.36	1.15	11.80	21.10	9.78	16.70	122	105
	MD21870	1.91	1.89	30.80	30.60	1.23	0.48	9.91	9.21	7.61	8.12	107	206

Pairs of samples were collected form 10 faces
A represents the original sample, B represents analysis of the reject

Table 5b - Test 5: Assay Data (See Fig 1)

	%Ni				%Cu				Au				Pt				Pd				Ag			
Sample	A1	A2	B1	B2	A1	A2	B1	B2	A1	A2	B1	B2	A1	A2	B1	B2	A1	A2	B1	B2	A1	A2	B1	B2
MD21871	0.04	0.06	0.02	0.02	33.6	33.6	33.4	34.2	0.62	0.54	0.68	0.73	16.2	17.1	17	17.5	25.7	27.2	22.3	26.9	229	260	236	207
MD21872	0.02	0.02	0.02	0.02	32.8	32.8	33.2	32.8	0.58	0.58	0.56	0.51	15.4	14.8	12.8	12.3	22.1	25	20.2	23.5	206	240	193	201
MD21873	0.02	0.02	0.02	0.02	33.4	33.2	33.2	33	0.87	0.77	0.91	0.78	12.2	13.3	12.9	14.2	24.1	25.6	27.1	25.1	226	188	215	219
MD21874	0.02	0.02	0.02	0.02	33.8	33.2	33.4	33.4	0.77	0.77	0.67	0.71	12.1	11.4	12.8	13	19.8	18.8	22.7	22.1	192	201	191	226
MD21875	0.02	0.02	0.02	0.02	33.2	33.2	33.6	33.4	0.69	0.73	0.6	0.55	18.2	18.8	21.7	19.5	22.5	23.9	27.9	24.4	201	202	171	178
MD21876	0.02	0.03	0.04	0.04	34.72	34.06	34.85	34.46	0.4	0.41	0.37	0.41	11.9	10.5	11.1	11.4	14.6	13.2	15.2	17.1	157	235	189	169
MD21877	0.03	0.04	0.04	0.05	34.3	34.8	35.12	35.17	0.88	1.09	0.79	0.9	9.03	11.1	10.4	9.64	14.6	15.1	15.9	13.9	223	232	241	291
MD21878	0.03	0.03	0.04	0.05	34.58	34.64	34.9	34.96	0.41	0.35	0.38	0.38	9.89	9.82	10	10.3	12.9	11.3	12.9	12.2	221	185	221	225
MD21879	0.03	0.04	0.05	0.05	34.51	34.67	35.19	35.26	0.66	0.76	1.01	1.01	9.99	10.9	11.2	10.9	18.6	19.2	17.1	19.1	162	177	203	185
MD21880	0.04	0.04	0.05	0.05	34.62	34.49	35.11	35.56	0.77	0.69	0.66	0.68	11	9.9	10.6	9.37	17.3	16.3	18.6	18.8	264	201	156	208
MD21881	0.06	0.06	0.07	0.04	36.56	36.69	37.34	35.3	0.68	0.82	0.97	1.11	11	11.3	8.5	11.7	15.9	15.9	16.3	17.1	233	220	202	257
MD21882	0.06	0.07	0.07	0.07	36.55	37.11	36.18	35.99	0.97	0.86	1.1	0.71	8.08	8.45	9.37	8.95	16.7	17.4	21.4	17.3	184	213	186	241
MD21883	0.05	0.06	0.07	0.07	36.04	35.83	35.91	36.17	1.03	0.66	0.6	0.61	7.5	7.54	7.77	8.32	16.5	16.9	19.1	18.8	241	193	290	459
MD21884	0.06	0.06	0.07	0.07	36.45	35.83	36.49	36.22	0.81	0.7	0.78	0.95	11.4	10.9	11.4	11	30.1	32.9	26	29.4	189	214	196	251
MD21885	0.06	0.06	0.07	0.07	36.18	36.67	36.28	36.32	0.45	0.35	0.53	0.73	11.1	10.1	12	11.7	22.7	19.2	25.6	22.6	224	223	182	206
MD21886	0.06	0.07	0.07	0.07	36.4	36.74	34.58	35.12	0.51	0.3	0.56	0.39	11.2	12.4	11.5	11.2	20.8	18.8	20.9	21.9	186	212	229	250
MD21887	0.09	0.1	0.11	0.1	36.52	37.34	35.46	34.43	0.42	0.58	0.56	0.41	20.4	17.3	28.3	28.1	28.6	27.1	28	26.8	204	210	206	203
MD21888	0.08	0.09	0.04	0.04	37.64	38.82	35.7	35.88	0.4	0.46	0.57	0.48	13.2	17.2	13.6	13.1	13.2	13	14.8	17.6	220	186	157	266

Cu

Only the intrinsic var could be partitioned and accounted for 94% of the total variance indicating variations in Cu are not related to the measurement process. Intrinsic variation in Cu is inversely proportional to Ni.

Au

This was the only element that could be fully partitioned* with the following results:

var (i) = 55%
var (s) = 33%
var (p) = 7%
var (a) = 5%

Lab associated variances are not significant contributors to the high variation of Au. Sample size and location are the source of high variations.

***The breakdown of var (i) and var (spa) could not be shown to be statistically significant but was close indicating a less than 95% confidence level.**

Pt and Pd

Var (i) could not be partitioned for either element. The partitioning of the measurement components are as follows (as a percentage of var (spa)):

	Pt	Pd
var (s) =	86%	95%
var (p) =	9%	2%
var (a) =	5%	2%

The significant component is the sampling variance, while the lab associated variance is insignificant. Sample size and the random probability of the number and size of grains included within the given sample are the significant factors.

Ag

None of the components could be partitioned.

The results indicate that for Pt, Pd, Ni and Au the major contribution to variance is

sampling and intrinsic.

Statistical hypothesis testing (F test) utilized in the above tests described in Appendix III.

Spatial Dependency:

The only elements showing systematic variation in abundance across the length of the vein sampled were Au and Cu (at a 99% Confidence Level). Variations for all other elements along the vein can be considered to be random using the given sampling regime. These results suggest geostatistical methods may be applicable for Au and Cu.

Precision of the face estimate:

The statistical precisions for the overall estimate of the grade of the face are as follows:

	Ni	*Cu*	*Au*	*Pt*	*Pd*	*Ag*
Arith. Mean	0.05	35.00	0.66	12.61	20.28	215
Geometric Mean	0.04	35.02	0.63	12.09	19.66	212
Median	0.05	35.04	0.66	11.40	19.15	208
95% CI	0.005	0.33	0.05	0.96	1.19	9.7
Lower CR	0.4	34.72	0.61	11.65	19.09	205
Upper CR	0.05	35.37	0.71	13.57	21.47	224
Range	0.09	6.02	0.81	20.8	21.6	303
Min	0.02	32.80	0.30	7.50	11.30	156
Max	0.11	38.82	1.11	28.30	32.90	459
% Coeff of Var	49	4	31	32	25	19

Table 6 - Precision associated with a face where 72 assays were taken.

The distribution of all elements is close to normal as the geometric mean, arithmetic mean and median are similar. There is a significant range or variation for all elements except Cu. Even by taking 72 assays on one face which is about half the number of assays collected on an entire mining cut, the grade of Pt for example can only be stated (within a 95% conf. interval) to being somewhere between 11.65 and 13.57 ppm. (This is similar to the difference in metal concentrations indicated for vertical variations within Zone 38).

The high Cu values in some of the samples indicate bornite or chalcocite may be present.

APPENDIX IV

Statistical Analysis and Detailed Results

Figures:

Tables:

1.0 Statistical Analysis and Assumptions

There are two important assumptions which relate to interpretations based on statistical parameters and tests used in this study:

i) The type of probability distribution the data and subgroups within the data form;
ii) The data is spatially independent. This requires that there are no spatial correlations between sample points.

Although normal distributions are not present in most of the data being compared the statistical parameter used are approximations which indicate relative ranges in the distribution of the data. For example, confidence limits which are used should actually be asymmetrical to varying degrees based on the skewness of the various population distributions (especially for Au and Ni).

Statistical spatial dependency at the various sample spacing was tested and shown to be insignificant (with the possible exception Pd at 3 metre spacing, as illustrated in Table 1). Therefore the data was assumed to be independent. Confidence ranges are only approximations and due to skewed distributions are not symmetrical.

Statistical tests were used to determine the probability that two different mean metal concentrations being compared, representing different areas of the deposit, are significant. These tests include the students t-test and the Kolmogorov-Smirnov (KS) test. These tests are designed to test a null hypothesis which is the assumption that two means are not from the same population (or probability distribution). The test are one way in that they confirm (to a certain probability level) whether the two samples are from different populations. However if the difference is not significant the conclusion is that either the differences is not statistically significant or that there is not enough data available.

The t-test is a parametric test which makes assumptions including that the data is from a normal population. The KS test on the other hand is non-parametric and does not make assumptions about population distributions, although it is less robust.

These tests were performed using Systat® statistical software on selected data from Zone 38 and 39 (Cuts 1 vs 3, Main vs Footwall veins, Zone 38 level comparisons). The following pages summarize the statistical data.

2.0 Detailed Results and Analysis

2.1 Lateral Variations in Metal Distribution - Variograms

Figure 1 contains a series of variograms from 3 metre spaced assays taken along the main east-west trending vein on the sill cut of Zone 39. Variograms are the basic tool used in geostatistics. These graphs help determine whether the data (at the given sample spacing) correlates spatially and at what distance (or sample spacing) the spatial correlation is lost (the variance is equivalent to the random or un-ordered variance of the data) The variance for an ordered set (as opposed to a standard variance formula which sums the differences between each sample and the mean) is the sum of squared differences between adjacent samples divided by the degrees of freedom.

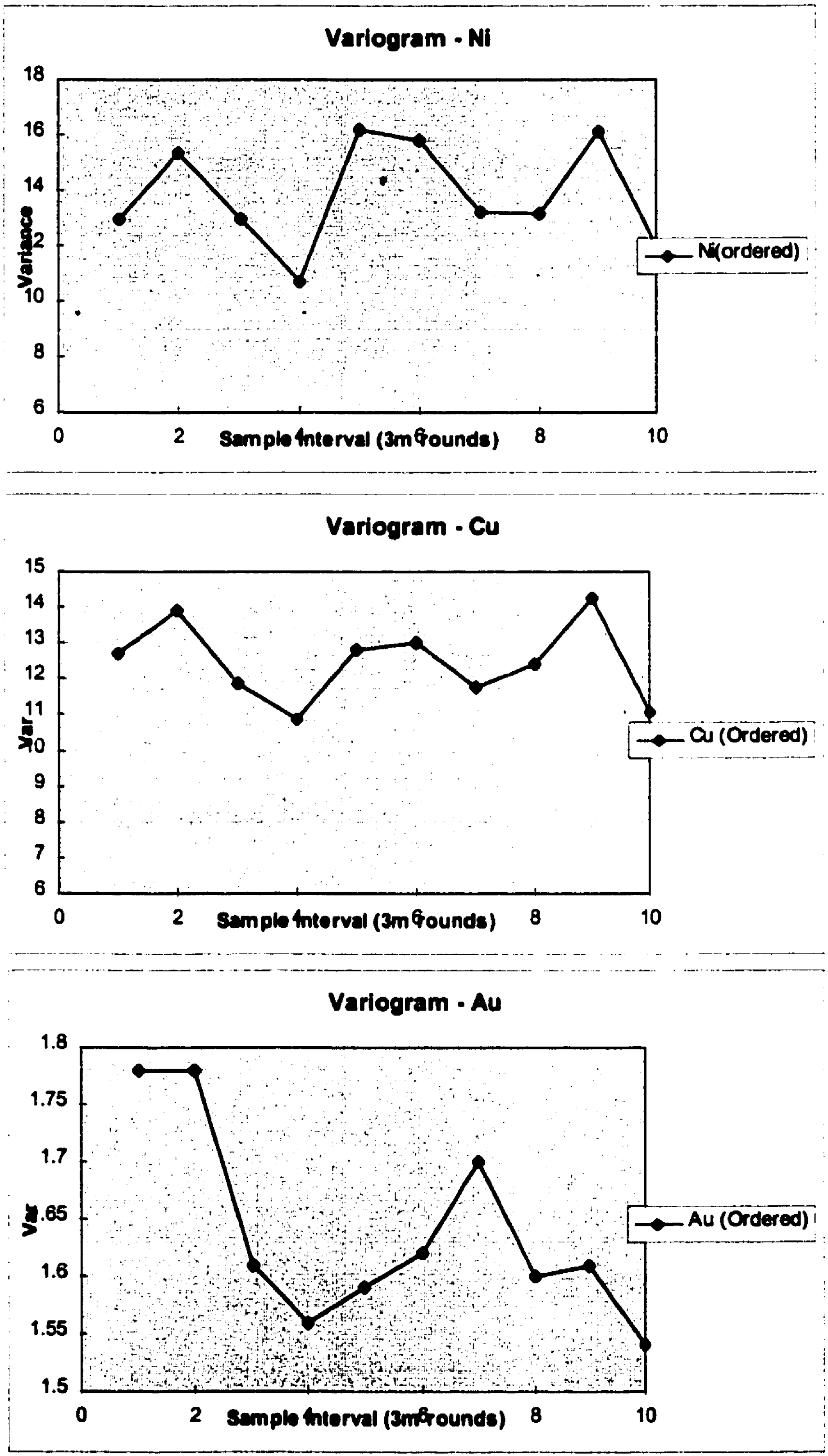


Figure 1 - (see description on following page)

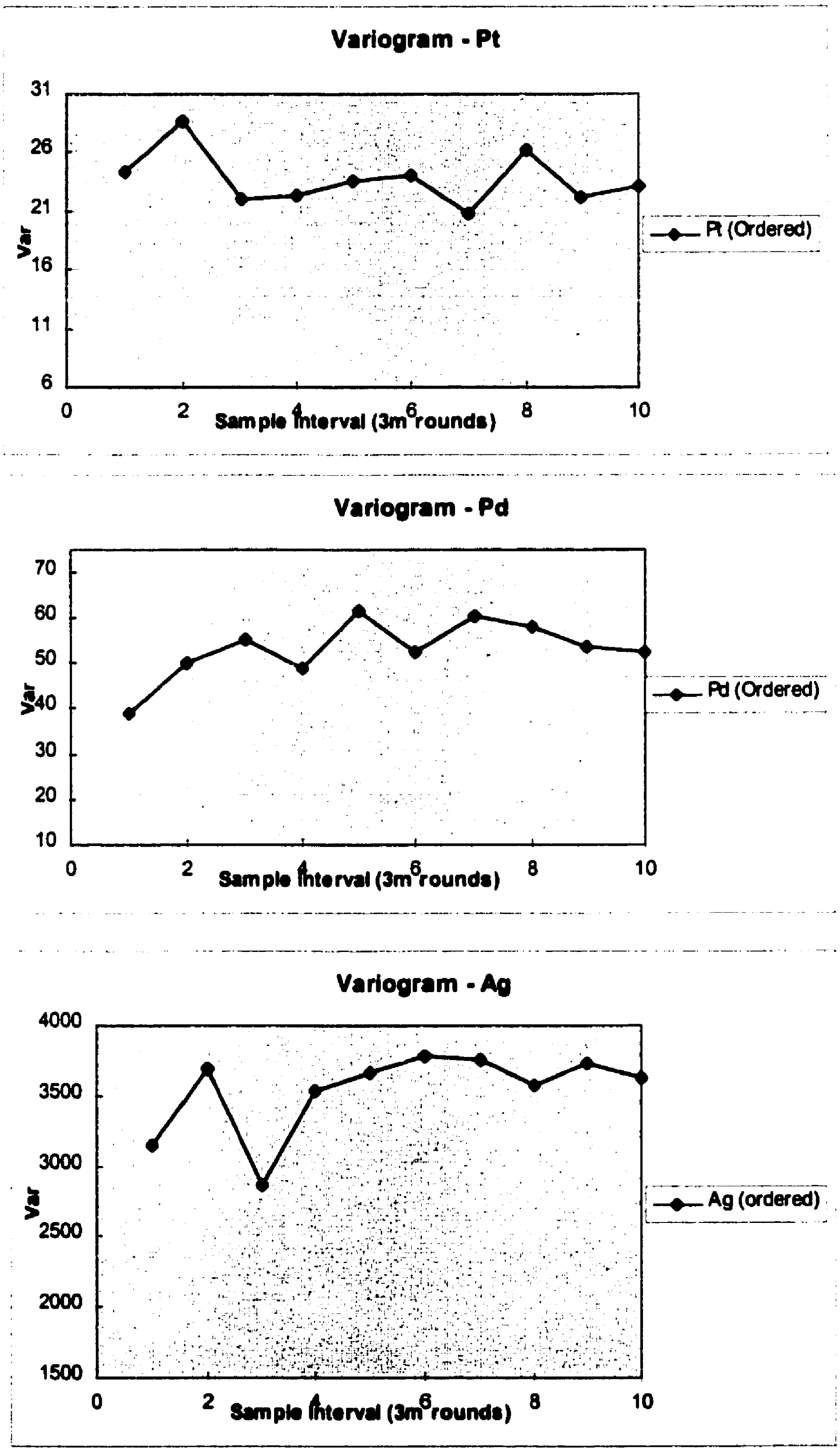


Figure 1 (Con't) - Variograms from the main east-west vein on the sill cut. Pd shows the potentially well developed sill.

Table 1 - Spatial Correlations/Dependency

Ratio of (random variance/ordered variance must > F to be statistically significant

2.55	Ni	30cm	-163	No
2.55	Cu	30cm	12.97	Yes
2.55	Au	30cm	4.13	Yes
2.55	Pt	30cm	-0.06	No
2.55	Pd	30cm	0.07	No
2.55	Ag	30cm	1.14	No
1.4	Ni	3m	0.98	No
1.4	Cu	3m	1.1	No
1.4	Au	3m	1.02	No
1.4	Pt	3m	0.97	No
1.4	Pd	3m	1.4	Just
1.4	Ag	3m	1.13	No

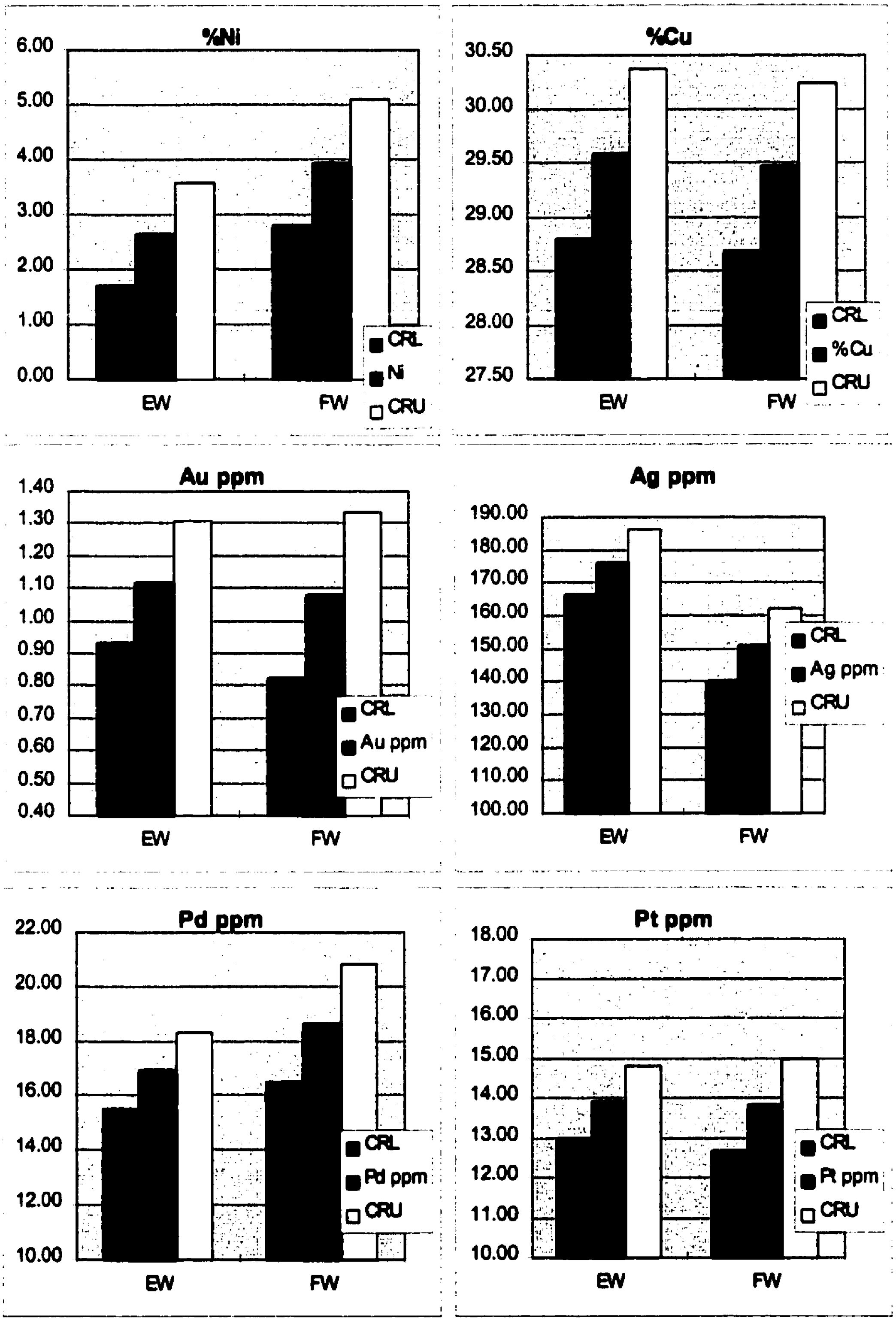


Figure 2 - Comparison between Footwall and East/West (main) veins. Central bar is mean. CRL = 95% Lower confidence level, CRU = 95% Upper confidence level.

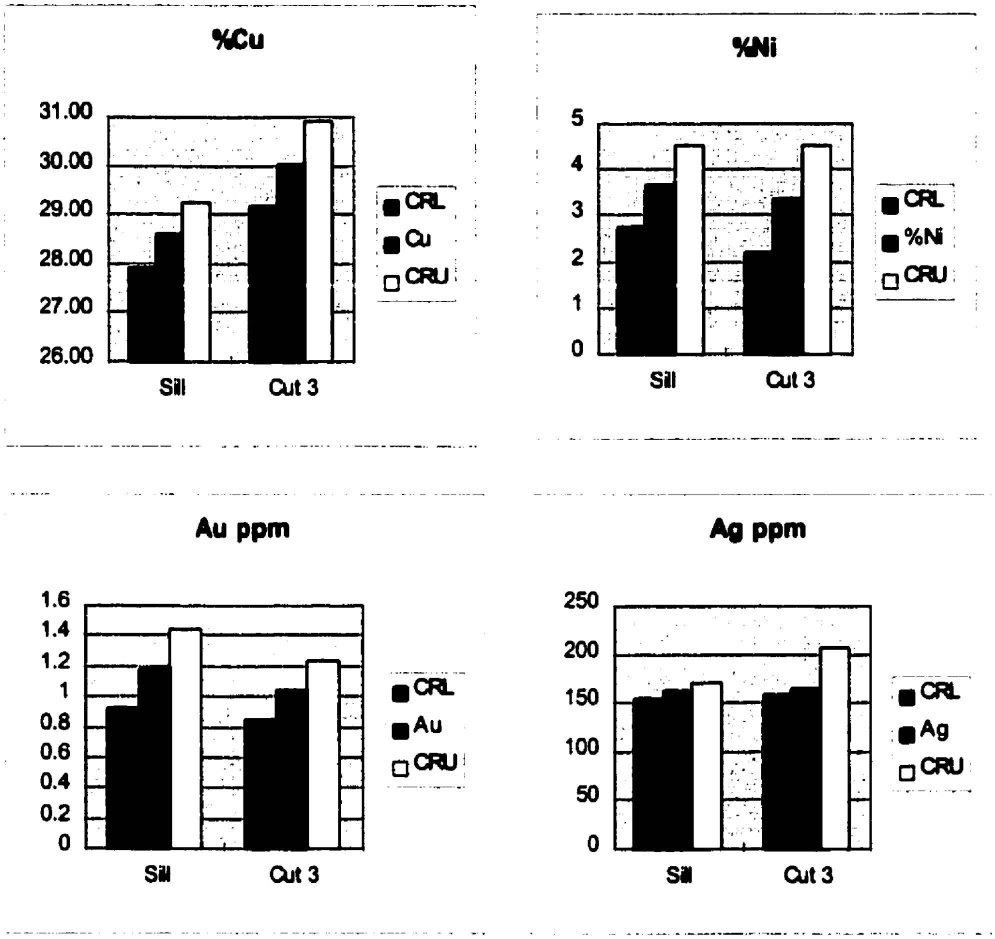


Figure 3 - Comparison between cuts 1 (sill) and 3, 44 level. Central bar is the mean with the adjacent bars showing 95% lower and upper confidence limits.

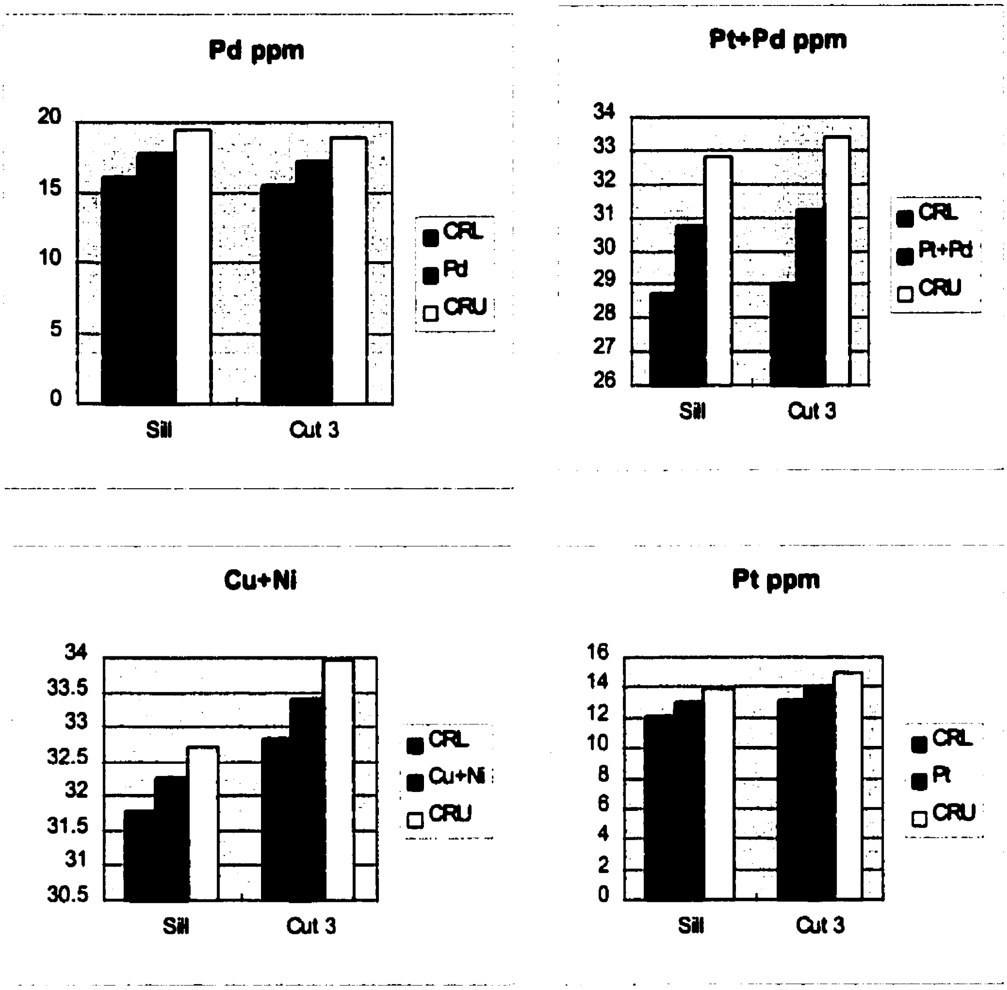


Figure 3 (con't)- Comparison between cuts 1 (sill) and 3. Central bar is the mean with the adjacent bars showing 95% lower and upper confidence limits.

2.2 3-D Distribution - Detailed Results

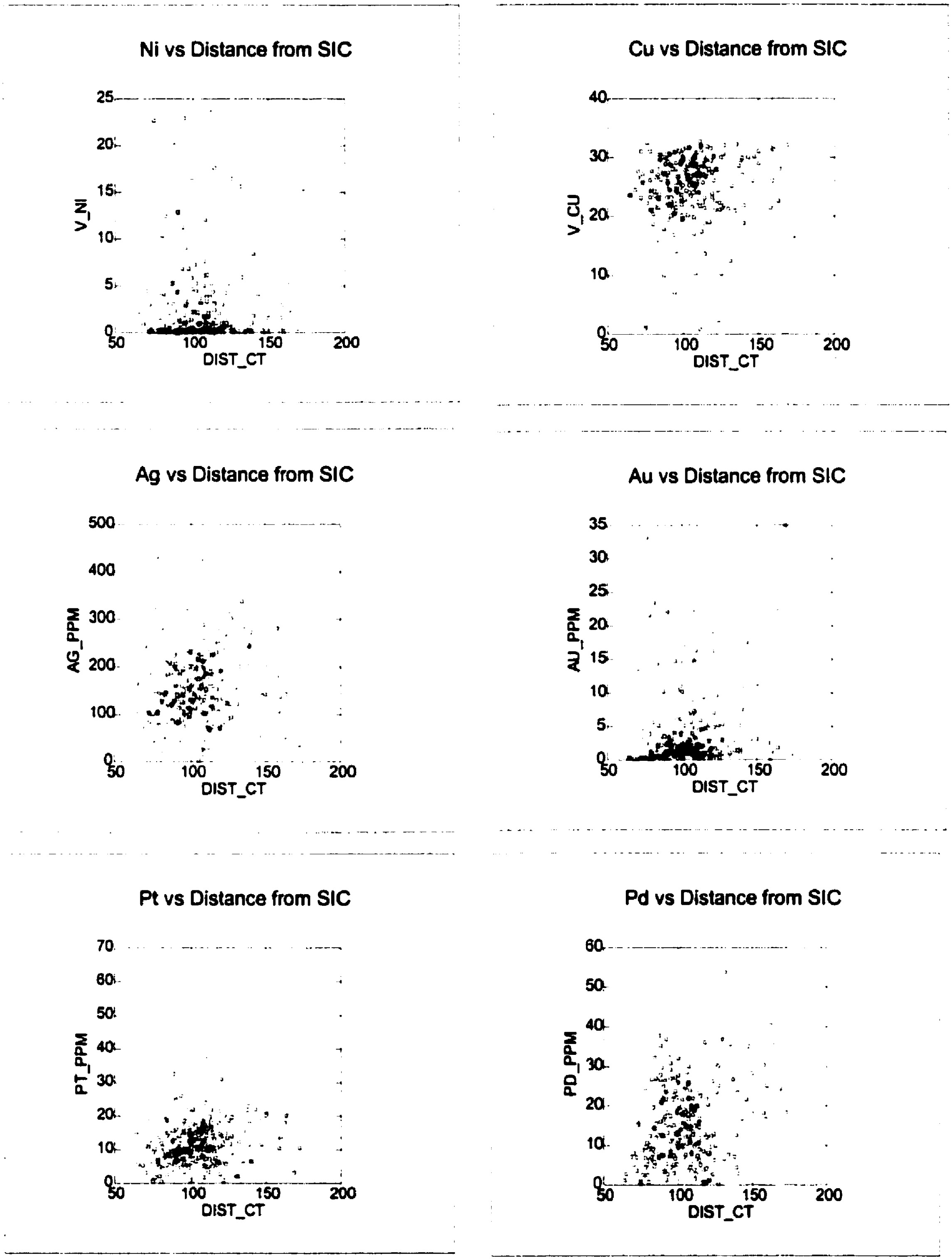


Figure 4 - Scatter diagrams of metals concentrations within massive veins vs. relative distance from the SIC.

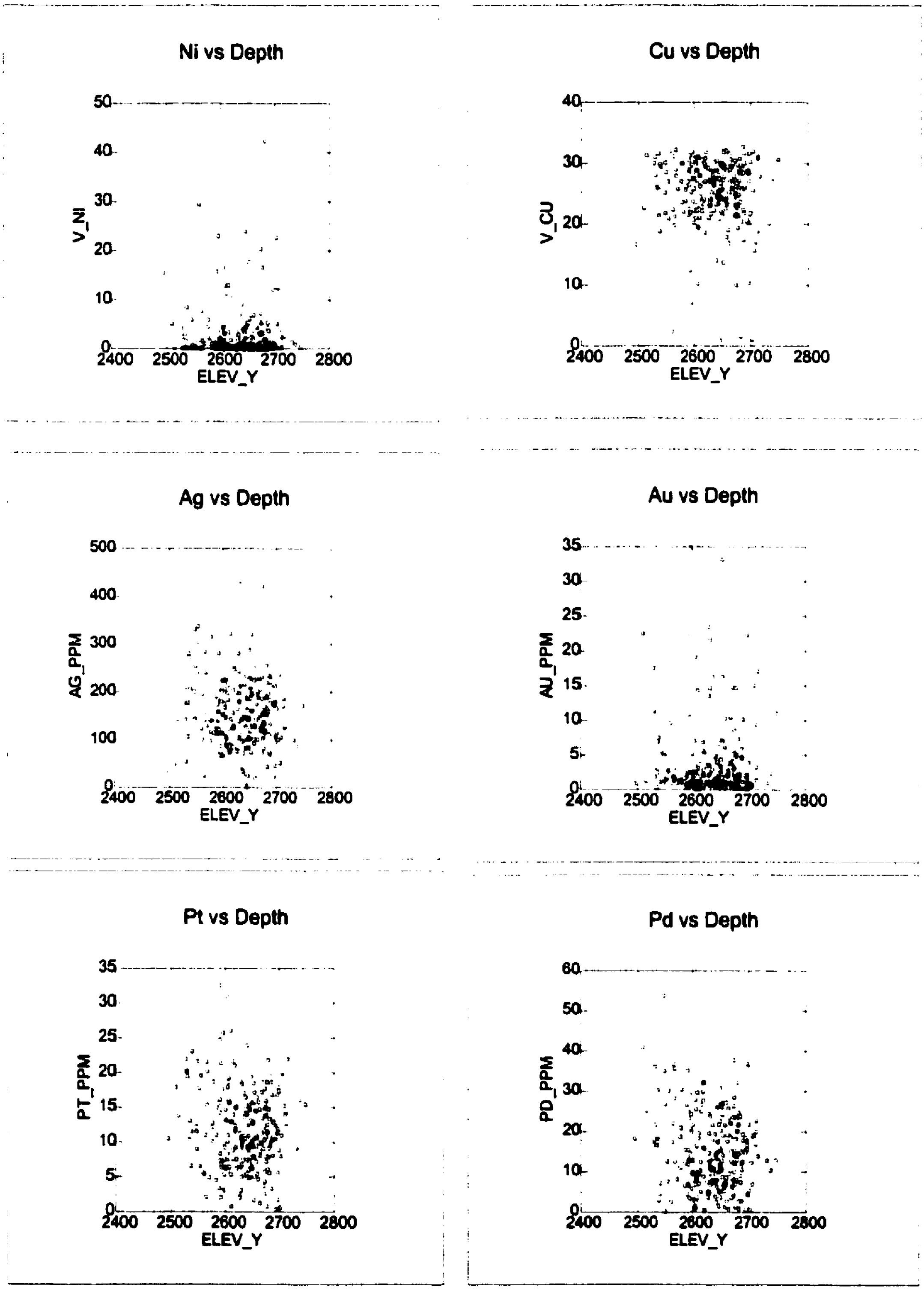


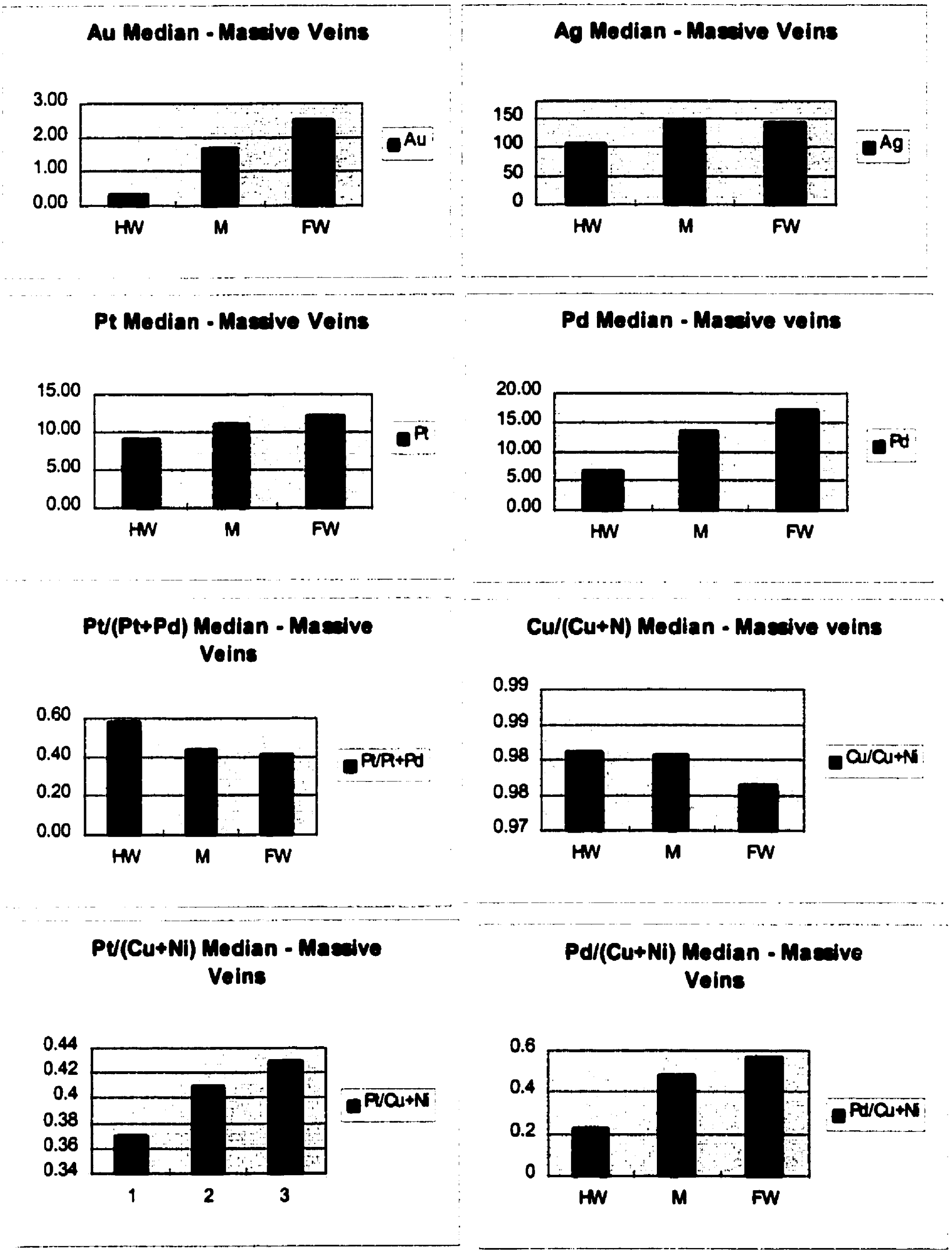
Figure 5 - Scatter diagrams of metal concentrations within massive veins vs. depth.

Comparison of Veins with outliers removed:

See Table 2.

Means	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
HW	1.17	113	9.16	6.24	14.8	0.58	0.96
M	3.30	153	11.85	14.70	26.60	0.47	0.94
FW	3.42	160	12.27	18.79	30.62	0.40	0.95
Median							
HW	0.33	102	9.12	6.04	16.55	0.59	0.98
M	1.65	146	10.95	13.35	26.65	0.44	0.98
FW	1.94	143	11.50	17.30	29.76	0.40	0.98

Table 2 - A comparison of veins found at different structural positions with outliers removed. Outliers removed were determined using binary plots and histograms where samples either fell well outside of clusters or were not part of a continuous distribution on a histogram. The results did not differ significantly from comparisons where outliers were included.



Au Median - Massive Veins

Ag Median - Massive Veins

Pt Median - Massive Veins

Pd Median - Massive veins

Pt/(Pt+Pd) Median - Massive Veins

Cu/(Cu+N) Median - Massive veins

Pt/(Cu+Ni) Median - Massive Veins

Pd/(Cu+Ni) Median - Massive Veins

Figure 6 - Comparisons of median values which helps to reduce the influence of outliers.

2.3 Metal Distribution within Zone 38

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
37	387	2.27	26.14	0.47	3.92	5.94	121	28.41	8.58
37*	386	2.07	26.14	0.37	3.99	7.09	120	28.71	11.08
39	1200	2.45	26.26	0.40	4.25	6.70	141	28.71	9.84
42	264	1.54	29.77	0.38	4.58	6.98	118	31.31	10.75
44**	26	3.35	26.14	1.73	7.48	10.55	150	29.49	18.03

Table 3 - Comparison between the different Zone 38 levels with 44 level included. The continuation of increasing PMs with depth is apparent when including this cut. However the samples are from a partial cut only and should only be compared with that part of other levels. Also, significantly fewer samples are available.

* From Money, 1992

Comparing Ni

When comparing average Ni concentrations it is important to have a proper volumetric proportion of Ni-rich minor veins and major vein terminations, which are actually a different statistical population. (These minor veinlets and vein terminations, which are thinner, and should be sampled such that they are representative of the total mass of the area being averaged, should be considered as a separate population if applying statistical analysis.) There is also a potential for nugget effect to influence means for Ni as it is commonly occurs as coarse grained 1-10cm eyes and is irregularly distributed and hence erratically represented in the data. The thickness of the veins should also be used to weight average the narrower high grade Ni veins to produce an accurate average for a given region of the vein. This would require having all corresponding vein thicknesses for each assay which are not available.

Therefore properly comparing Ni concentrations is difficult. In addition cut off grades have changed in the past and it is possible that 42 level did not mine or sample as many of the narrow Ni-rich vein terminations as 37 or 39 levels. Cu+ Ni, which indirectly reflects decreasing Fe content and is depleted in the core of the levels and higher in the 42 level average, can also be skewed if the sampling proportions are not consistent for each level. The same theory holds for Pt, Pd and Au, if certain regions (see lateral zoning) with high (or low) PM concentrations were sampled in a different proportions the average could be biased.

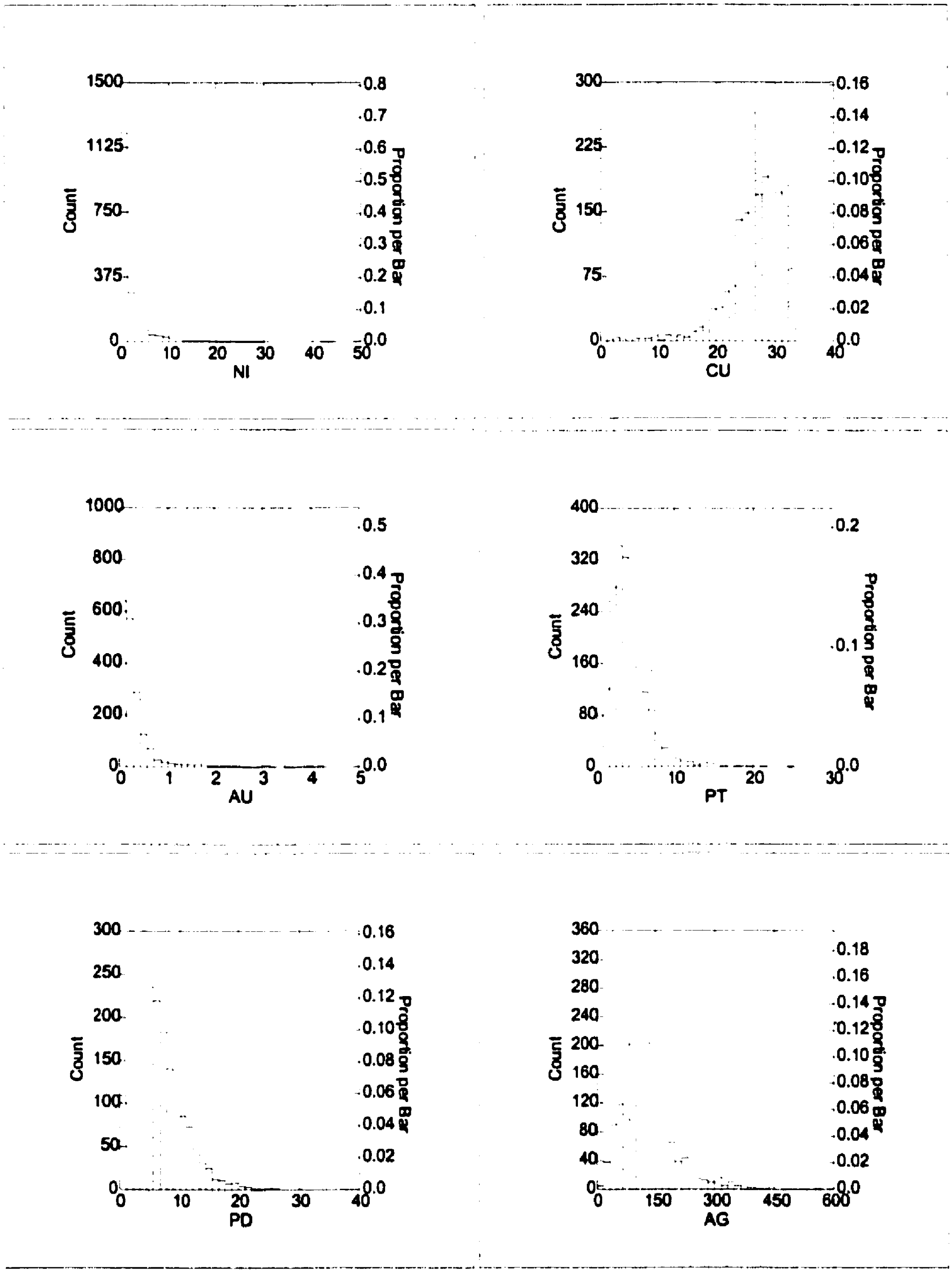


Figure 7 - Zone 38 Histograms : Levels 37, 39 and 42

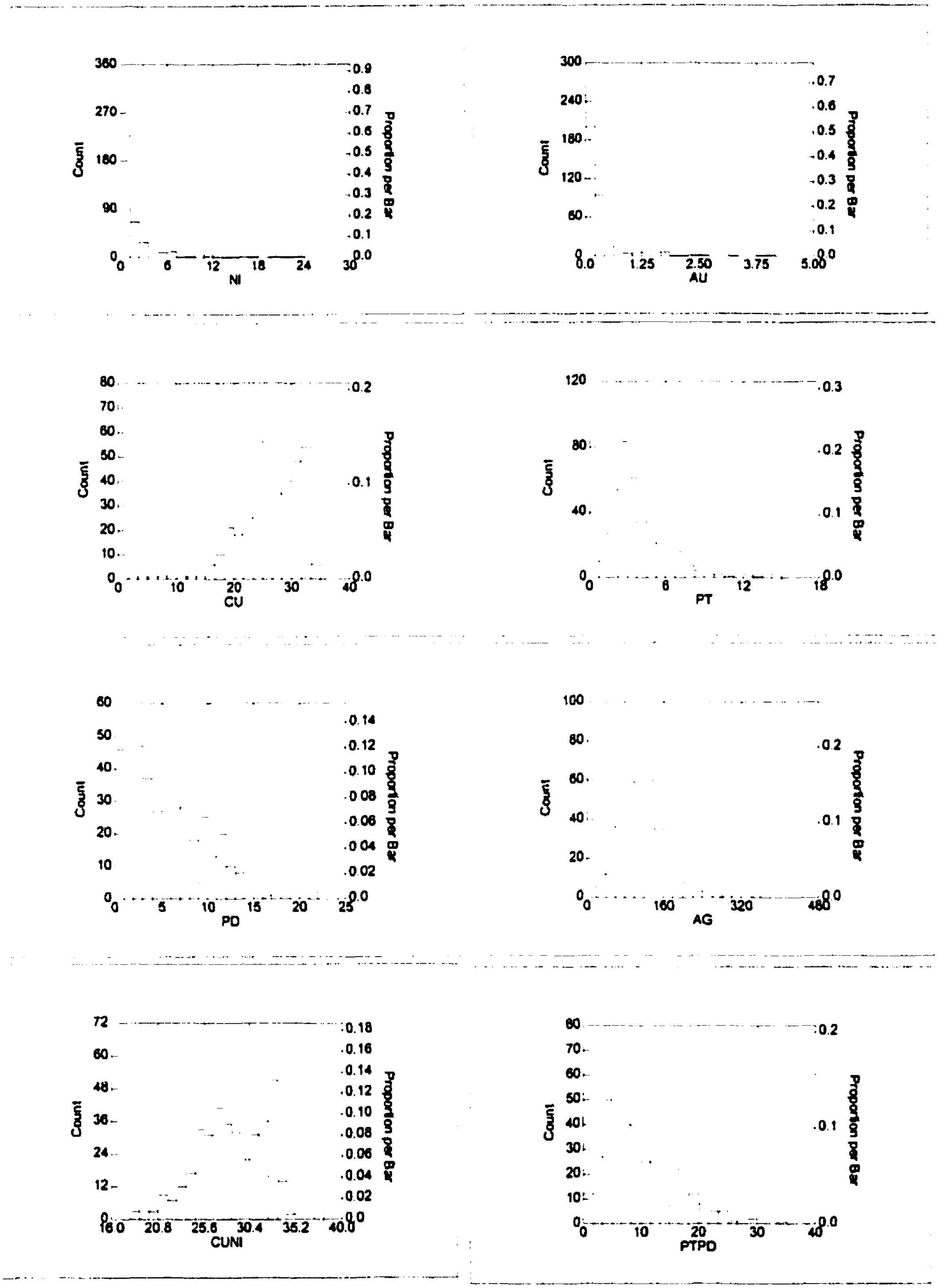


Figure 8 - Zone 38 Histograms: 37 level Only

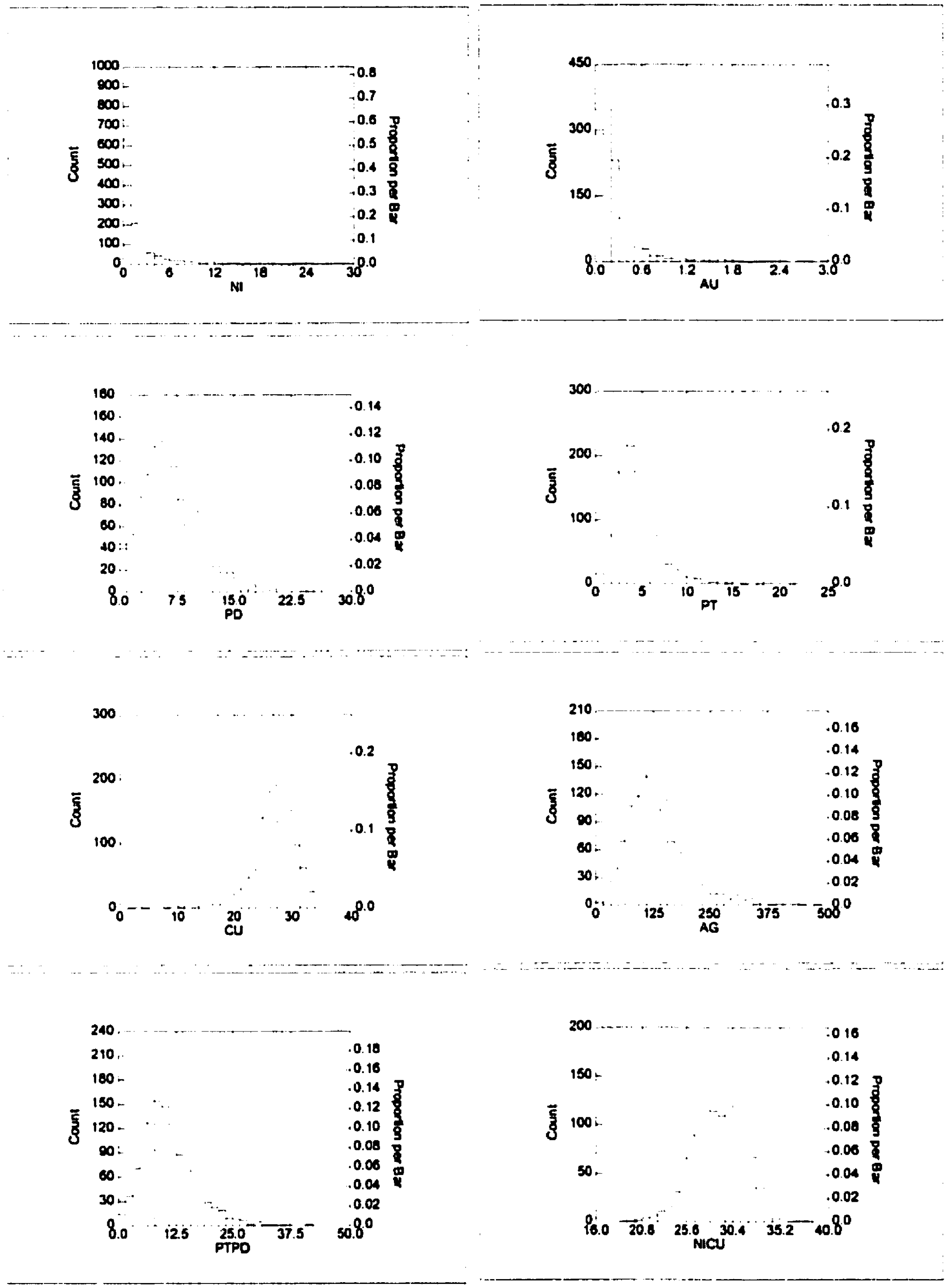


Figure 9 - Zone 38 Histograms: 39 Level Only

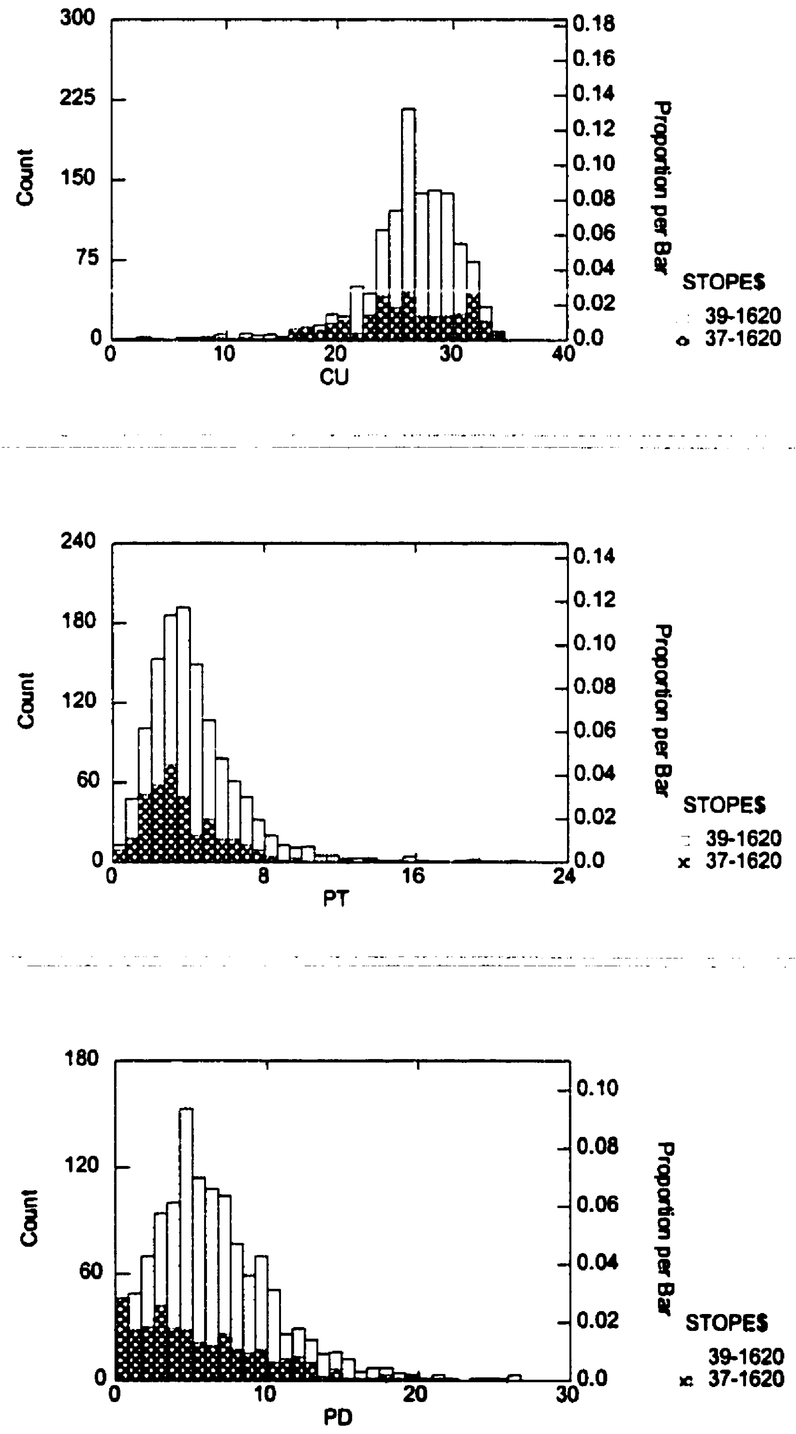


Figure 10 - Zone 38 Histograms: Comparison between 37 and 39 Levels.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
37	387	0.83	26.40	0.20	3.18	5.15	109	27.43	8.33
39	1203	0.93	26.60	0.20	3.78	5.86	120	27.53	9.64
42	264	0.45	30.60	0.20	4.04	6.42	116	31.05	10.52

Table 4 - Comparisons of Medians. Zone 38 Levels 37, 39 and 42.

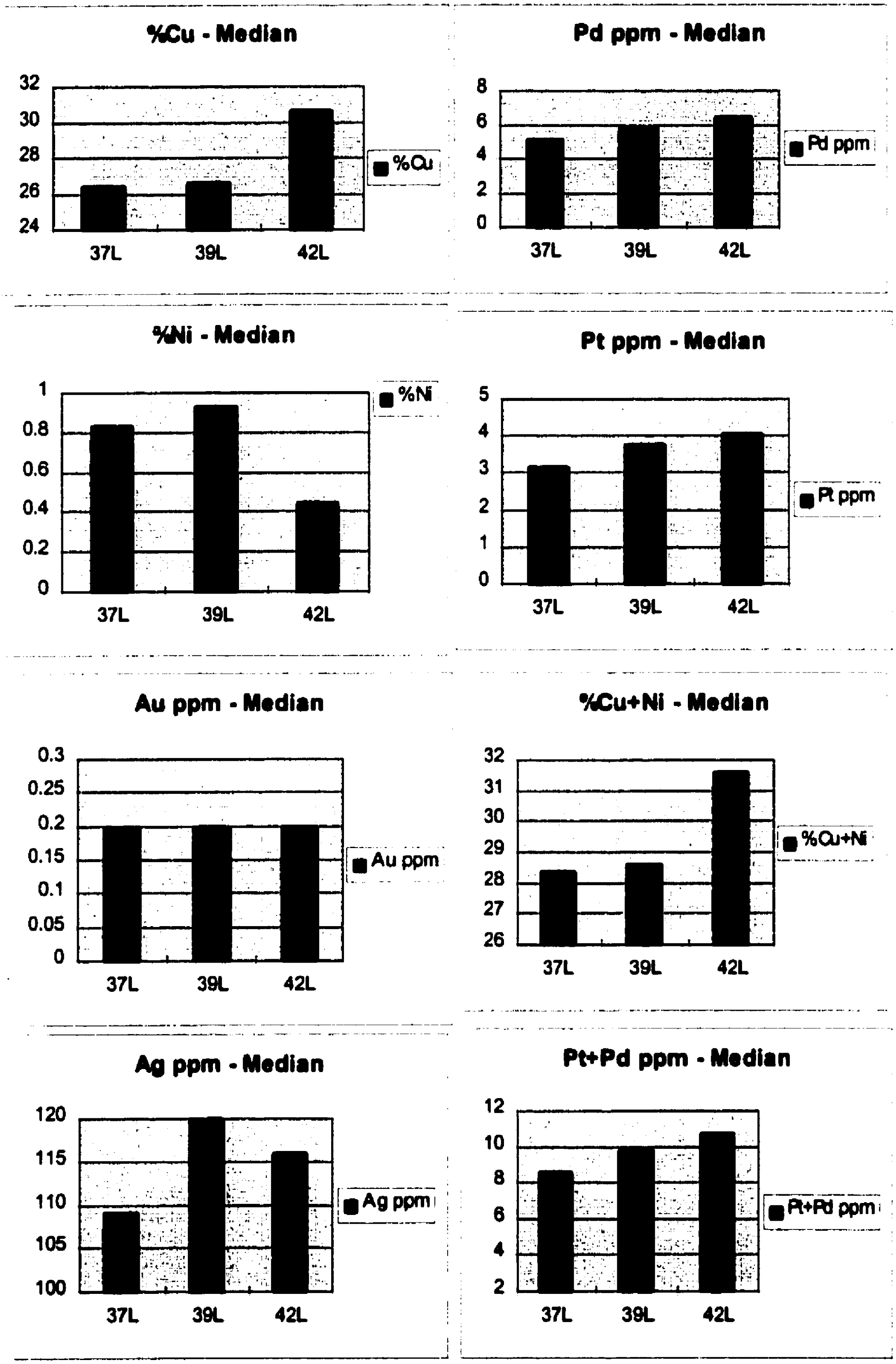


Figure 11 -Zone 38: Comparison of median values for levels 37, 39 and 42.

2.4 Trace Element Distribution - Detailed Results

Reproducibility (analytical):

Based on 5 duplicate samples, reproducibility was calculated (Table 23). Pulps were used, which is a measurement of precision of the analytical technique and doesn't include variations due to sample preparation or sampling variance. With the exception of Pt, As, Bi, Te, and Se duplicates for all elements were within 10% of the original. All elements are expected to have total sampling and local intrinsic variances much higher than these analytical variances due to their low concentrations and nugget effect. Similar concerns experienced in the previous part of the study with respect to local variations and outliers biasing average comparisons are present.

	Pt	Pd	F	Cl	As	Bi	Te	Se	Sn	S	Cu	Ni
% Var	19	0	4	3	111	23	48	25	0	3	10	0

Table 5: Variance in relative % for duplicates (average of 5) vs original.

The following bar graphs (Fig. 12) showing variations in trace element concentrations along a drill hole traversing a cross section across the strike of Zone 39.

Pt, Pd vs Depth

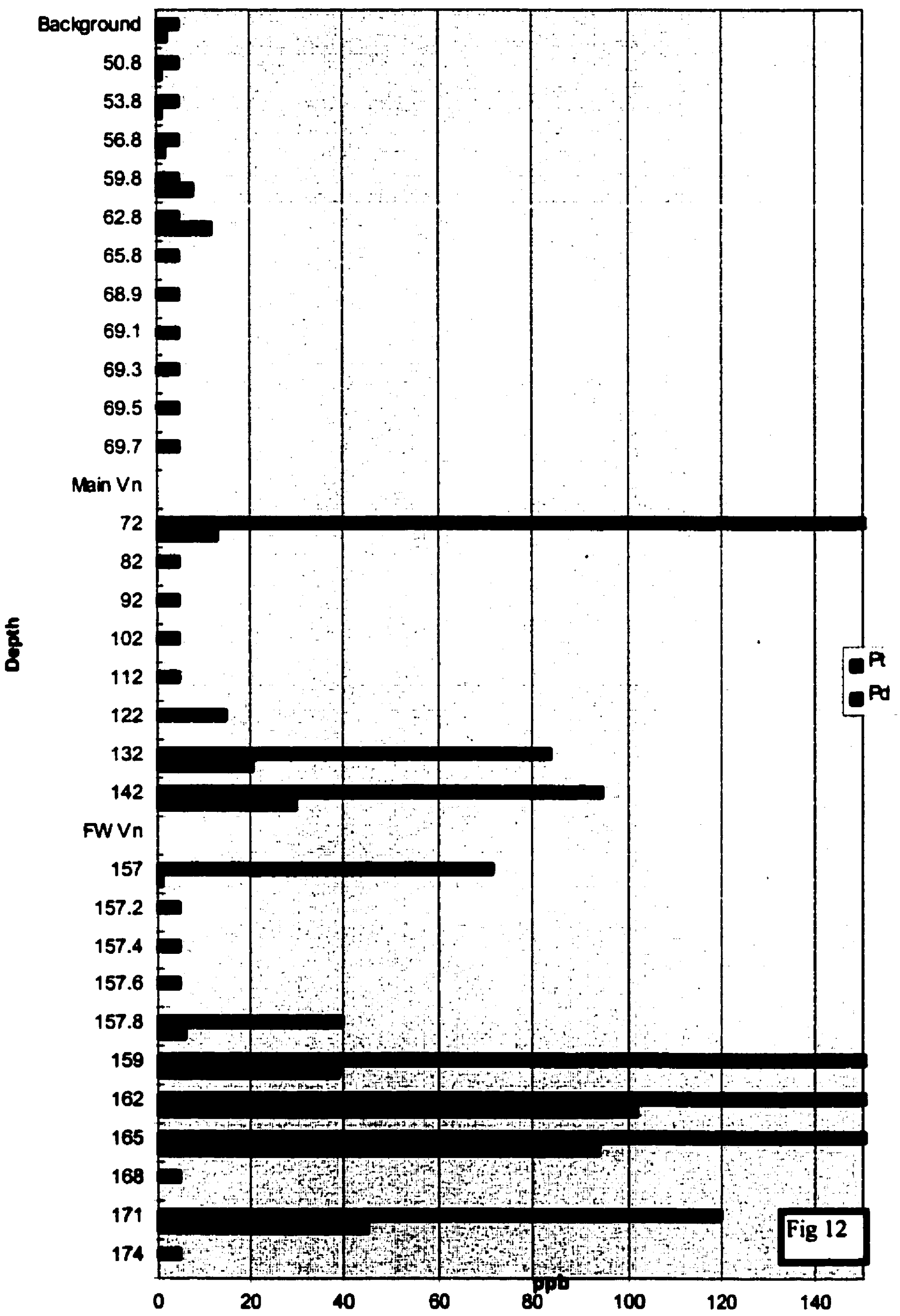


Fig 12

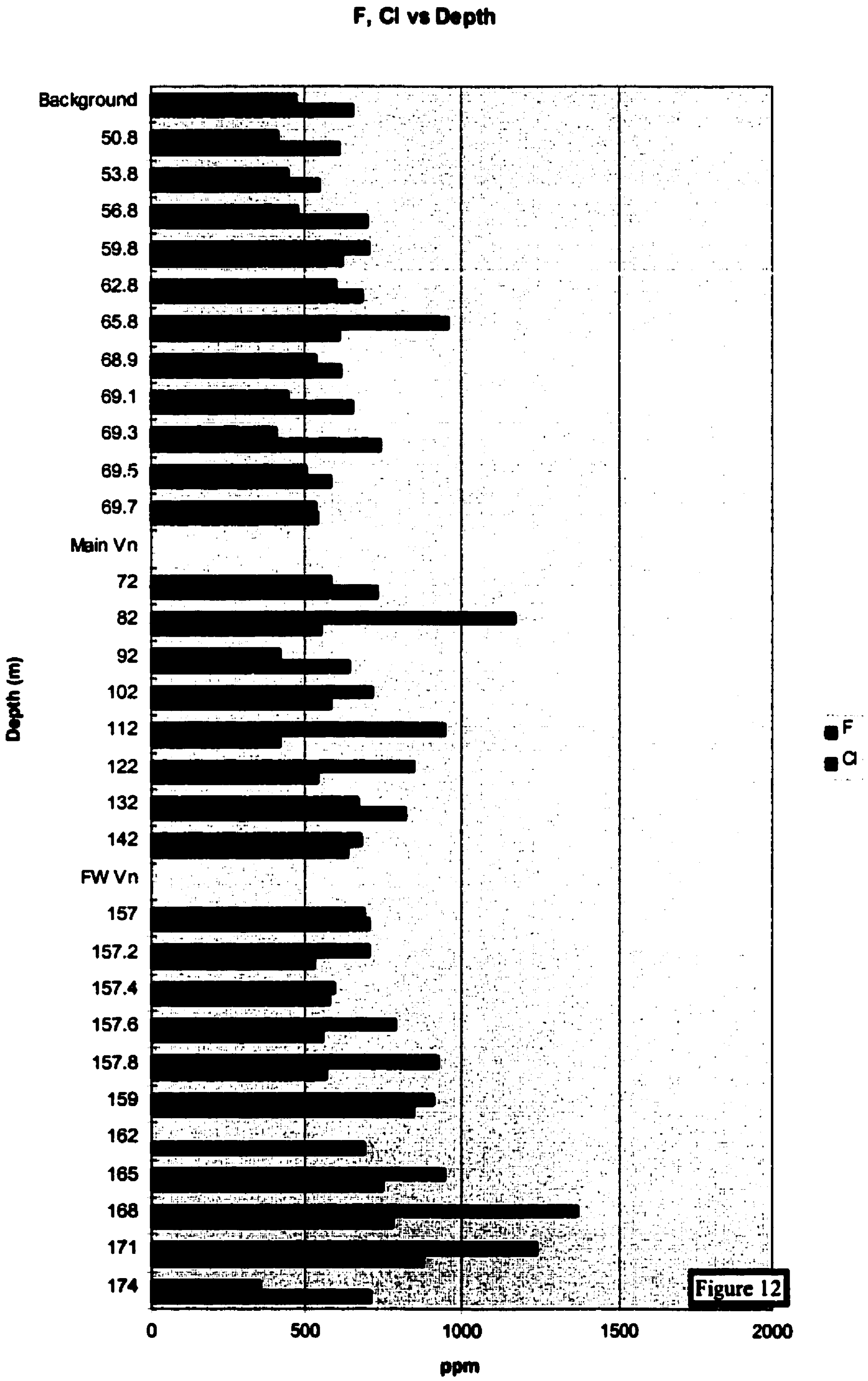

F, Cl vs Depth
Depth (m)
Background
50.8
53.8
56.8
59.8
62.8
65.8
68.9
69.1
69.3
69.5
69.7
Main Vn
72
82
92
102
112
122
132
142
FW Vn
157
157.2
157.4
157.6
157.8
159
162
165
168
171
174
0
500
1000
1500
2000
ppm
F
Cl

Figure 12

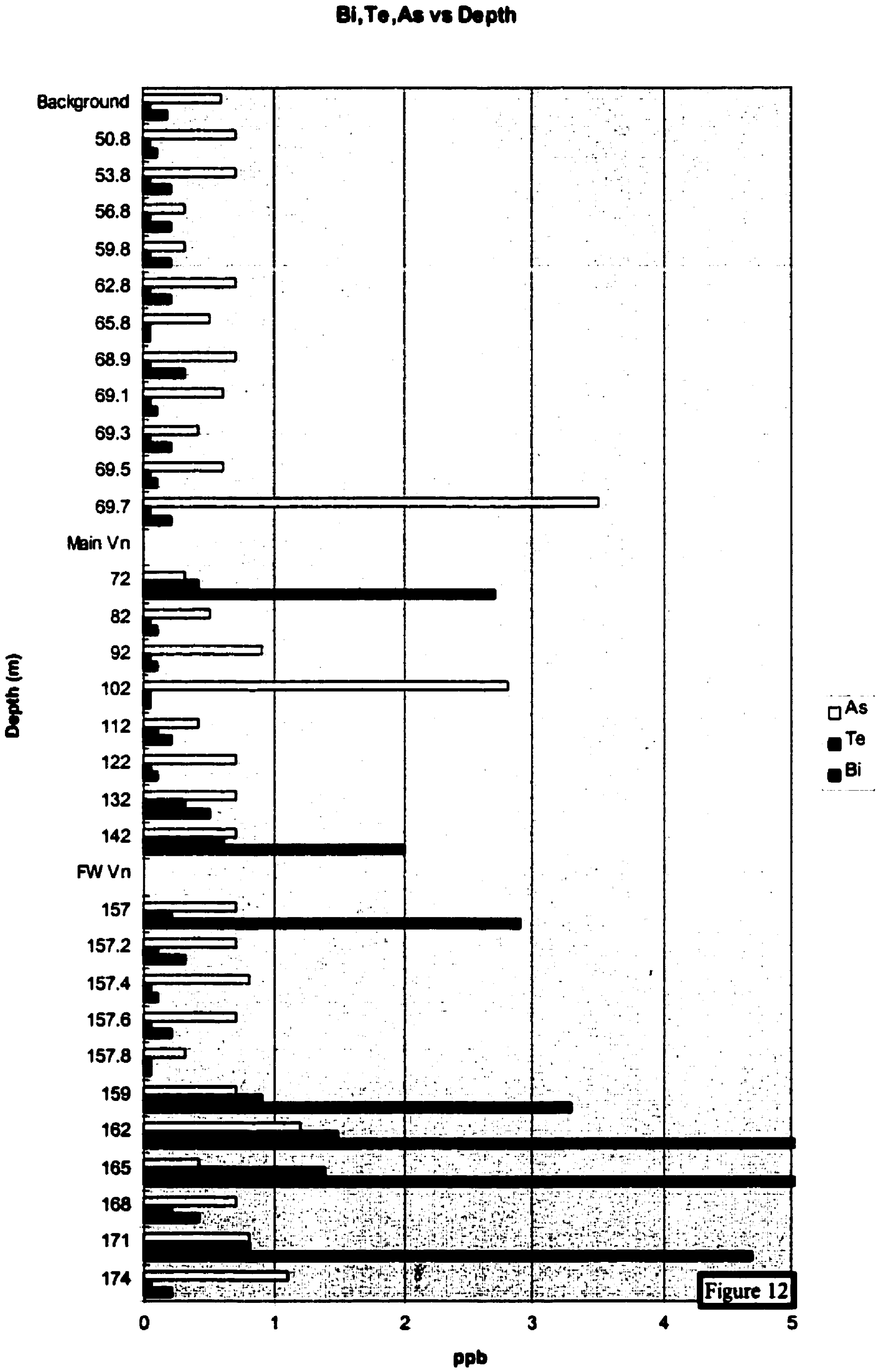

Bi,Te,As vs Depth
Depth (m)
Background
50.8
53.8
56.8
59.8
62.8
65.8
68.9
69.1
69.3
69.5
69.7
Main Vn
72
82
92
102
112
122
132
142
FW Vn
157
157.2
157.4
157.6
157.8
159
162
165
168
171
174
0
1
2
3
4
5
ppb
As
Te
Bi

Figure 12

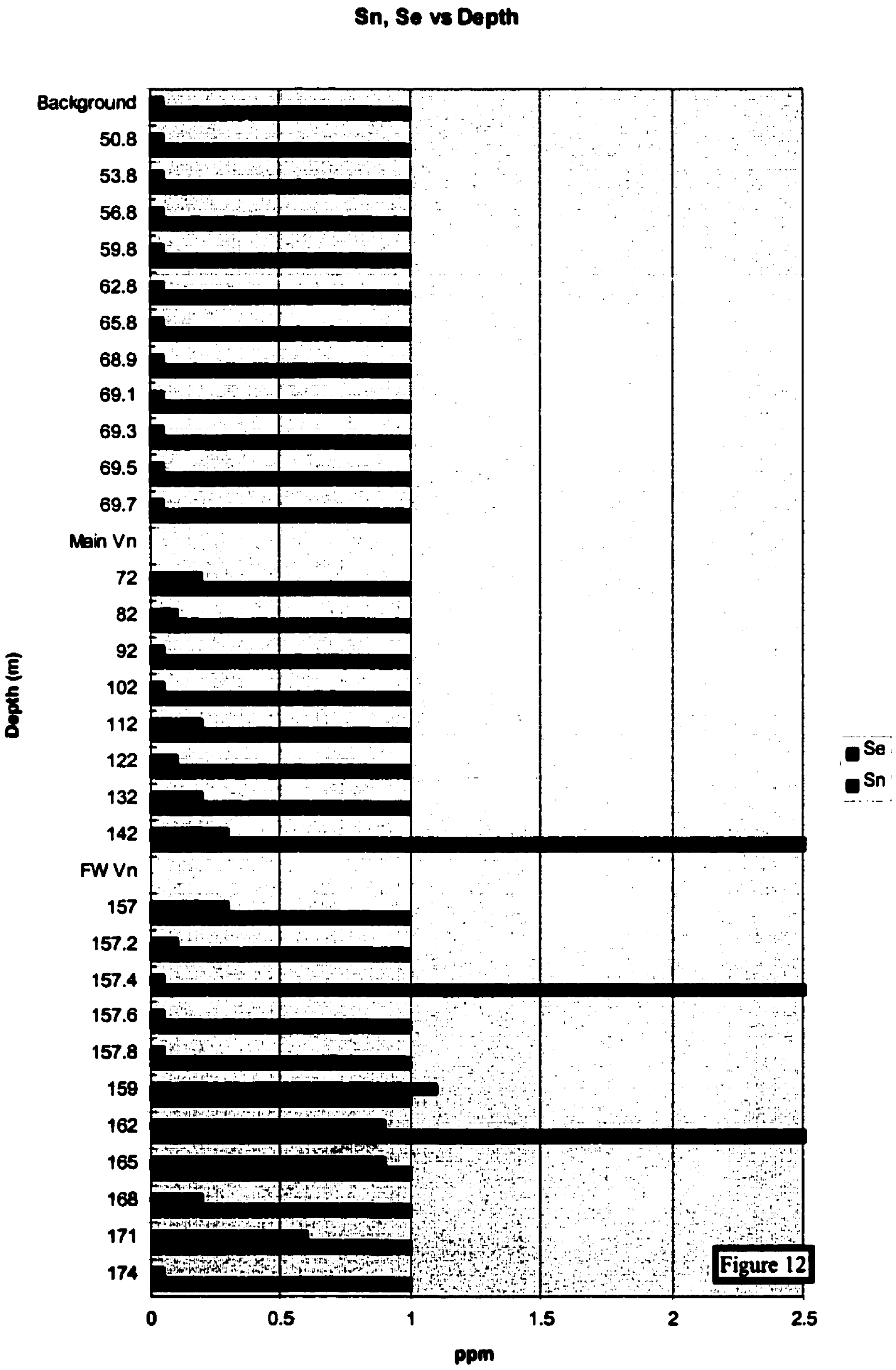

Sn, Se vs Depth
Depth (m)
Background
50.8
53.8
56.8
59.8
62.8
65.8
68.9
69.1
69.3
69.5
69.7
Main Vn
72
82
92
102
112
122
132
142
FW Vn
157
157.2
157.4
157.6
157.8
159
162
165
168
171
174
0
0.5
1
1.5
2
2.5
ppm
Se
Sn

Figure 12

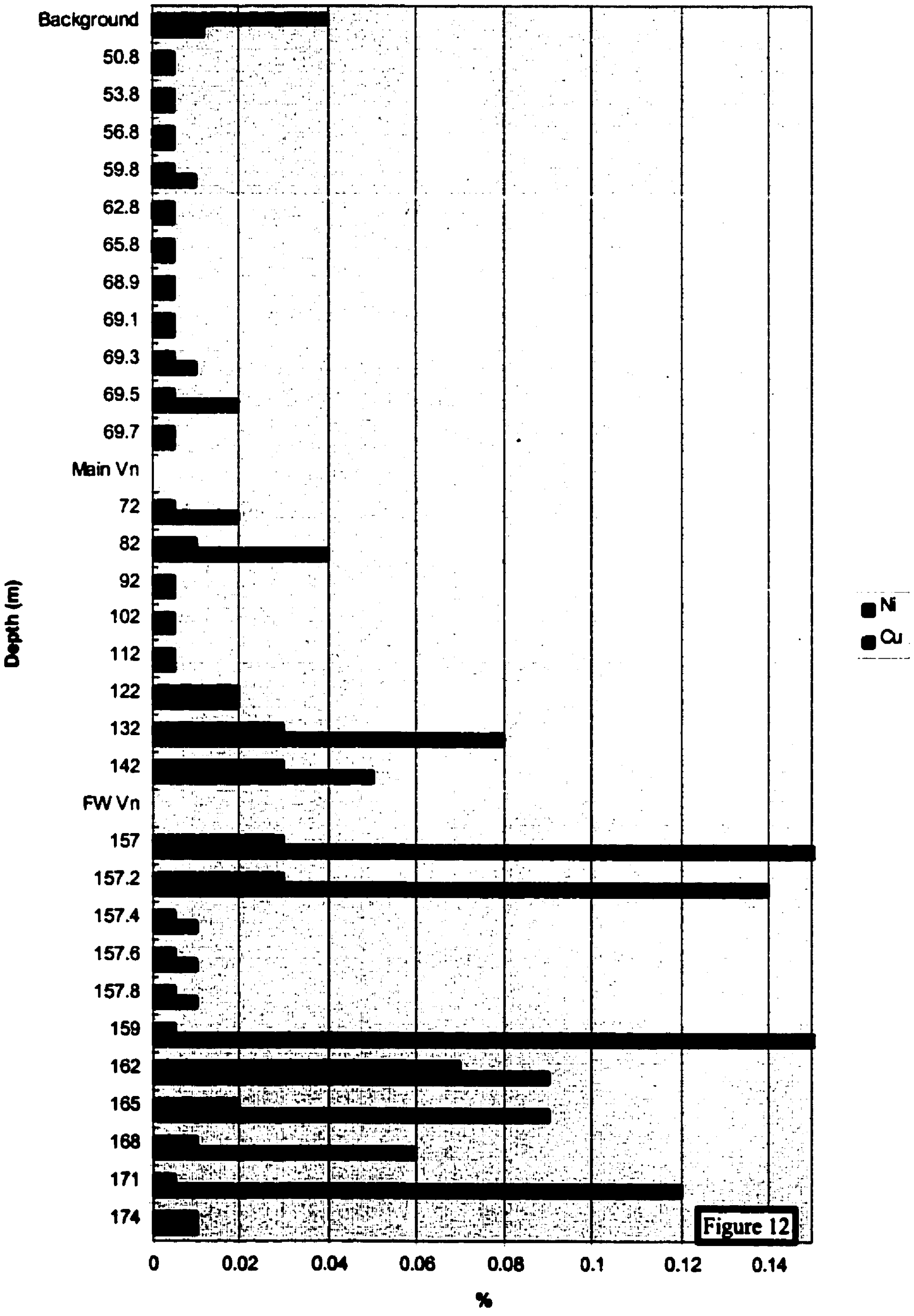

Cu, Ni vs Depth

Figure 12

Precious Metal Traverse Between Zone 39 and PM occurrence:

The following bar graphs (Fig. 13) show metals and ratios vs distance for a sample traverse from the P5 vein which is the furthest extending vein into the footwall (farthest from SIC contact), and a precious metal occurrence located 30m further into the footwall.

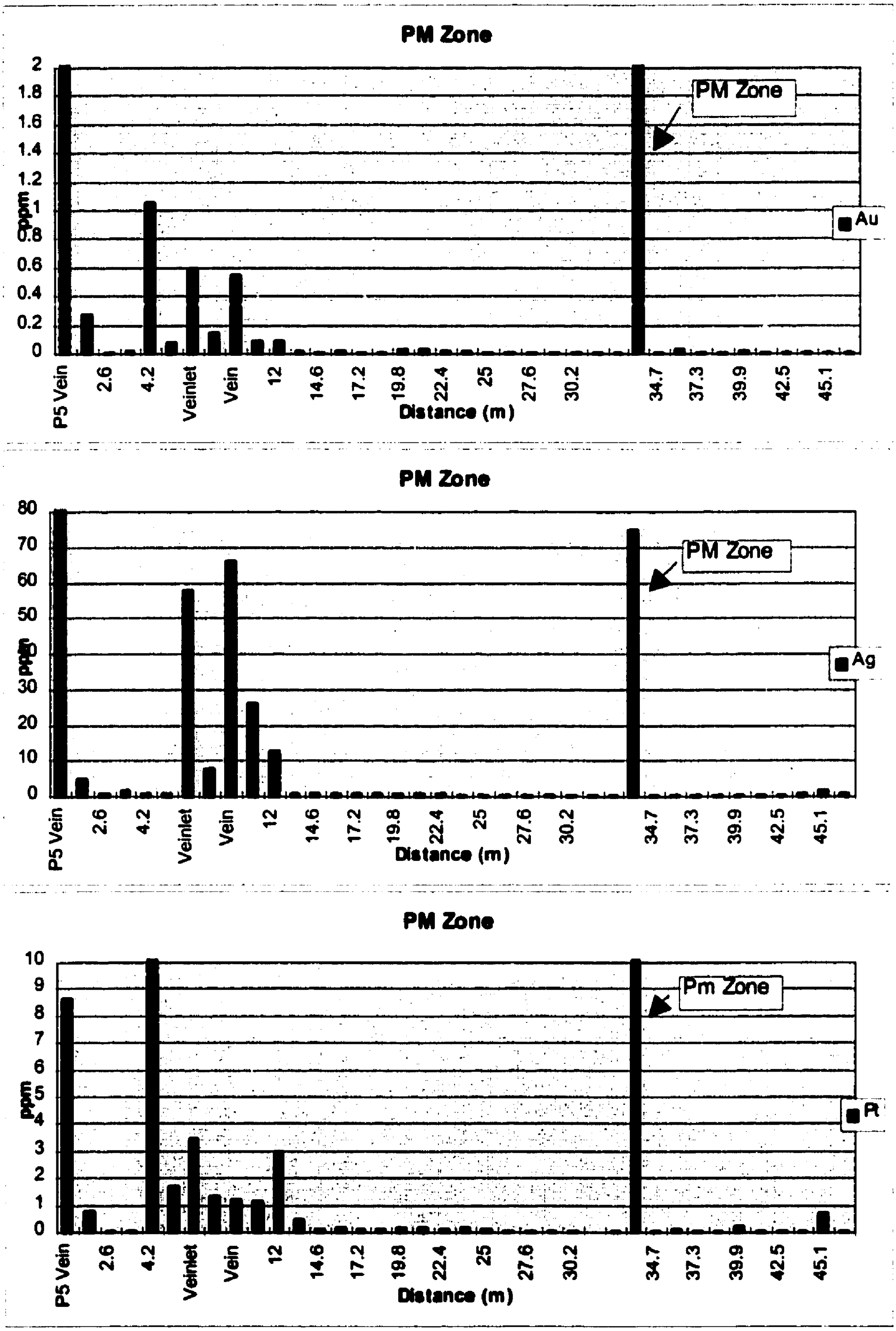


Figure 13 -Bar graphs showing PM traverse towards PM Occurrence.

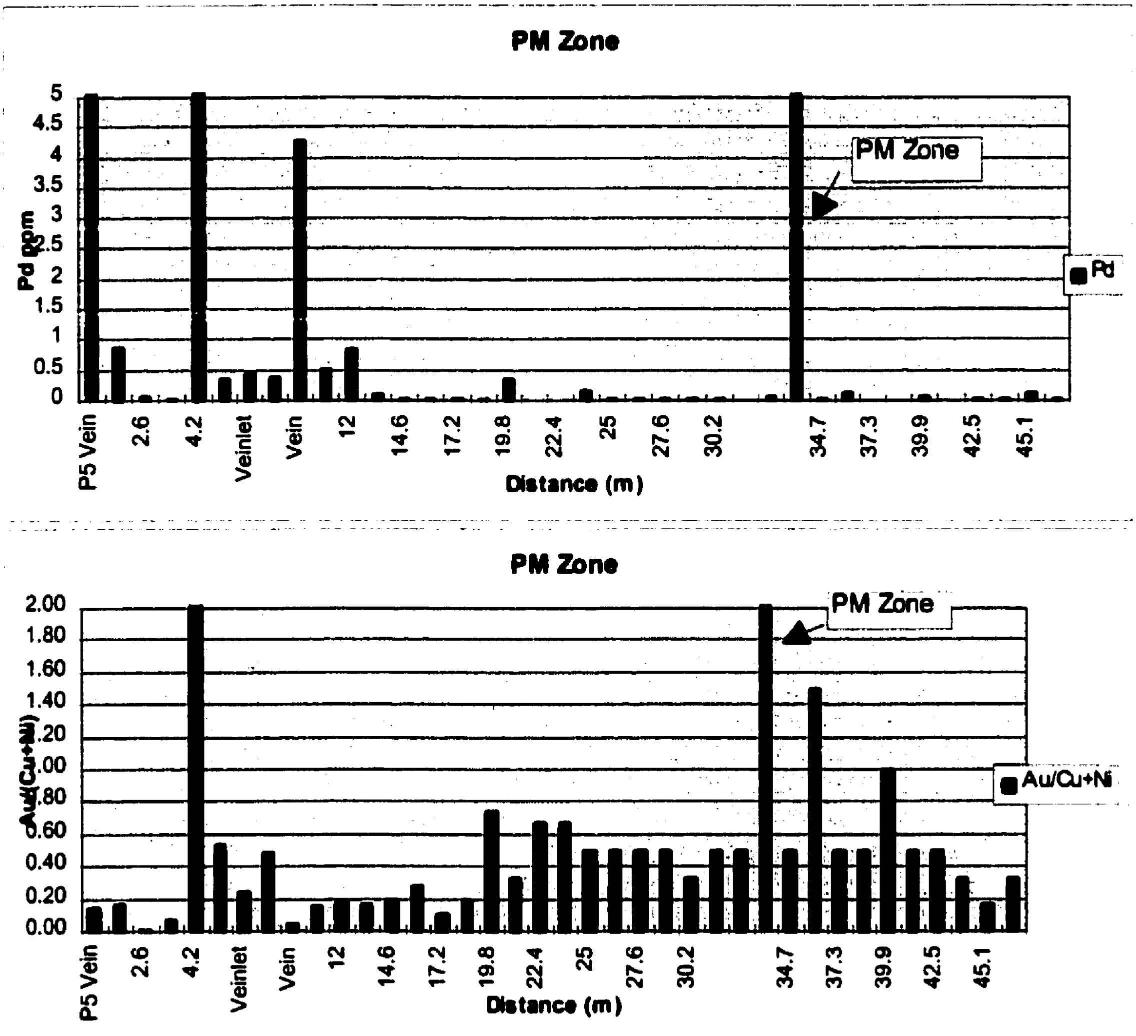
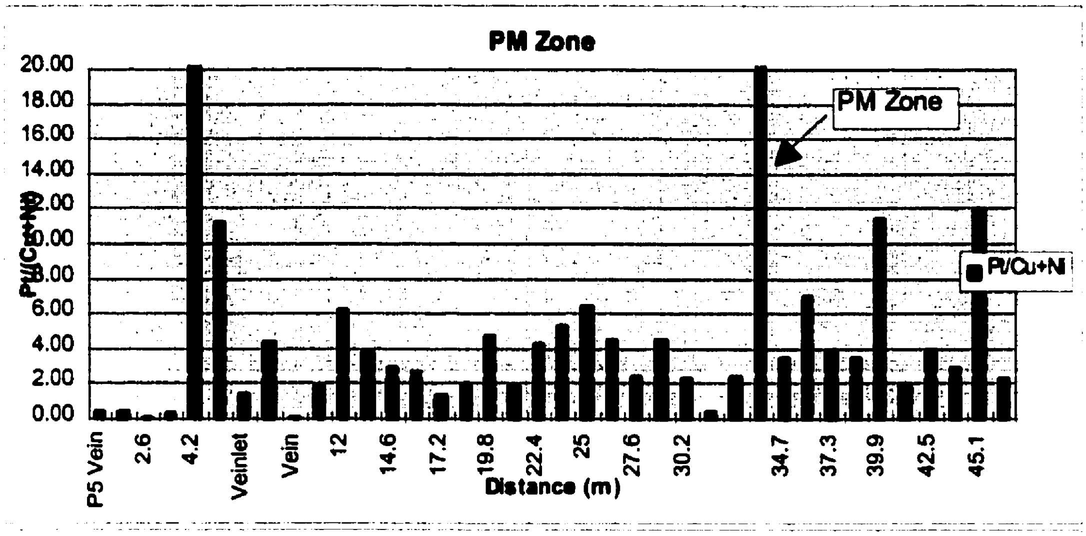


Figure 13(con't)



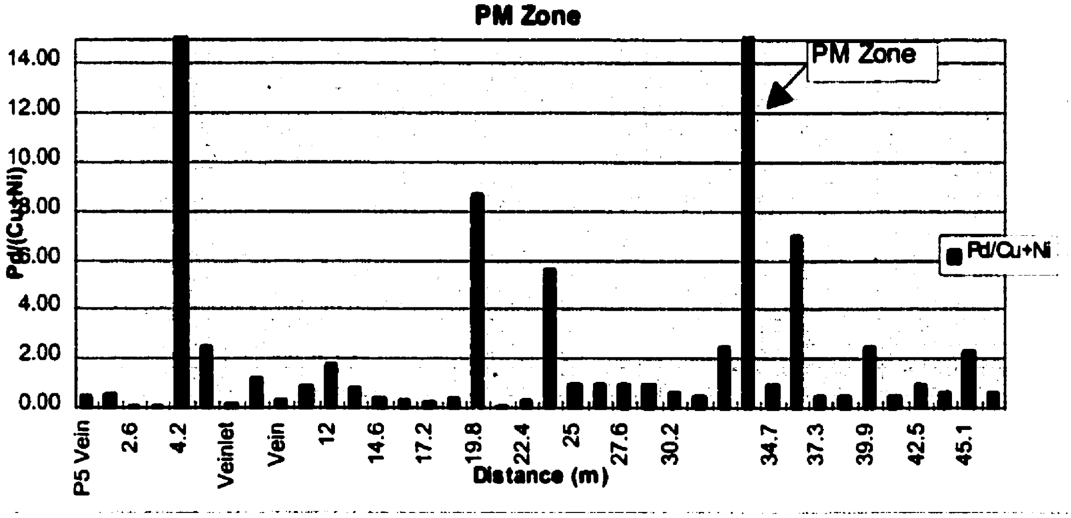


Figure 13 (con't)

PM Traverse Across vertical x-section of Zone 39:

The following two pages illustrate (Figure 14) PM variations along a vertical cross section (taken as a continuous sampling traverse) perpendicular to the strike of Zone 39. (See following page also)

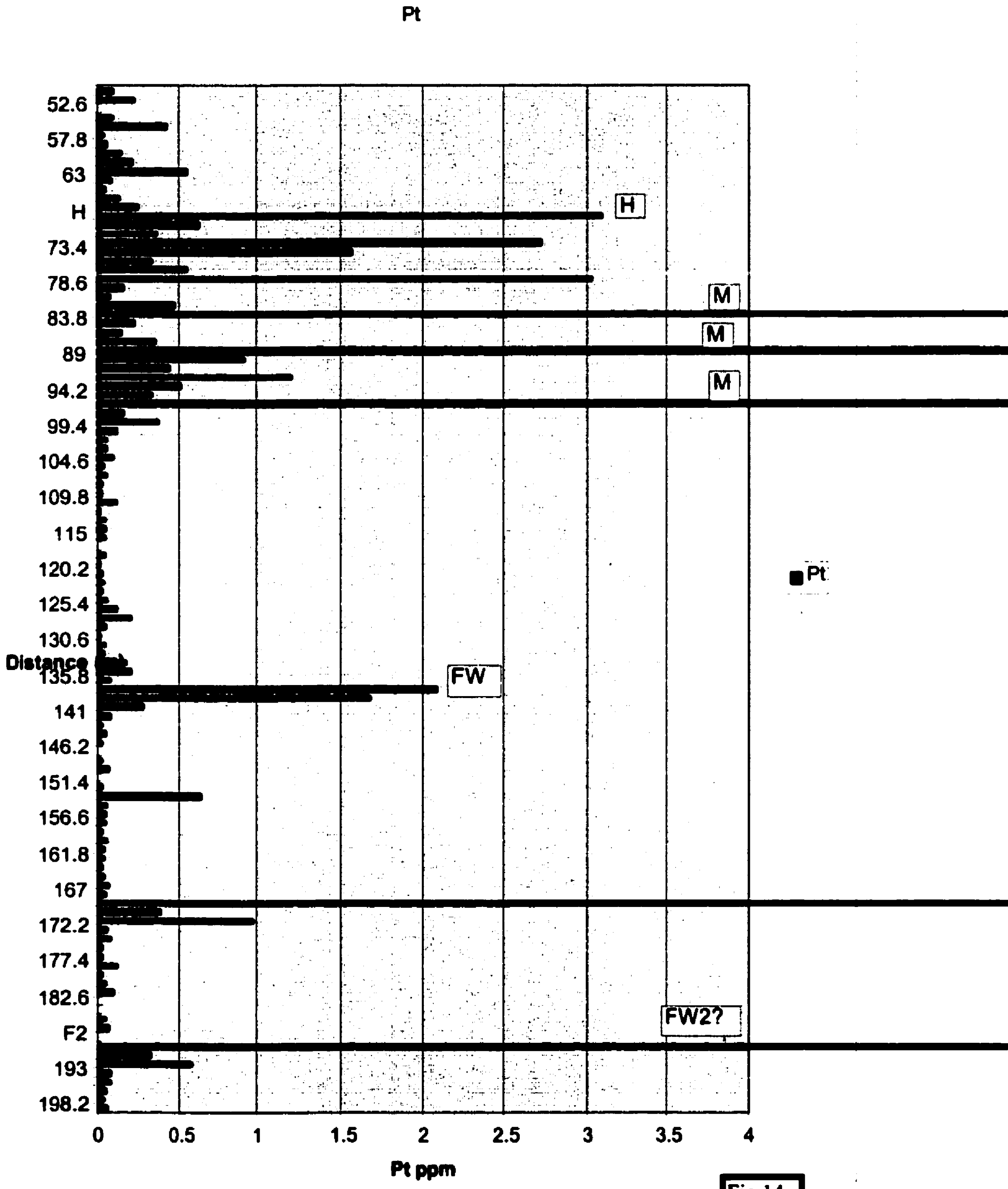

Pt
52.6
57.8
63
H
73.4
78.6
83.8
89
94.2
99.4
104.6
109.8
115
120.2
125.4
130.6
Distance
135.8
141
146.2
151.4
156.6
161.8
167
172.2
177.4
182.6
F2
193
198.2
0
0.5
1
1.5
2
2.5
3
3.5
4
Pt ppm
H
M
M
M
FW
FW2?
■ Pt

Fig 14

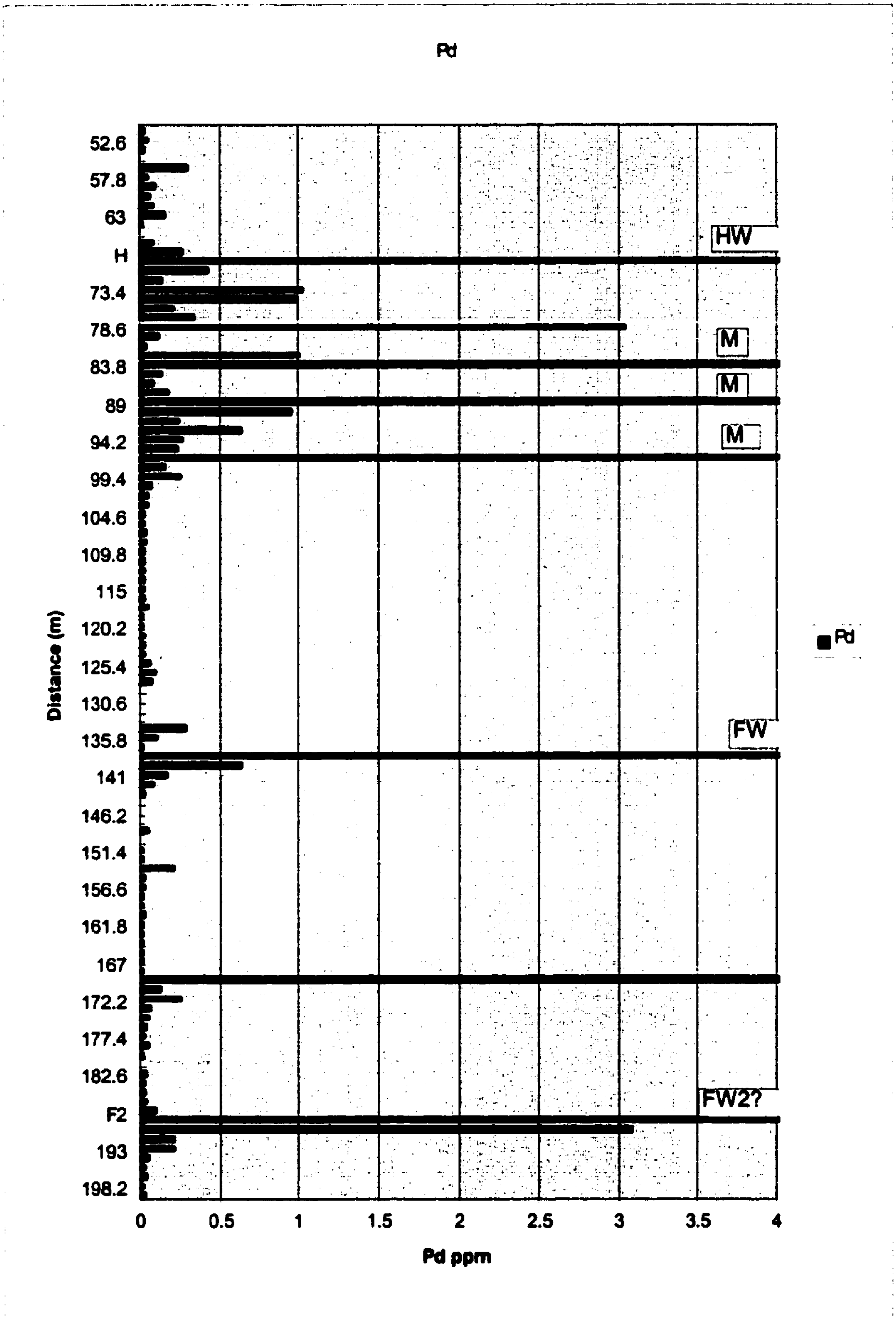


Figure 14 (con't) - Bar graphs showing PM traverse along a x-section.(Zone 39)

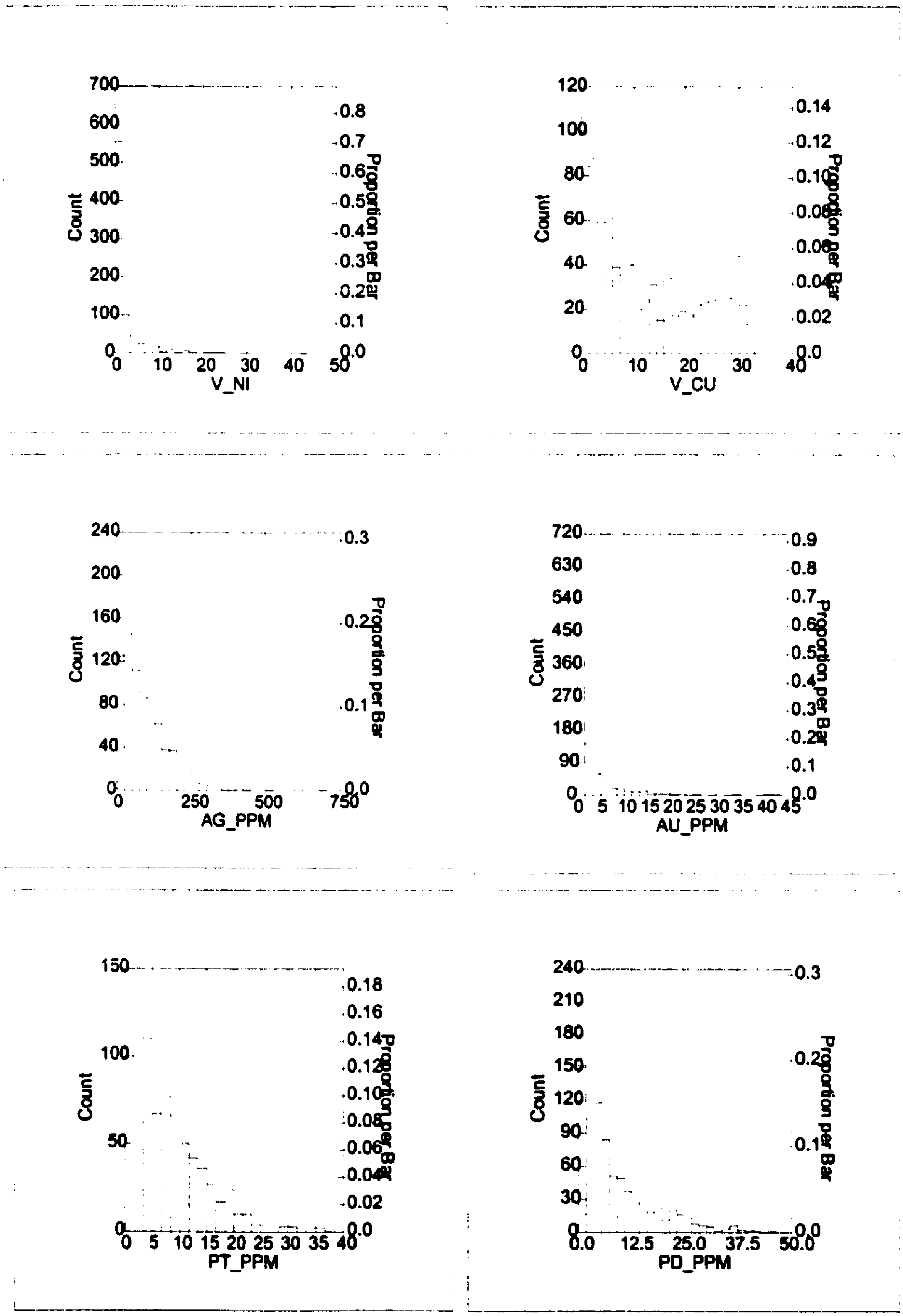


Figure 15 - Histograms of all Drill hole assays (mass, semi-mass and mineralization)

Mass- SM-
Minz

[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
dip dist	1.00								
Dist. To Ct	0.17	1.00							
% Ni	-0.02	-0.02	1.00						
% Cu	0.02	-0.11	-0.10	1.00					
% S	-0.05	-0.03	-0.02	0.91	1.00				
Ag ppm	0.00	-0.12	-0.08	**0.21**	0.07	1.00			
Au ppm	-0.01	0.02	-0.01	-0.05	0.04	**0.13**	1.00		
Pt ppm	0.03	**0.16**	-0.02	**0.26**	0.32	0.08	0.00	1.00	
Pd ppm	0.04	**0.11**	0.00	**0.35**	0.13	0.06	0.00	**0.27**	1.00
Cu Eq	0.01	-0.02	0.65	0.57	0.50	0.18	0.20	0.43	0.42
PT+Pd	0.04	**0.16**	-0.01	**0.38**	0.23	0.08	0.00	0.67	0.89
Cu+Ni	0.02	-0.12	0.26	0.93	0.94	0.18	-0.05	0.24	0.33
Pt/Pt+Pd	-0.03	0.01	0.04	-0.28	-0.12	-0.03	-0.07	0.23	-0.39
Cu/Cu+Ni	0.05	-0.06	-0.70	0.47	0.16	0.20	-0.02	0.15	0.15
Pt/Cu+Ni	-0.01	**0.20**	-0.10	-0.24	-0.10	-0.07	-0.02	0.39	-0.02
Pd/Cu+Ni	0.00	**0.25**	-0.14	-0.26	-0.08	-0.08	0.02	0.33	0.34
Pt+Pd/Cu+Ni	-0.01	**0.22**	-0.12	-0.26	-0.10	-0.08	-0.01	0.39	0.07

Table 6 - Correlations for all drill assays.

	dip dist	*Dist. To Ct*	*% Ni*	*% Cu*	*% S*	*Cu+S*	*Ag ppm*	*Au ppm*	*Pt ppm*	*Pd ppm*
dip dist	1.00									
Dist. To Ct	0.18	1.00								
% Ni	0.01	-0.01	1.00							
% Cu	0.03	0.09	-0.77	1.00						
% S	-0.02	0.03	-0.21	0.75	1.00					
Cu+S	-0.01	0.05	-0.51	0.95	0.92	1.00				
Ag ppm	0.05	**0.13**	**-0.27**	**0.38**	0.31	0.36	1.00			
Au ppm	-0.03	**0.11**	-0.02	0.07	-0.10	-0.02	**0.24**	1.00		
Pt ppm	0.05	**0.27**	-0.09	**0.14**	0.15	0.13	**0.14**	0.04	1.00	
Pd ppm	0.08	**0.27**	**-0.20**	**0.32**	0.22	0.27	0.09	0.02	**0.30**	1.00
Cu Eq	0.03	**0.16**	**0.86**	-0.46	0.10	-0.14	-0.05	**0.24**	**0.27**	**0.10**
Cu+Ni	0.06	**0.13**	0.27	0.42	0.78	0.70	**0.19**	0.06	0.09	0.20
Pt/Pt+Pd	0.02	-0.04	**0.17**	**-0.21**	-0.05	-0.10	0.04	-0.03	0.34	-0.65
Cu/Cu+Ni	-0.06	-0.07	-0.99	0.74	0.25	0.56	**0.24**	0.00	0.04	0.15
North (X)	-0.99	-0.03	-0.01	-0.02	0.03	0.02	-0.03	0.05	-0.01	-0.04
Elev (Y)	-0.94	-0.47	-0.01	-0.06	0.00	-0.01	-0.10	0.00	**-0.12**	**-0.15**
East (Section)	-0.48	-0.39	0.02	-0.08	-0.02	-0.02	-0.03	-0.01	**-0.23**	**-0.25**

Df = 248

95% Conf > **0.126**

Table 7 - Correlation coefficients for massive drill hole assays.

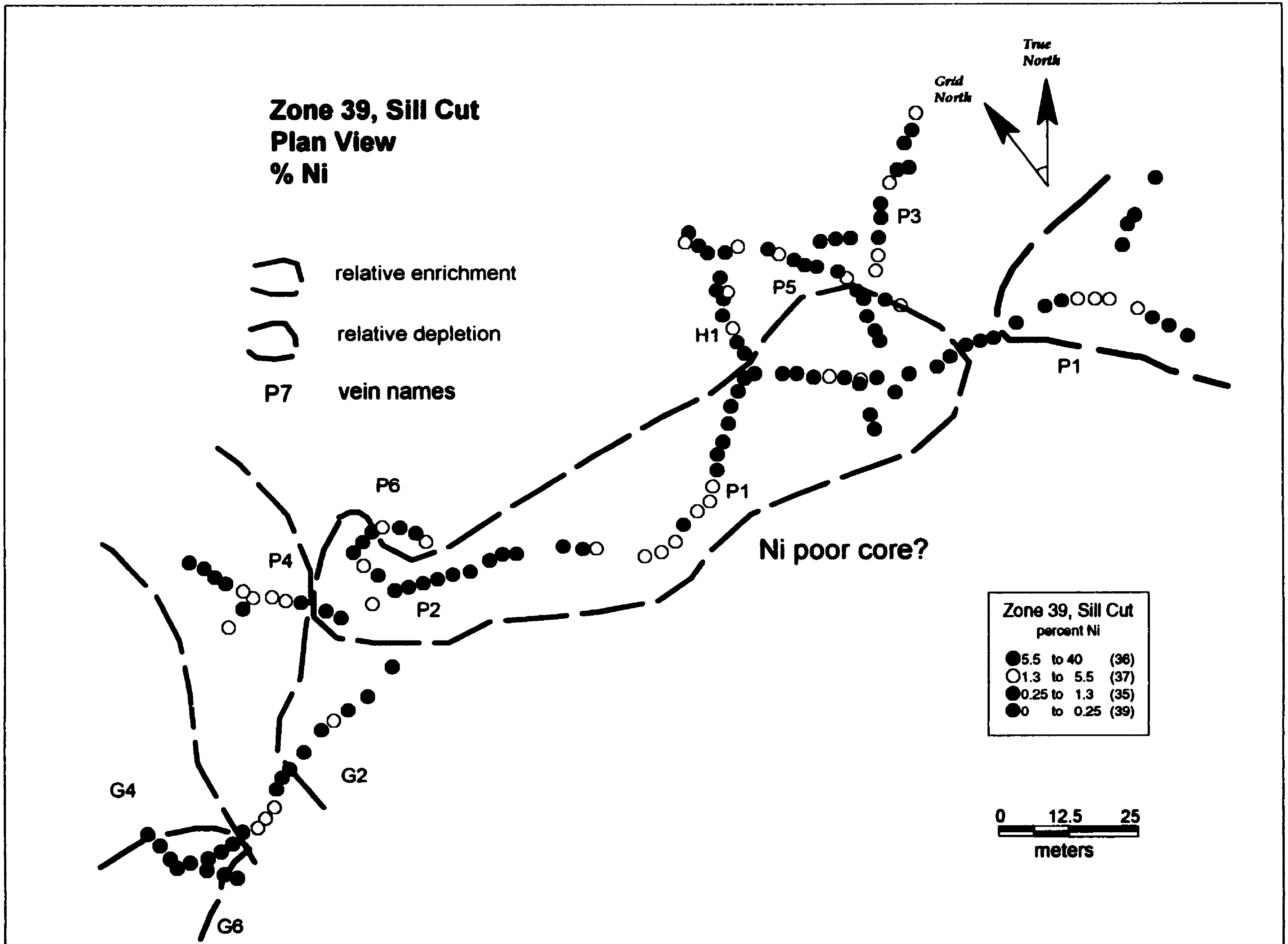
APPENDIX V

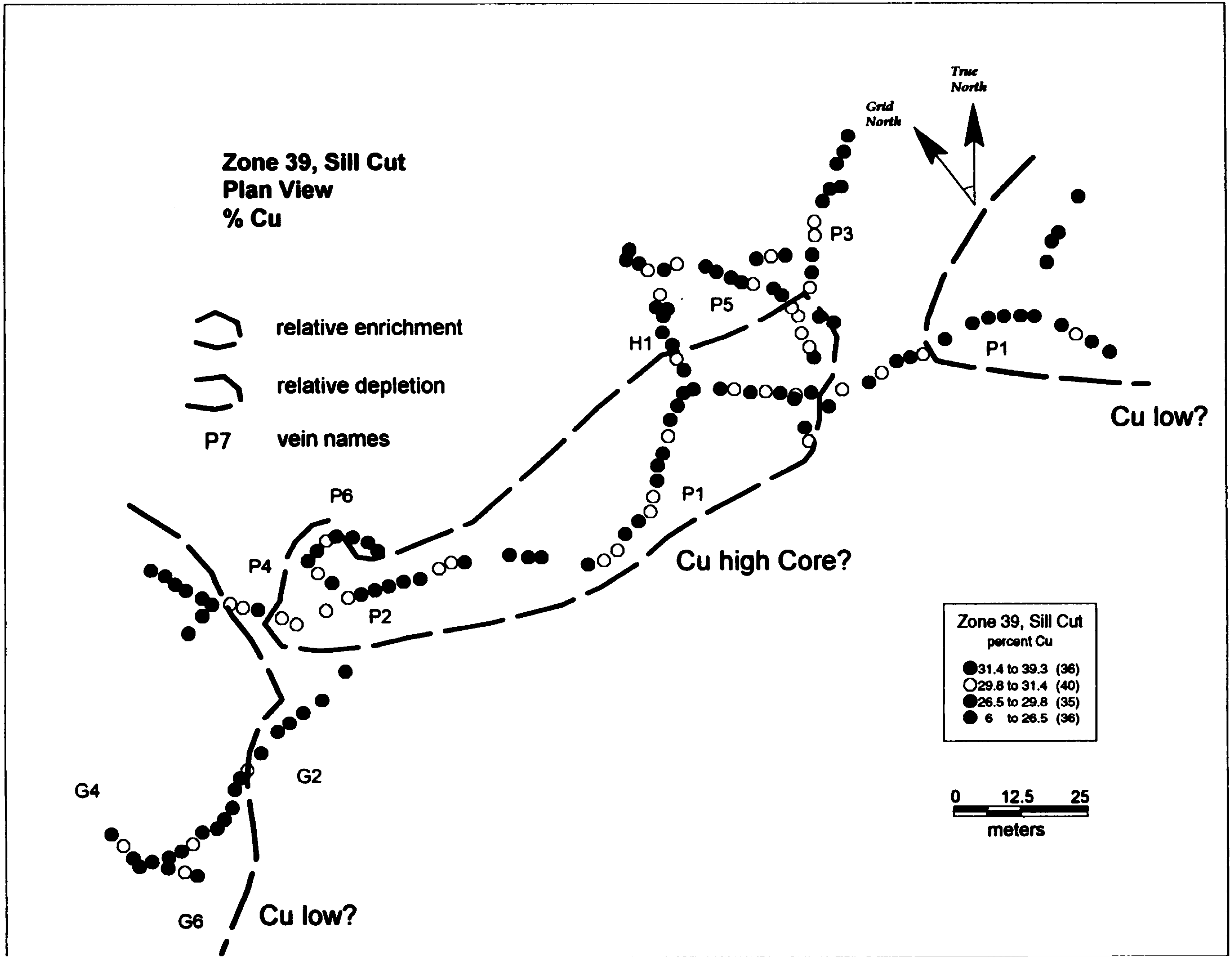
Point Plots - Zone 39

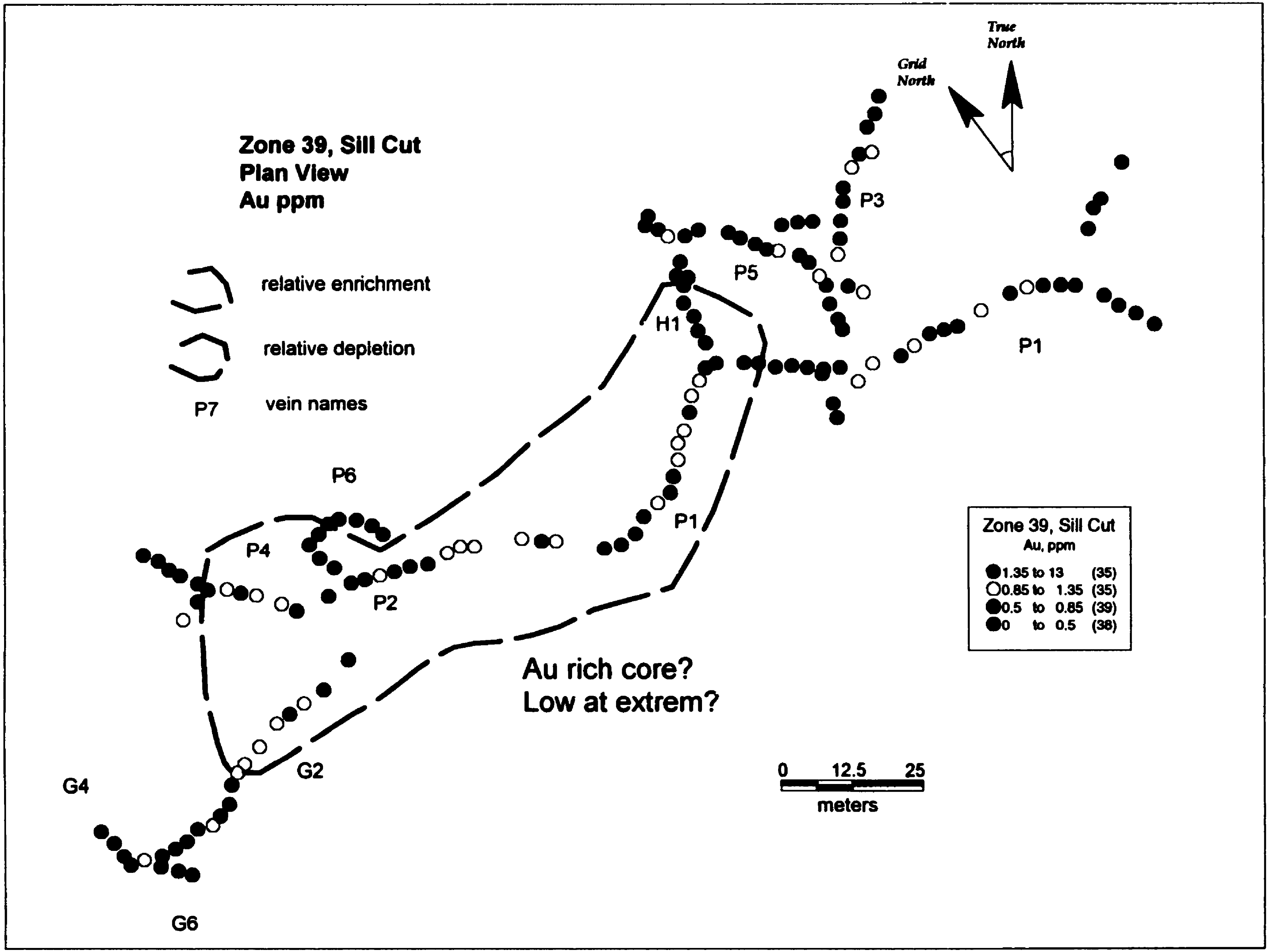
FIGURES

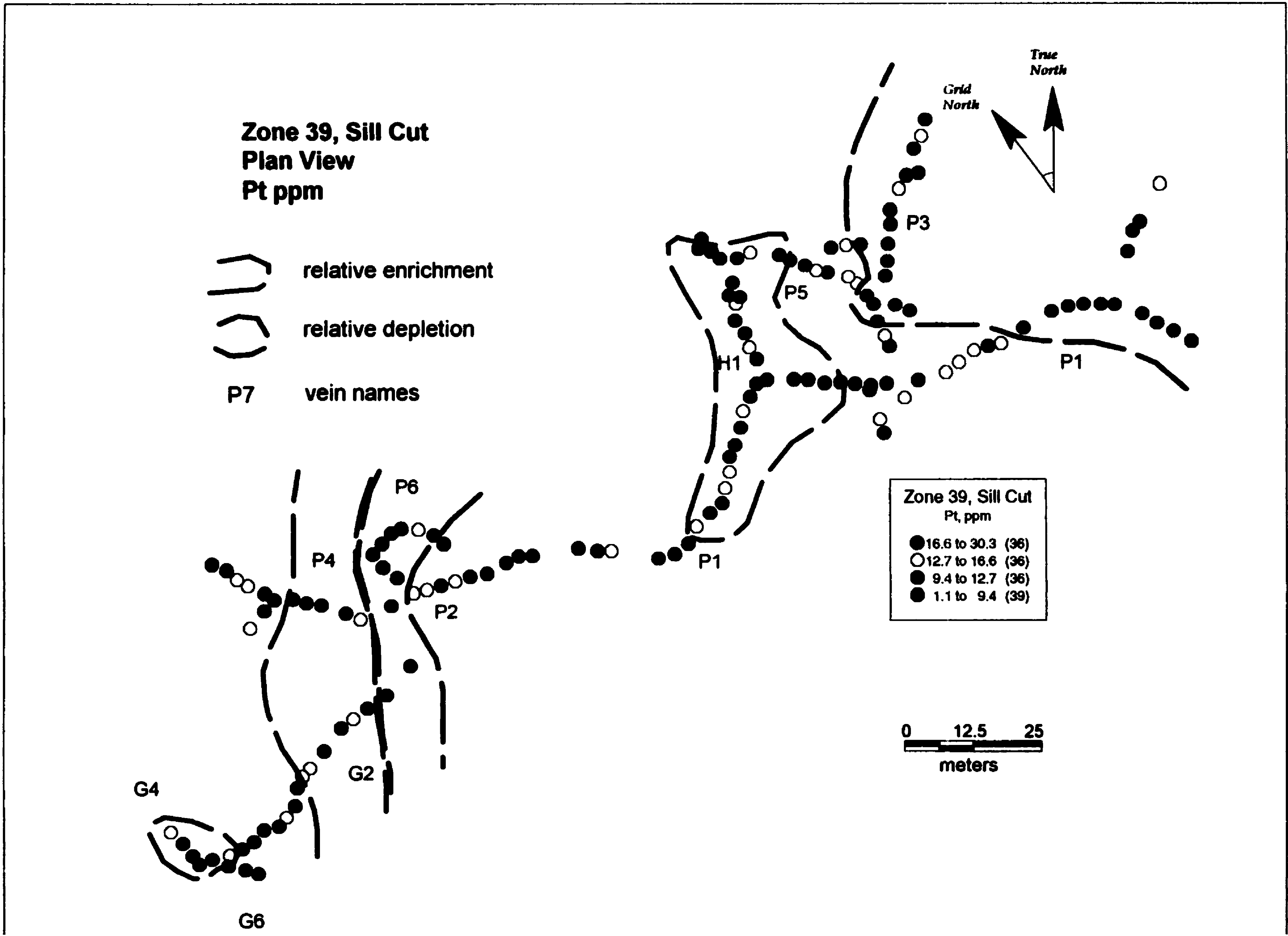
1.0 Lateral Distribution

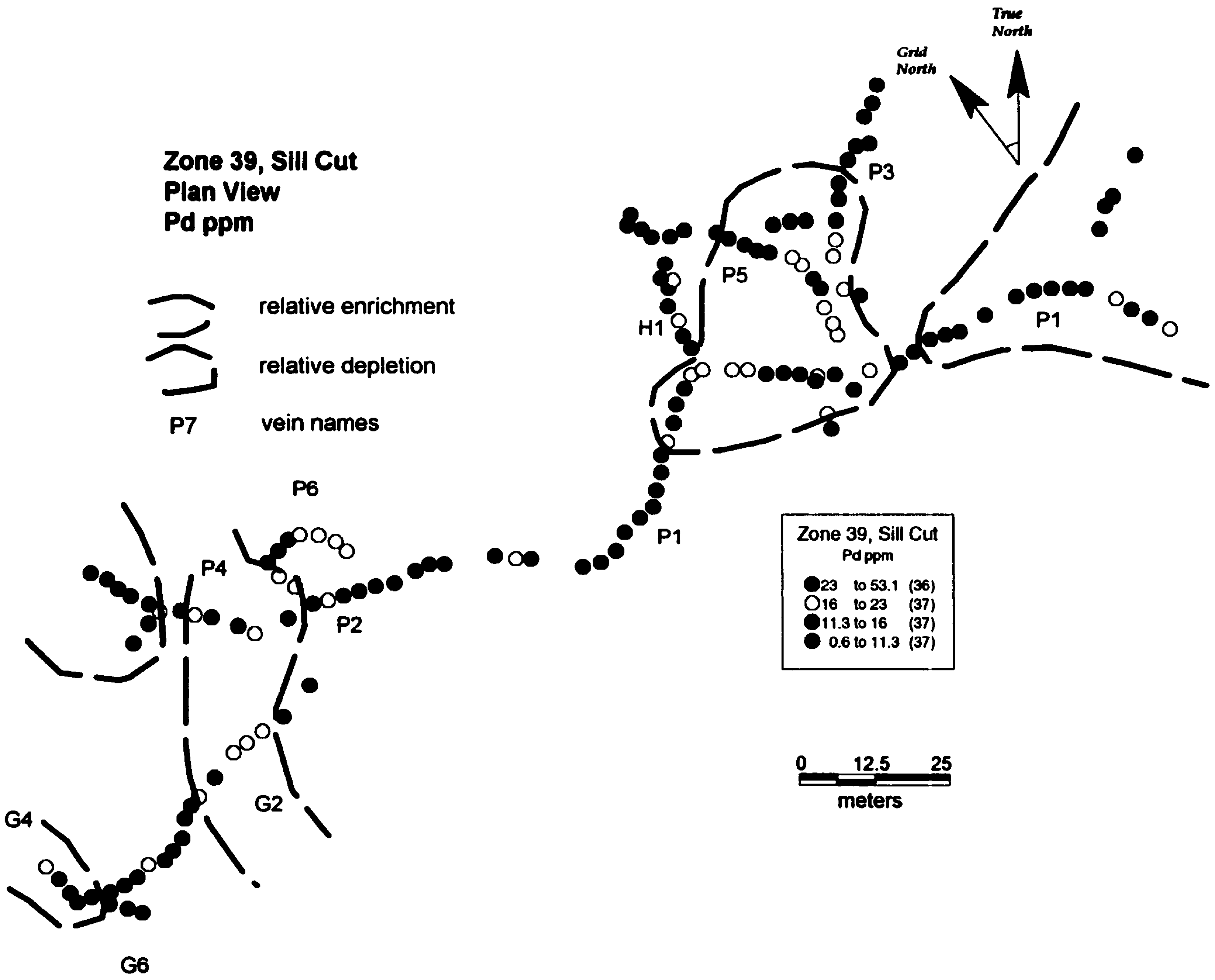
1.1 Sill (Cut 1) - Plans

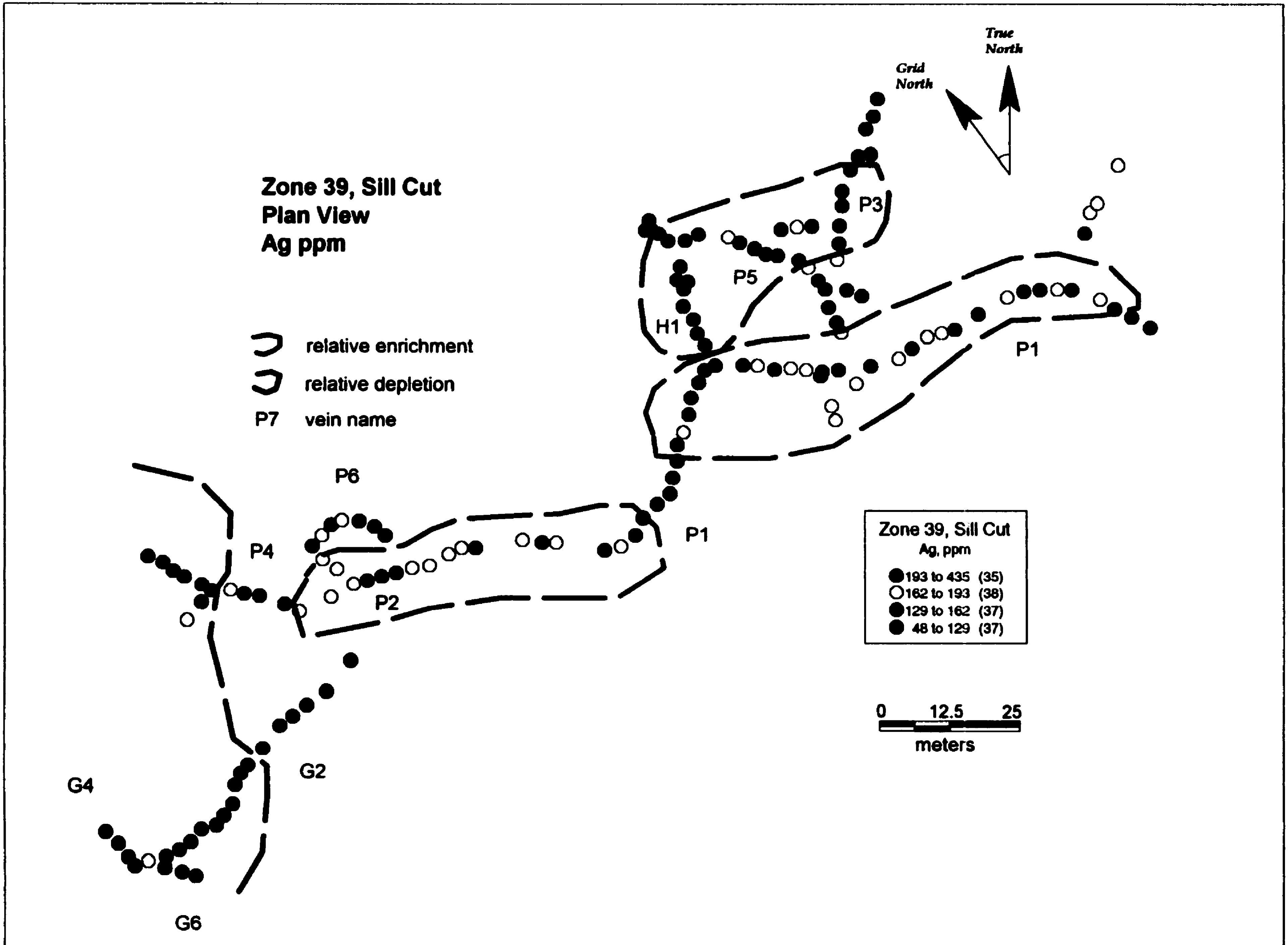

Zone 39, Sill Cut
Plan View
% Ni
relative enrichment
relative depletion
P7 vein names
True North
Grid North
P3
P5
H1
P1
P1
P6
P4
P2
Ni poor core?
G2
G4
G6
Zone 39, Sill Cut
percent Ni
● 5.5 to 40 (36)
○ 1.3 to 5.5 (37)
● 0.25 to 1.3 (35)
● 0 to 0.25 (39)
0 12.5 25
meters

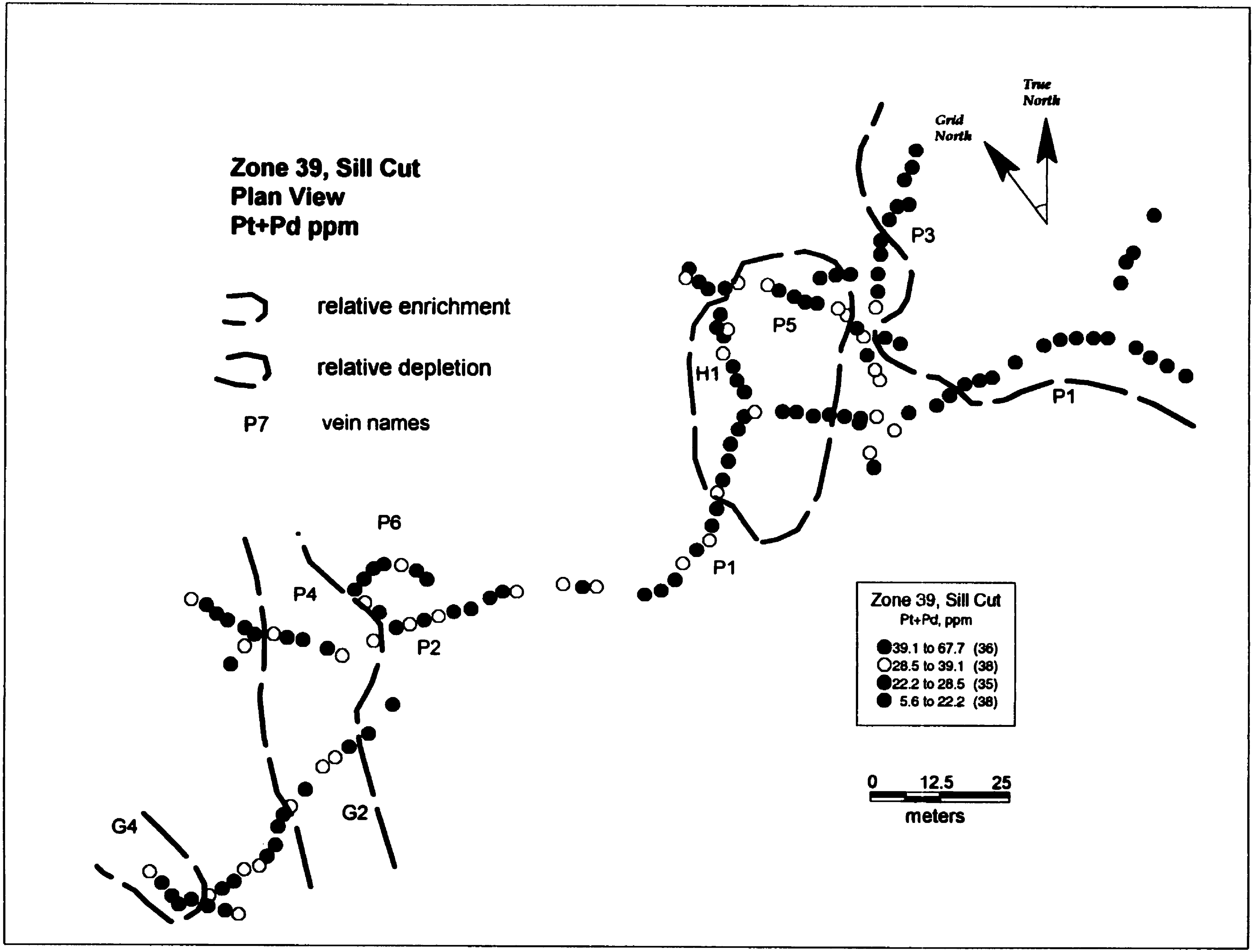

Zone 39, Sill Cut
Plan View
% Cu
relative enrichment
relative depletion
P7 vein names
True North
Grid North
P3
P5
H1
P1
P1
P6
P4
P2
Cu high Core?
Cu low?
G2
G4
G6
Cu low?
Zone 39, Sill Cut
percent Cu
● 31.4 to 39.3 (36)
○ 29.8 to 31.4 (40)
● 26.5 to 29.8 (35)
● 6 to 26.5 (36)
0 12.5 25
meters

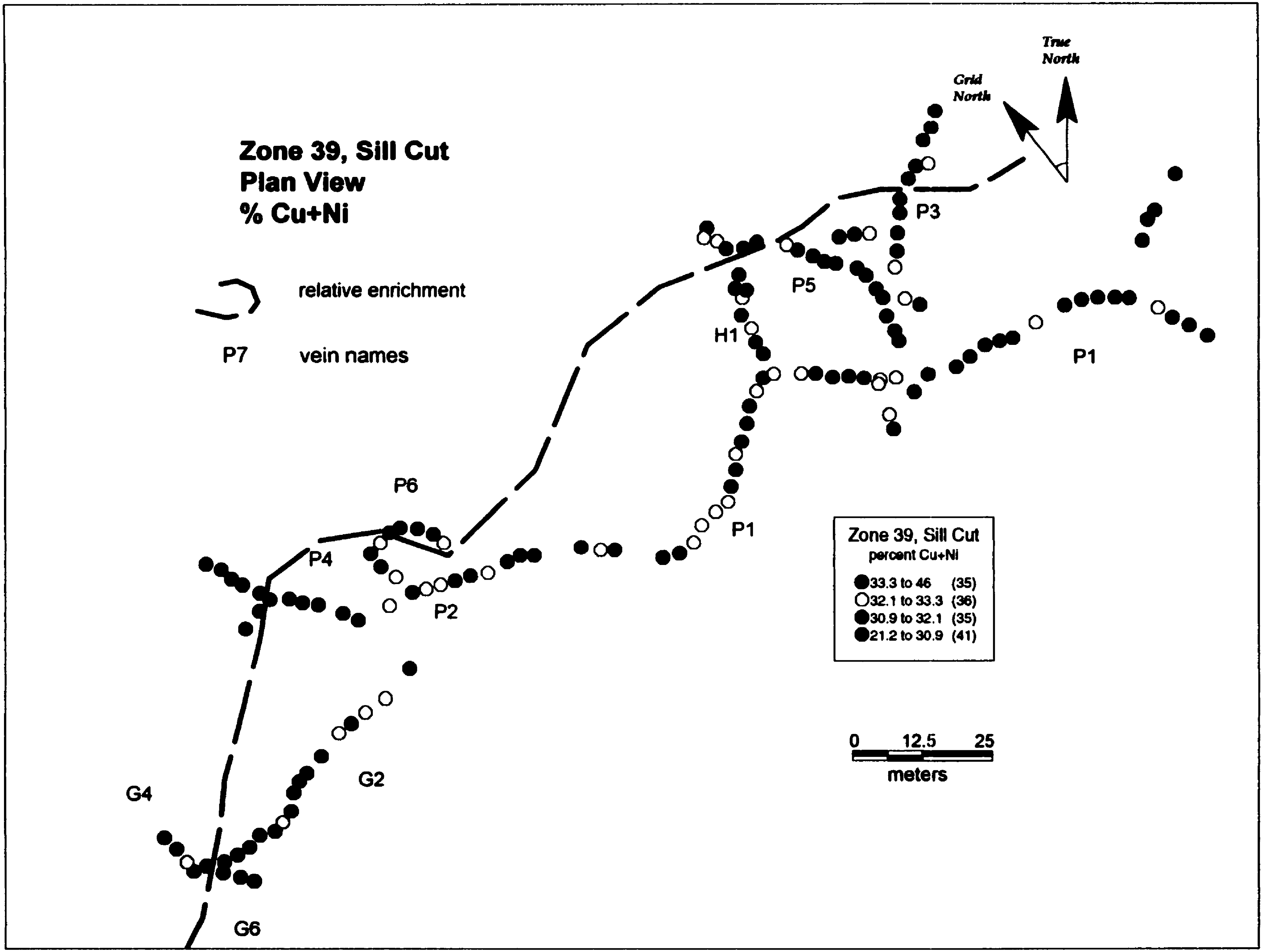

Zone 39, Sill Cut
Plan View
Au ppm
relative enrichment
relative depletion
P7 vein names
True North
Grid North
P3
P5
H1
P1
P1
P6
P4
P2
G2
G4
G6
Au rich core?
Low at extrem?
0 12.5 25
meters
Zone 39, Sill Cut
Au, ppm
●1.35 to 13 (35)
○0.85 to 1.35 (35)
●0.5 to 0.85 (39)
●0 to 0.5 (38)

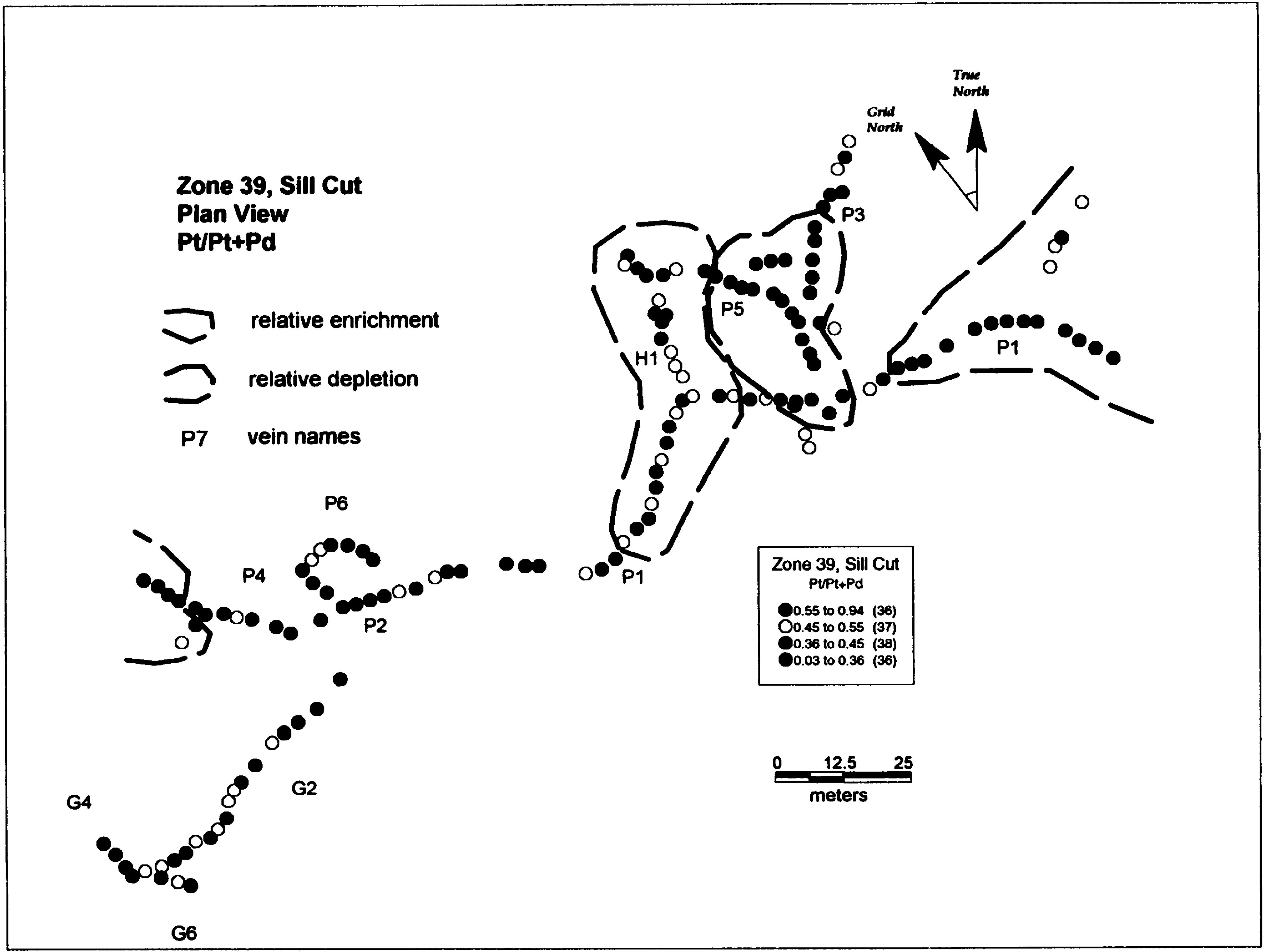

Zone 39, Sill Cut
Plan View
Pt ppm
relative enrichment
relative depletion
P7 vein names
True North
Grid North
P3
P5
H1
P1
P6
P4
P2
G2
G4
G6
Zone 39, Sill Cut
Pt, ppm
● 16.6 to 30.3 (36)
○ 12.7 to 16.6 (36)
● 9.4 to 12.7 (36)
● 1.1 to 9.4 (39)
0 12.5 25
meters


Zone 39, Sill Cut
Plan View
Pd ppm
relative enrichment
relative depletion
P7
vein names
True North
Grid North
P3
P5
H1
P1
P1
P6
P4
P2
G2
G4
G6
Zone 39, Sill Cut
Pd ppm
● 23 to 53.1 (36)
○ 16 to 23 (37)
● 11.3 to 16 (37)
● 0.6 to 11.3 (37)
0
12.5
25
meters

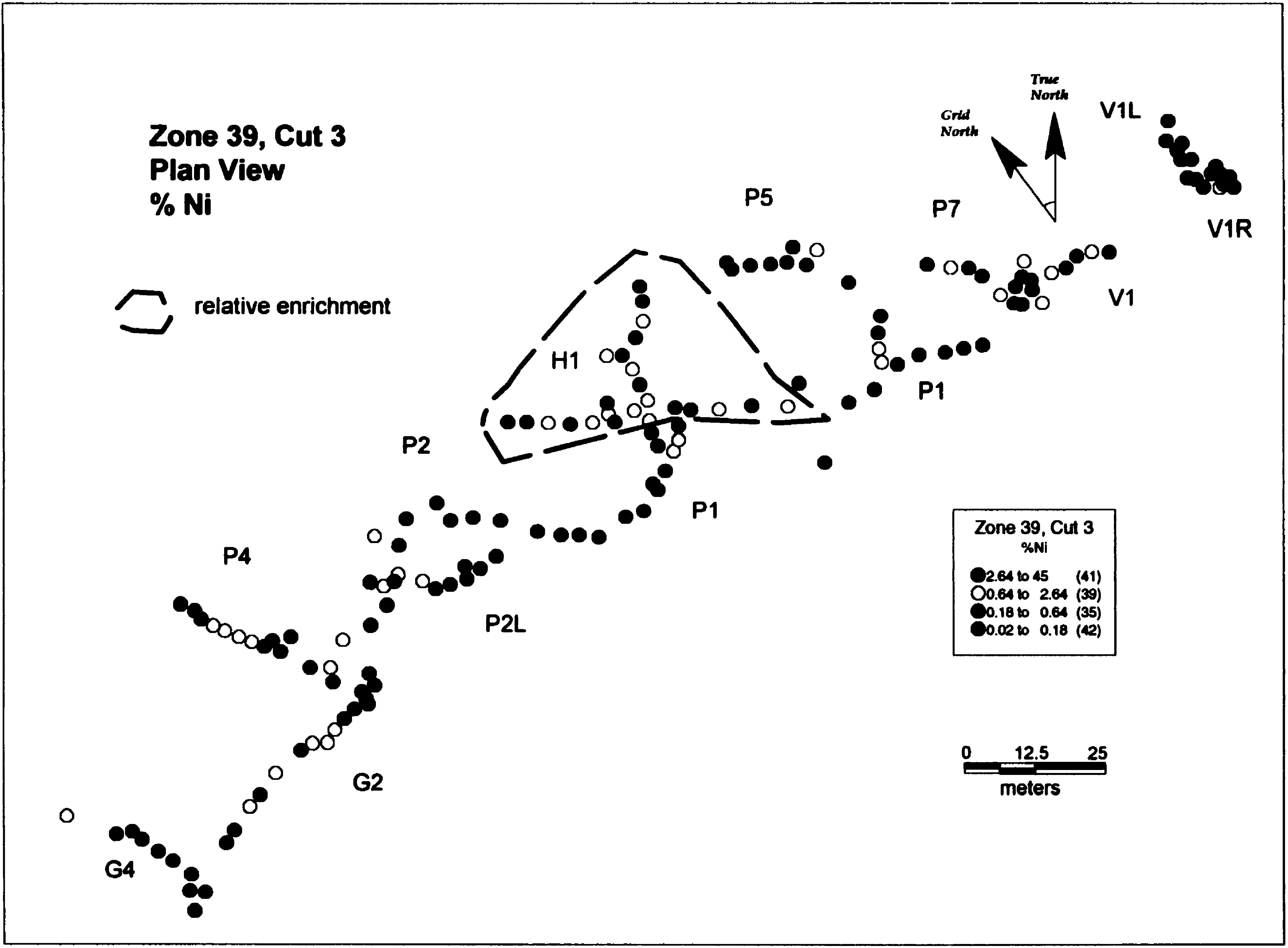

Zone 39, Sill Cut
Plan View
Ag ppm
relative enrichment
relative depletion
P7 vein name
True North
Grid North
P1
P1
P2
P3
P4
P5
P6
H1
G2
G4
G6
Zone 39, Sill Cut
Ag, ppm
● 193 to 435 (35)
○ 162 to 193 (38)
● 129 to 162 (37)
● 48 to 129 (37)
0
12.5
25
meters

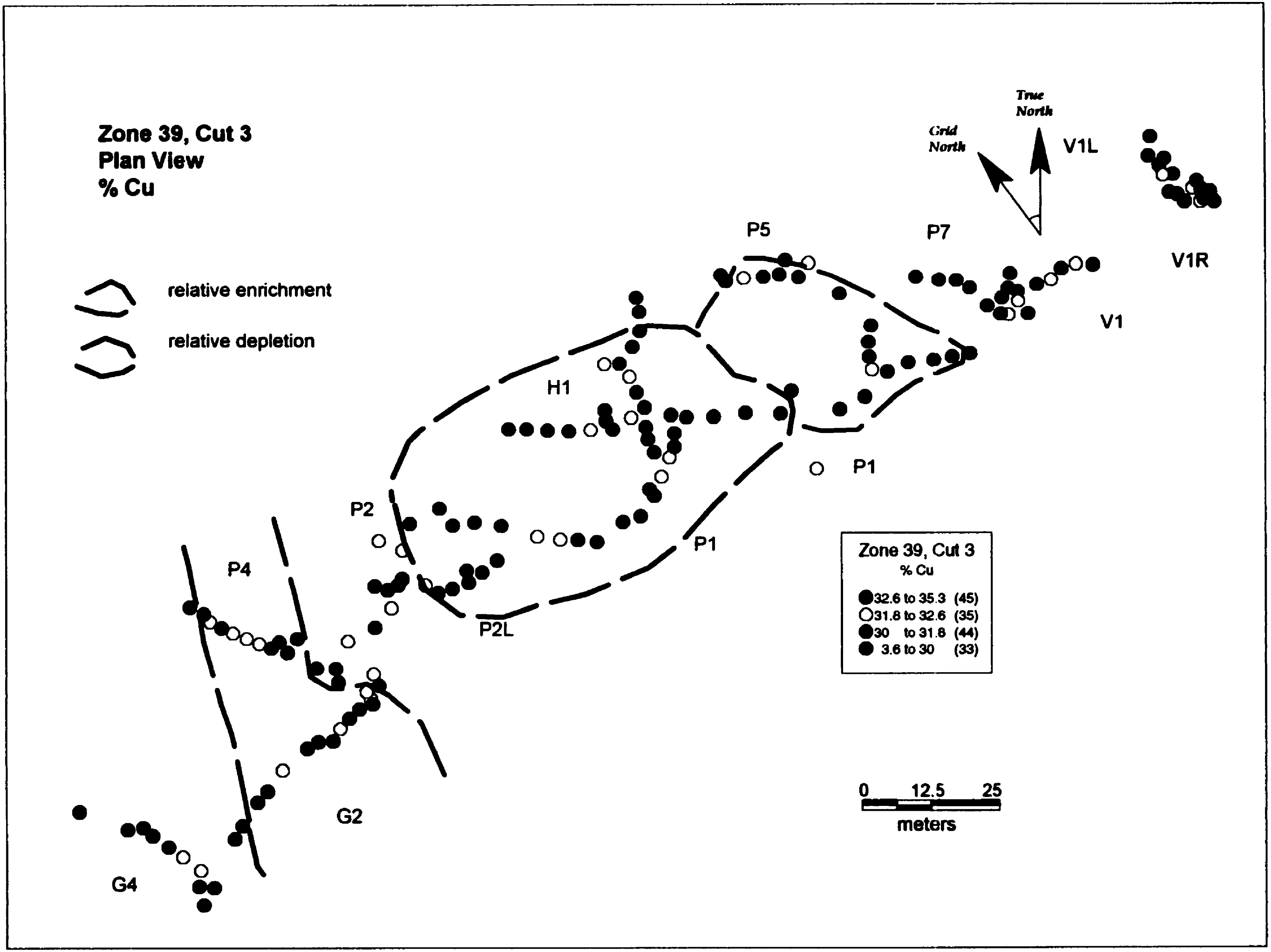

Zone 39, Sill Cut
Plan View
Pt+Pd ppm
relative enrichment
relative depletion
P7 vein names
True North
Grid North
P1
P2
P3
P4
P5
P6
H1
G2
G4
Zone 39, Sill Cut
Pt+Pd, ppm
● 39.1 to 67.7 (36)
○ 28.5 to 39.1 (38)
● 22.2 to 28.5 (35)
● 5.6 to 22.2 (38)
0 12.5 25
meters

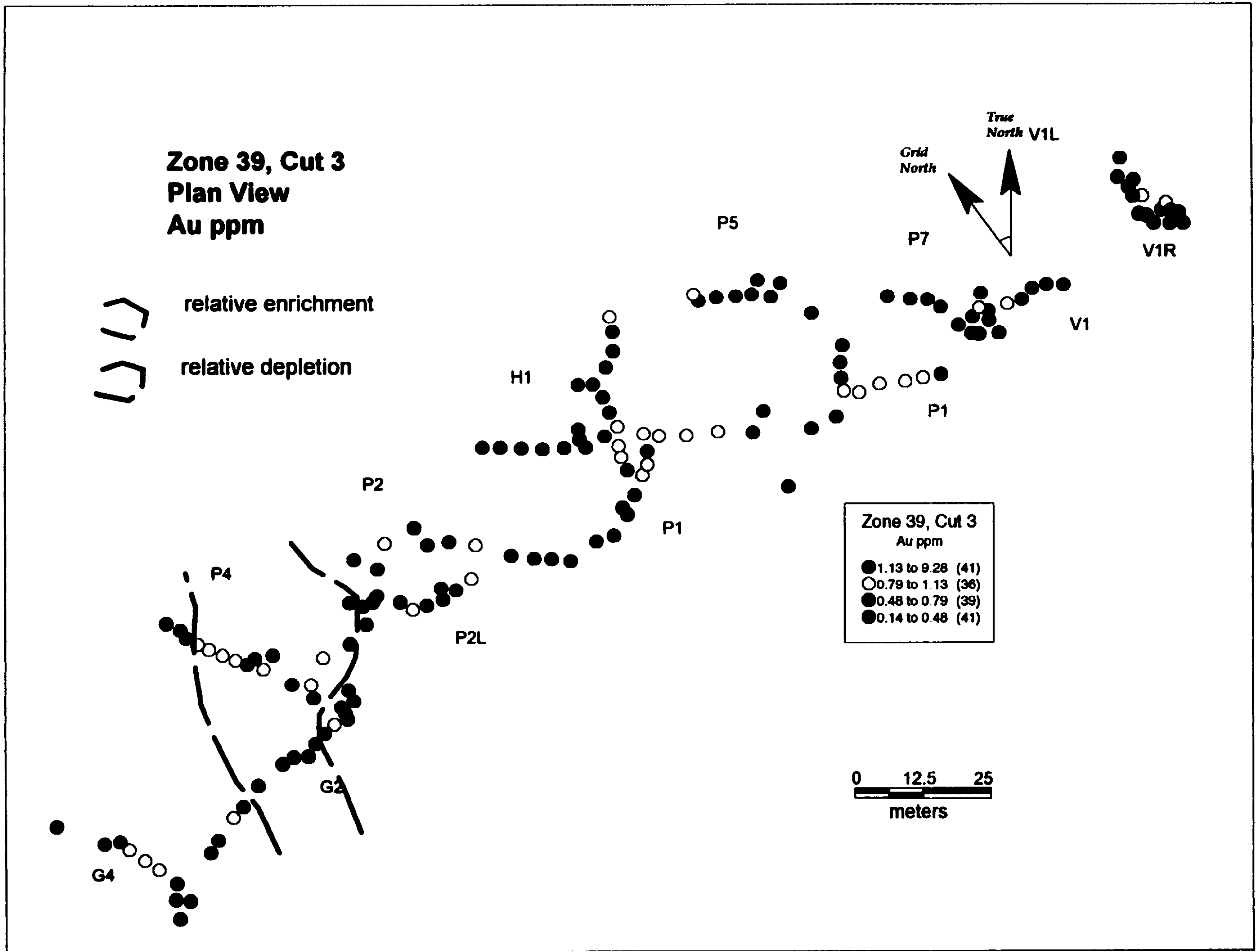

Zone 39, Sill Cut
Plan View
% Cu+Ni
relative enrichment
P7 vein names
Grid North
True North
P3
P5
H1
P1
P1
P6
P4
P2
G2
G4
G6
Zone 39, Sill Cut
percent Cu+Ni
● 33.3 to 46 (35)
○ 32.1 to 33.3 (36)
● 30.9 to 32.1 (35)
● 21.2 to 30.9 (41)
0 12.5 25
meters

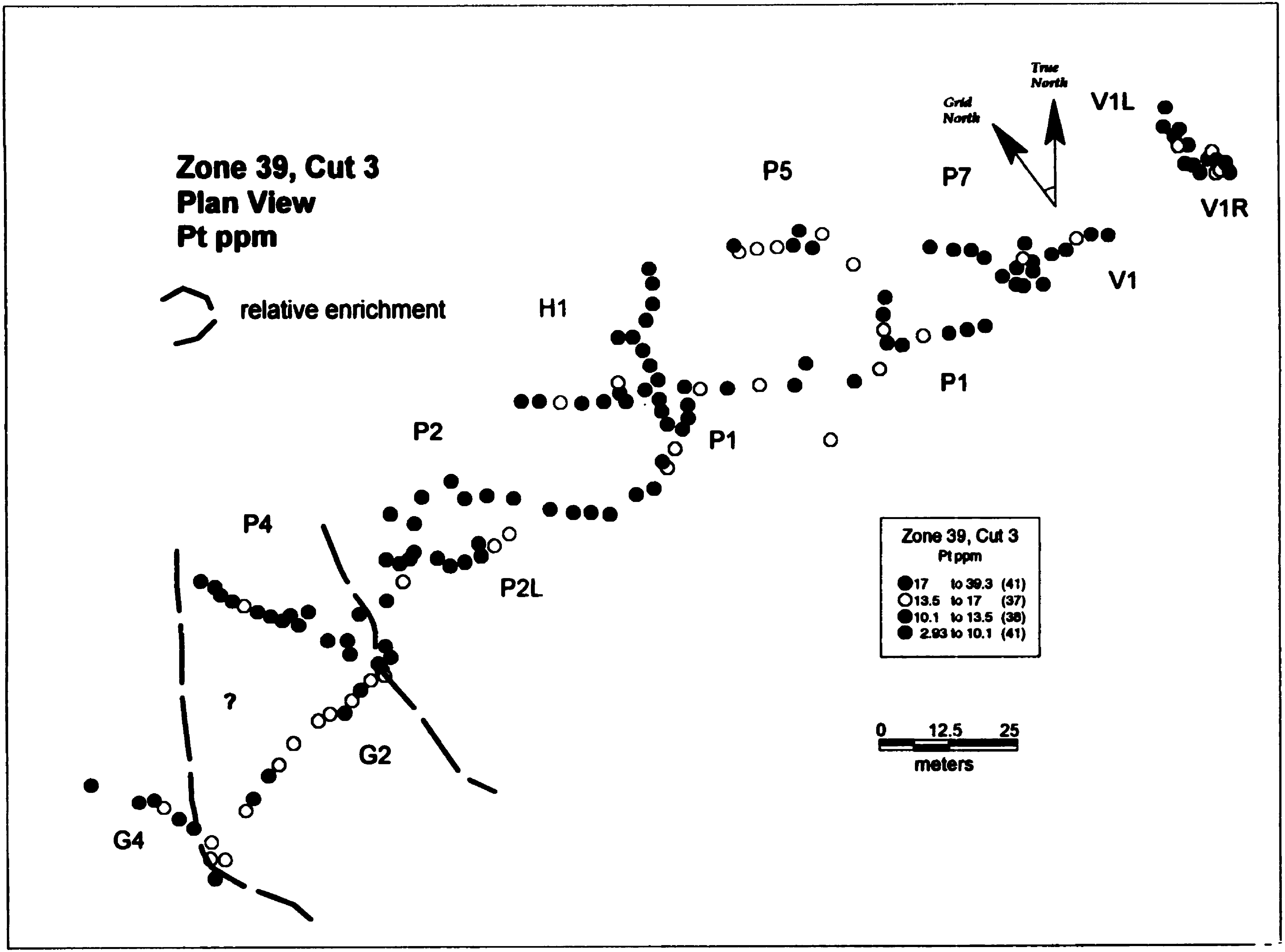

Zone 39, Sill Cut
Plan View
Pt/Pt+Pd
relative enrichment
relative depletion
P7 vein names
True North
Grid North
P3
P5
H1
P1
P6
P4
P2
P1
G2
G4
G6
Zone 39, Sill Cut
Pt/Pt+Pd
● 0.55 to 0.94 (36)
○ 0.45 to 0.55 (37)
● 0.36 to 0.45 (38)
● 0.03 to 0.36 (36)
0 12.5 25
meters

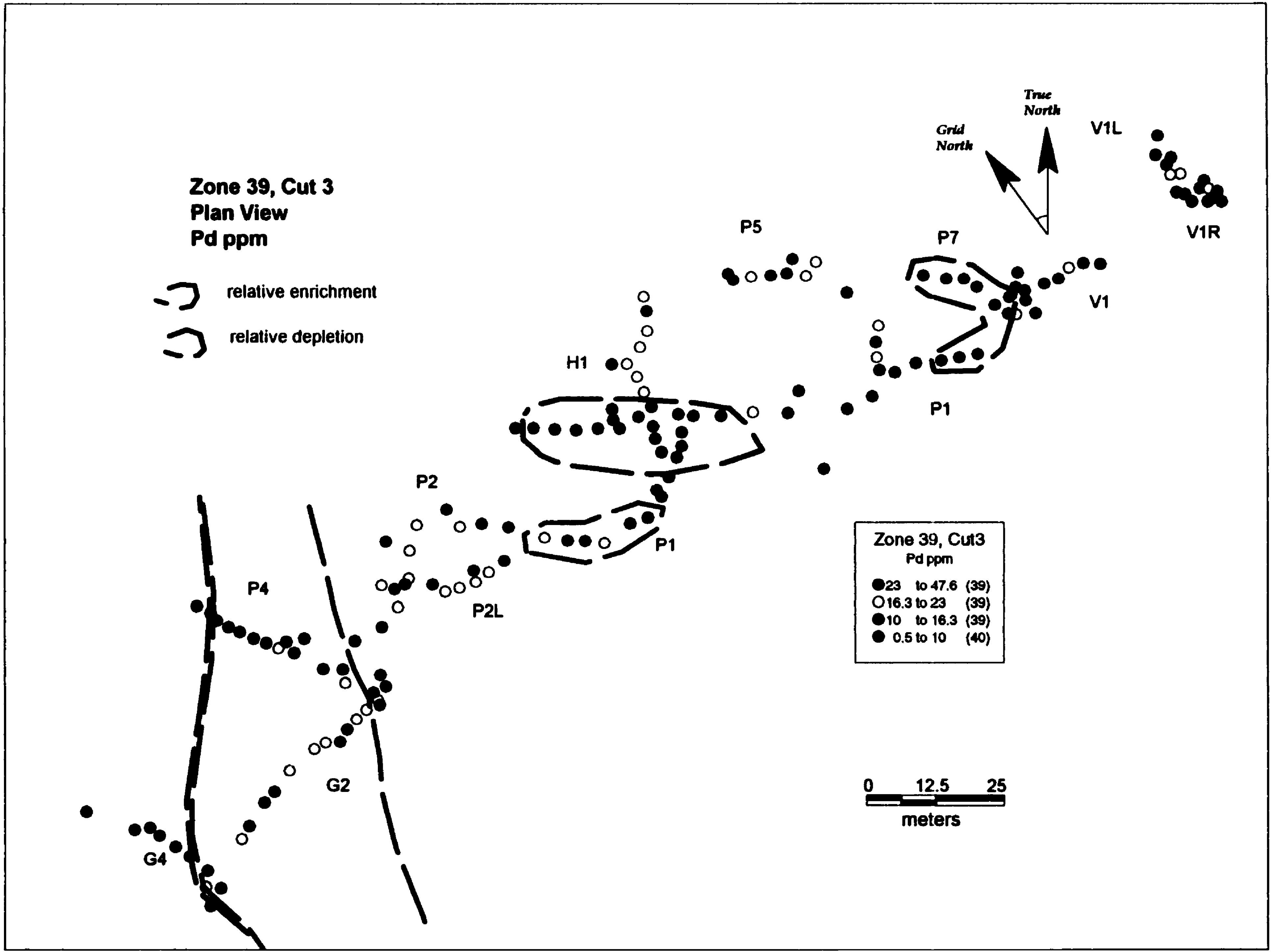
1.2 Cut 3 - Plans

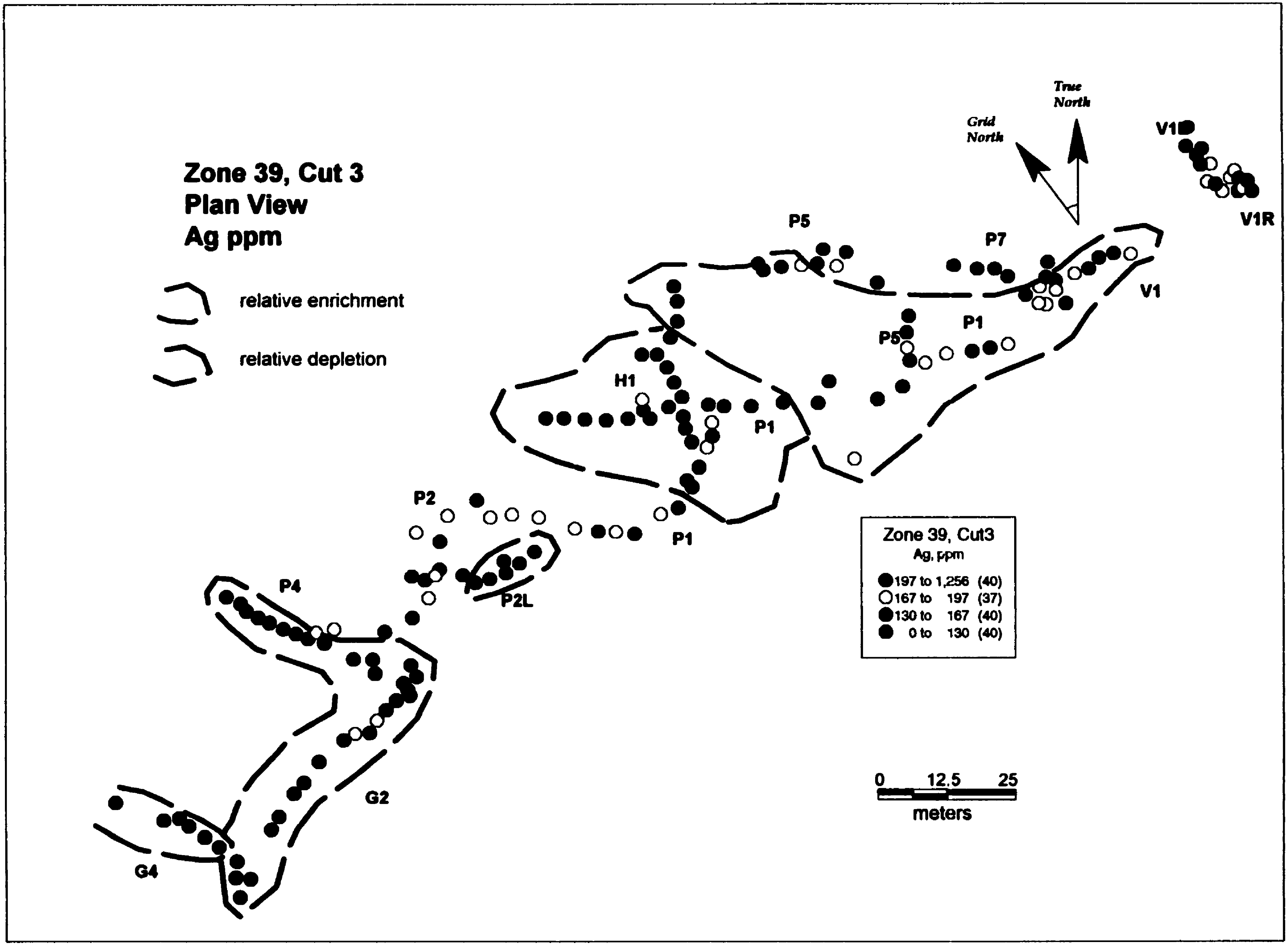

Zone 39, Cut 3
Plan View
% Ni
relative enrichment
Grid North
True North
V1L
V1R
P5
P7
V1
H1
P1
P2
P1
P4
P2L
G2
G4
Zone 39, Cut 3
%Ni
● 2.64 to 45 (41)
○ 0.64 to 2.64 (39)
● 0.18 to 0.64 (35)
● 0.02 to 0.18 (42)
0 12.5 25
meters

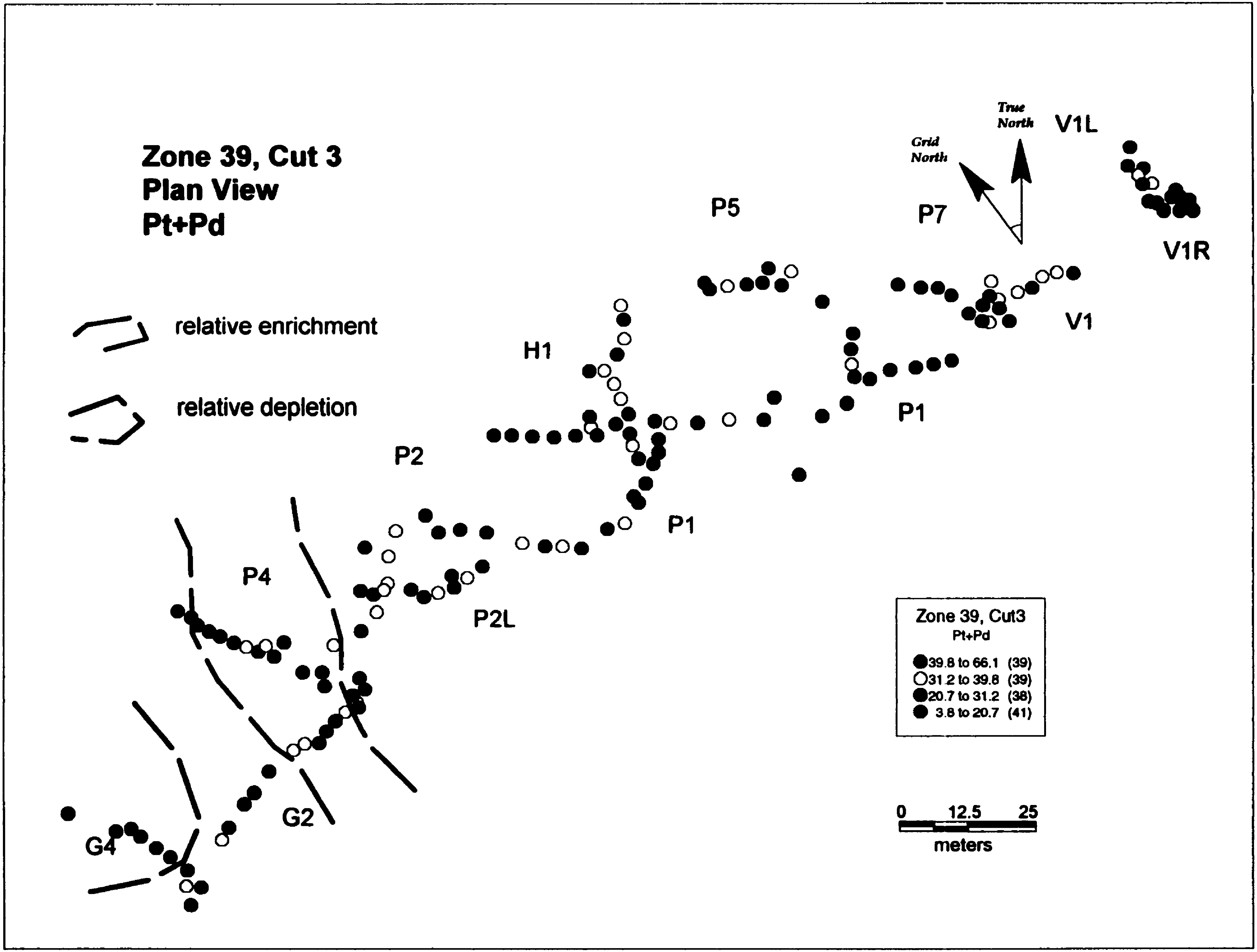

Zone 39, Cut 3
Plan View
% Cu
relative enrichment
relative depletion
True North
Grid North
V1L
V1R
V1
P7
P5
P1
H1
P1
P2
P2L
P4
G2
G4
Zone 39, Cut 3
% Cu
● 32.6 to 35.3 (45)
○ 31.8 to 32.6 (35)
● 30 to 31.8 (44)
● 3.6 to 30 (33)
0 12.5 25
meters


Zone 39, Cut 3
Plan View
Au ppm
relative enrichment
relative depletion
True North
Grid North
V1L
V1R
P5
P7
V1
H1
P1
P1
P2
P2L
P4
G2
G4
Zone 39, Cut 3
Au ppm
● 1.13 to 9.28 (41)
○ 0.79 to 1.13 (36)
● 0.48 to 0.79 (39)
● 0.14 to 0.48 (41)
0
12.5
25
meters

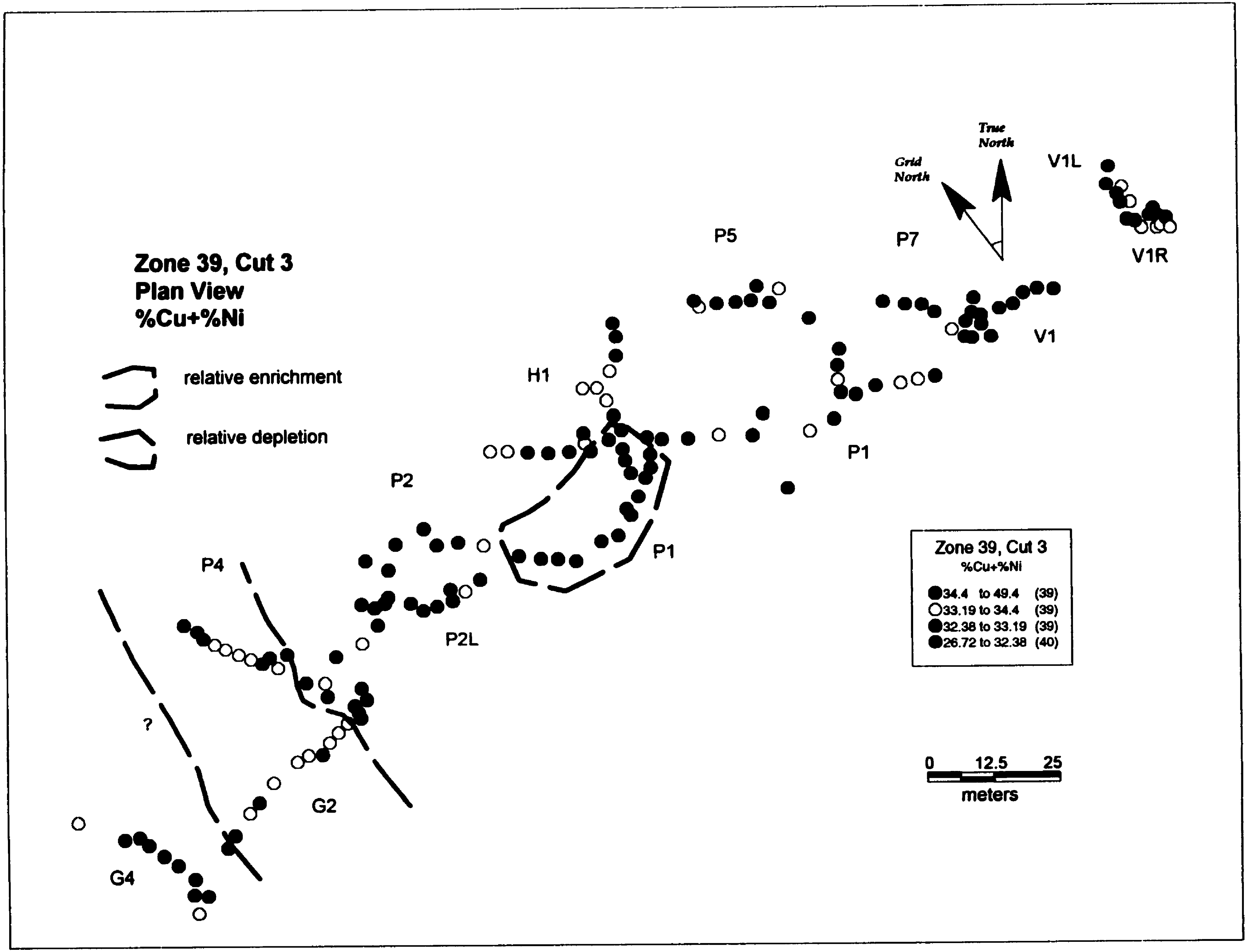

Zone 39, Cut 3
Plan View
Pt ppm
relative enrichment
True North
Grid North
V1L
V1R
V1
P7
P5
P1
H1
P1
P2
P2L
P4
?
G2
G4
Zone 39, Cut 3
Pt ppm
● 17 to 39.3 (41)
○ 13.5 to 17 (37)
● 10.1 to 13.5 (38)
● 2.93 to 10.1 (41)
0
12.5
25
meters

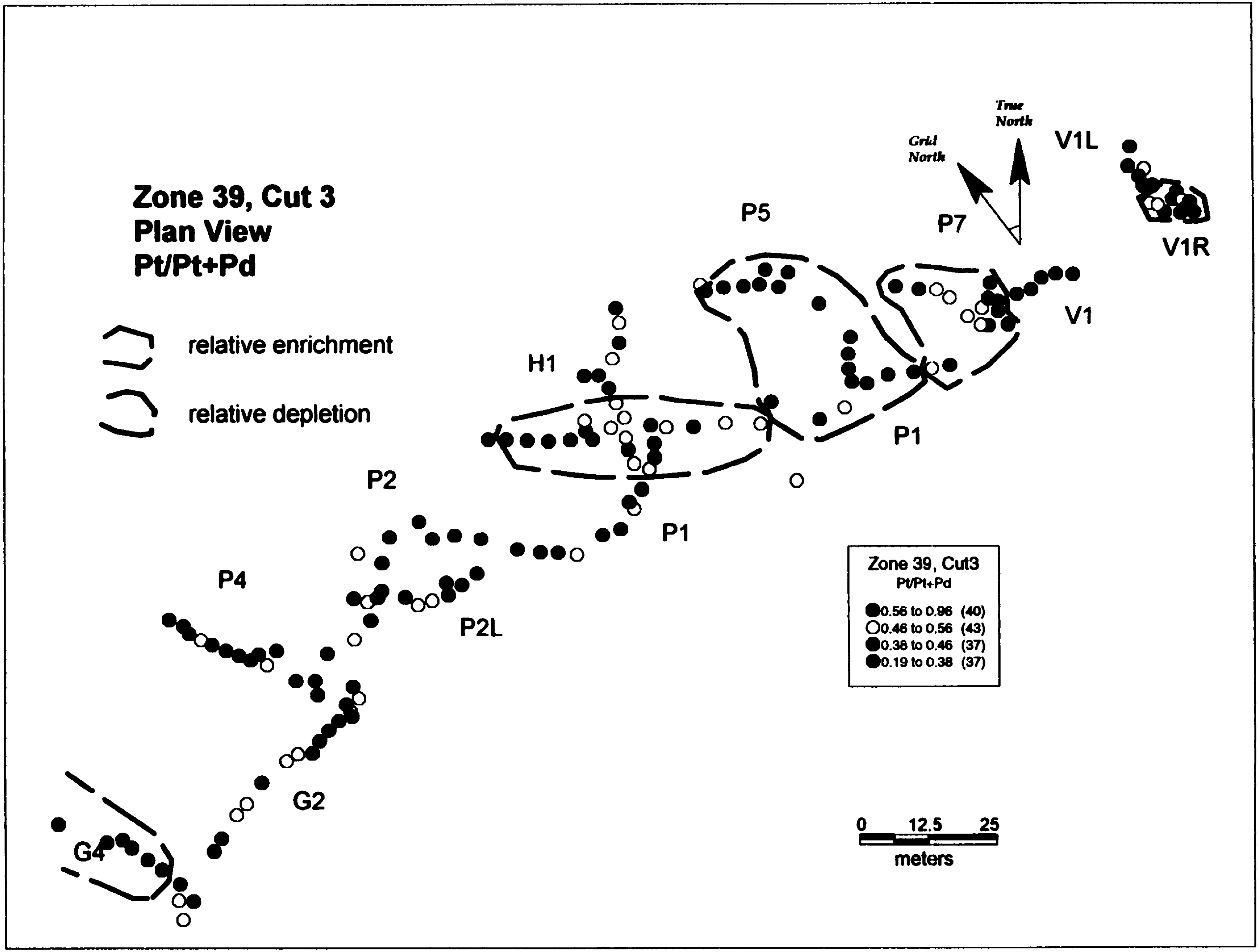

Zone 39, Cut 3
Plan View
Pd ppm
relative enrichment
relative depletion
True North
Grid North
V1L
V1R
V1
P5
P7
P1
H1
P1
P2
P2L
P4
G2
G4
Zone 39, Cut3
Pd ppm
●23 to 47.6 (39)
○16.3 to 23 (39)
●10 to 16.3 (39)
● 0.5 to 10 (40)
0
12.5
25
meters

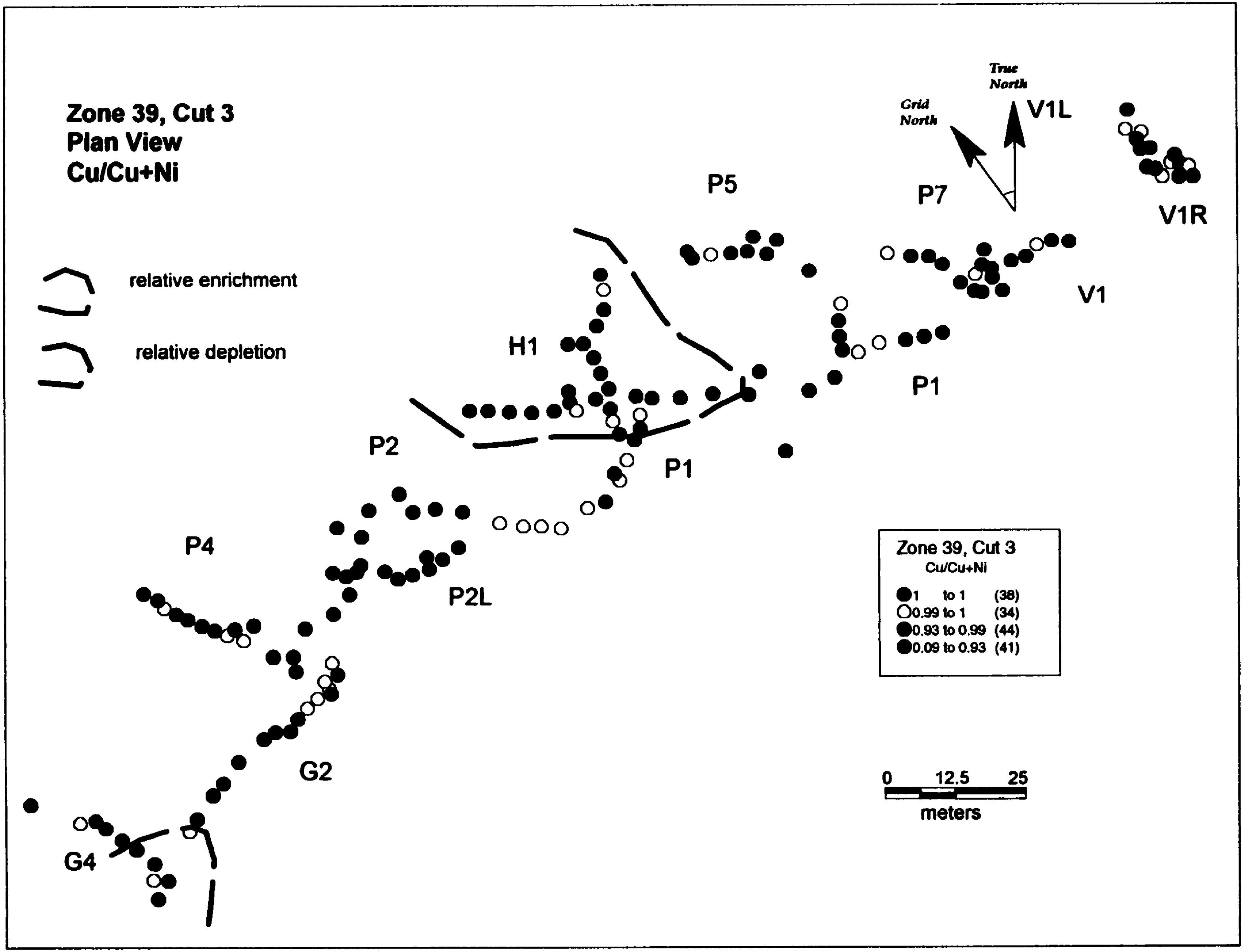

Zone 39, Cut 3
Plan View
Ag ppm
relative enrichment
relative depletion
True North
Grid North
V1
V1R
V1
P7
P5
P1
P5
H1
P1
P1
P2
P2L
P4
G2
G4
Zone 39, Cut3
Ag, ppm
●197 to 1,256 (40)
○167 to 197 (37)
●130 to 167 (40)
● 0 to 130 (40)
0
12.5
25
meters



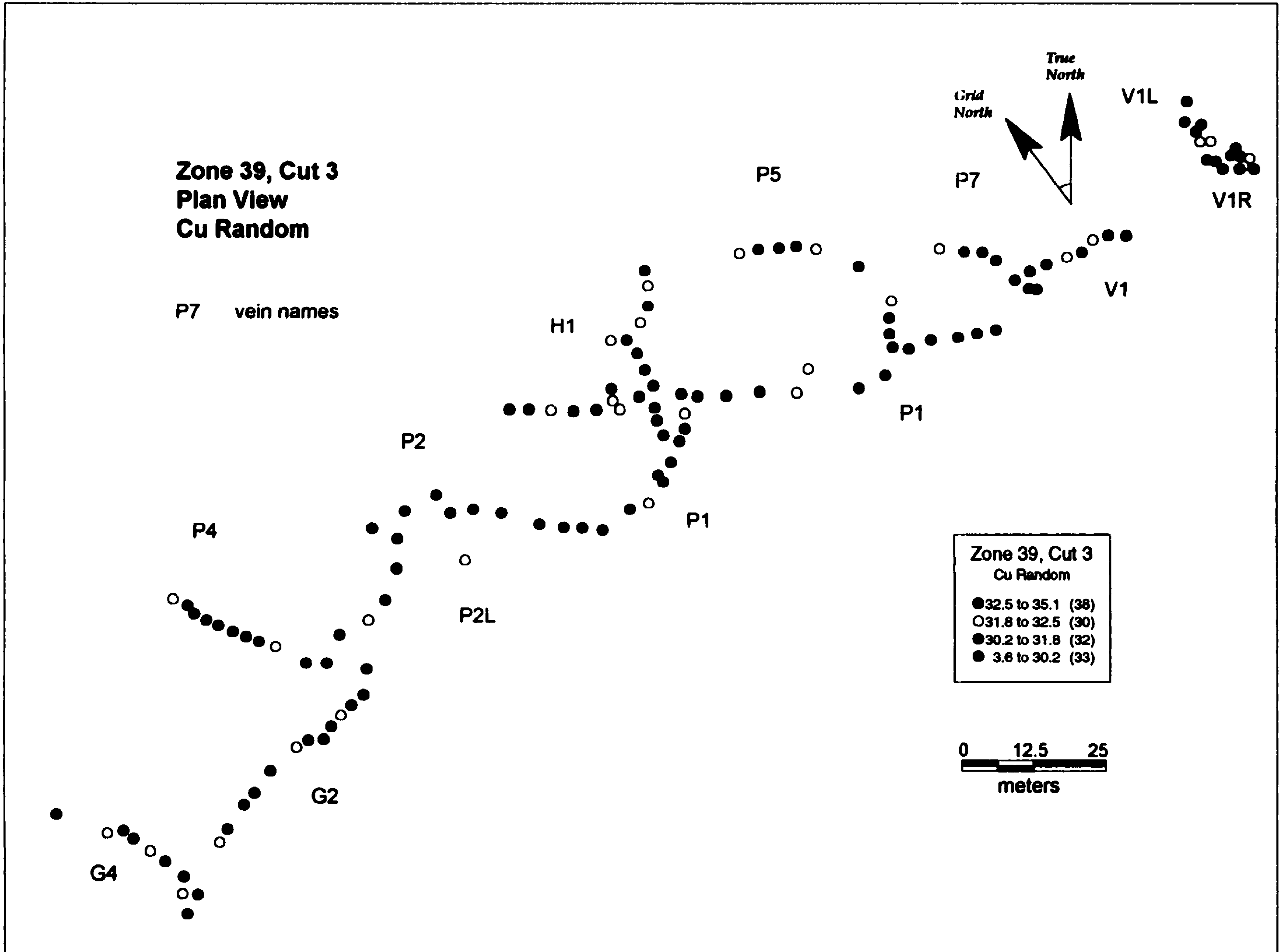
Zone 39, Cut 3
Plan View
Pt+Pd


Zone 39, Cut 3
Plan View
%Cu+%Ni
relative enrichment
relative depletion
True North
Grid North
V1L
V1R
P5
P7
V1
H1
P1
P1
P2
P2L
P4
?
G2
G4
Zone 39, Cut 3
%Cu+%Ni
● 34.4 to 49.4 (39)
○ 33.19 to 34.4 (39)
● 32.38 to 33.19 (39)
● 26.72 to 32.38 (40)
0
12.5
25
meters

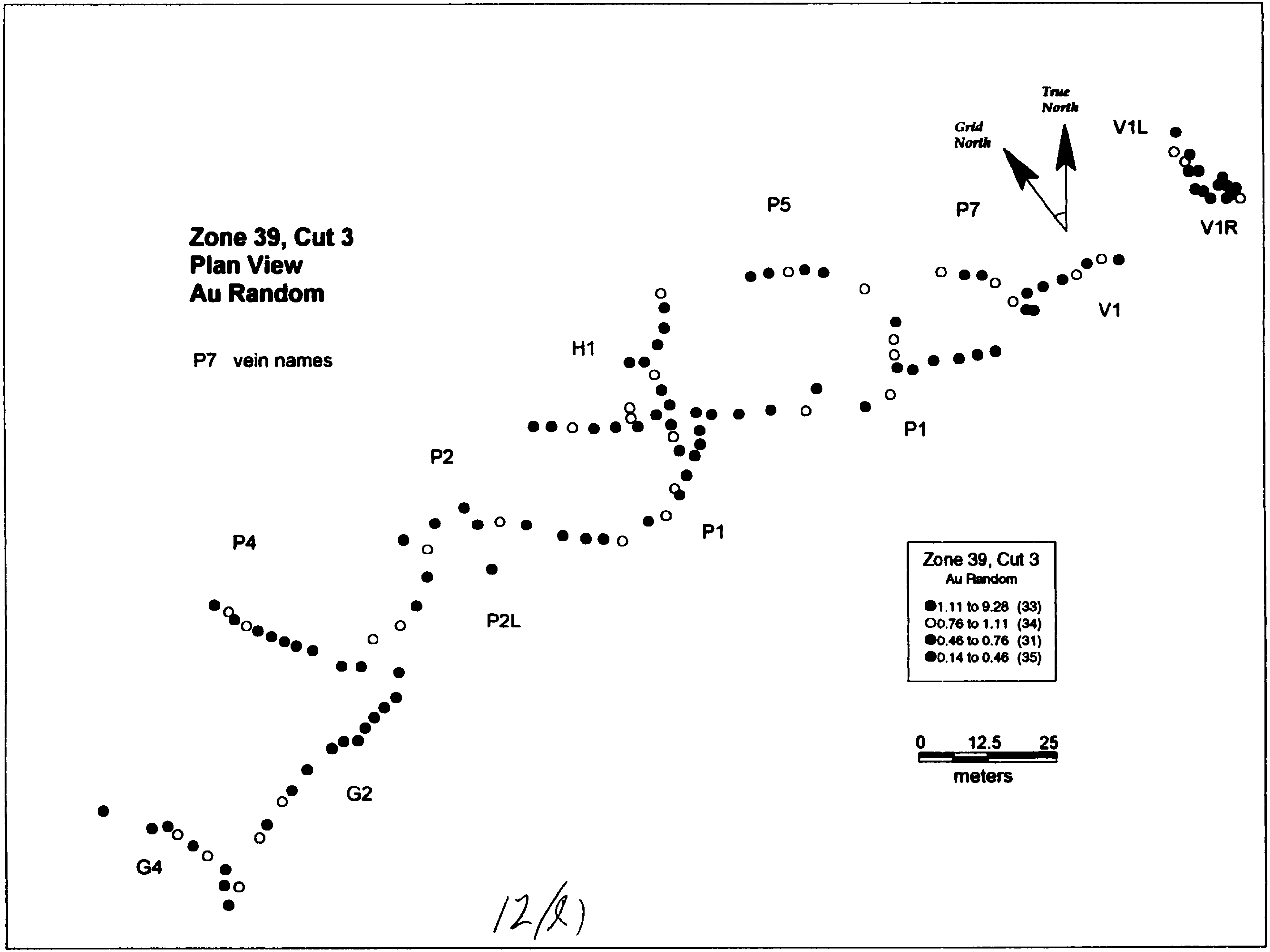

Zone 39, Cut 3
Plan View
Pt/Pt+Pd
relative enrichment
relative depletion
Grid North
True North
V1L
V1R
V1
P7
P5
P1
H1
P1
P2
P2L
P4
G2
G4
Zone 39, Cut3
Pt/Pt+Pd
● 0.56 to 0.96 (40)
○ 0.46 to 0.56 (43)
● 0.38 to 0.46 (37)
● 0.19 to 0.38 (37)
0
12.5
25
meters


Zone 39, Cut 3
Plan View
Cu/Cu+Ni
relative enrichment
relative depletion
True North
Grid North
V1L
V1R
V1
P5
P7
H1
P1
P1
P2
P2L
P4
G2
G4
Zone 39, Cut 3
Cu/Cu+Ni
● 1 to 1 (38)
○ 0.99 to 1 (34)
● 0.93 to 0.99 (44)
● 0.09 to 0.93 (41)
0
12.5
25
meters

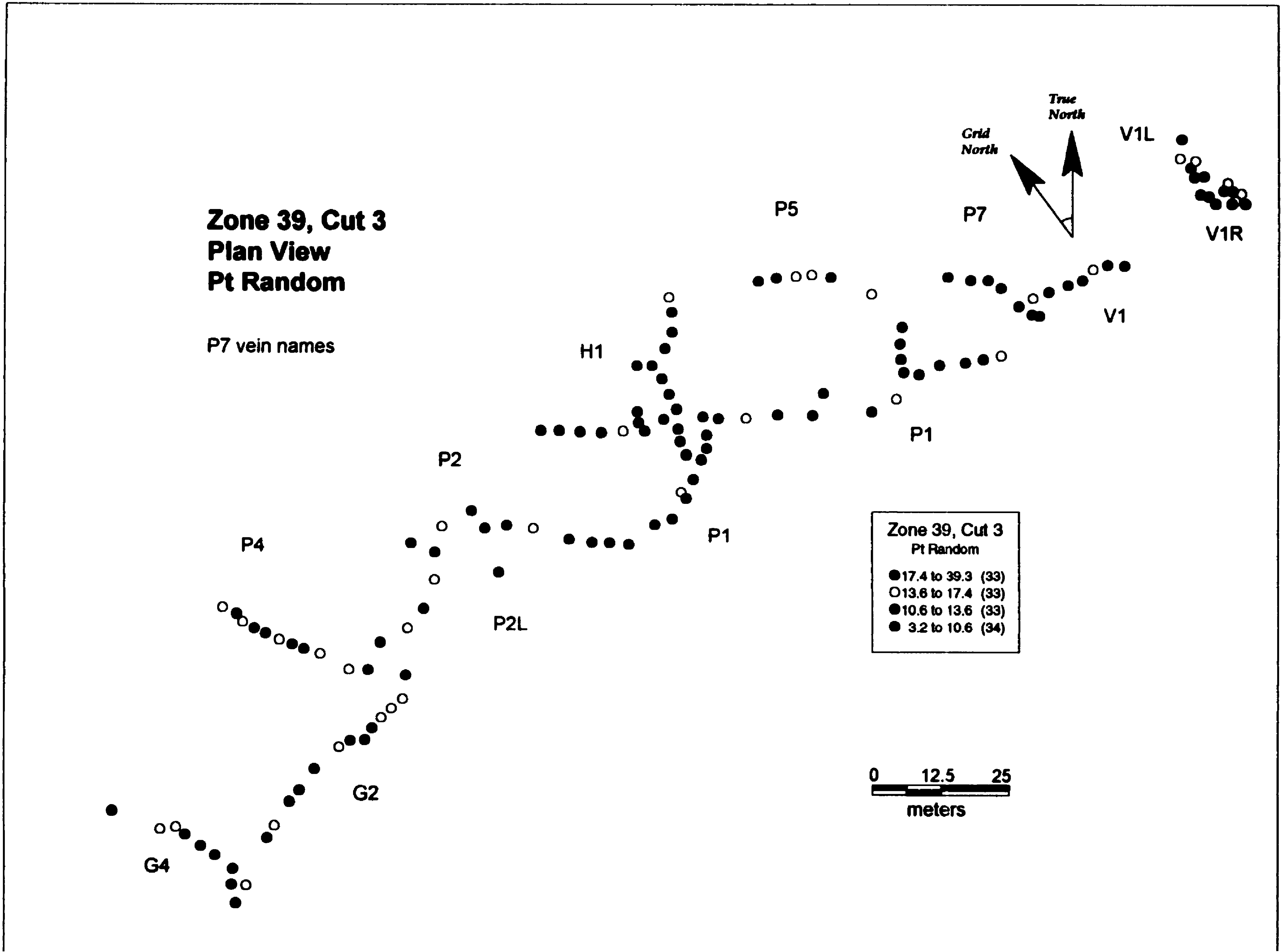
1.3 Randomized Plans (Cut 3)

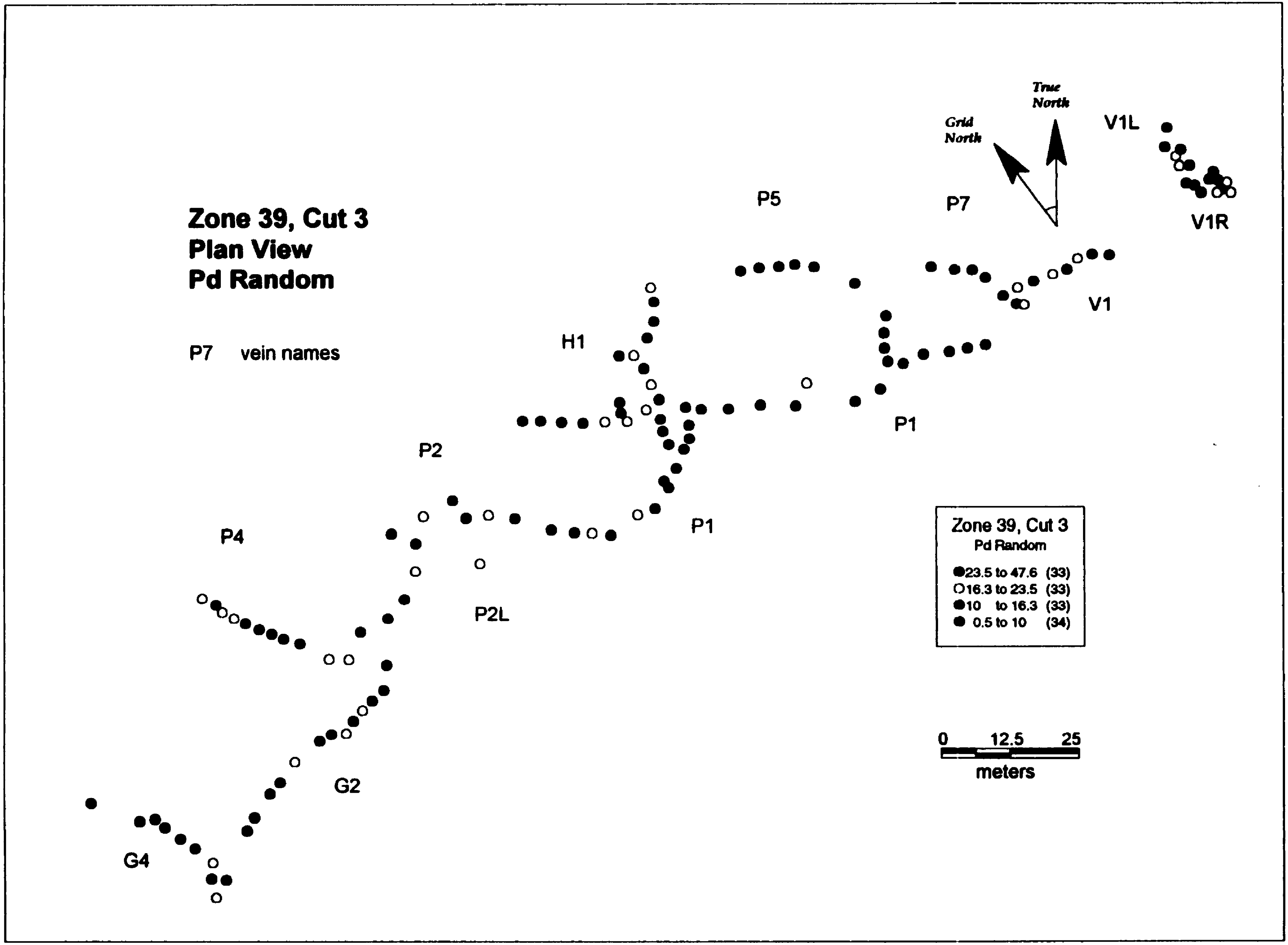


Zone 39, Cut 3
Plan View
Cu Random

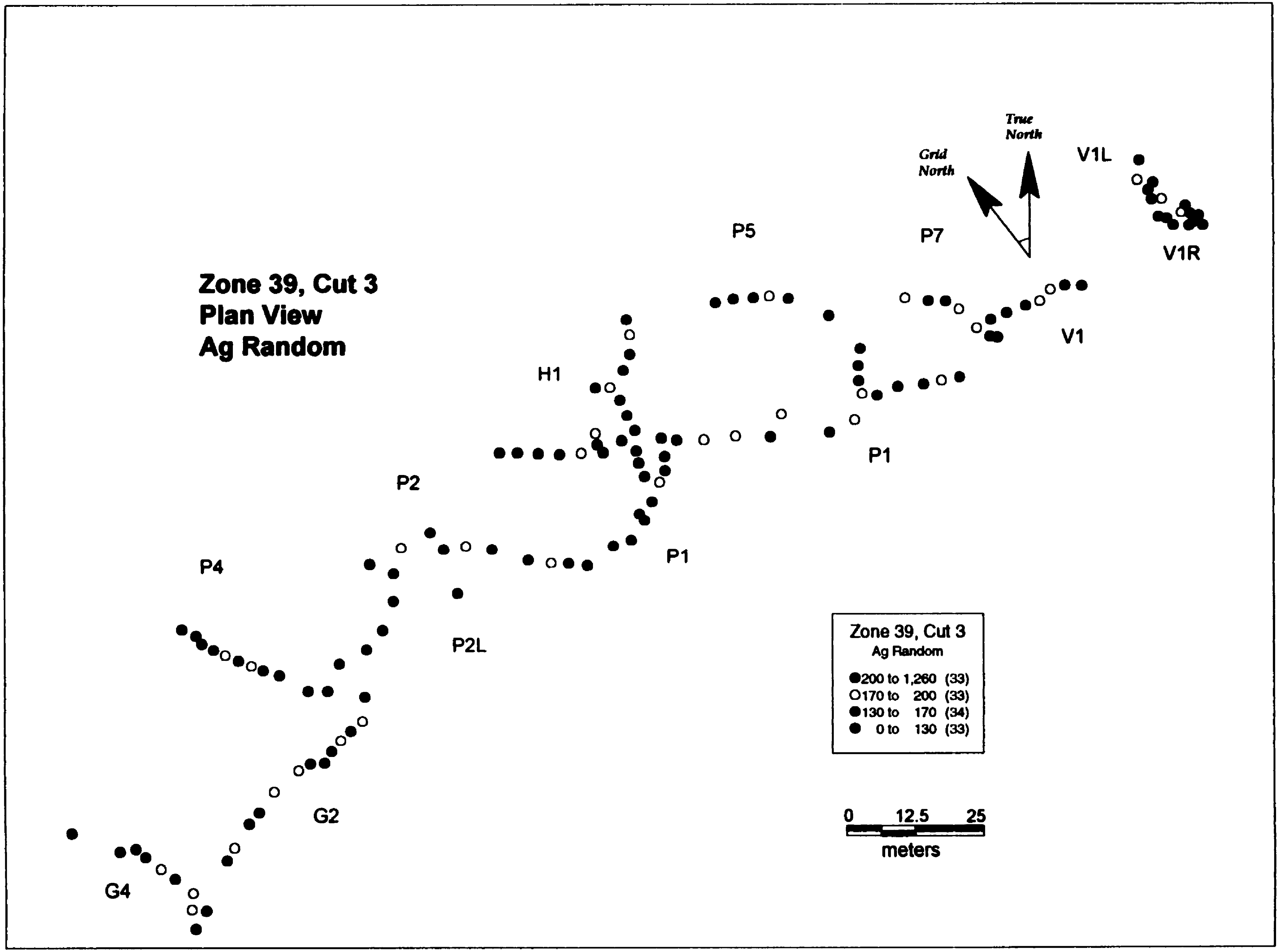

Zone 39, Cut 3
Plan View
Au Random
P7 vein names
Grid North
True North
V1L
V1R
V1
P7
P5
P1
H1
P1
P2
P2L
P4
G2
G4
Zone 39, Cut 3
Au Random
●1.11 to 9.28 (33)
○0.76 to 1.11 (34)
●0.46 to 0.76 (31)
●0.14 to 0.46 (35)
0
12.5
25
meters

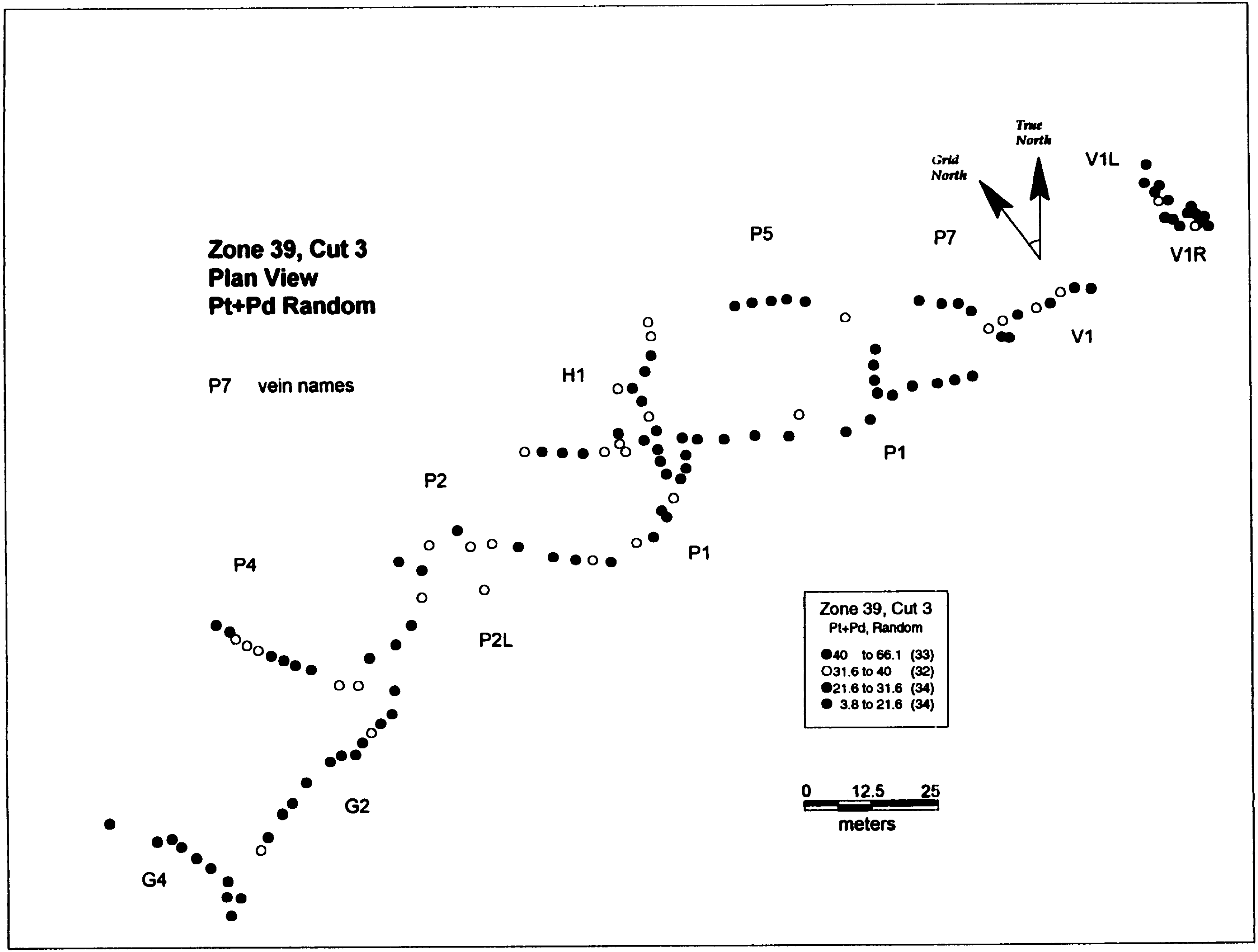
12(2)


Zone 39, Cut 3
Plan View
Pt Random
P7 vein names
True North
Grid North
V1L
V1R
P5
P7
V1
H1
P1
P2
P1
P4
P2L
G2
G4
Zone 39, Cut 3
Pt Random
● 17.4 to 39.3 (33)
○ 13.6 to 17.4 (33)
● 10.6 to 13.6 (33)
● 3.2 to 10.6 (34)
0 12.5 25
meters



Zone 39, Cut 3
Plan View
Pd Random


Zone 39, Cut 3
Plan View
Ag Random
Grid North
True North
V1L
V1R
P5
P7
V1
H1
P1
P2
P1
P4
P2L
G2
G4
Zone 39, Cut 3
Ag Random
● 200 to 1,260 (33)
○ 170 to 200 (33)
● 130 to 170 (34)
● 0 to 130 (33)
0
12.5
25
meters


Zone 39, Cut 3
Plan View
Pt+Pd Random
P7 vein names
Grid North
True North
V1L
V1R
P5
P7
V1
H1
P1
P2
P1
P4
P2L
G2
G4
Zone 39, Cut 3
Pt+Pd, Random
● 40 to 66.1 (33)
○ 31.6 to 40 (32)
● 21.6 to 31.6 (34)
● 3.8 to 21.6 (34)
0
12.5
25
meters

1.4 Detailed Interpretation of Point Plots:

Copper:

The sill cut shows the reverse trend to Ni with a Cu enriched core and low regions at the east and west end of the zone. Cut 3 does not have similar trends with an enriched region cross cutting the G2/P4 area and the P5 area and a low core region. No coincident zones are apparent in data from both cuts. Zone 38 by comparison to the sill cut showed a strong relative depletion in Cu in the core region.

Gold:

An enriched western core area along with depleted extremities are indicated in the sill cut. Cut 3 only has one apparent zone cross cutting the G2/P4 veins. Both cuts show only a weakly defined enriched region cross cutting the G2/P4 veins. Overall there is no strong evidence for any zoning or support for multiple populations.

Platinum:

The sill cut shows enriched regions cross cutting the P4/G2 area and in an area where the H1/P1 veins intersect. The eastern extremities of the zone appear depleted. The cut 3 data and data from both the sill cut and cut 3 together show only an enriched region cross cutting the P4/G2 area. Weakly defined potential PGE enrichment trends indicated at the east and west extremities of Zone 38 are not apparent in Zone 39. There is no evisence spatially for a bimodal population.

Palladium:

Enriched regions are located on the sill cut through an area cross cutting the P4/G2 veins (coincident with Pt) and in the P1/P5 area. Depleted regions occur at the ends of the P4 and G2 veins and at the east end of P1. Cut 3 shows a broader enriched region in the P4/G2 area covering part of the depleted region on the sill cut. Depleted regions occur at the P1/H1 junction and P7/P1 junction. Data from both cuts shows an enriched region through the G2/P4 area and possibly a weakly defined enrichment in the P5 region. A weakly defined enriched region in the P1 vein is also apparent. These enriched areas may support the statistical indications multiple populations.

Silver:

Silver shows the most well defined regions of the sill cut having highs concentrated mainly along the east-west trending vein and low regions in the footwall veins and west extremities. Cut 3 has some well defined zones but does not have similar patterns to the sill cut. There are distinct lows in the H1/P1 junction area and the G2/P4 areas. An extremely enriched region occurs at the end of the G4 vein where extensive native silver and bornite were observed. Data from the two cuts combined show depleted areas in the P4 and H1 veins and an enriched eastern region.

Copper + Nickel

The only apparent pattern within the sill cut data is an enrichment (weakly defined) at the northern extremities of the NW and NE trending (footwall) veins and a well defined depletion in part of the P1 vein. Cut 3 shows an enriched region coincident with PM trends in the G2/P4 veins and a low through part of the P1 vein (where the vein is the thickest). Data from both cuts shows an enrichment towards the north (further into the footwall) as in the sill cut and a high in the P4 vein. The well defined Cu+Ni depletion in the core of Zone 38 (discussed in part 2) is not obvious in Zone 39.

Platinum + Palladium:

The sill cut shows enriched regions through the G2/P4 area and the H1/P1 intersection area. The east end is depleted. Cut 3 shows a similar enriched area in the G2/P4 area. Data from both cuts show similar patterns to the sill cut.

Platinum/(Platinum+Palladium):

Similar patterns occur in both cuts with enriched regions in the H1 vein and eastern end of the zone and a depleted region in the P5/P3 area.

Copper/(Copper+Nickel):

Data from both cuts shows a depleted H1 and enriched region at the G2/G4 junction. These regions are coincident with high Ni in the H1 vein and PM enrichment in the G2/P4 area.

Copper+Nickel/Sulphur (decreasing Fe):

Data from cut 3 shows a weakly defined enrichment towards the ends of the NW and NE trending (footwall) veins.

Copper Equivalent:

The only significant region indicated is an enrichment through the area cross cutting the G2/P4 veins influenced by enriched PM's.

1.5 *Geology Plans With Interpreted Metal Zones*

Figure 13b-j: Geology Plans with Metal Zones Interpreted from Point Plots

Metal Distribution
Zone 39 – Sill Cut and Cut 3
Plan View

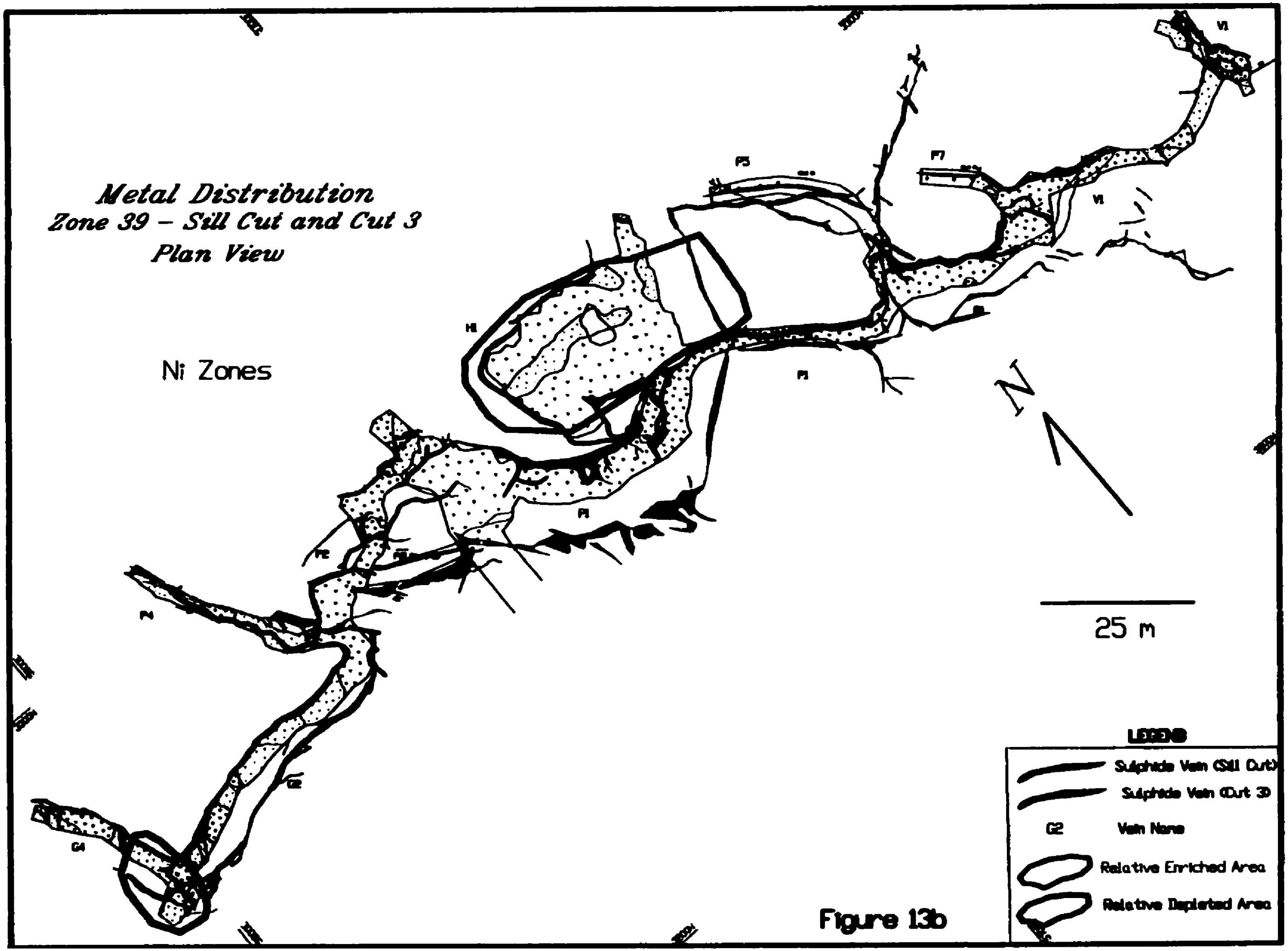


Figure 13b

Metal Distribution
Zone 39 – Sill Cut and Cut 3
Plan View

Au zones

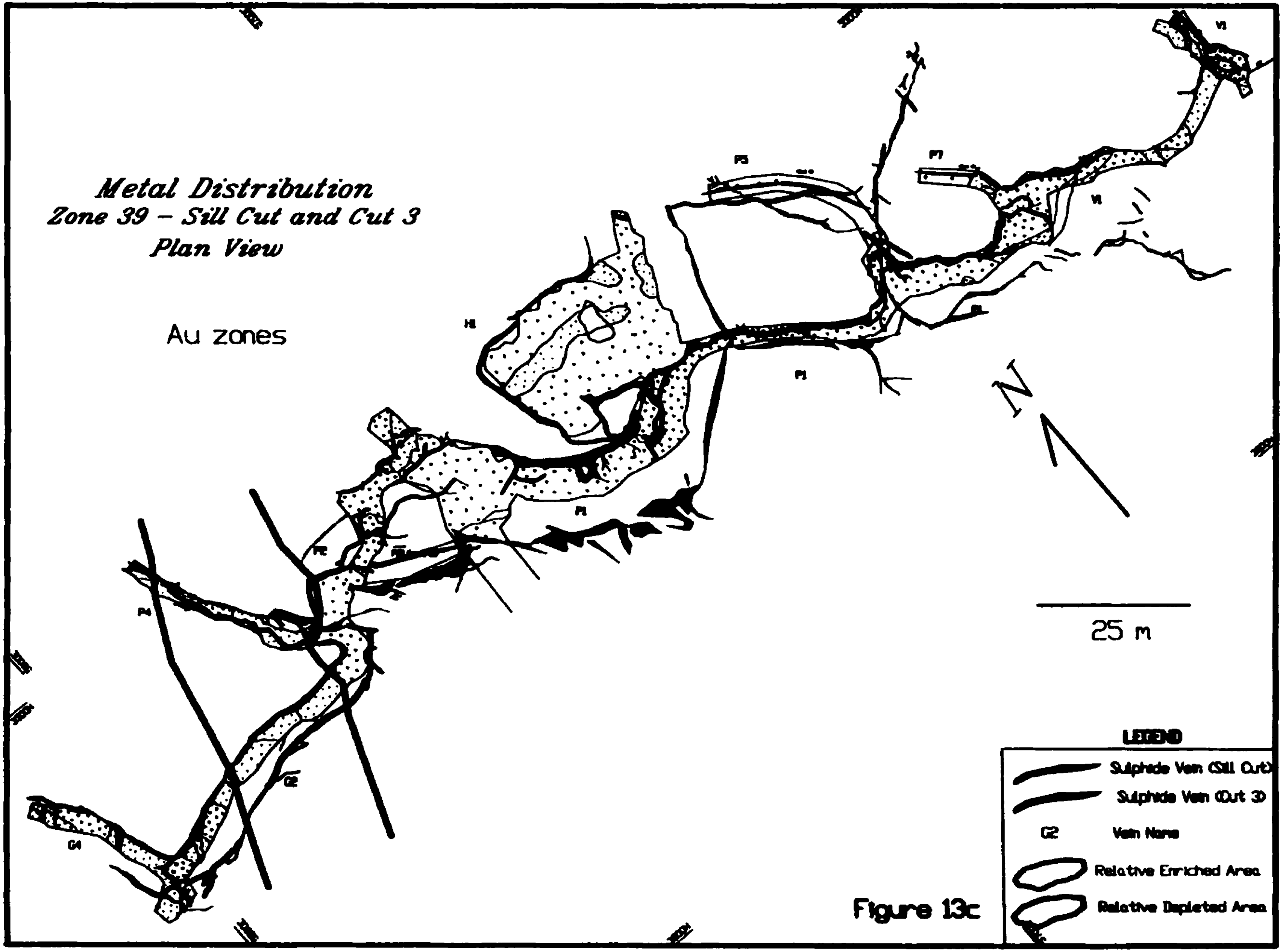
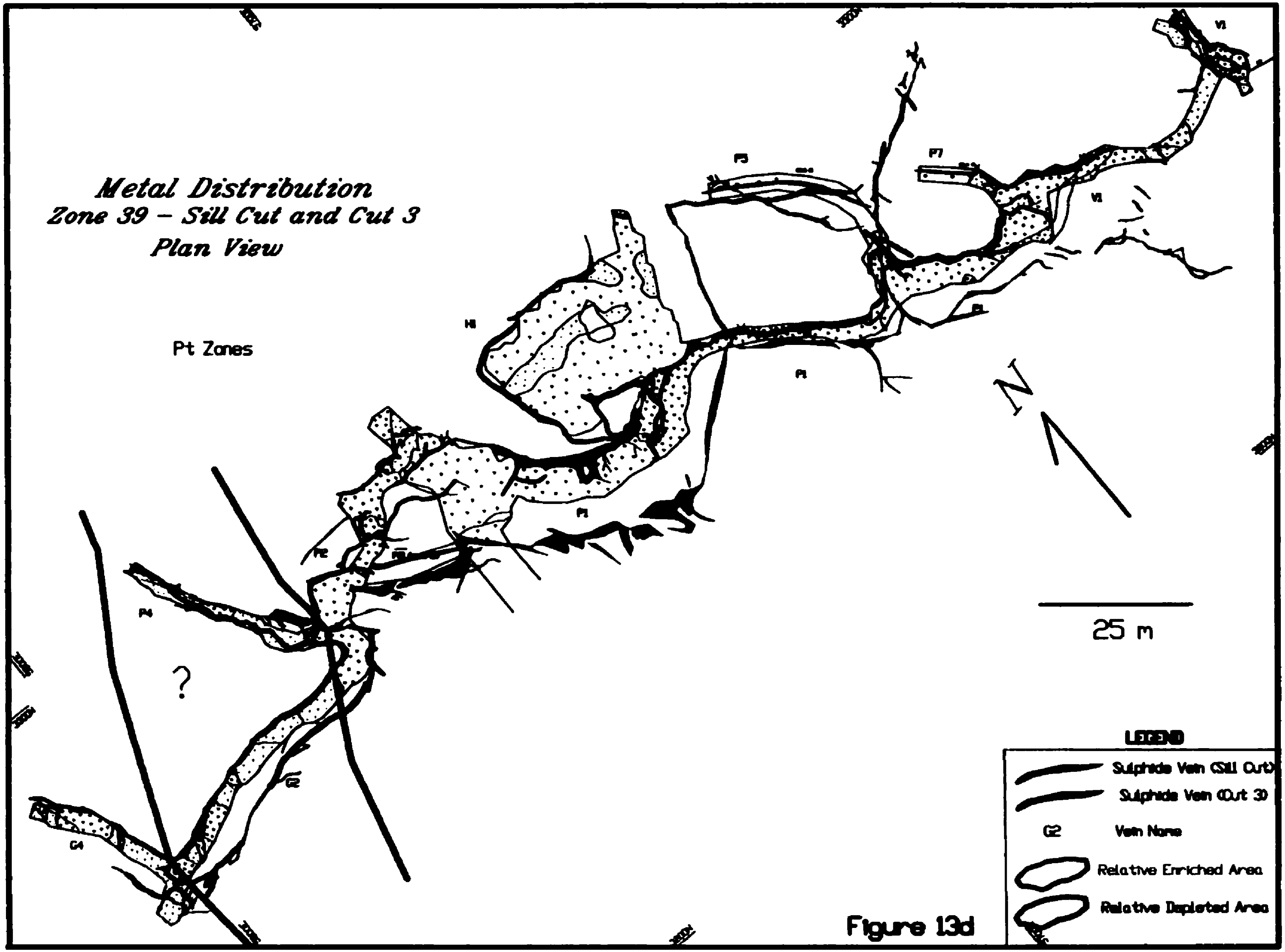


Figure 13c



Metal Distribution
Zone 39 – Sill Cut and Cut 3
Plan View

Figure 13d

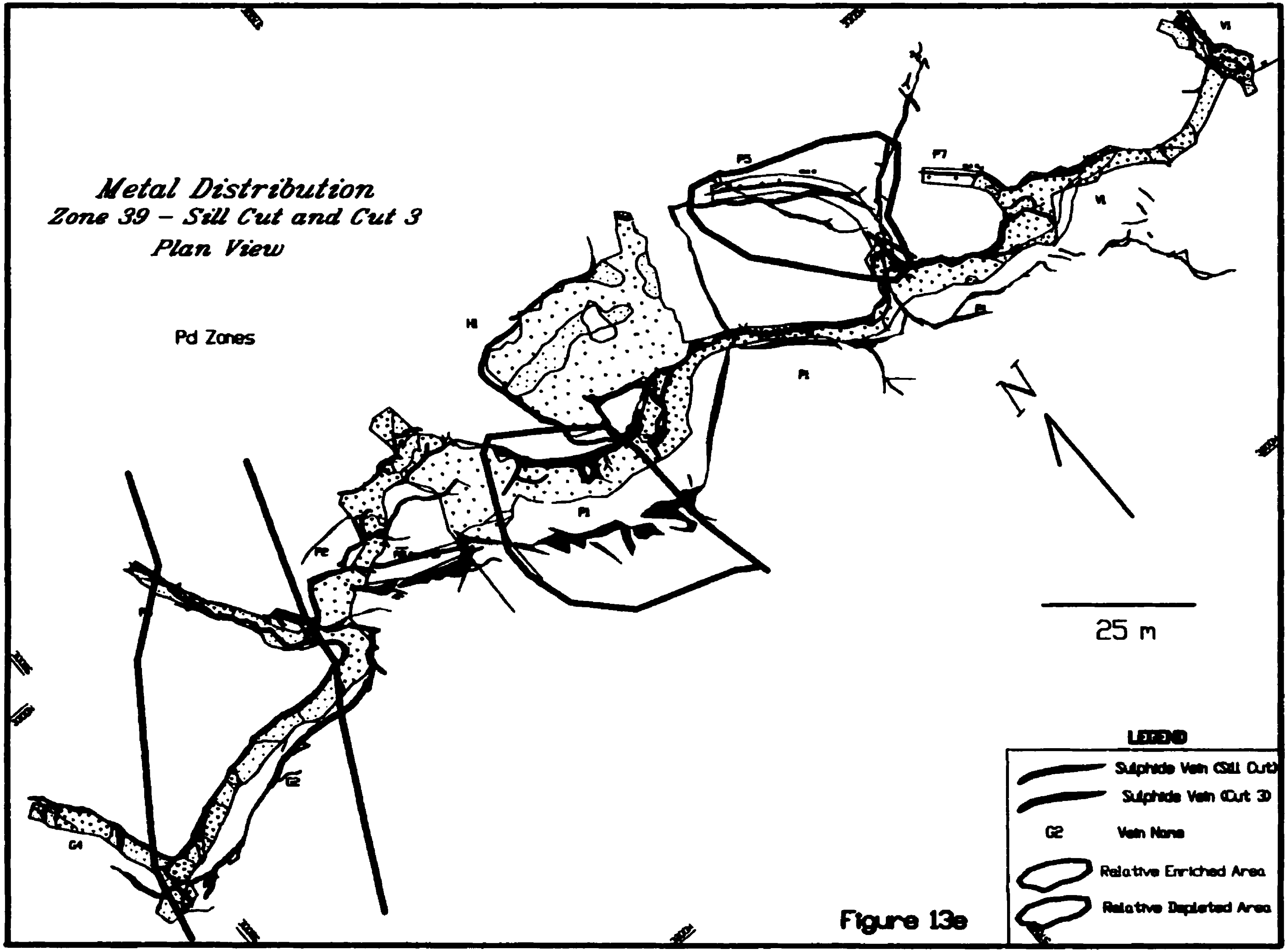

Metal Distribution
Zone 39 – Sill Cut and Cut 3
Plan View

Figure 13e

Metal Distribution
Zone 39 – Sill Cut and Cut 3
Plan View

Ag Zones

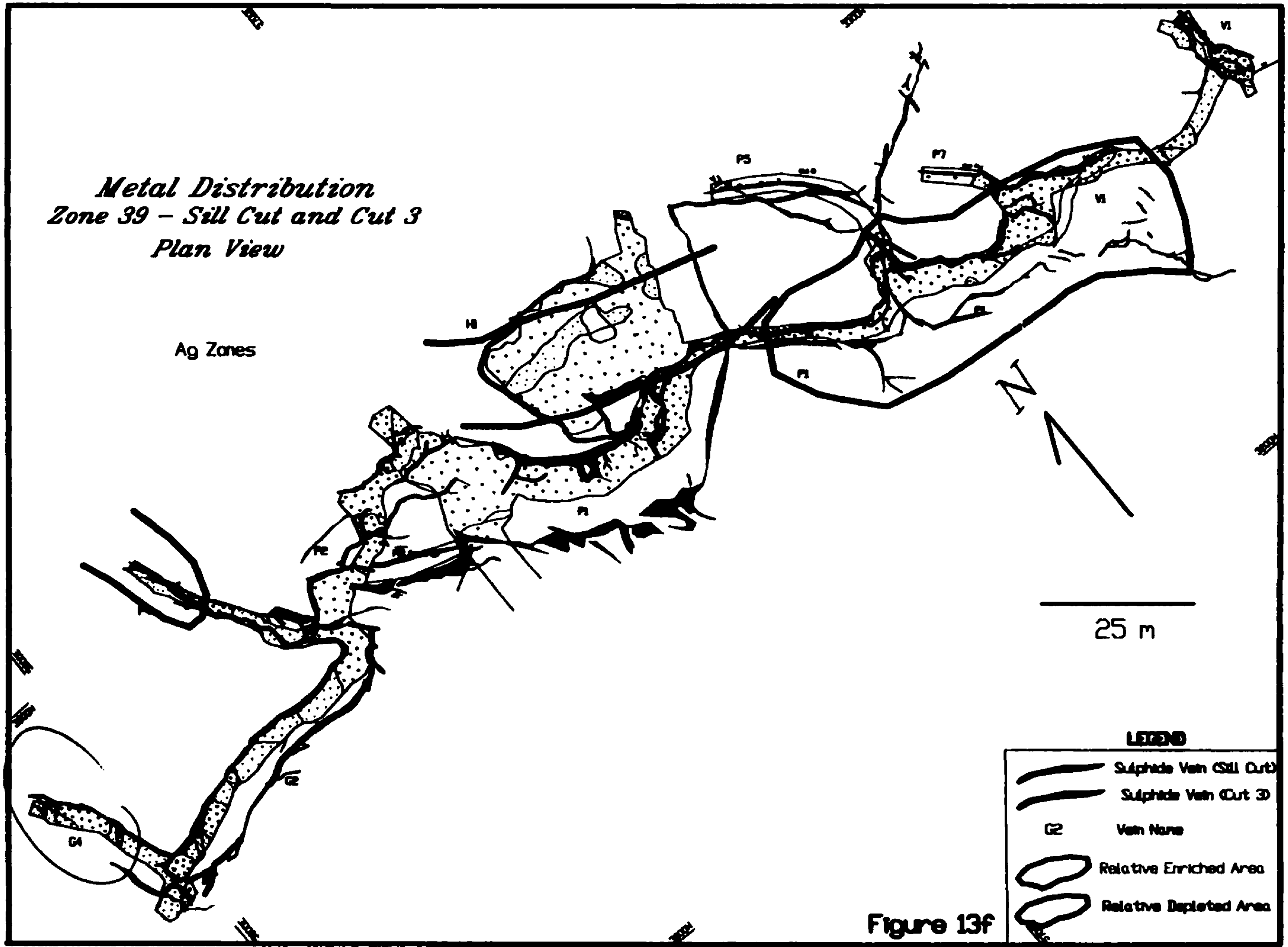
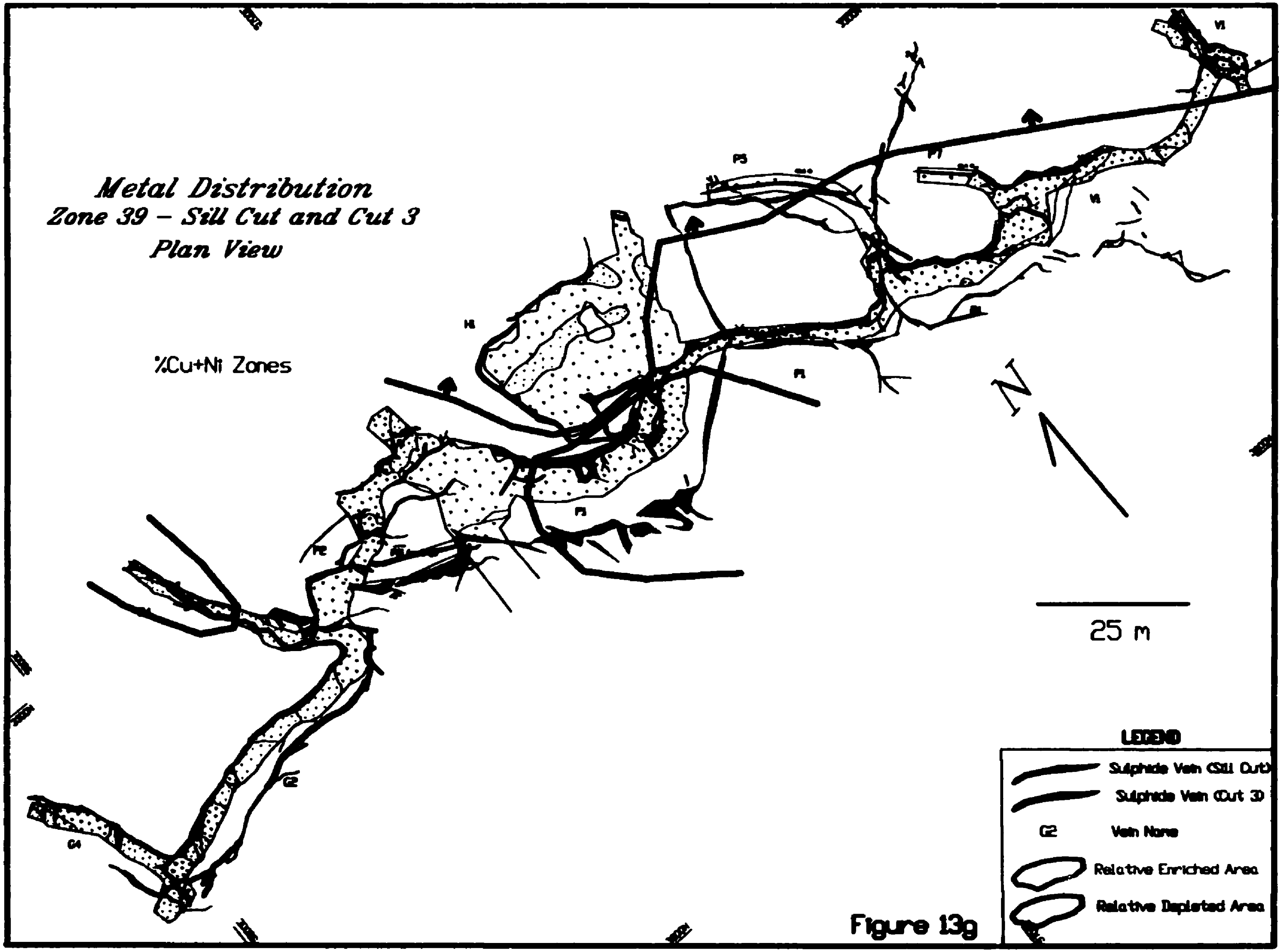


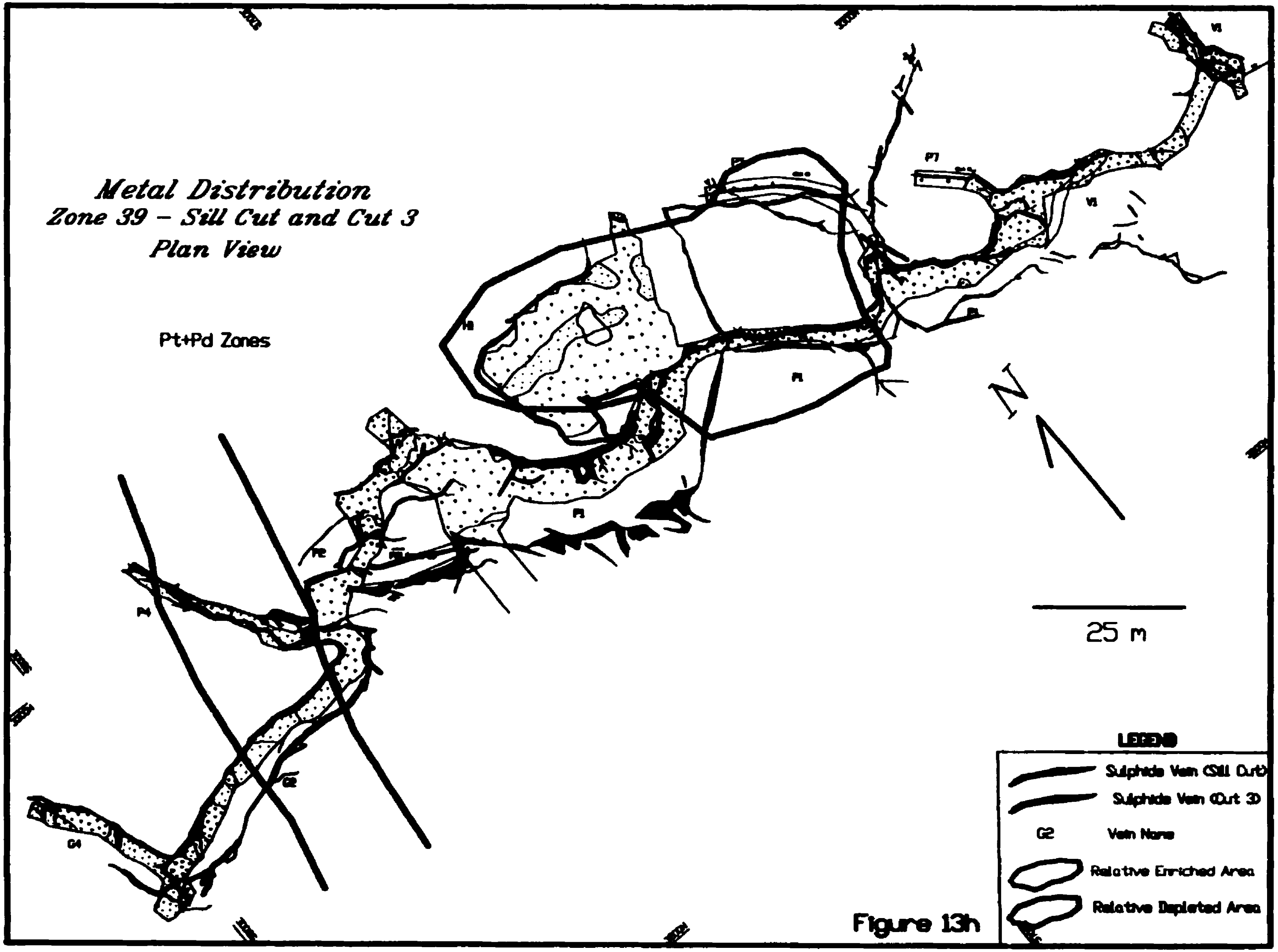
Figure 13f



Metal Distribution
Zone 39 – Sill Cut and Cut 3
Plan View

%Cu+Ni Zones

Figure 13g



Metal Distribution
Zone 39 – Sill Cut and Cut 3
Plan View

Pt+Pd Zones

Figure 13h

Metal Distribution
Zone 39 – Sill Cut and Cut 3
Plan View

Pt/Pt+Pd Zones

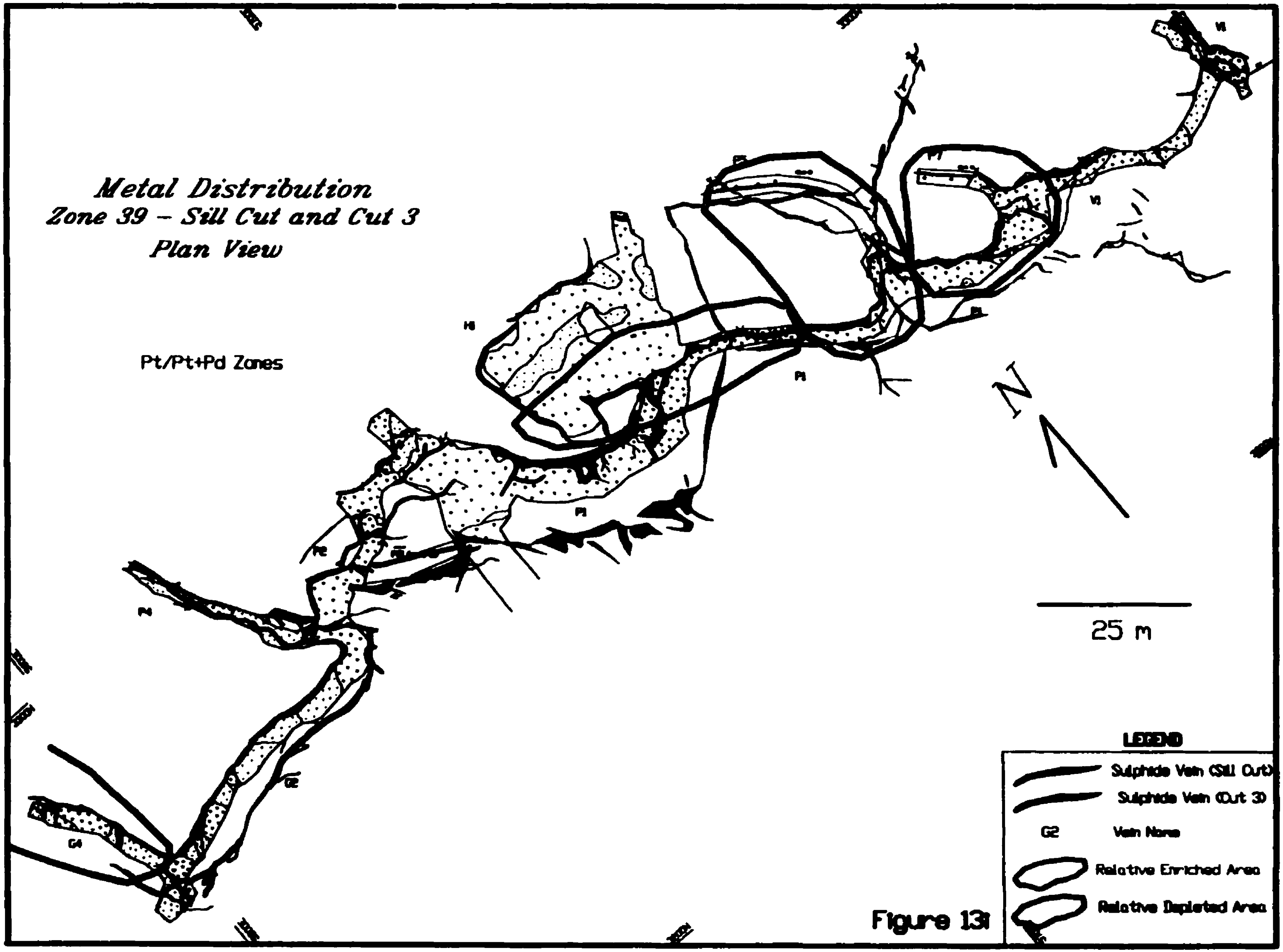
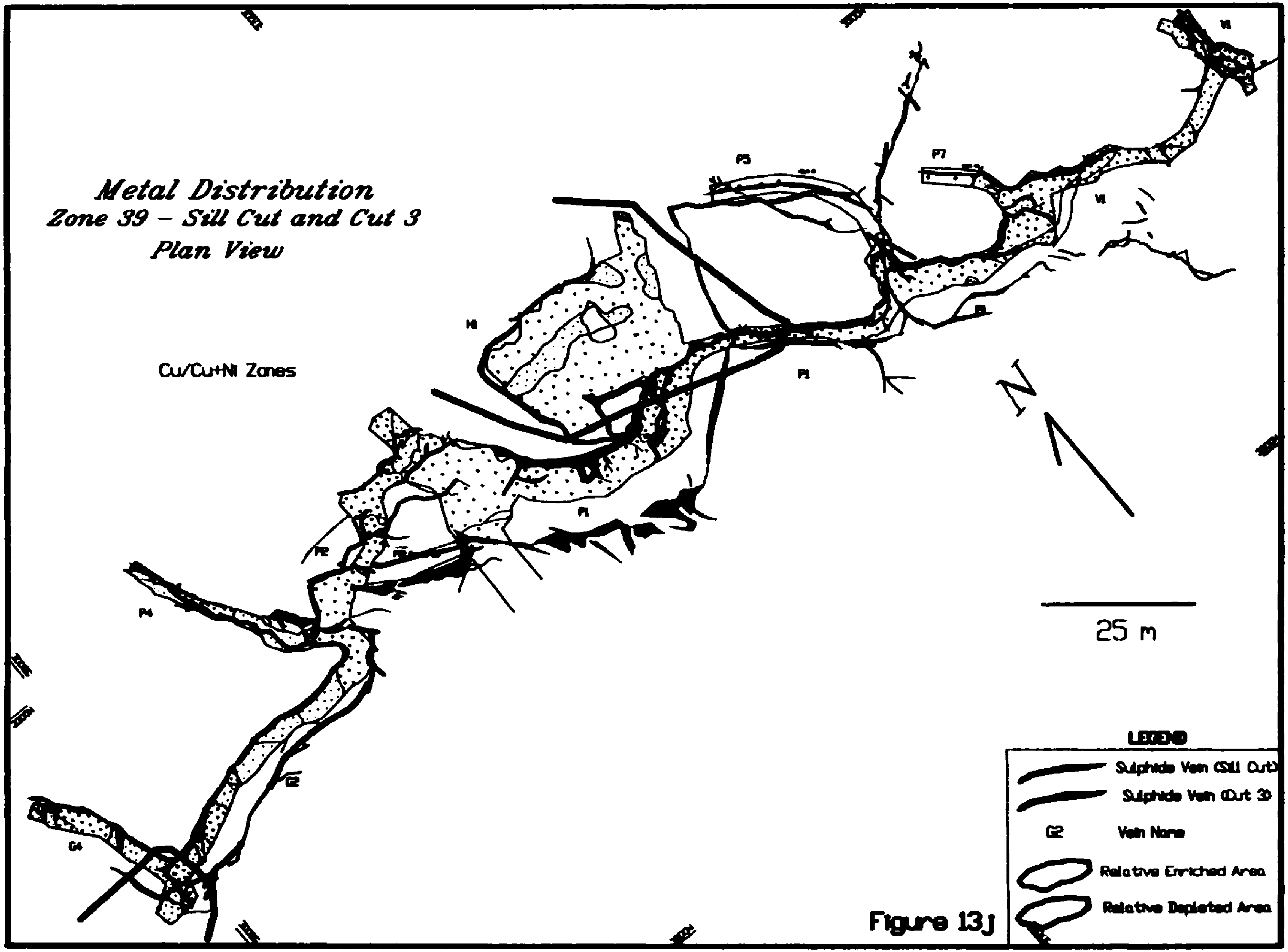


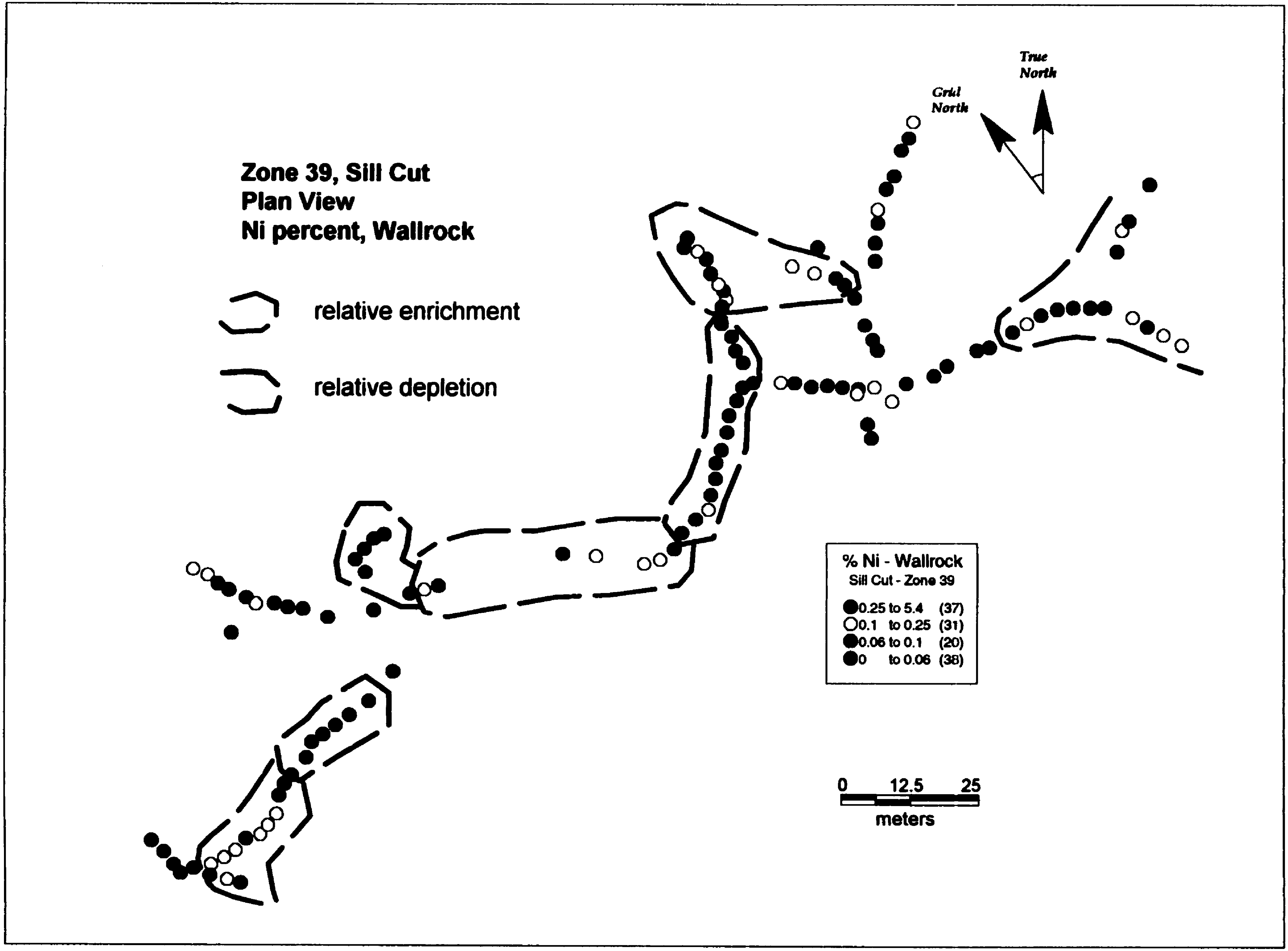
Figure 131

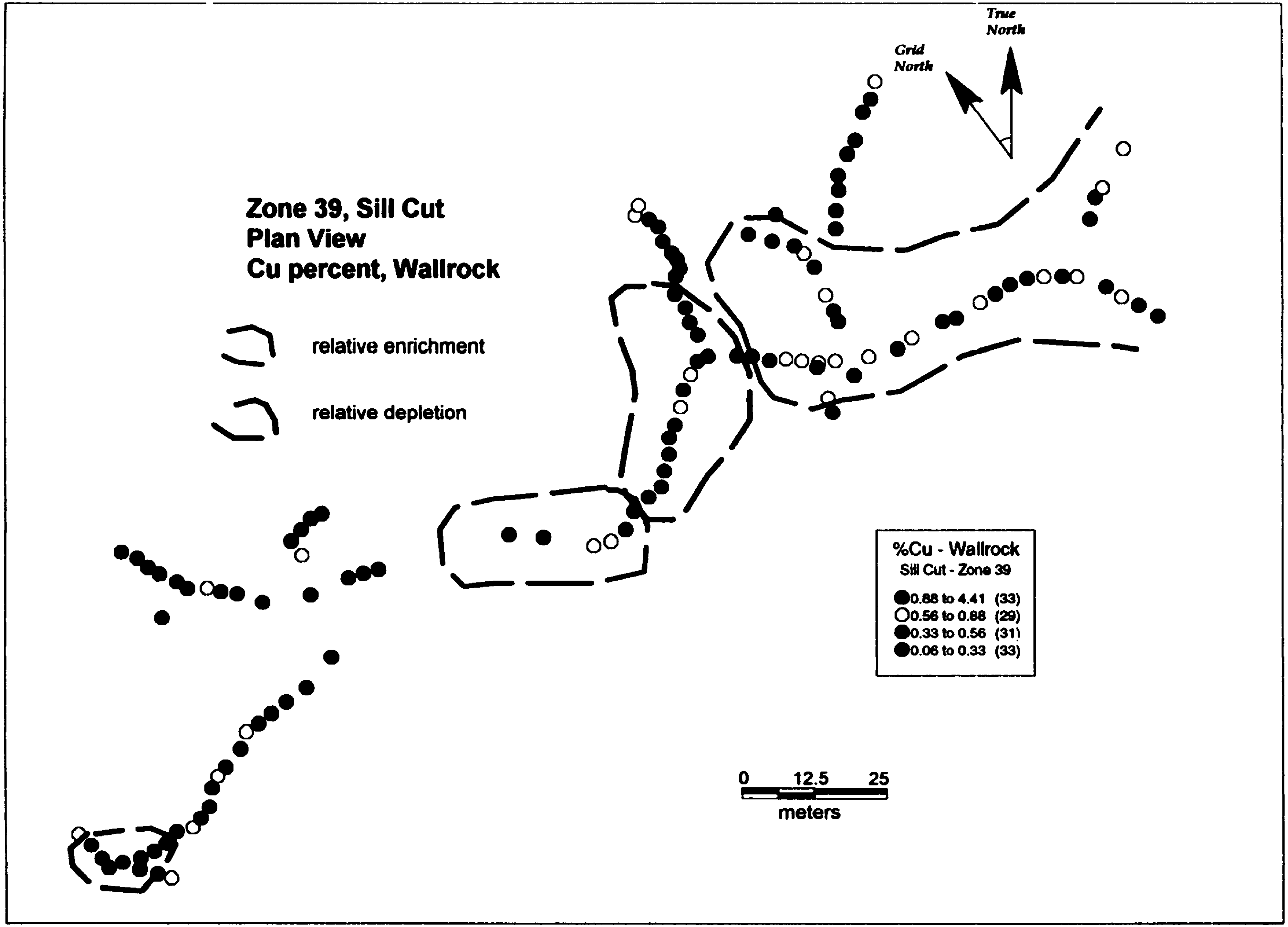


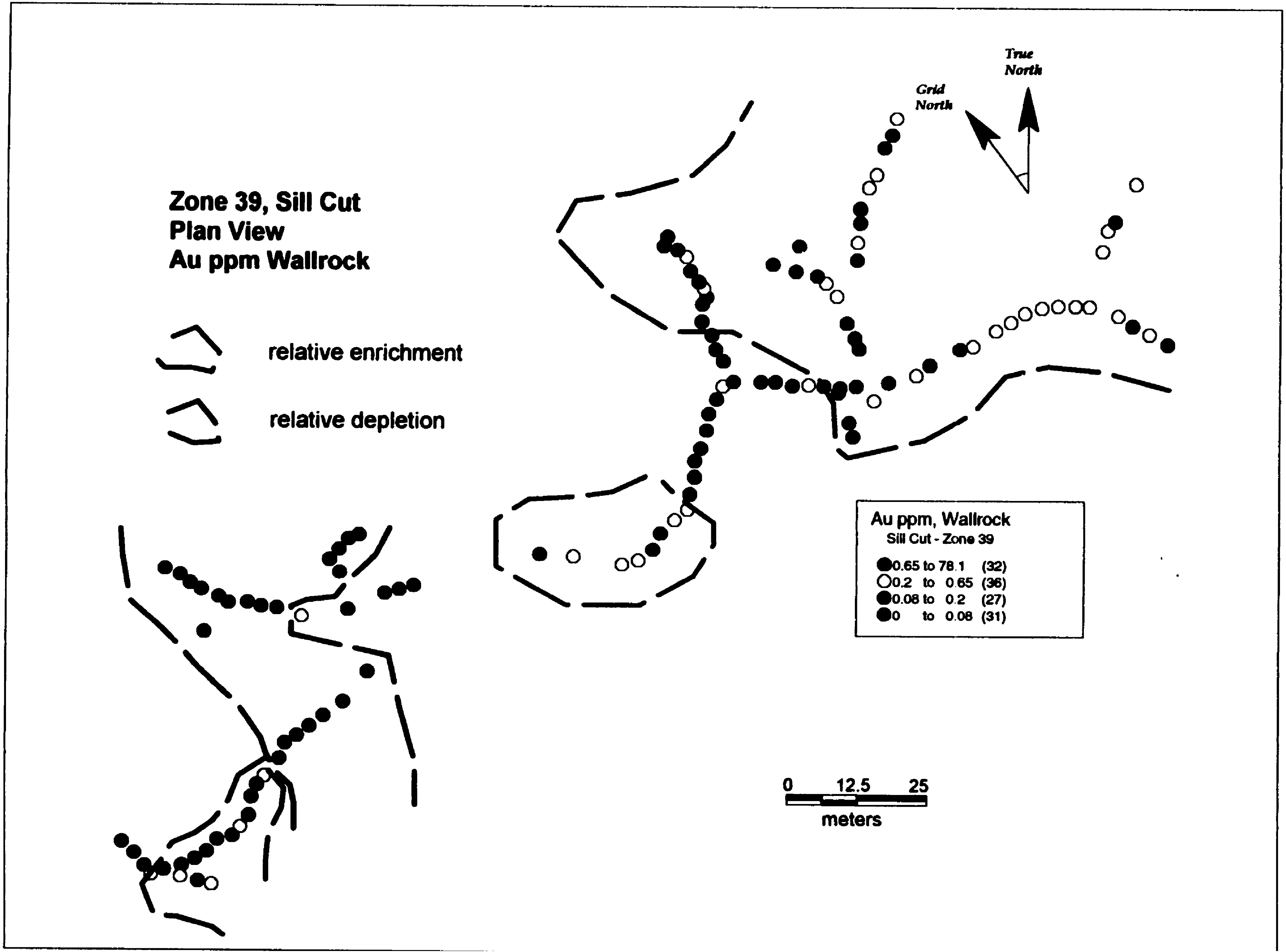
Metal Distribution
Zone 39 – Sill Cut and Cut 3
Plan View

Figure 13j

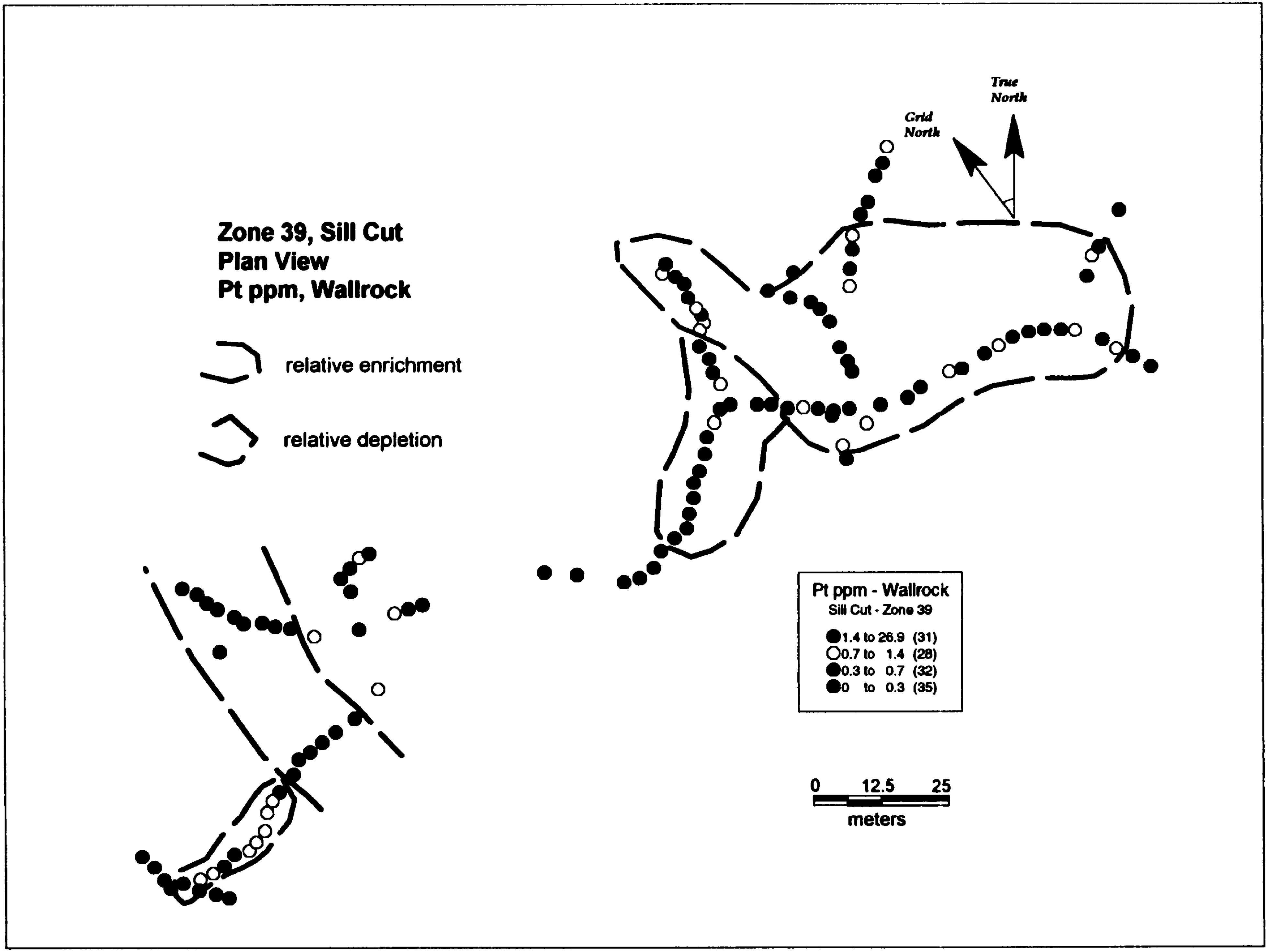
1.6 Wallrock Plots - Sill Cut

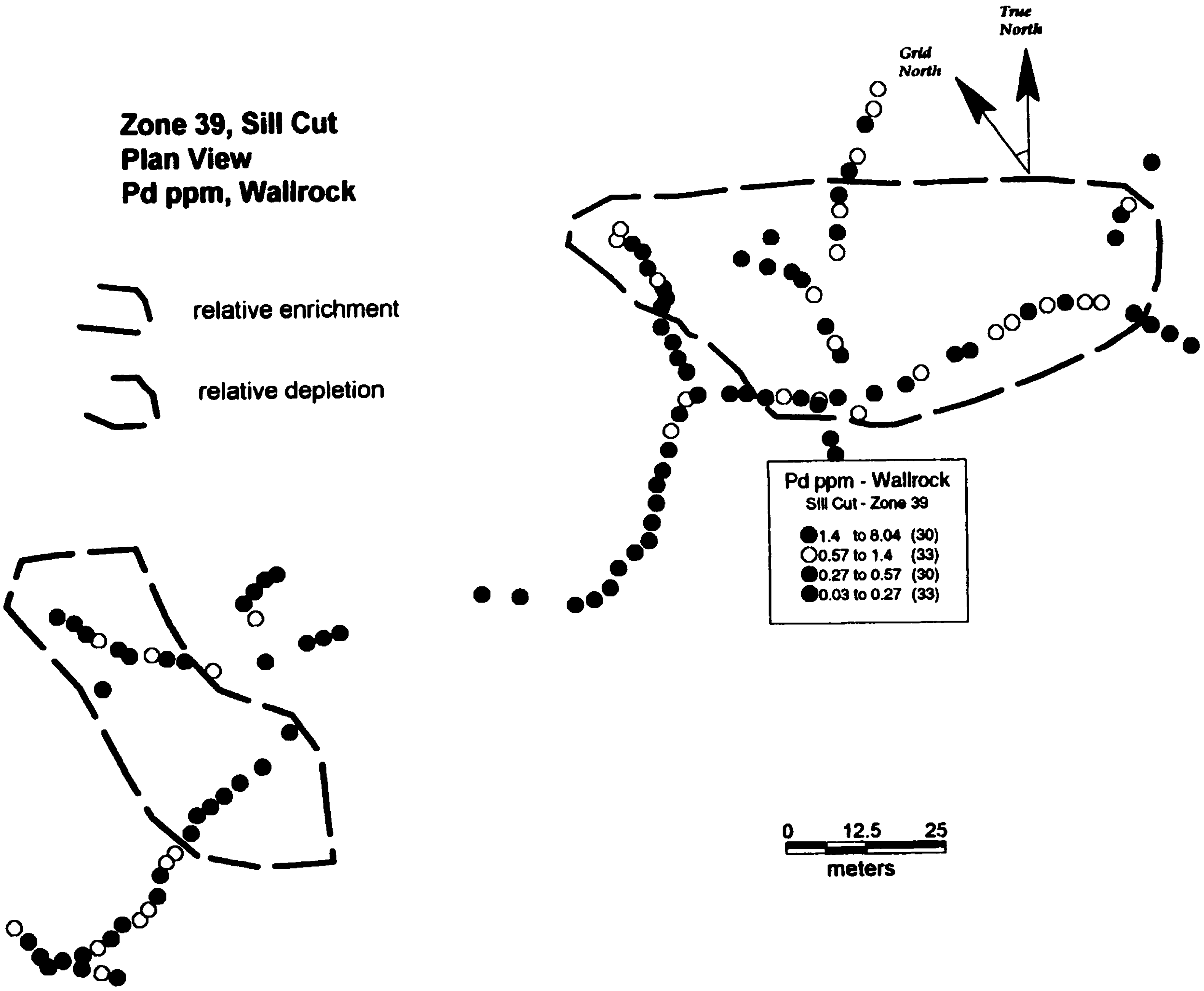

Zone 39, Sill Cut
Plan View
Ni percent, Wallrock
relative enrichment
relative depletion
Grid North
True North
% Ni - Wallrock
Sill Cut - Zone 39
●0.25 to 5.4 (37)
○0.1 to 0.25 (31)
●0.06 to 0.1 (20)
●0 to 0.06 (38)
0
12.5
25
meters


Zone 39, Sill Cut
Plan View
Cu percent, Wallrock
relative enrichment
relative depletion
True North
Grid North
%Cu - Wallrock
Sill Cut - Zone 39
●0.88 to 4.41 (33)
○0.56 to 0.88 (29)
●0.33 to 0.56 (31)
●0.06 to 0.33 (33)
0
12.5
25
meters

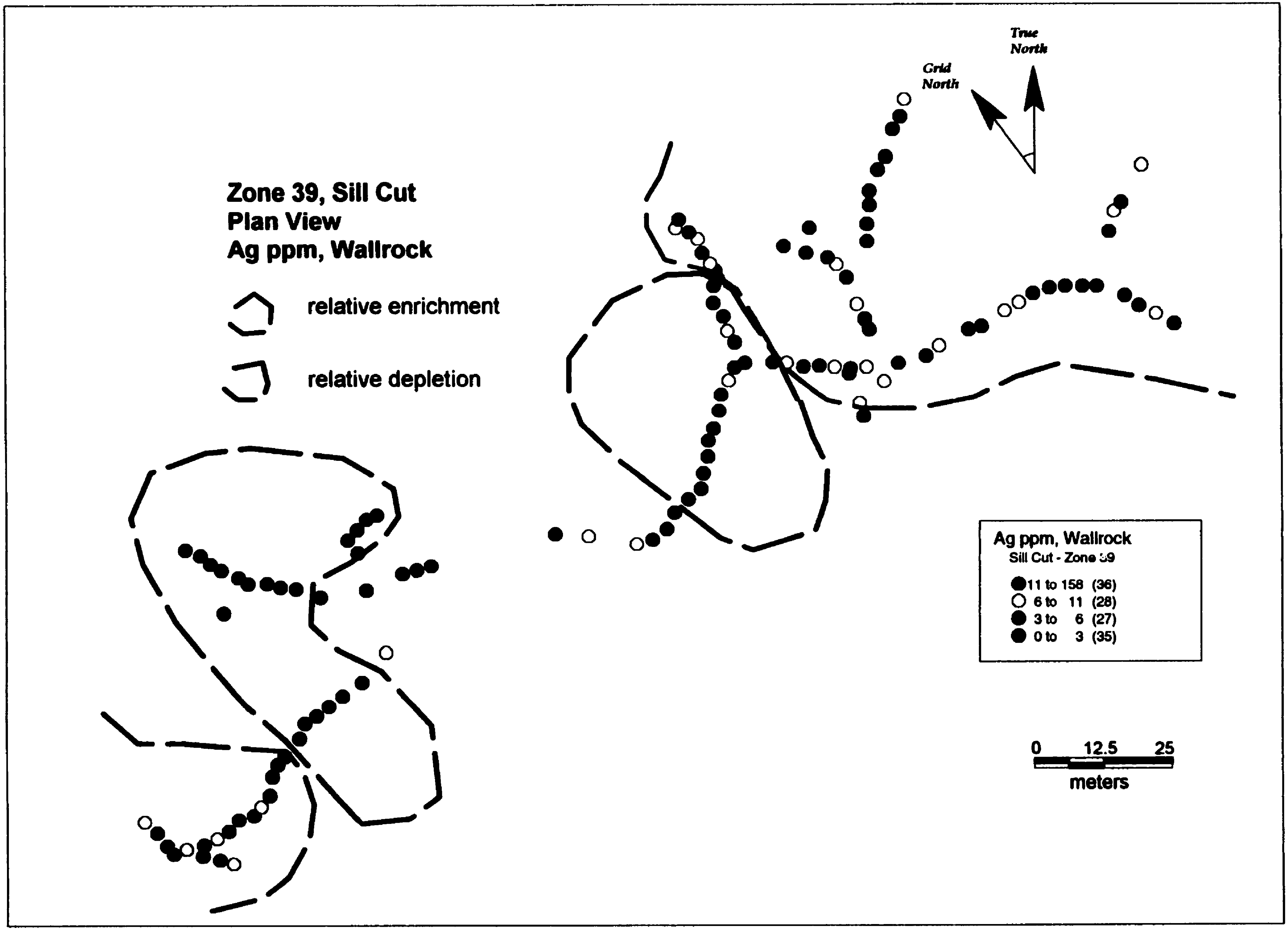


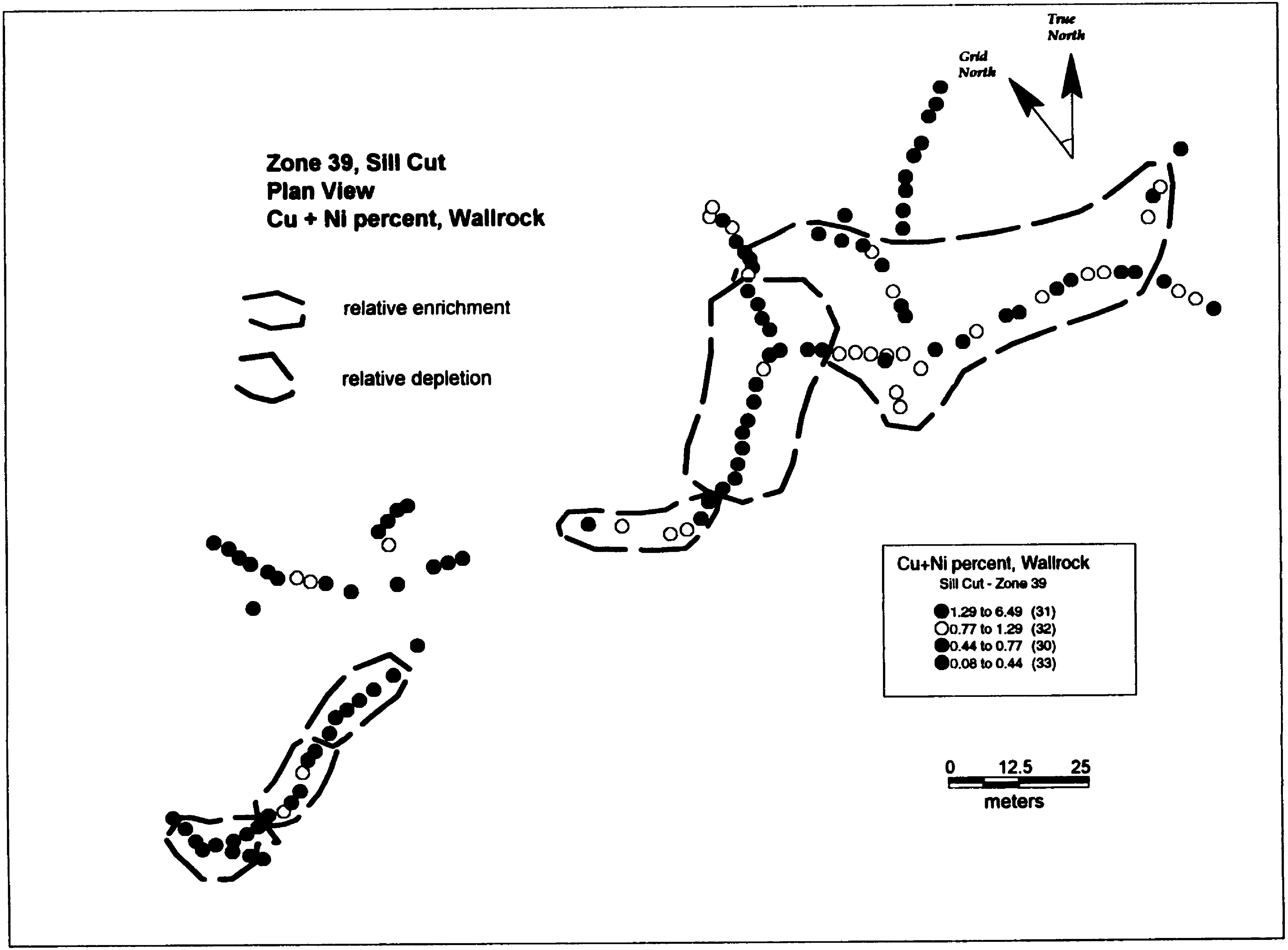
Zone 39, Sill Cut
Plan View
Au ppm Wallrock


Zone 39, Sill Cut
Plan View
Pt ppm, Wallrock
relative enrichment
relative depletion
True North
Grid North
Pt ppm - Wallrock
Sill Cut - Zone 39
● 1.4 to 26.9 (31)
○ 0.7 to 1.4 (28)
● 0.3 to 0.7 (32)
● 0 to 0.3 (35)
0
12.5
25
meters

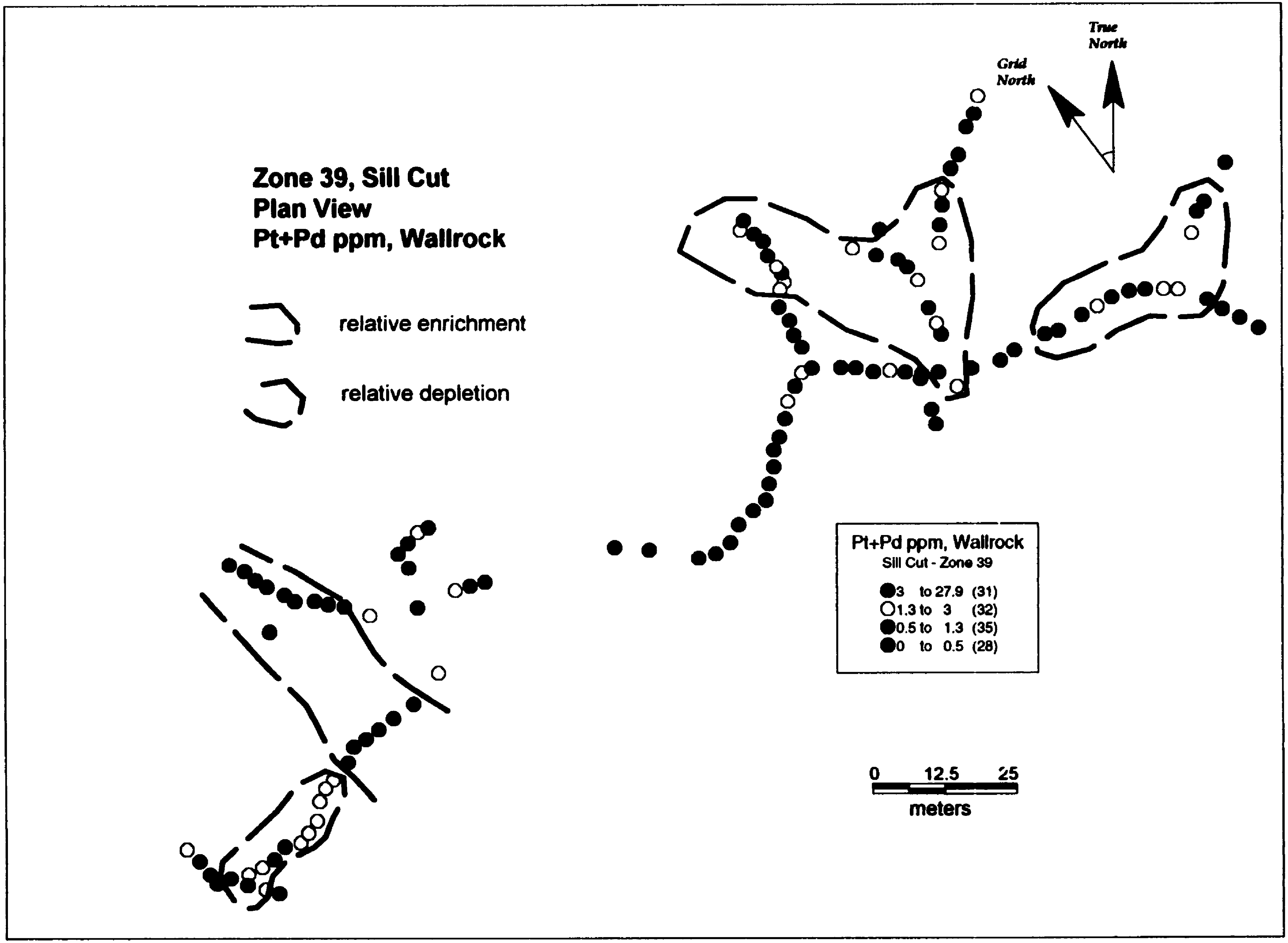


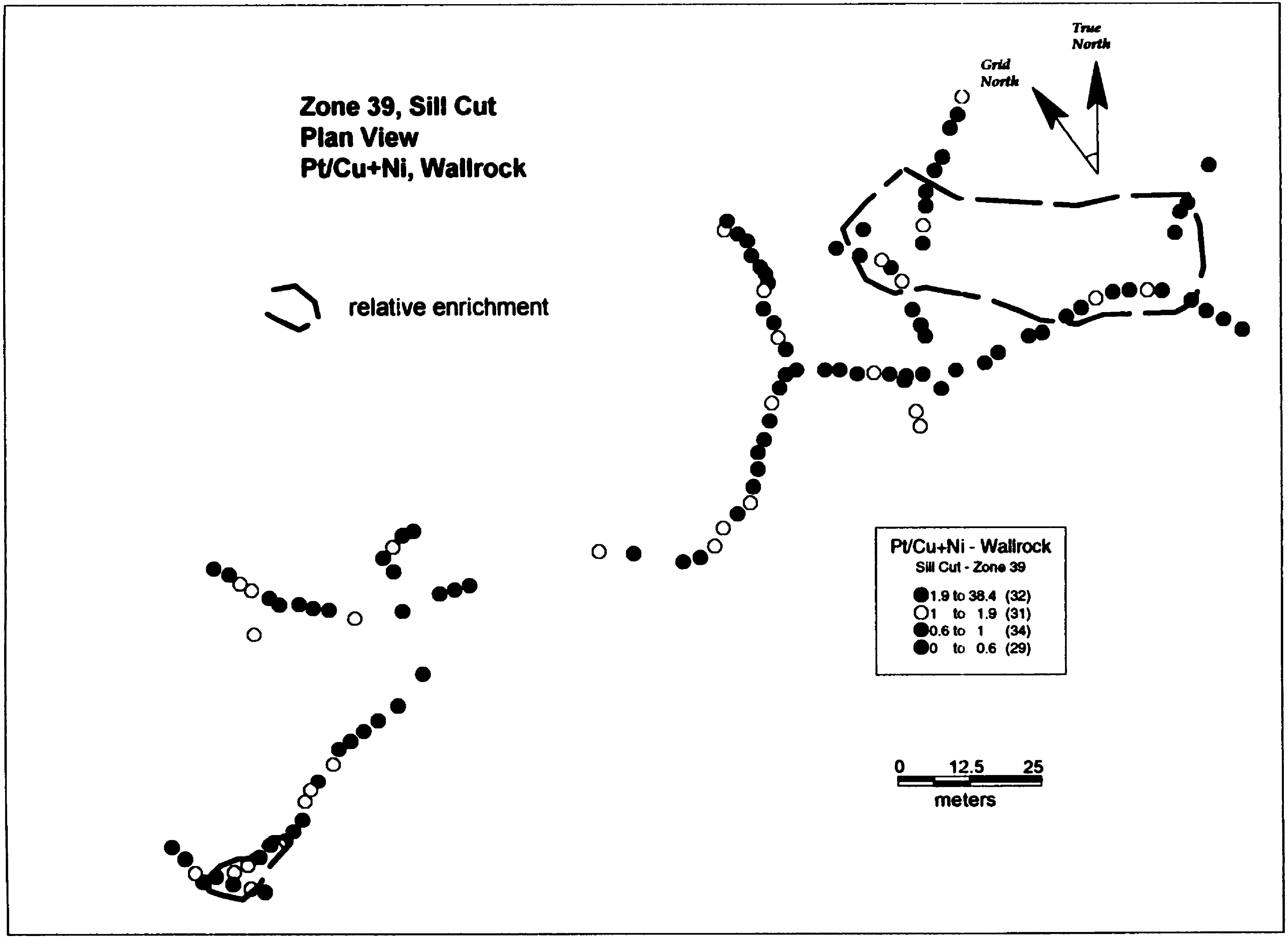
Zone 39, Sill Cut
Plan View
Pd ppm, Wallrock

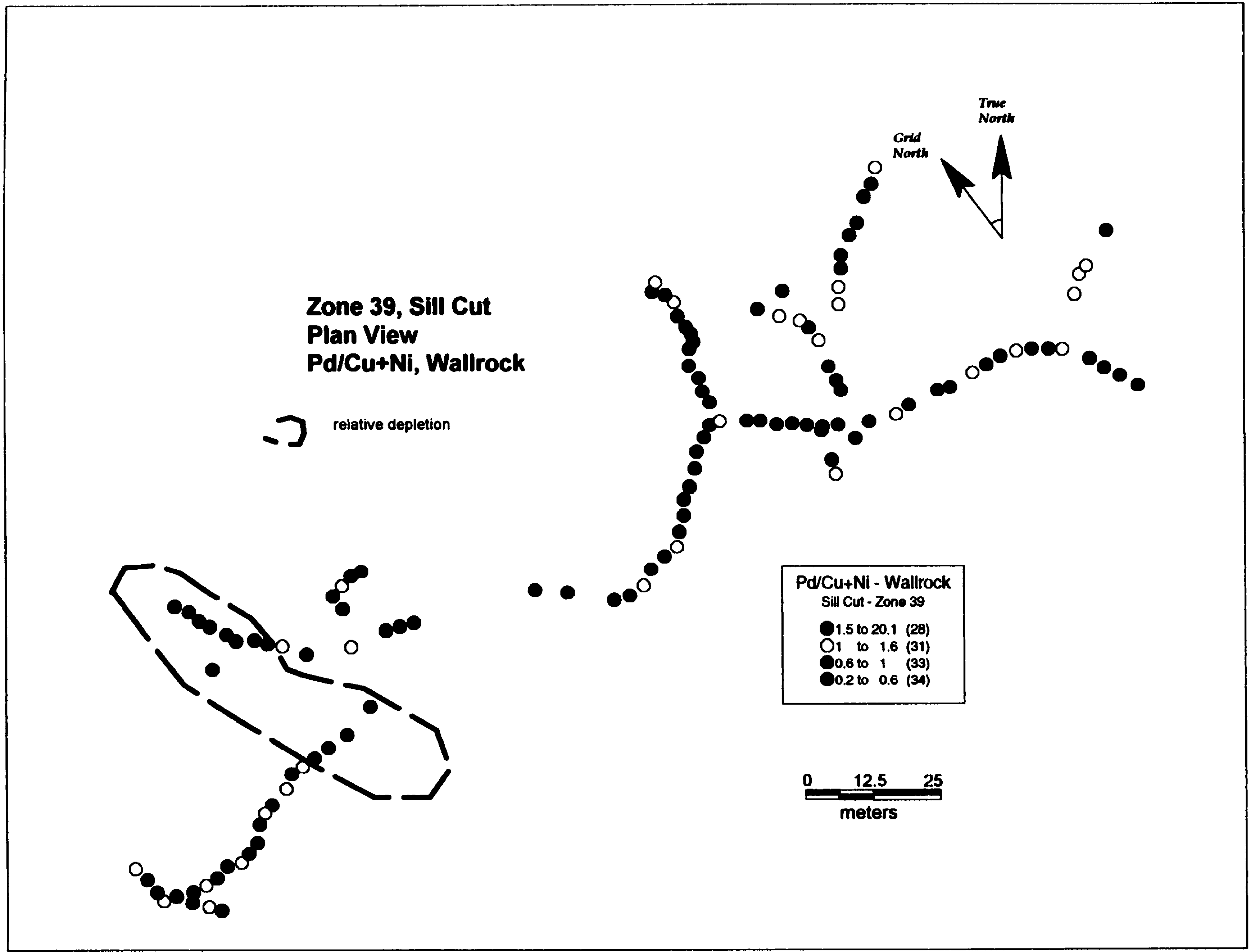

Zone 39, Sill Cut
Plan View
Ag ppm, Wallrock
relative enrichment
relative depletion
Grid North
True North
Ag ppm, Wallrock
Sill Cut - Zone 39
● 11 to 158 (36)
○ 6 to 11 (28)
● 3 to 6 (27)
● 0 to 3 (35)
0
12.5
25
meters



Zone 39, Sill Cut
Plan View
Cu + Ni percent, Wallrock

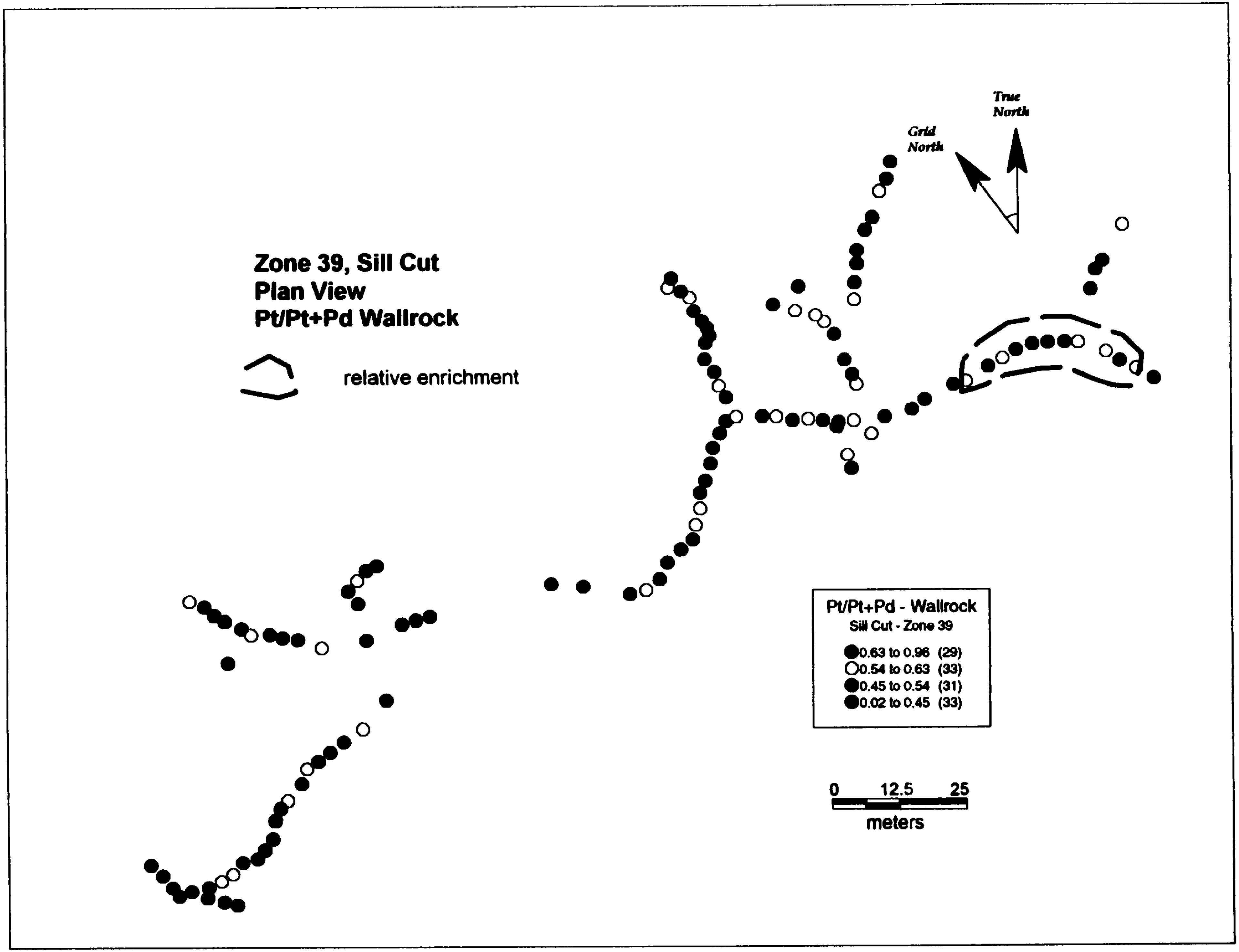

Zone 39, Sill Cut
Plan View
Pt+Pd ppm, Wallrock
relative enrichment
relative depletion
True North
Grid North
Pt+Pd ppm, Wallrock
Sill Cut - Zone 39
● 3 to 27.9 (31)
○ 1.3 to 3 (32)
● 0.5 to 1.3 (35)
● 0 to 0.5 (28)
0 12.5 25
meters

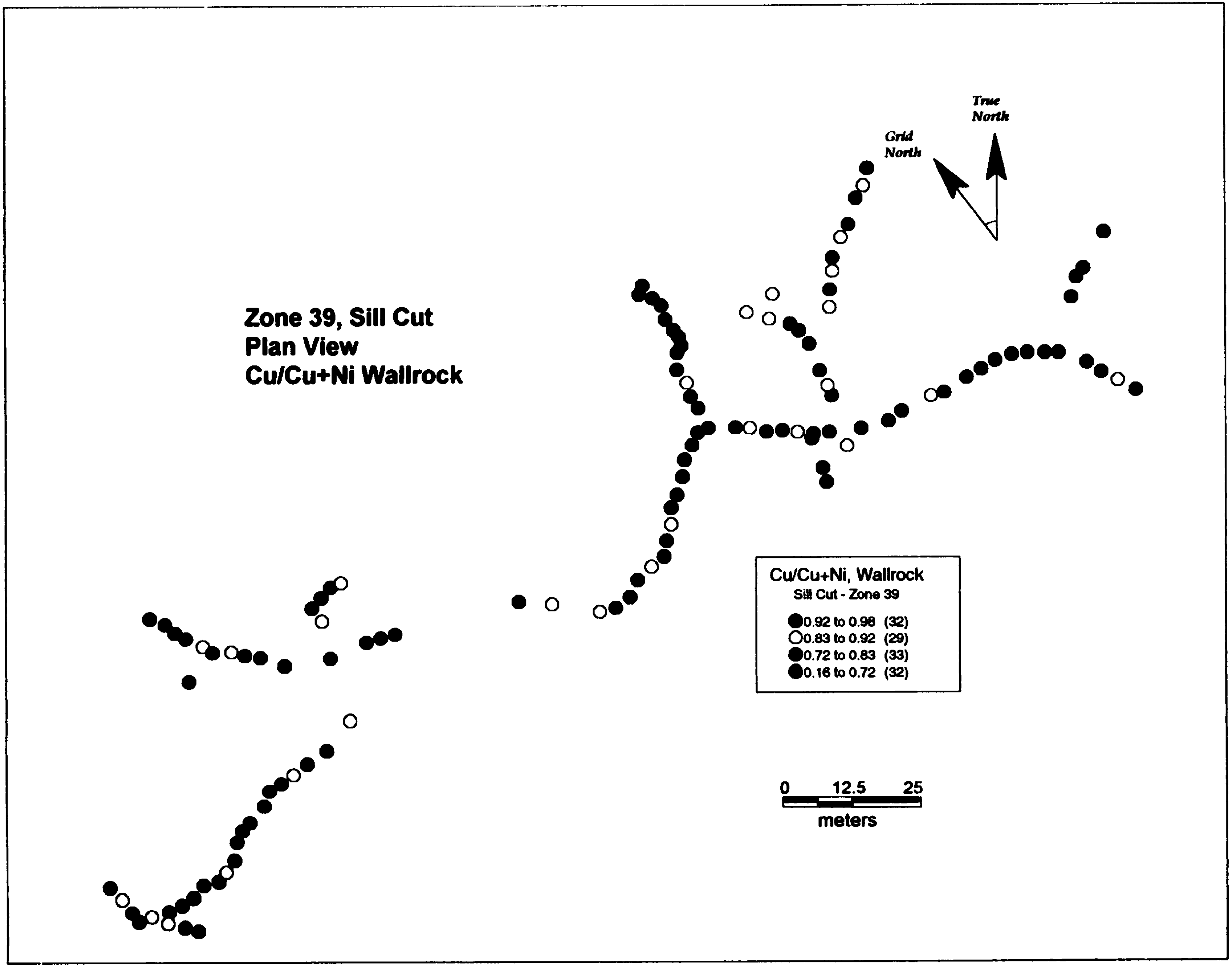

Zone 39, Sill Cut
Plan View
Pt/Cu+Ni, Wallrock
relative enrichment
True North
Grid North
Pt/Cu+Ni - Wallrock
Sill Cut - Zone 39
● 1.9 to 38.4 (32)
○ 1 to 1.9 (31)
● 0.6 to 1 (34)
● 0 to 0.6 (29)
0 12.5 25
meters



Zone 39, Sill Cut
Plan View
Pd/Cu+Ni, Wallrock

Zone 39, Sill Cut
Plan View
Pt/Pt+Pd Wallrock

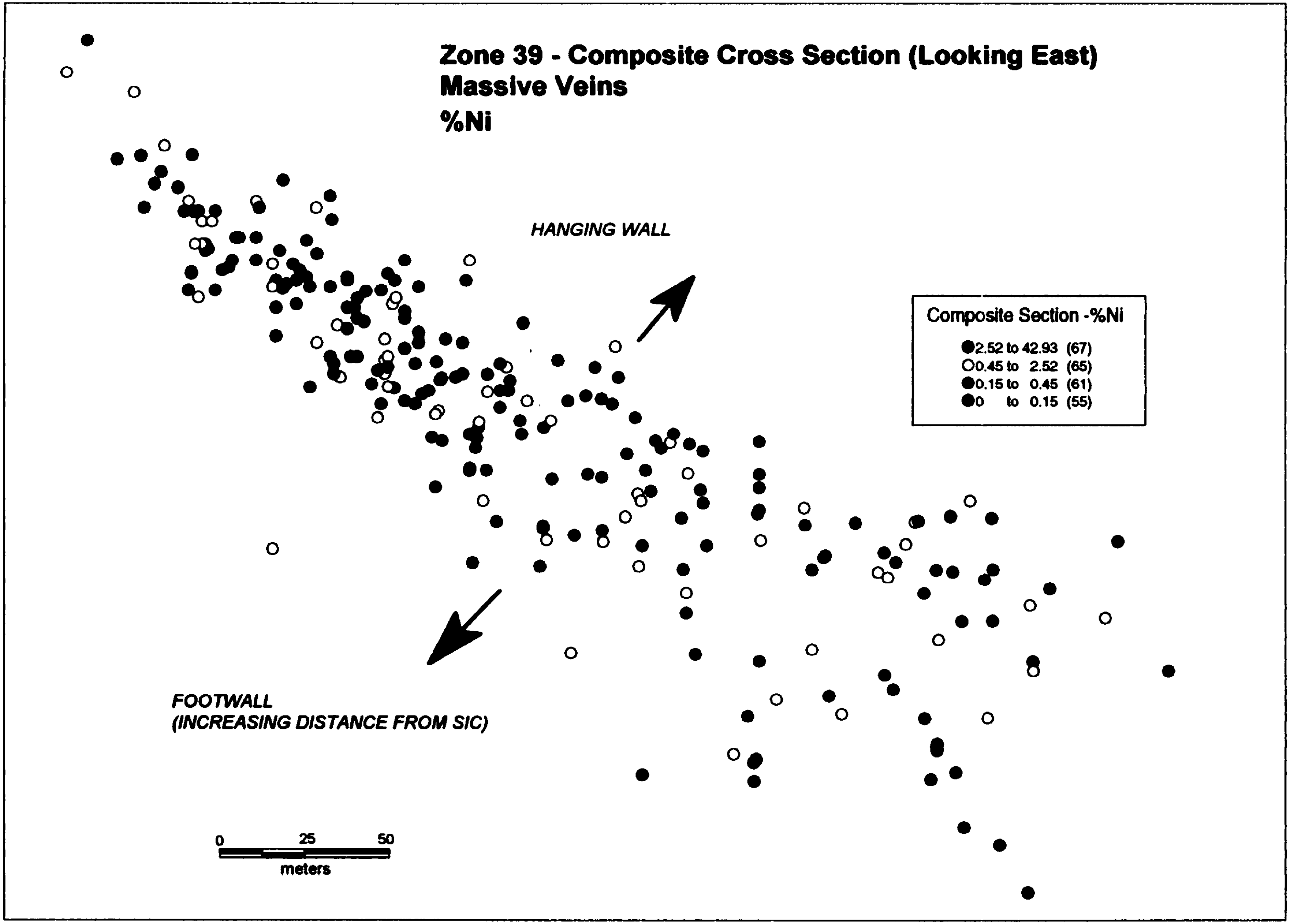




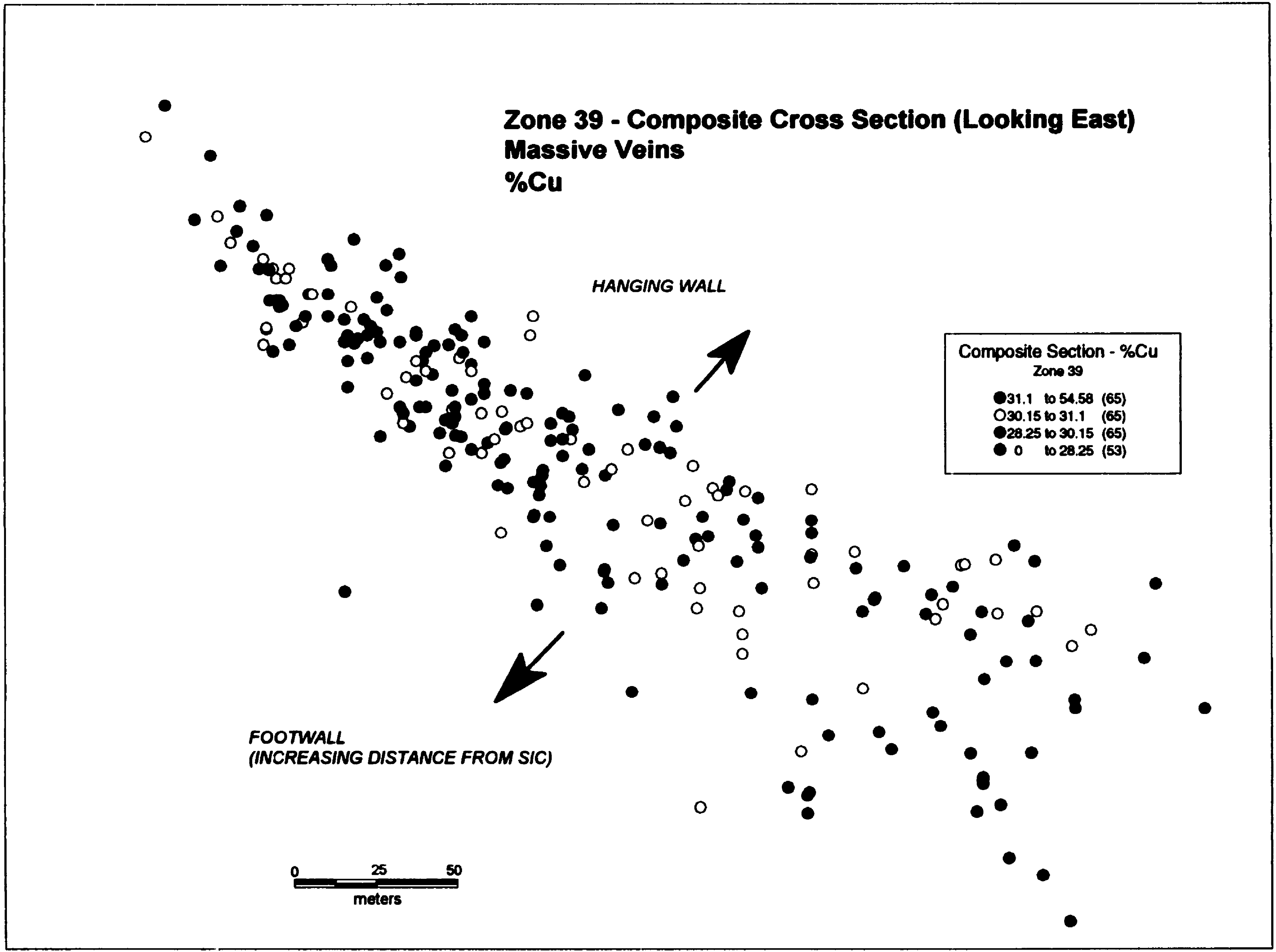
Zone 39, Sill Cut
Plan View
Cu/Cu+Ni Wallrock

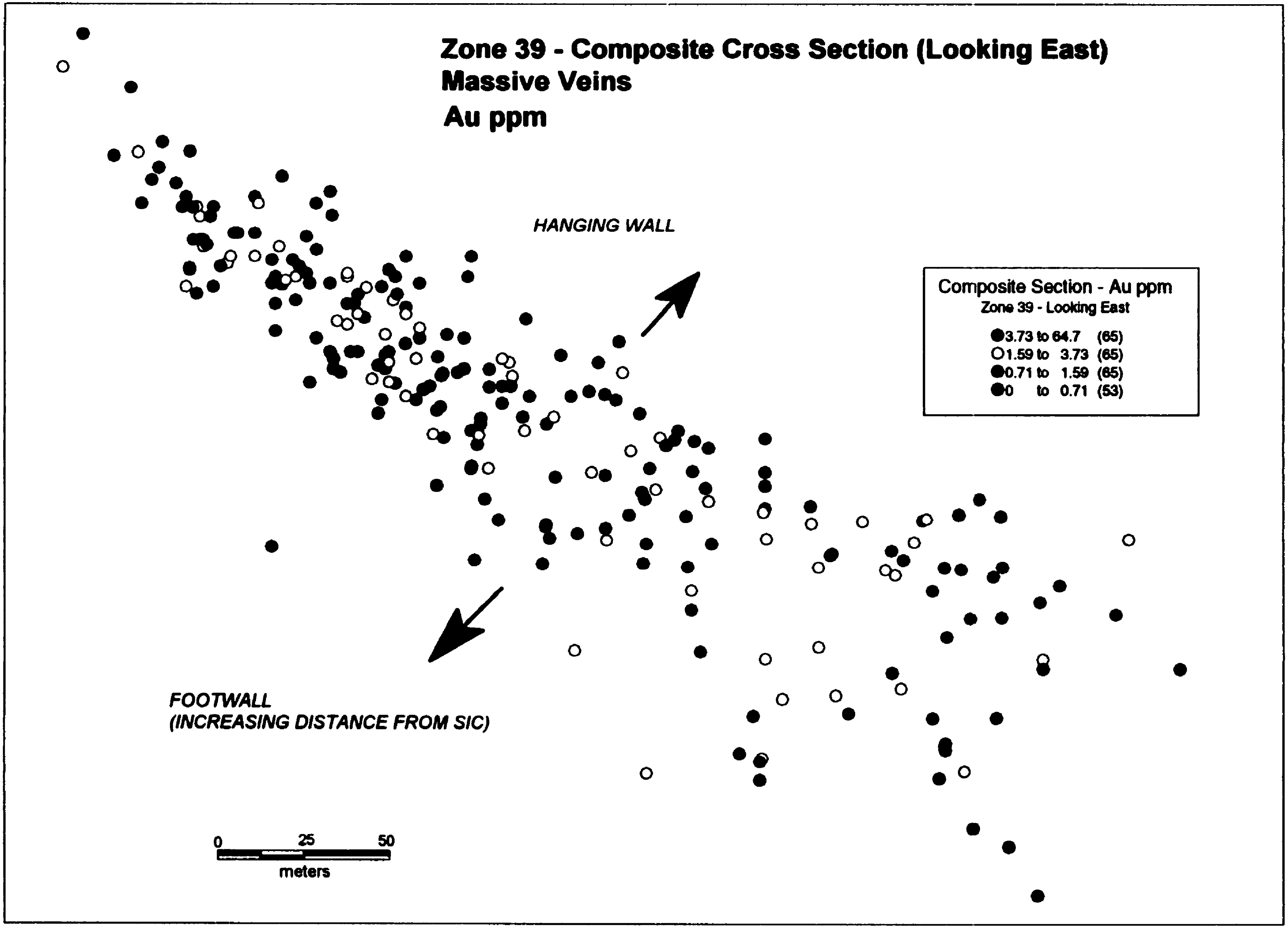
2.0 3-D Distribution

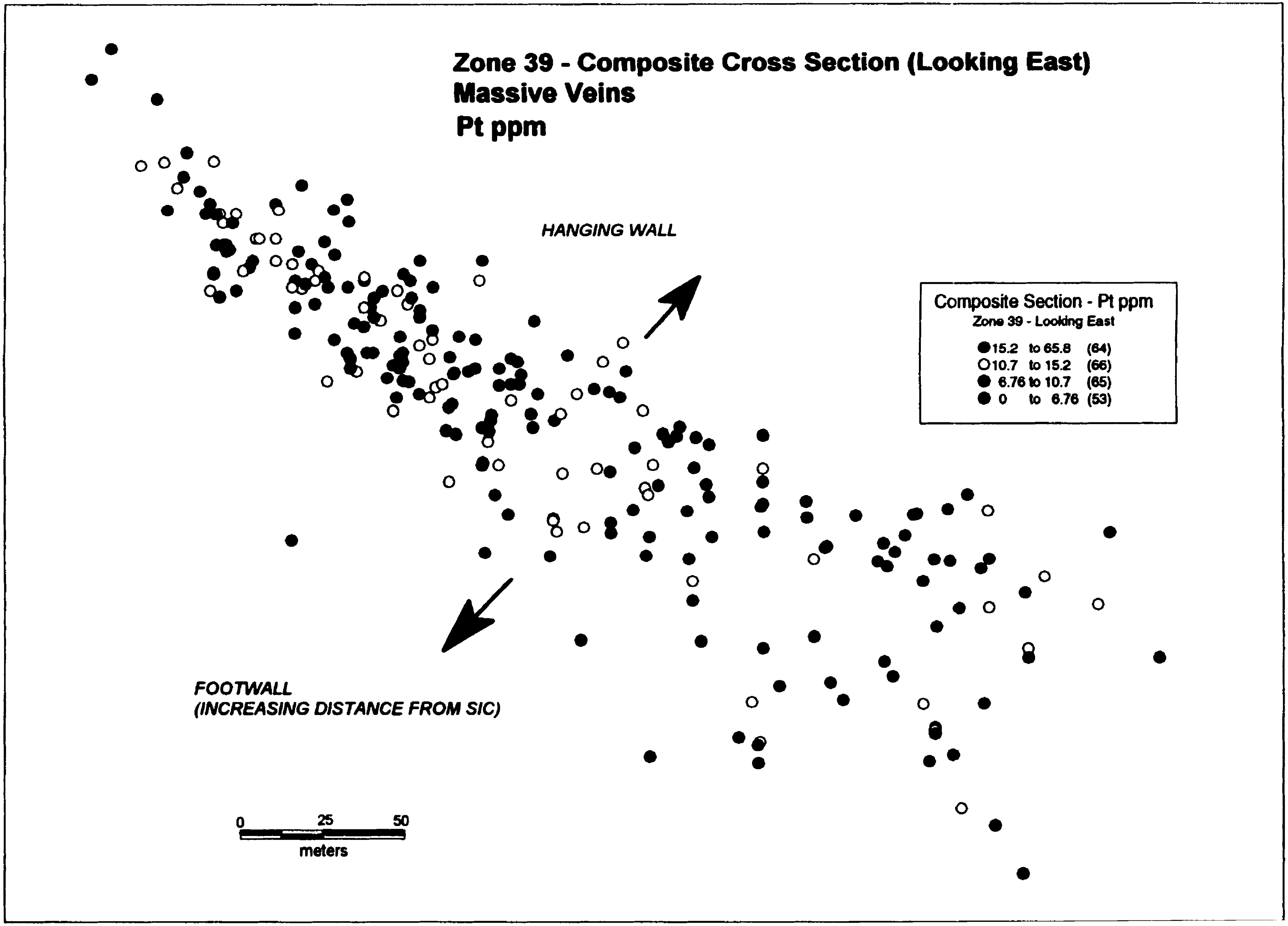
2.1 Composite Cross Sections Massive Veins



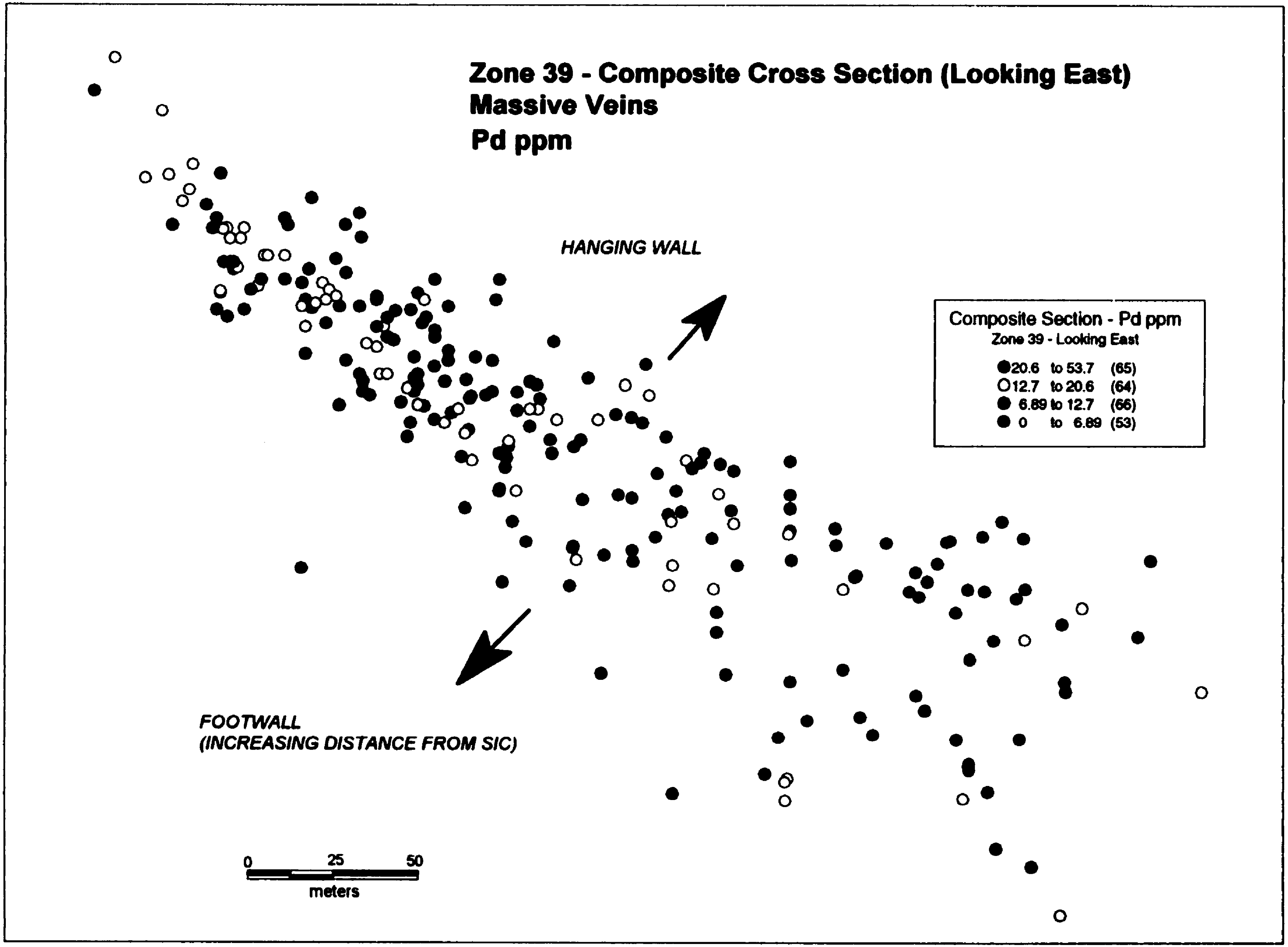
Zone 39 - Composite Cross Section (Looking East)
Massive Veins
%Ni


Zone 39 - Composite Cross Section (Looking East)
Massive Veins
%Cu
HANGING WALL
FOOTWALL
(INCREASING DISTANCE FROM SIC)
Composite Section - %Cu
Zone 39
●31.1 to 54.58 (65)
○30.15 to 31.1 (65)
●28.25 to 30.15 (65)
● 0 to 28.25 (53)
0
25
50
meters

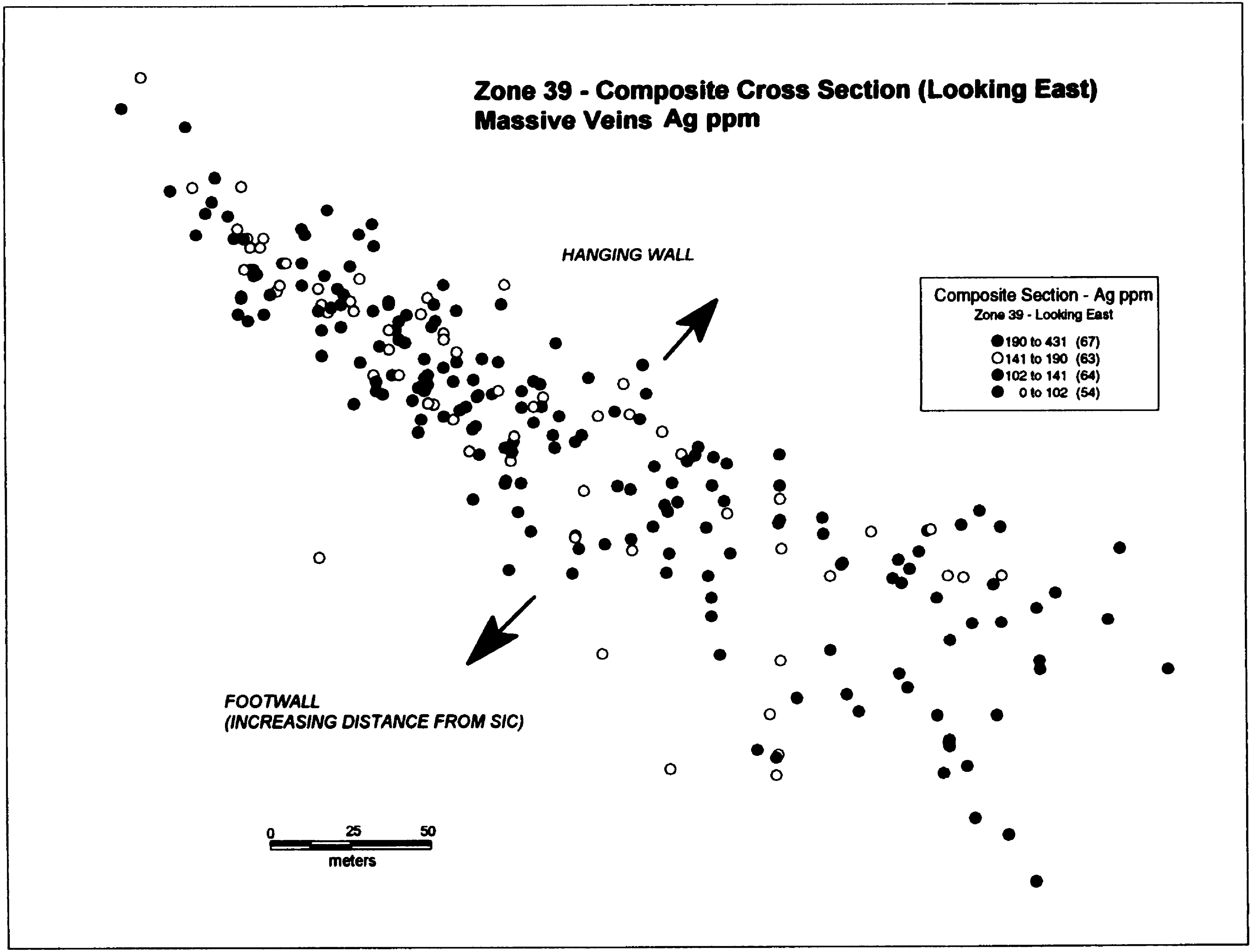

Zone 39 - Composite Cross Section (Looking East)
Massive Veins
Au ppm
HANGING WALL
FOOTWALL
(INCREASING DISTANCE FROM SIC)
Composite Section - Au ppm
Zone 39 - Looking East
●3.73 to 64.7 (65)
○1.59 to 3.73 (65)
●0.71 to 1.59 (65)
●0 to 0.71 (53)
0
25
50
meters

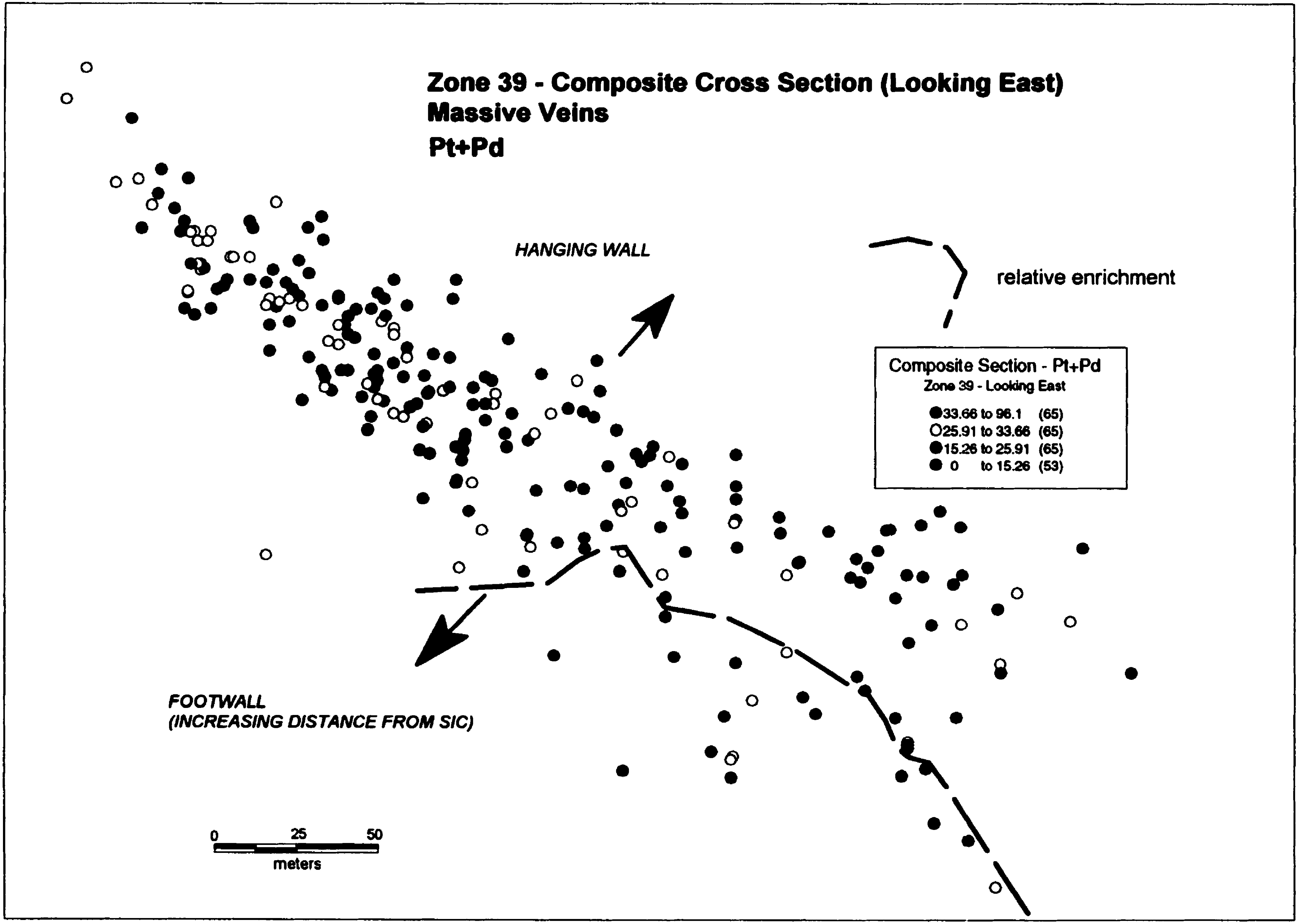


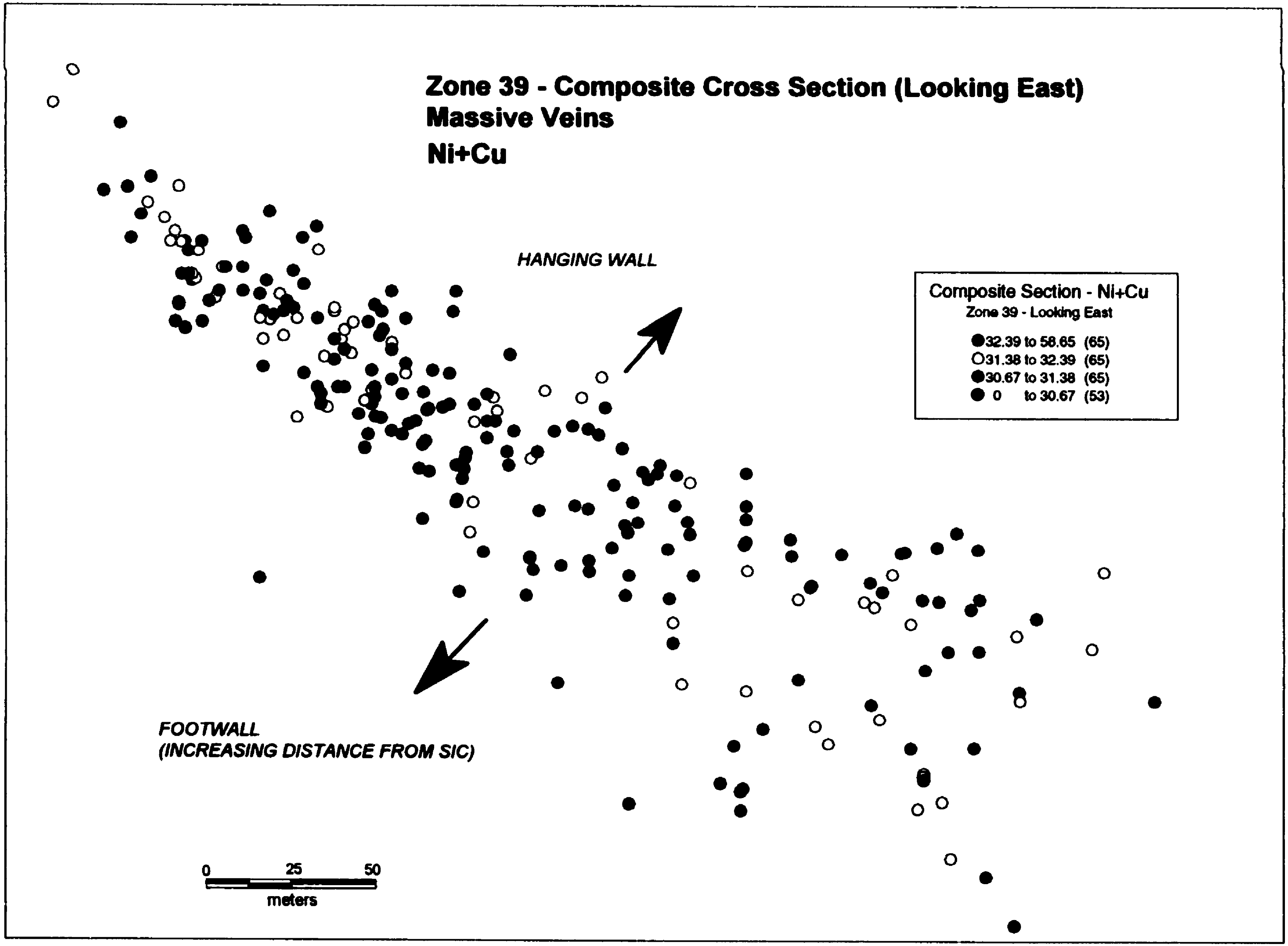
Zone 39 - Composite Cross Section (Looking East)
Massive Veins
Pt ppm

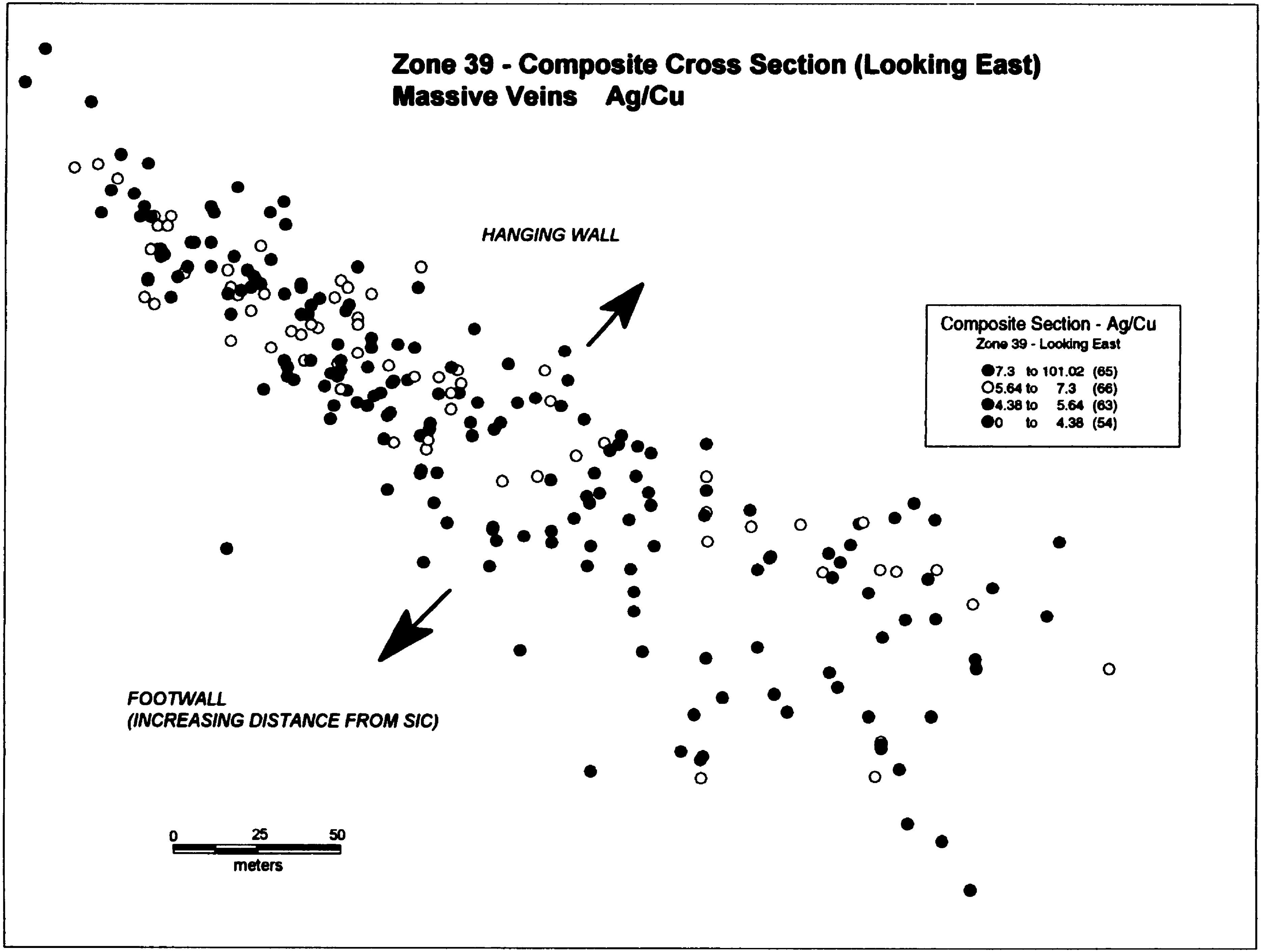


Zone 39 - Composite Cross Section (Looking East)
Massive Veins
Pd ppm

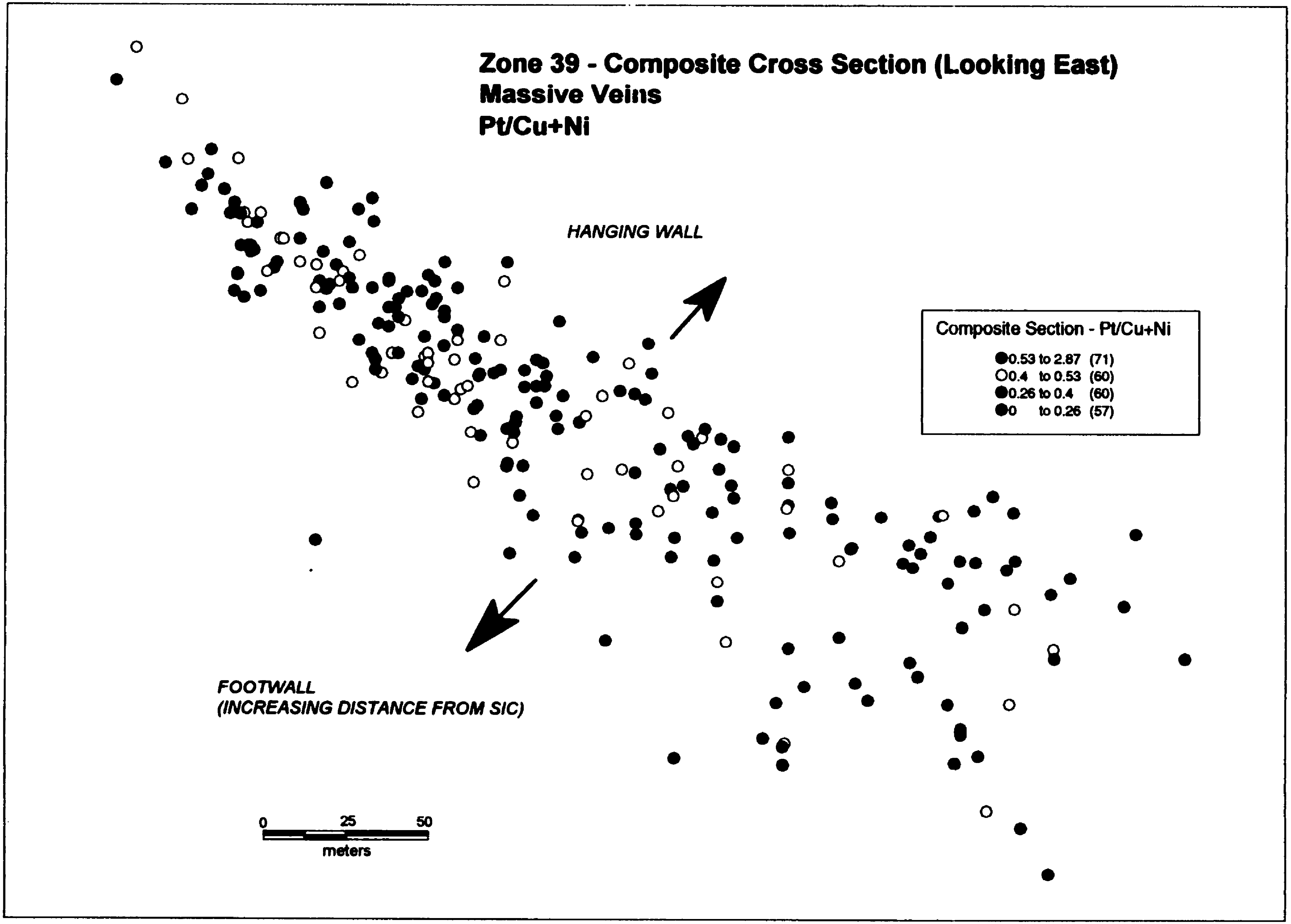

Zone 39 - Composite Cross Section (Looking East)
Massive Veins Ag ppm
HANGING WALL
FOOTWALL
(INCREASING DISTANCE FROM SIC)
Composite Section - Ag ppm
Zone 39 - Looking East
● 190 to 431 (67)
○ 141 to 190 (63)
● 102 to 141 (64)
● 0 to 102 (54)
0
25
50
meters

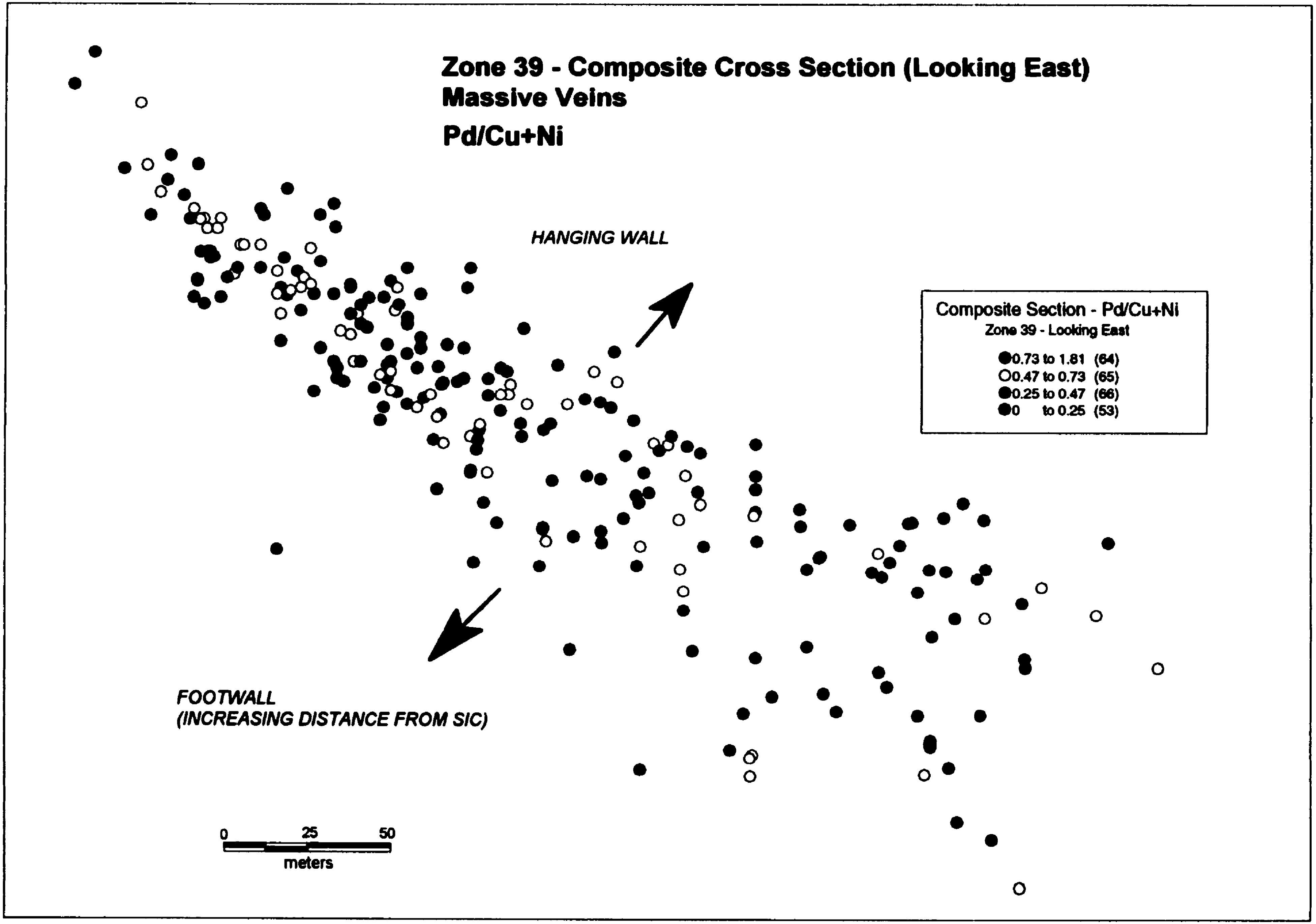

Zone 39 - Composite Cross Section (Looking East)
Massive Veins
Pt+Pd
HANGING WALL
relative enrichment
Composite Section - Pt+Pd
Zone 39 - Looking East
● 33.66 to 96.1 (65)
○ 25.91 to 33.66 (65)
● 15.26 to 25.91 (65)
● 0 to 15.26 (53)
FOOTWALL
(INCREASING DISTANCE FROM SIC)
0
25
50
meters

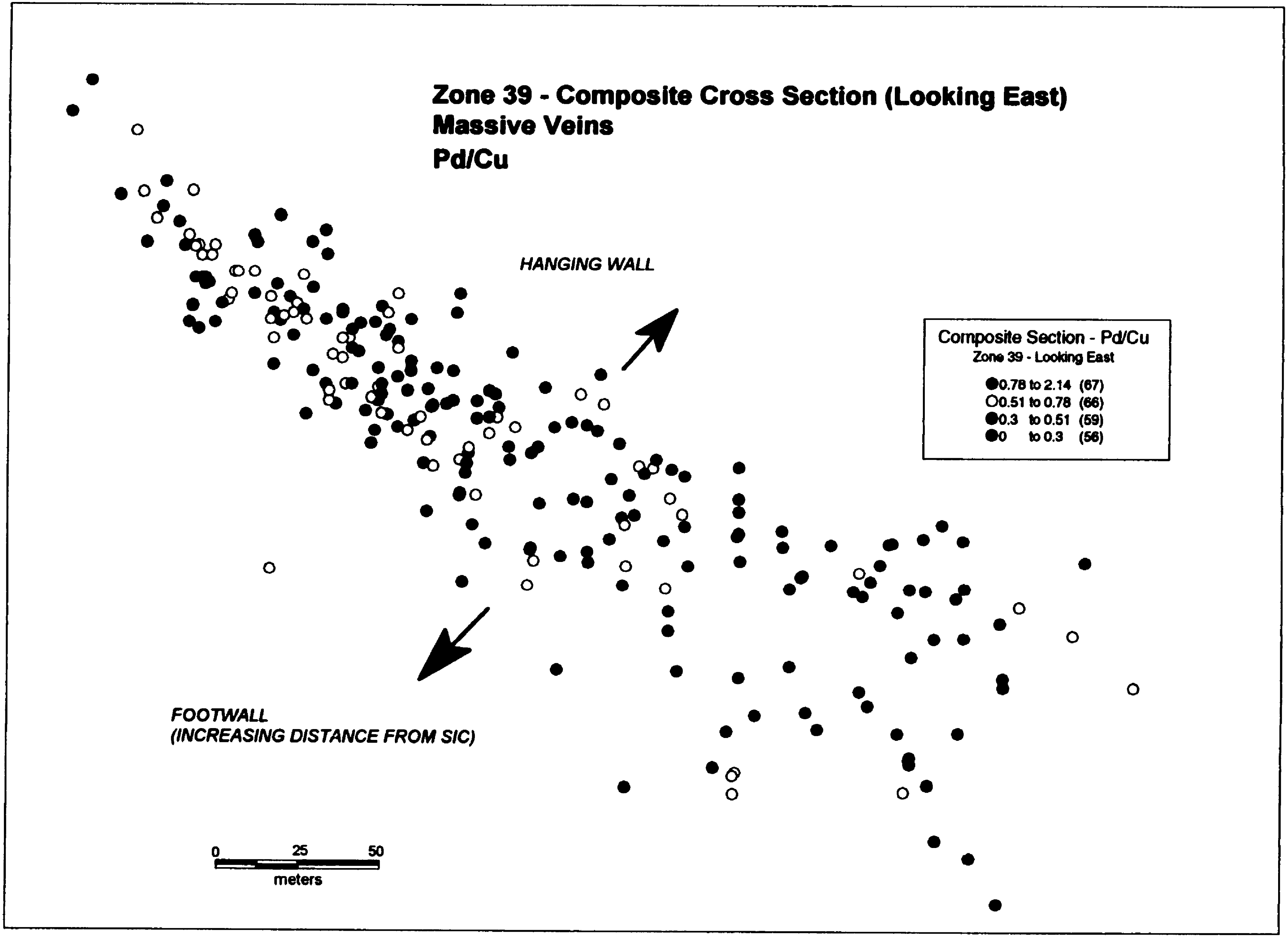

Zone 39 - Composite Cross Section (Looking East)
Massive Veins
Ni+Cu
HANGING WALL
FOOTWALL
(INCREASING DISTANCE FROM SIC)
Composite Section - Ni+Cu
Zone 39 - Looking East
●32.39 to 58.65 (65)
○31.38 to 32.39 (65)
●30.67 to 31.38 (65)
● 0 to 30.67 (53)
0
25
50
meters



Zone 39 - Composite Cross Section (Looking East)
Massive Veins Ag/Cu

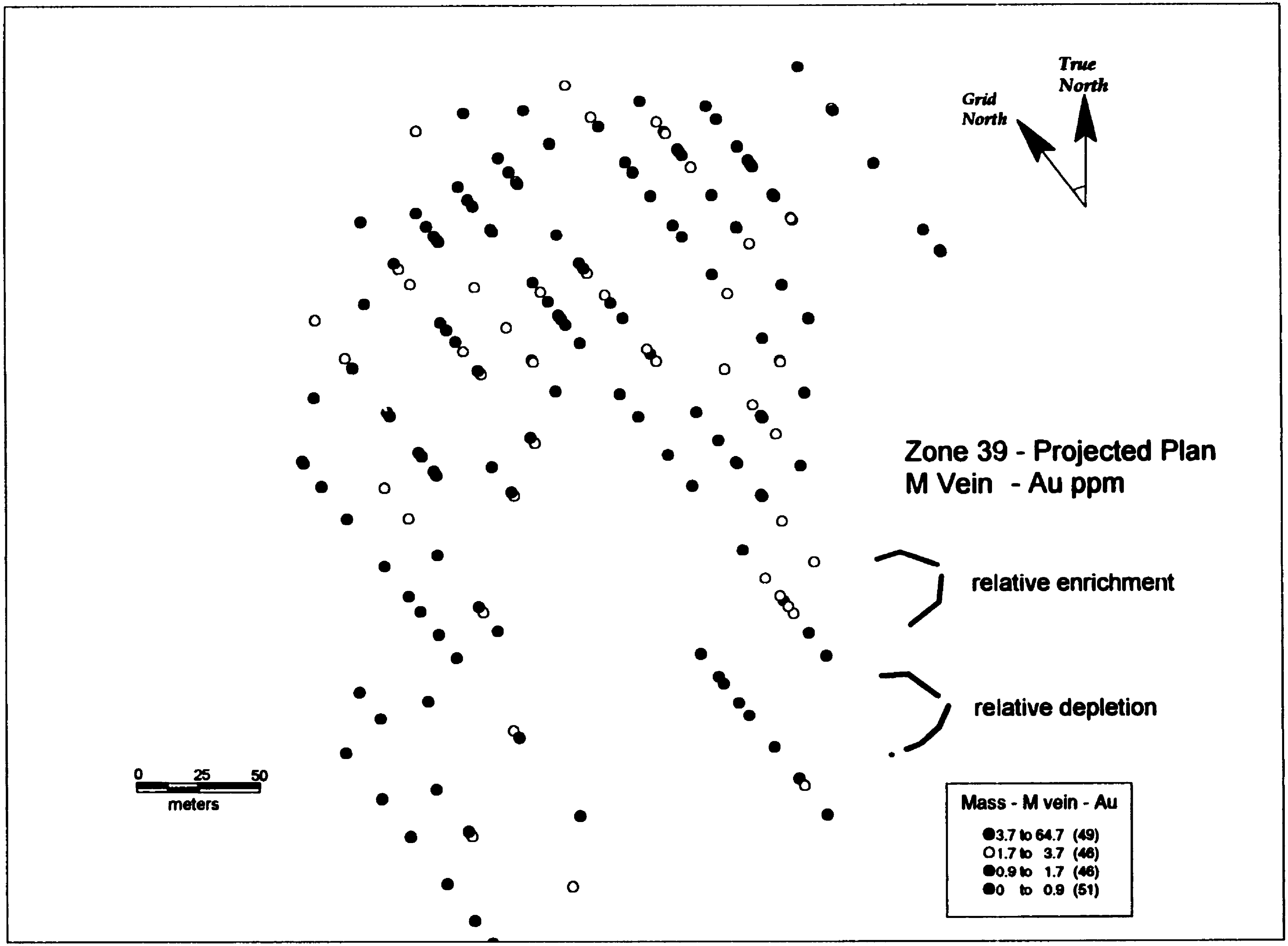

Zone 39 - Composite Cross Section (Looking East)
Massive Veins
Pt/Cu+Ni
HANGING WALL
FOOTWALL
(INCREASING DISTANCE FROM SIC)
Composite Section - Pt/Cu+Ni
●0.53 to 2.87 (71)
○0.4 to 0.53 (60)
●0.26 to 0.4 (60)
●0 to 0.26 (57)
0
25
50
meters

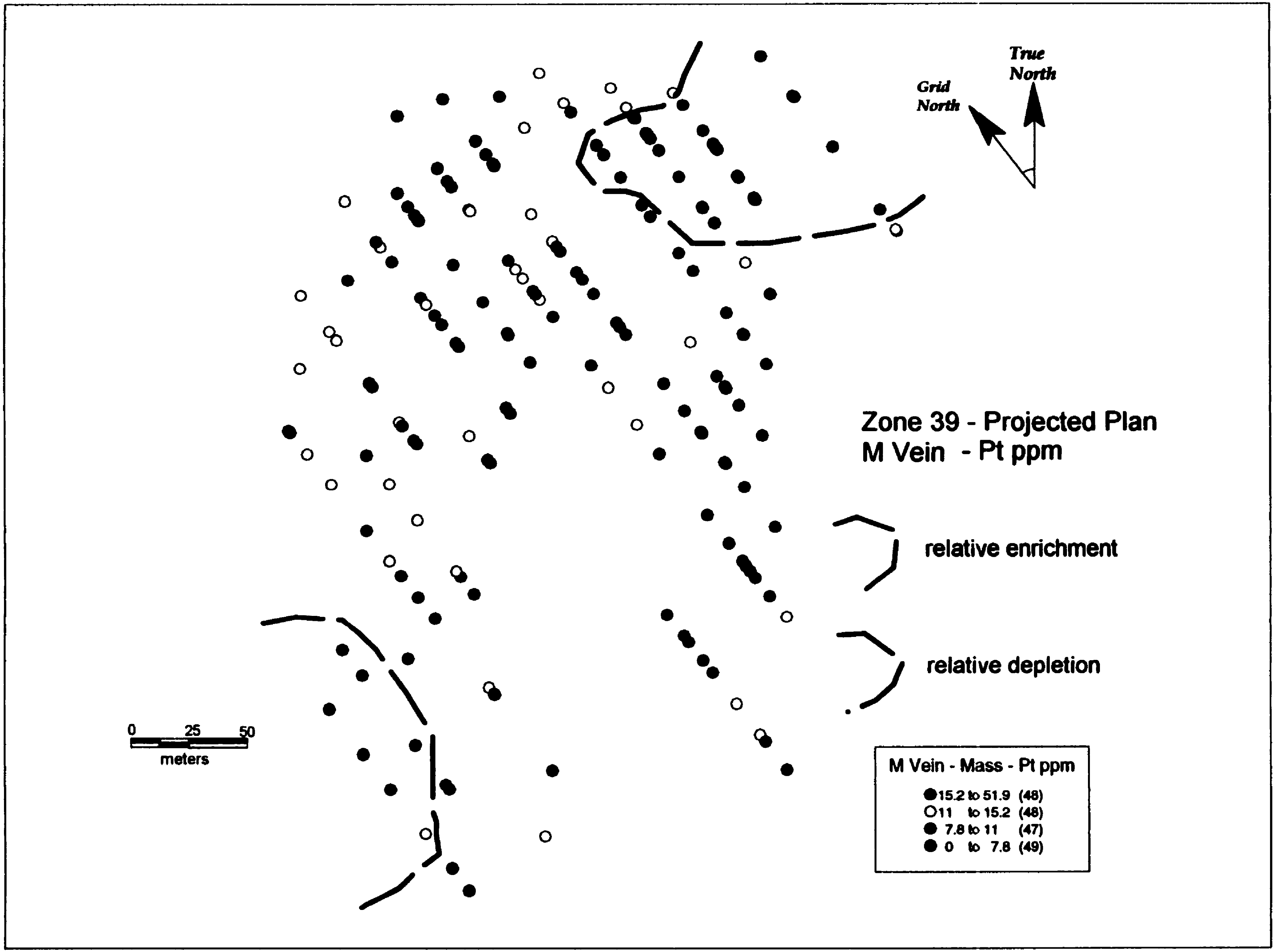

Zone 39 - Composite Cross Section (Looking East)
Massive Veins
Pd/Cu+Ni
HANGING WALL
FOOTWALL
(INCREASING DISTANCE FROM SIC)
Composite Section - Pd/Cu+Ni
Zone 39 - Looking East
● 0.73 to 1.81 (64)
○ 0.47 to 0.73 (65)
● 0.25 to 0.47 (66)
● 0 to 0.25 (53)
0
25
50
meters



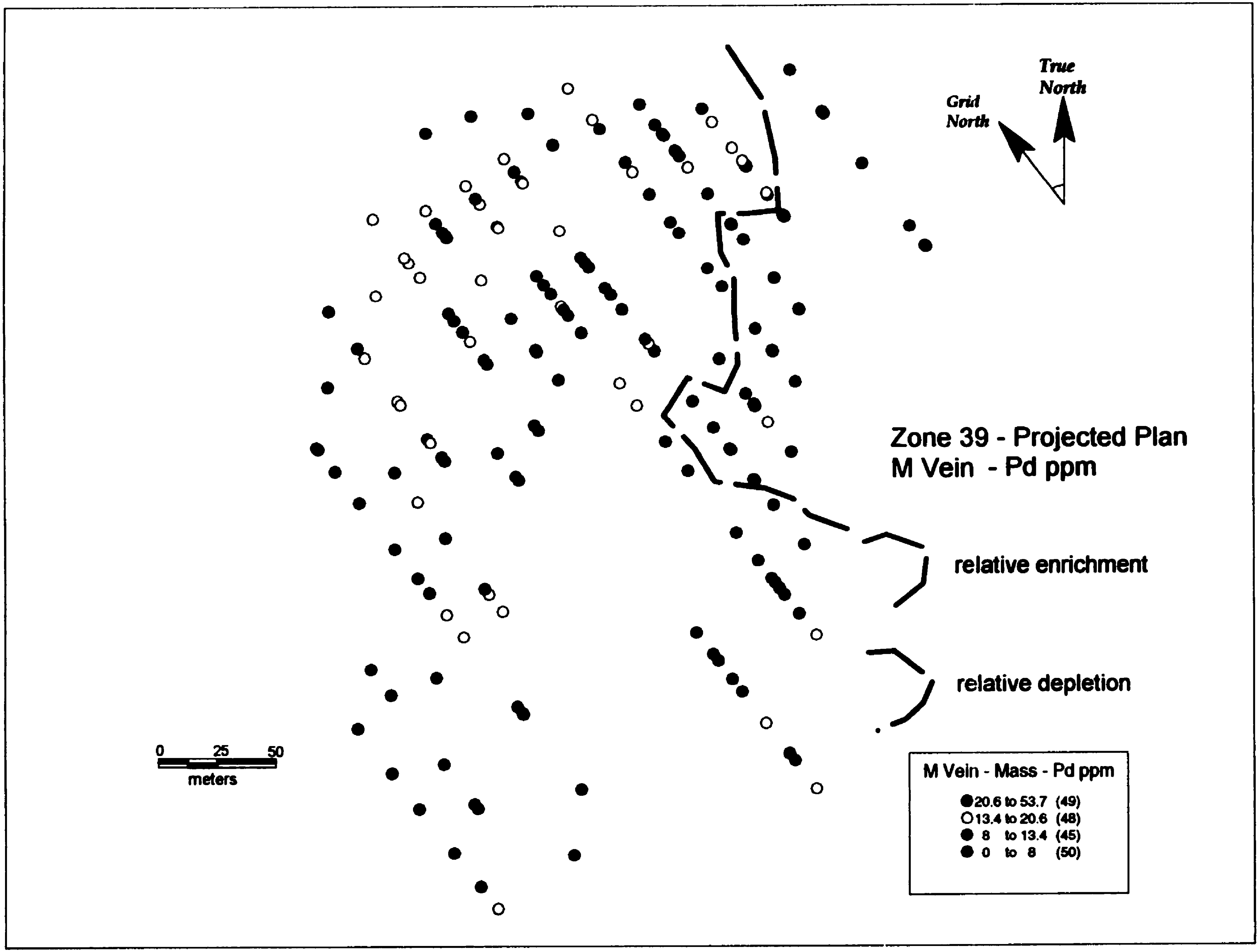
Zone 39 - Composite Cross Section (Looking East)
Massive Veins
Pd/Cu

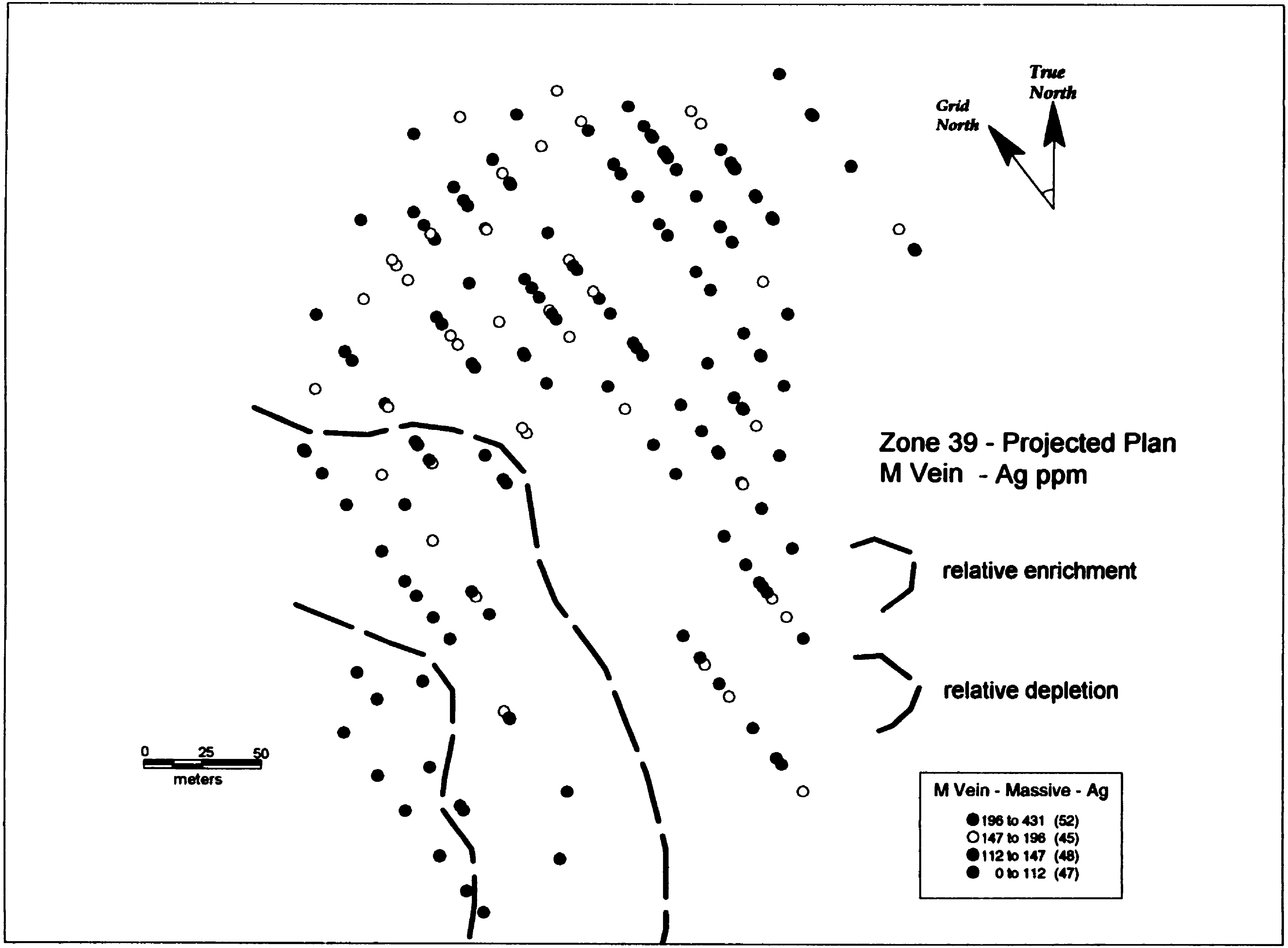
2.2 Projected Plans - Massive Main Veins

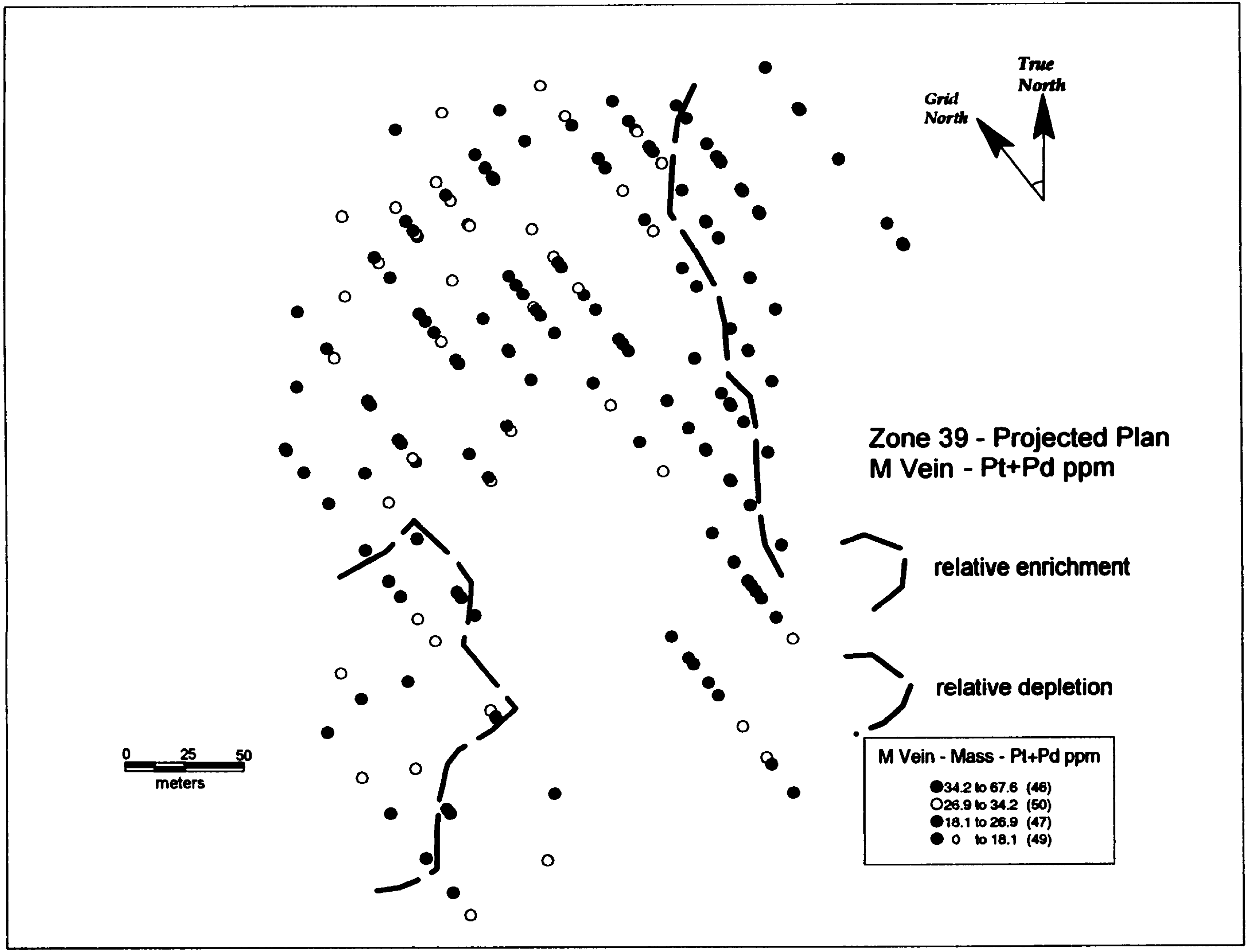

True North
Grid North
Zone 39 - Projected Plan
M Vein - Au ppm
relative enrichment
relative depletion
0 25 50
meters
Mass - M vein - Au
●3.7 to 64.7 (49)
○1.7 to 3.7 (46)
●0.9 to 1.7 (46)
●0 to 0.9 (51)



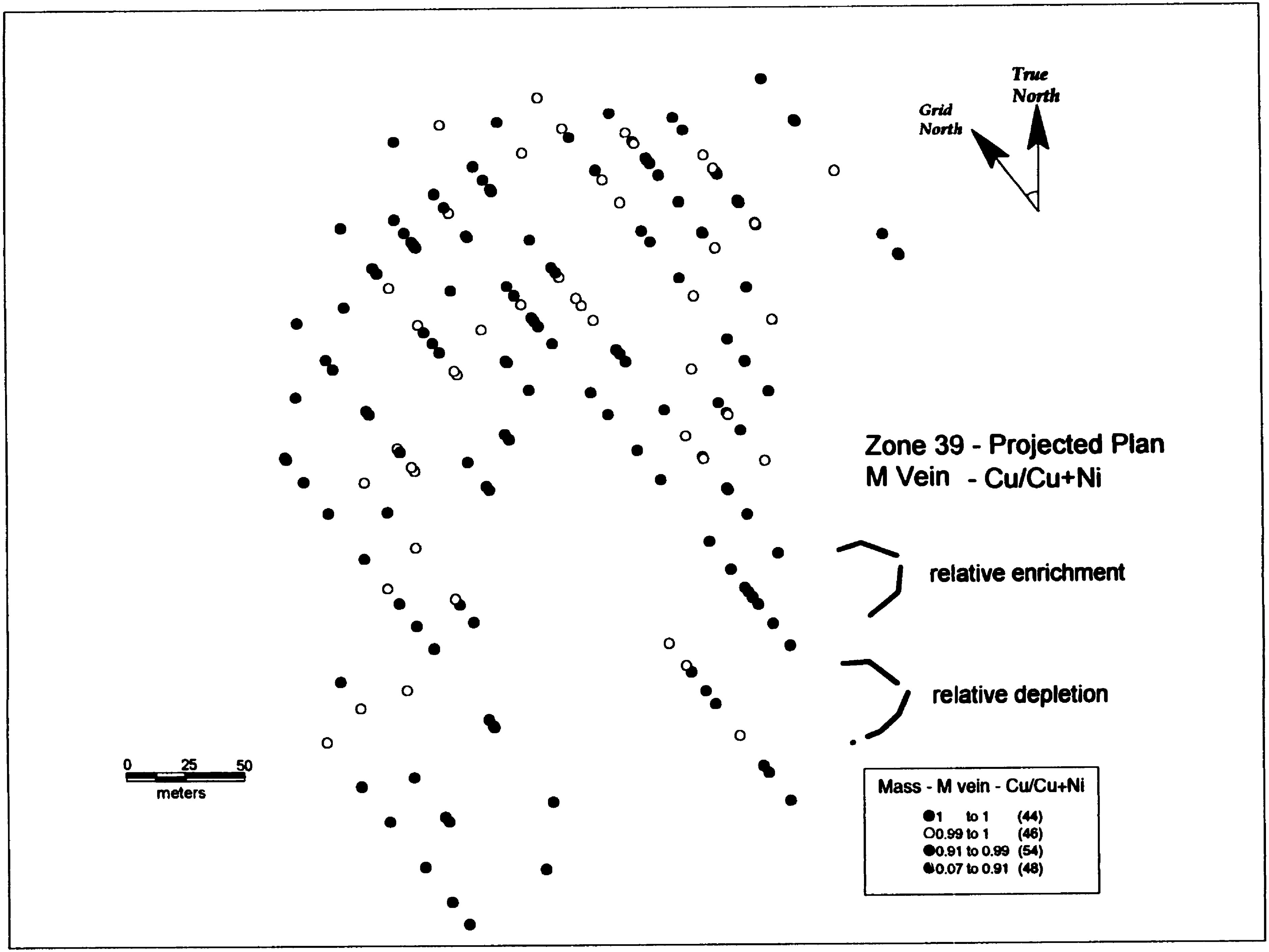
Zone 39 - Projected Plan
M Vein - Pt ppm

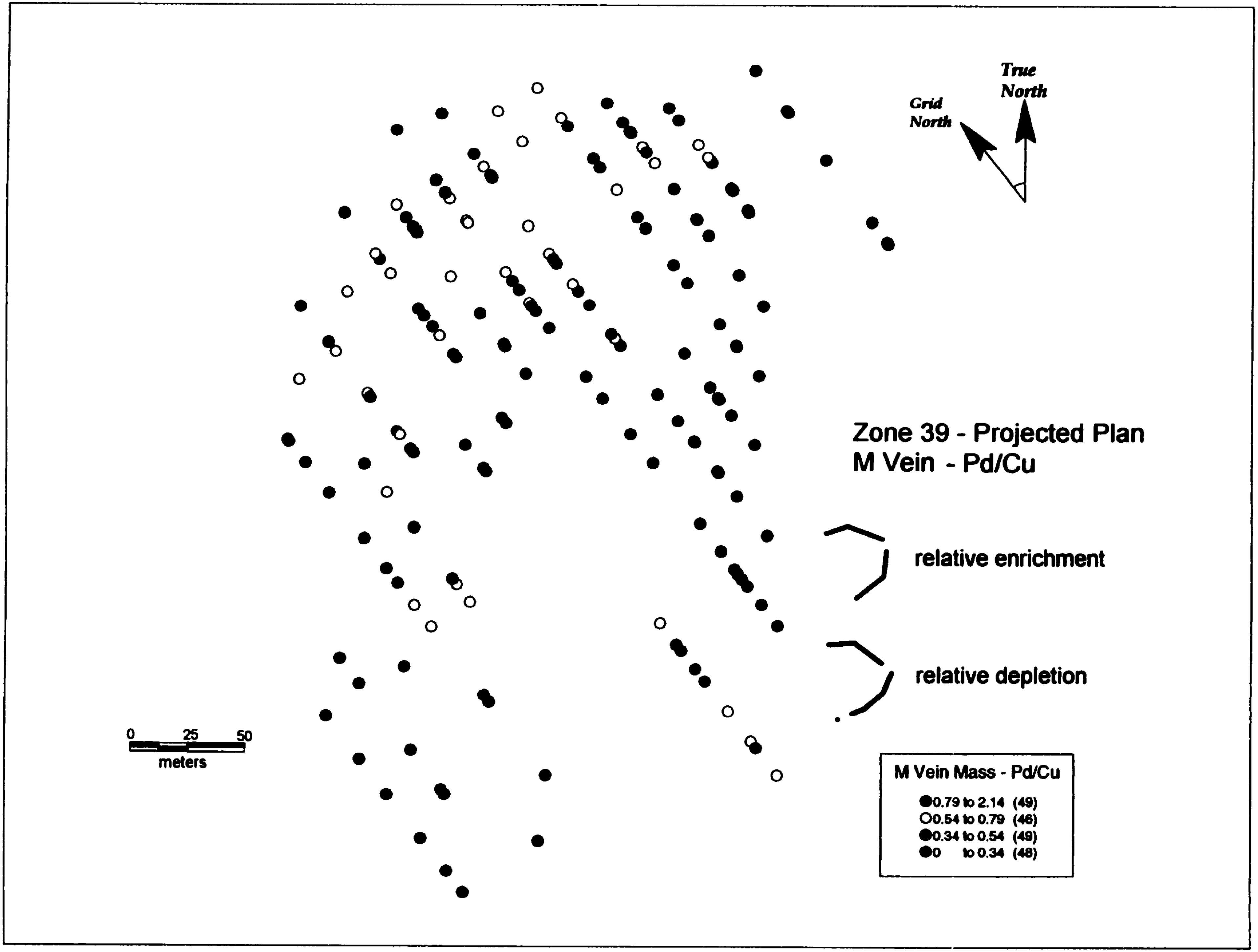

Zone 39 - Projected Plan
M Vein - Pd ppm
True North
Grid North
relative enrichment
relative depletion
M Vein - Mass - Pd ppm
● 20.6 to 53.7 (49)
○ 13.4 to 20.6 (48)
● 8 to 13.4 (45)
● 0 to 8 (50)
0
25
50
meters

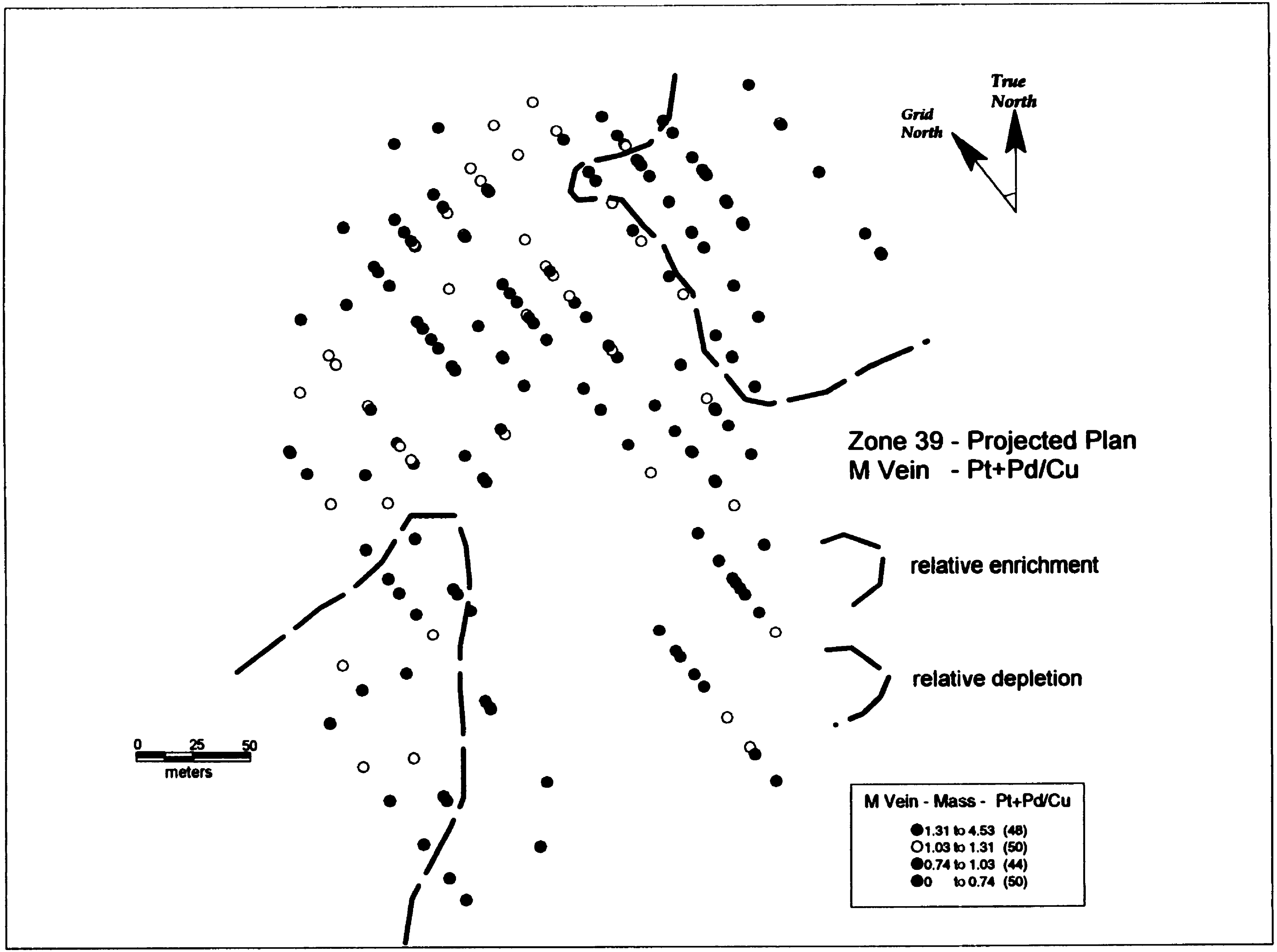

Zone 39 - Projected Plan
M Vein - Ag ppm
True North
Grid North
relative enrichment
relative depletion
0 25 50
meters
M Vein - Massive - Ag
● 196 to 431 (52)
○ 147 to 196 (45)
● 112 to 147 (48)
● 0 to 112 (47)

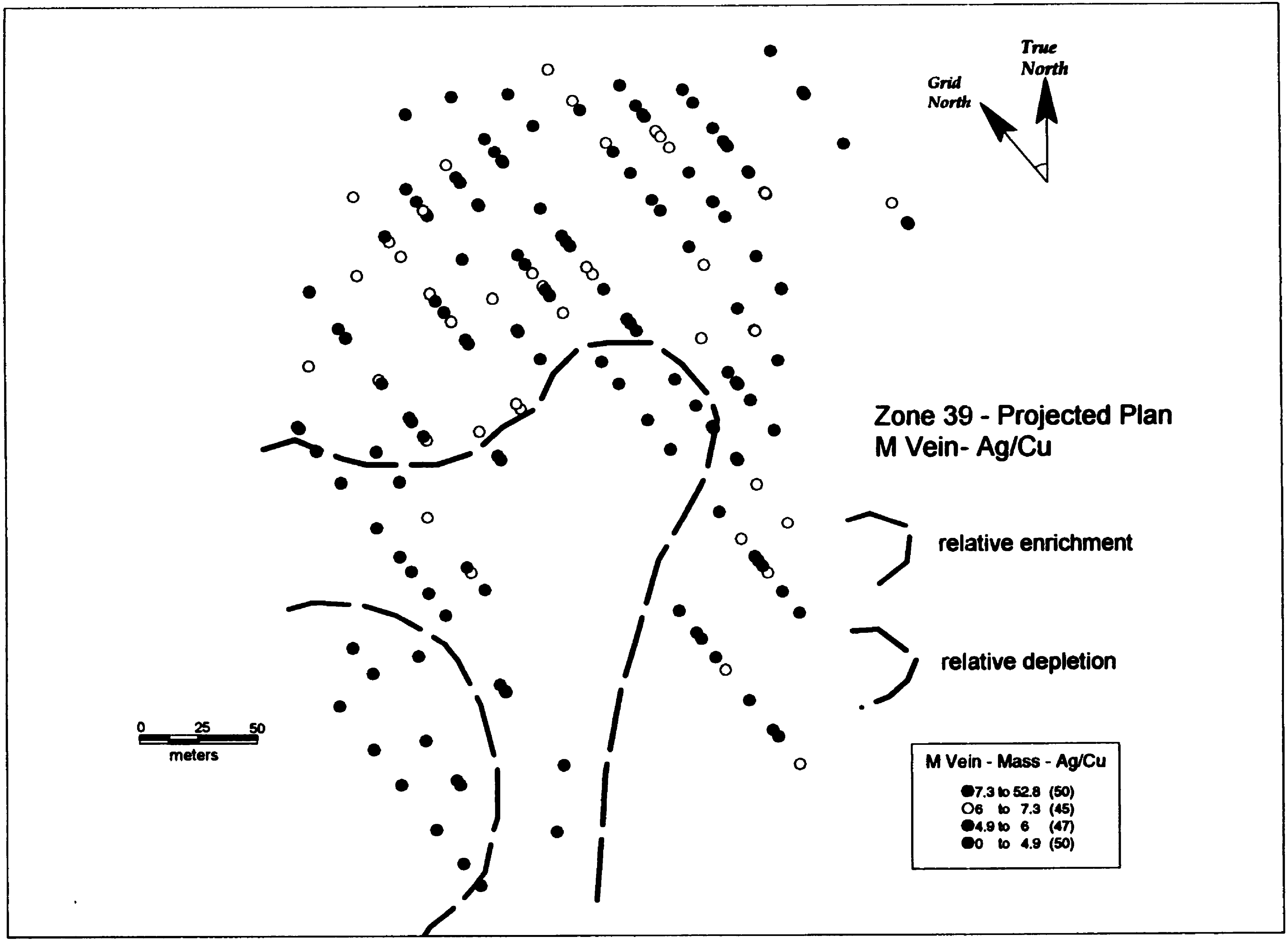


Zone 39 - Projected Plan
M Vein - Pt+Pd ppm

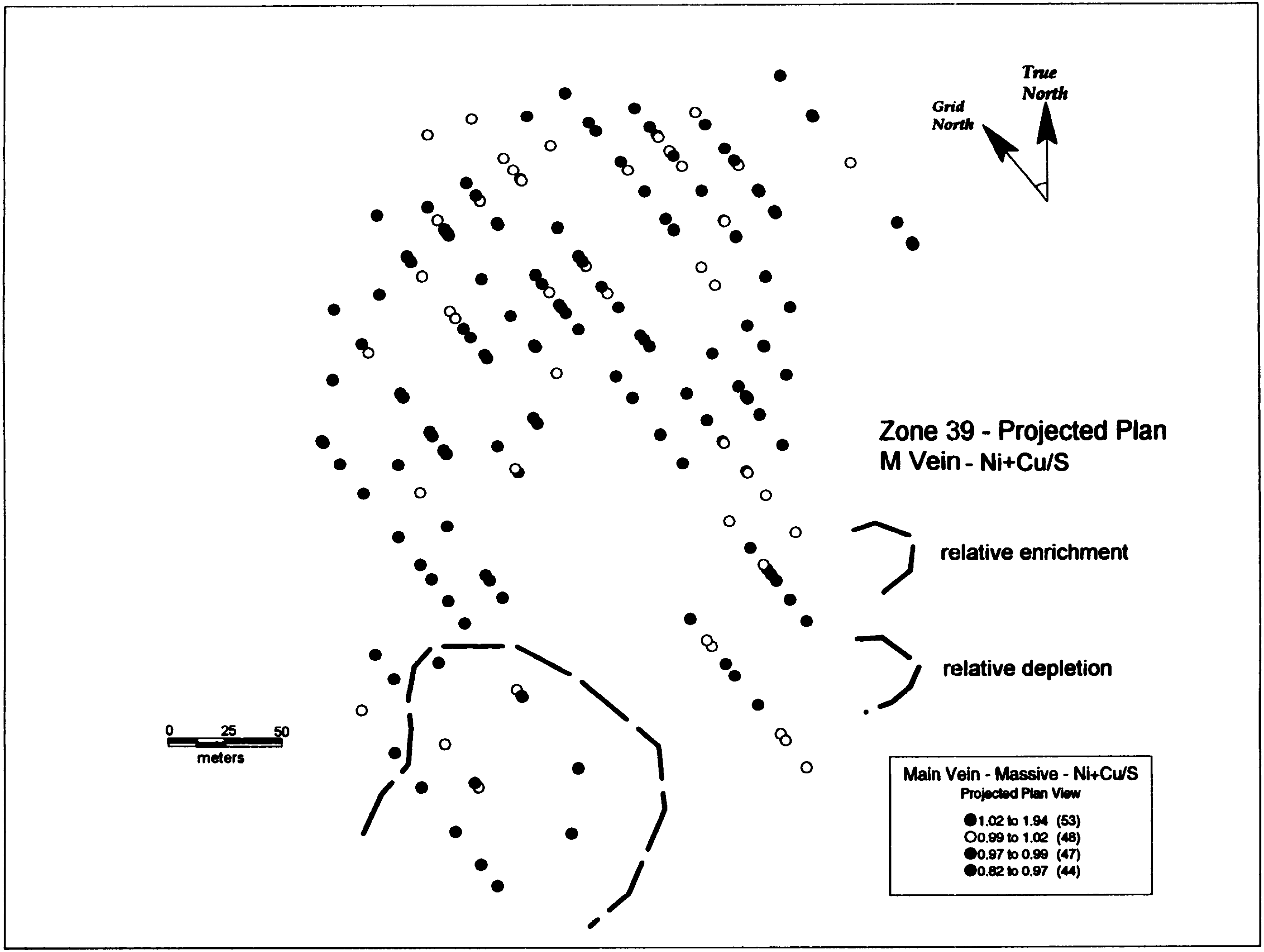

True North
Grid North
Zone 39 - Projected Plan
M Vein - Cu/Cu+Ni
relative enrichment
relative depletion
0
25
50
meters
Mass - M vein - Cu/Cu+Ni
● 1 to 1 (44)
○ 0.99 to 1 (46)
● 0.91 to 0.99 (54)
● 0.07 to 0.91 (48)

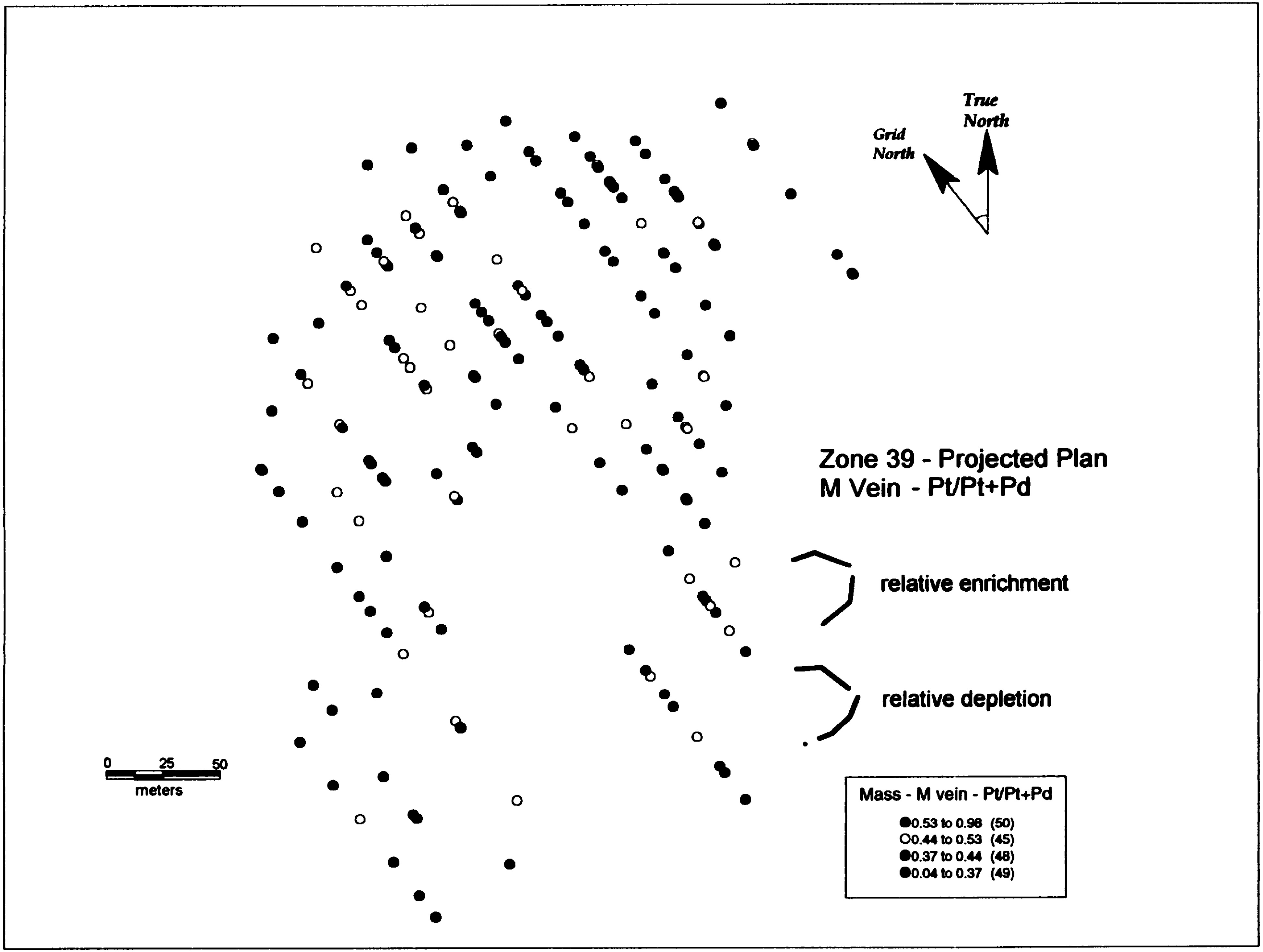

Zone 39 - Projected Plan
M Vein - Pd/Cu
True North
Grid North
relative enrichment
relative depletion
0
25
50
meters
M Vein Mass - Pd/Cu
●0.79 to 2.14 (49)
○0.54 to 0.79 (46)
●0.34 to 0.54 (49)
●0 to 0.34 (48)


Zone 39 - Projected Plan
M Vein - Pt+Pd/Cu
True North
Grid North
relative enrichment
relative depletion
0
25
50
meters
M Vein - Mass - Pt+Pd/Cu
● 1.31 to 4.53 (48)
○ 1.03 to 1.31 (50)
● 0.74 to 1.03 (44)
● 0 to 0.74 (50)



Zone 39 - Projected Plan
M Vein- Ag/Cu


Zone 39 - Projected Plan
M Vein - Ni+Cu/S
True North
Grid North
relative enrichment
relative depletion
0
25
50
meters
Main Vein - Massive - Ni+Cu/S
Projected Plan View
● 1.02 to 1.94 (53)
○ 0.99 to 1.02 (48)
● 0.97 to 0.99 (47)
● 0.82 to 0.97 (44)

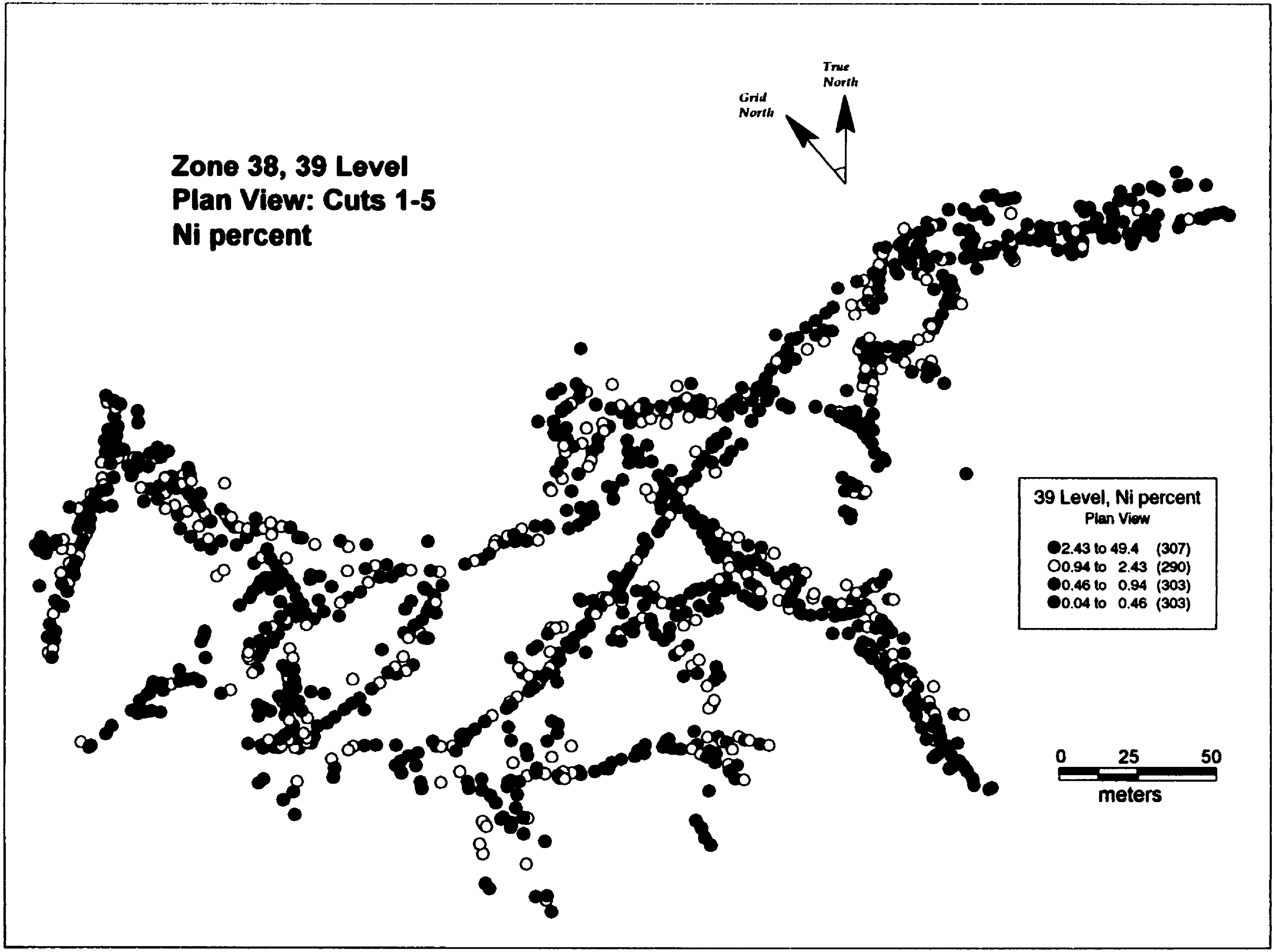


Zone 39 - Projected Plan
M Vein - Pt/Pt+Pd

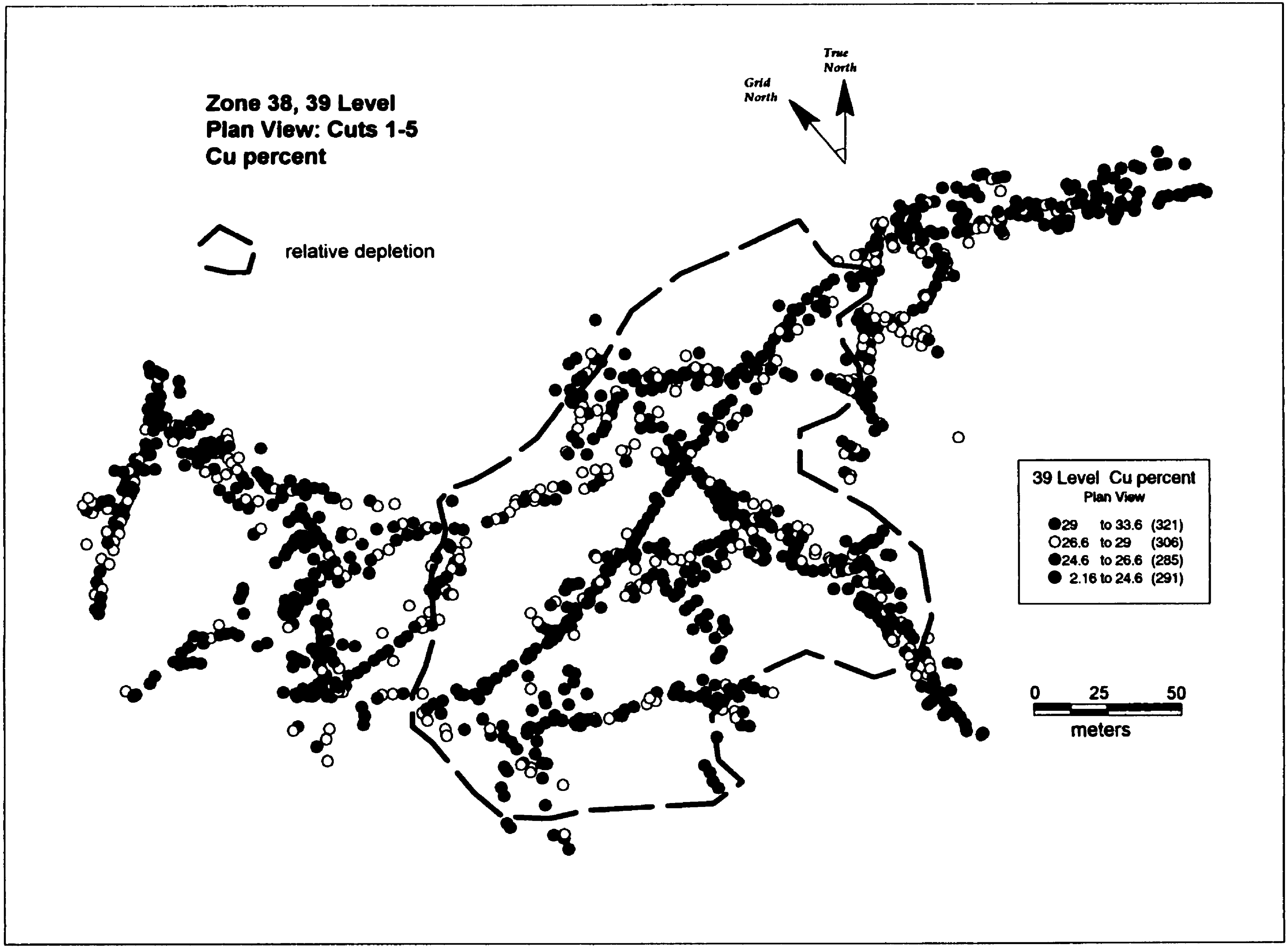
APPENDIX VI

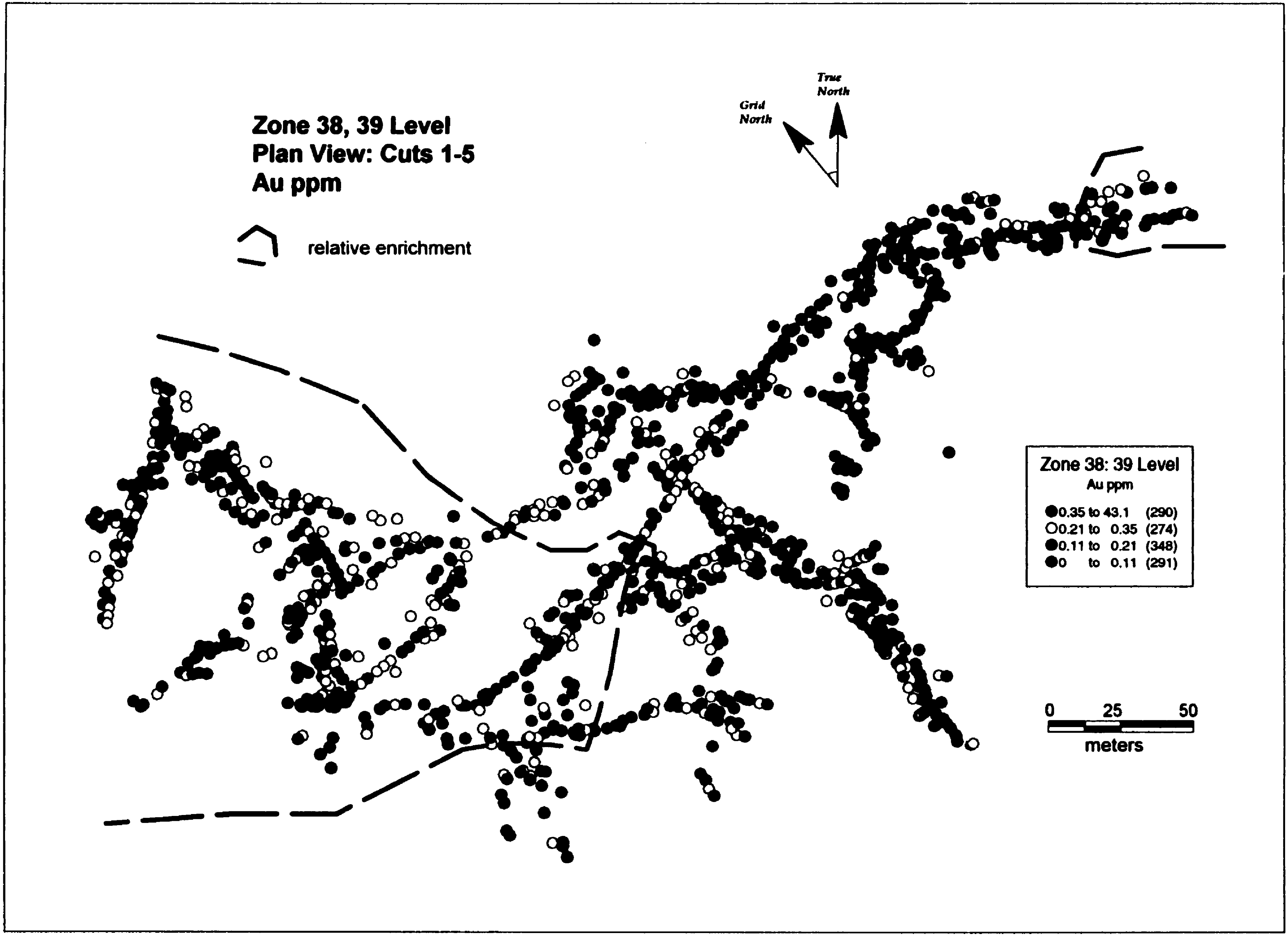
Zone 38 - Point Plots

1.0 Level 39 - Plans

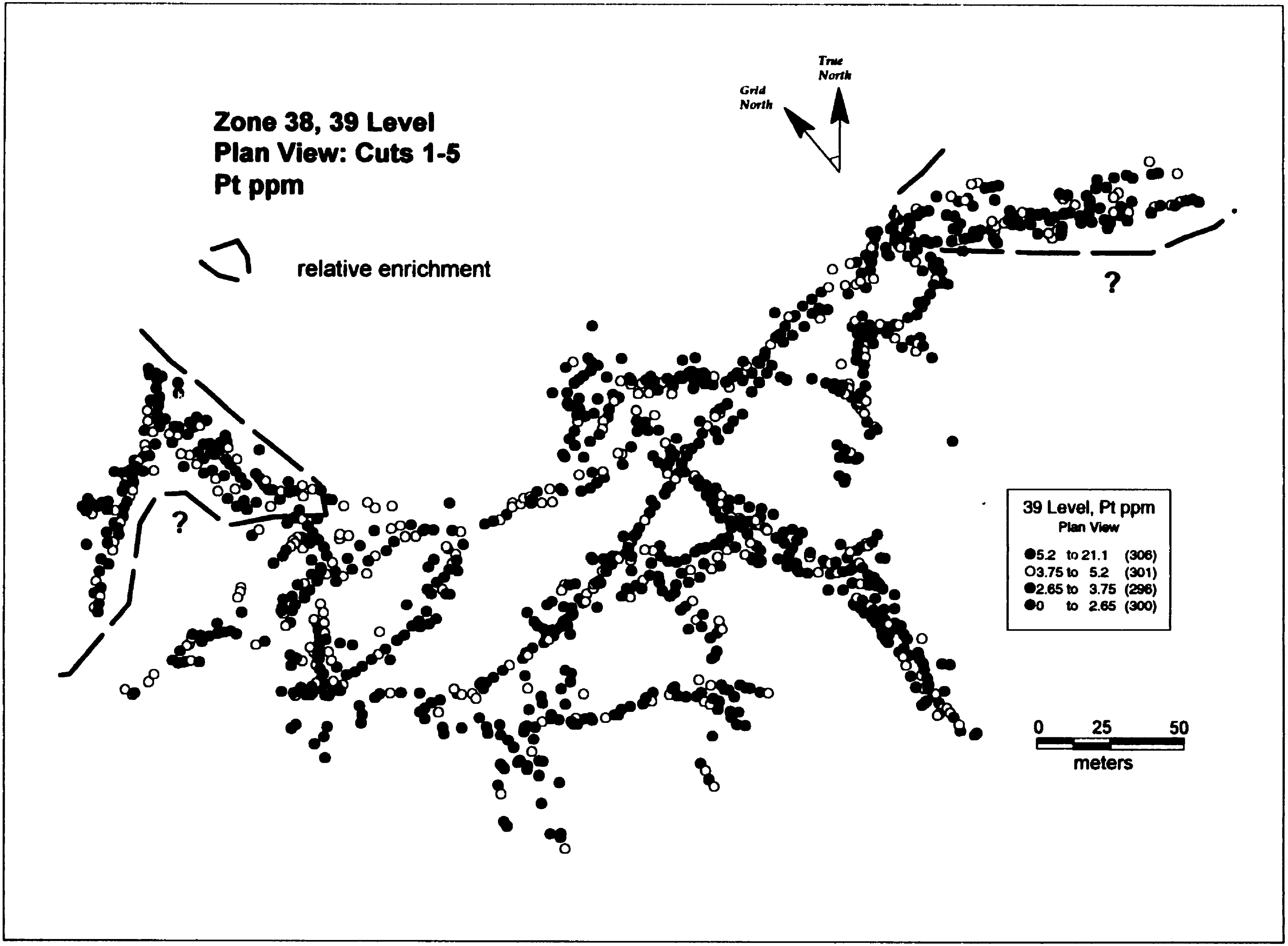


Zone 38, 39 Level
Plan View: Cuts 1-5
Ni percent

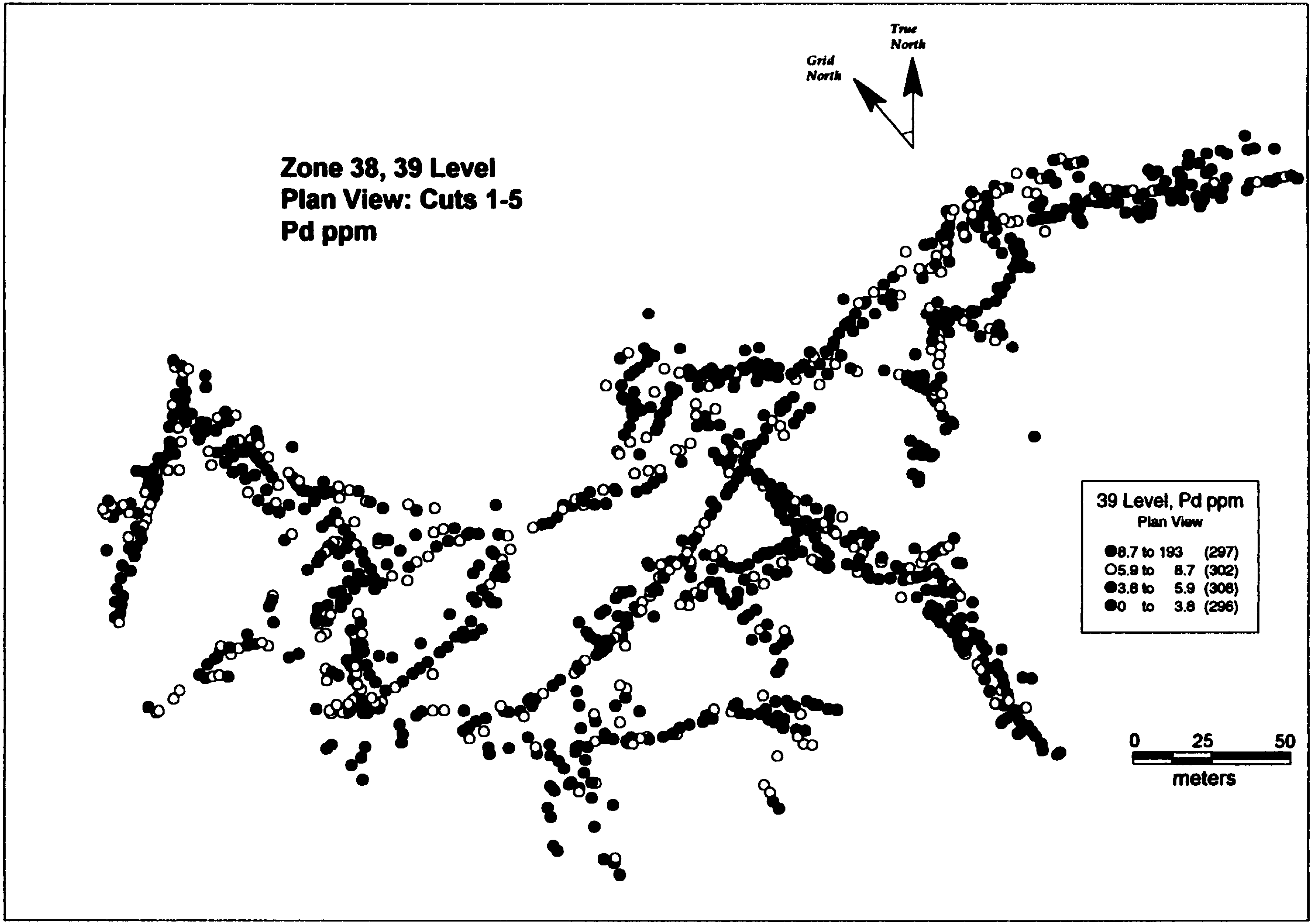

Zone 38, 39 Level
Plan View: Cuts 1-5
Cu percent
relative depletion
Grid North
True North
39 Level Cu percent
Plan View
● 29 to 33.6 (321)
○ 26.6 to 29 (306)
● 24.6 to 26.6 (285)
● 2.16 to 24.6 (291)
0
25
50
meters



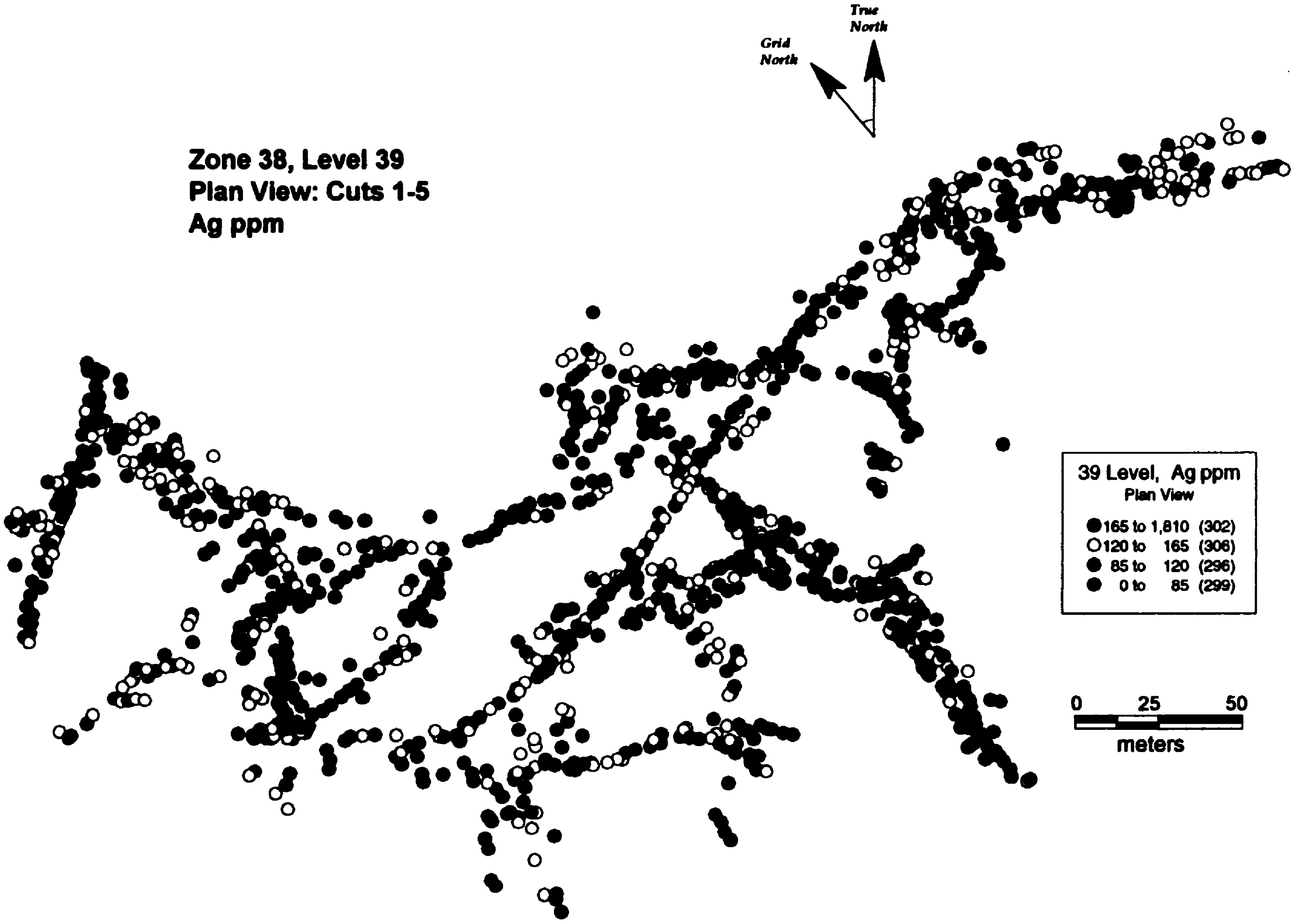
Zone 38, 39 Level
Plan View: Cuts 1-5
Au ppm



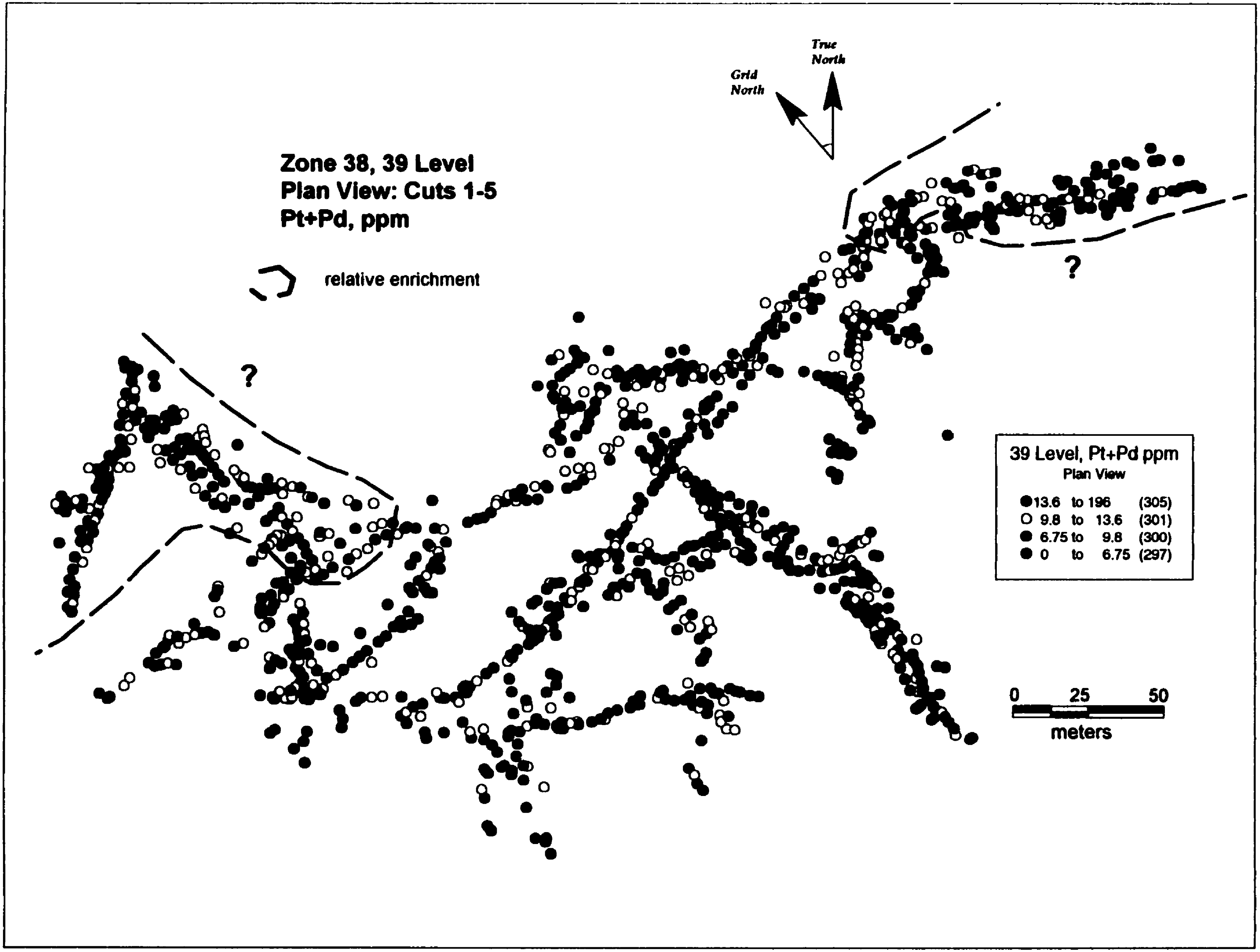
Zone 38, 39 Level
Plan View: Cuts 1-5
Pt ppm

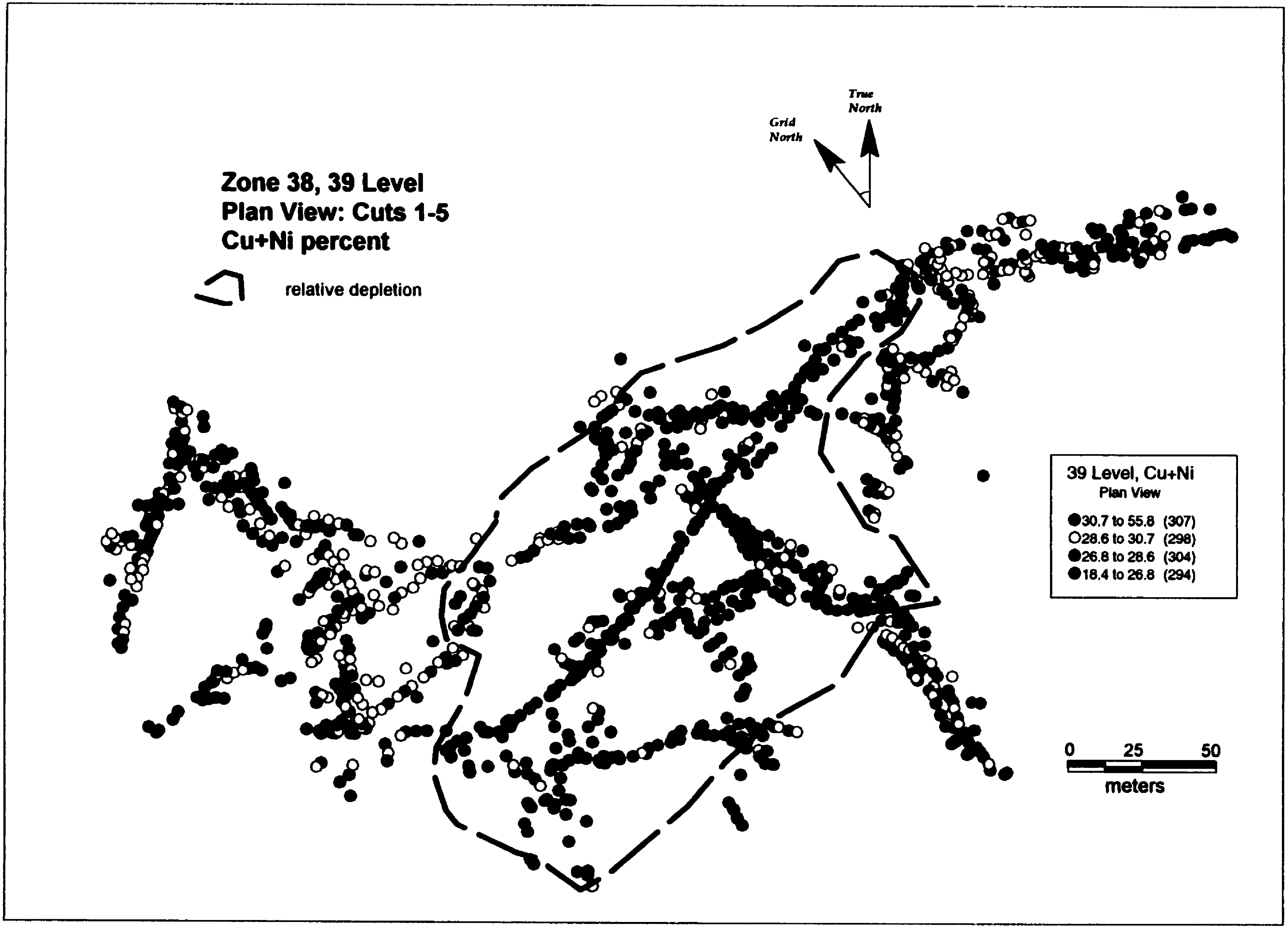


Zone 38, 39 Level
Plan View: Cuts 1-5
Pd ppm

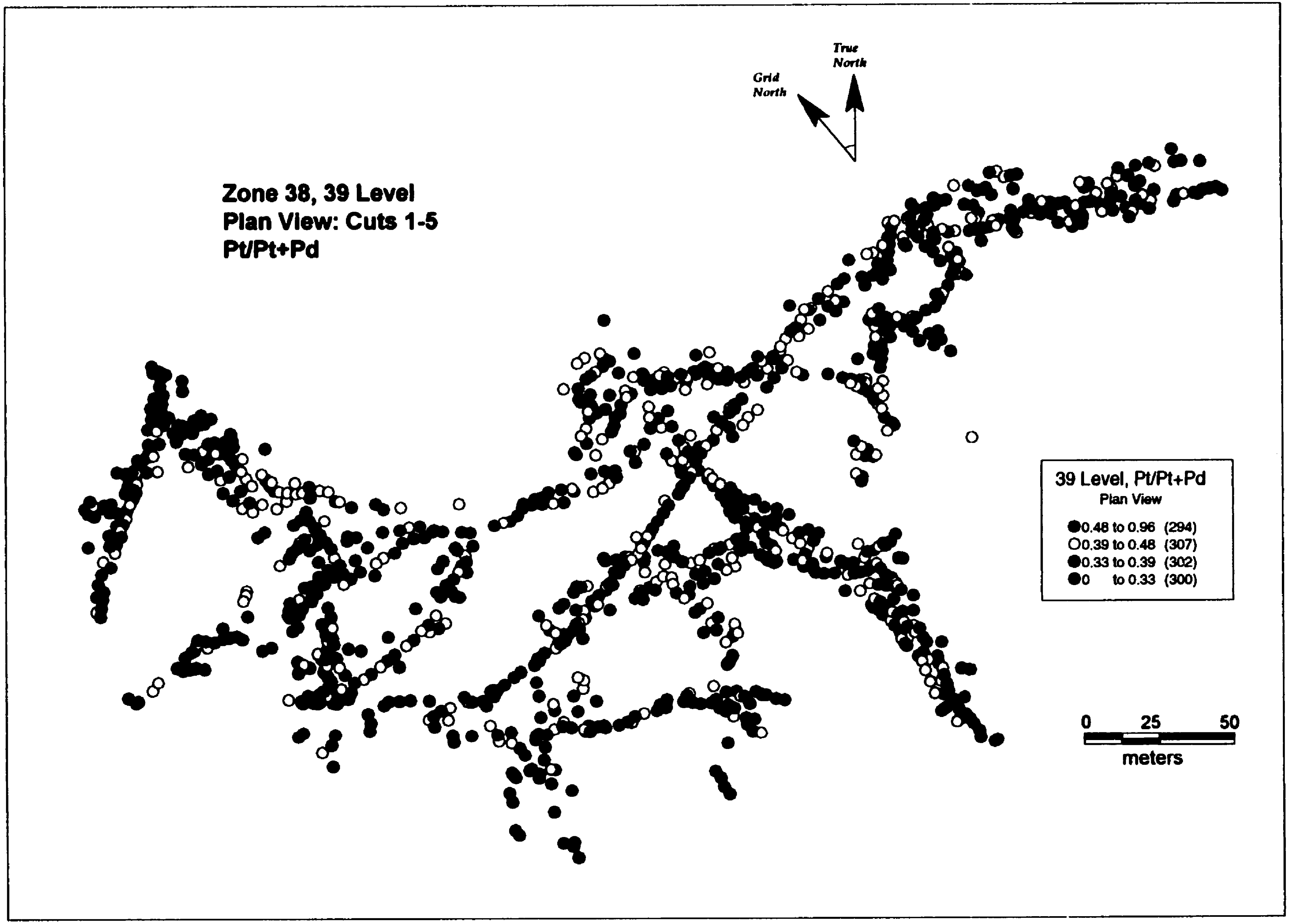


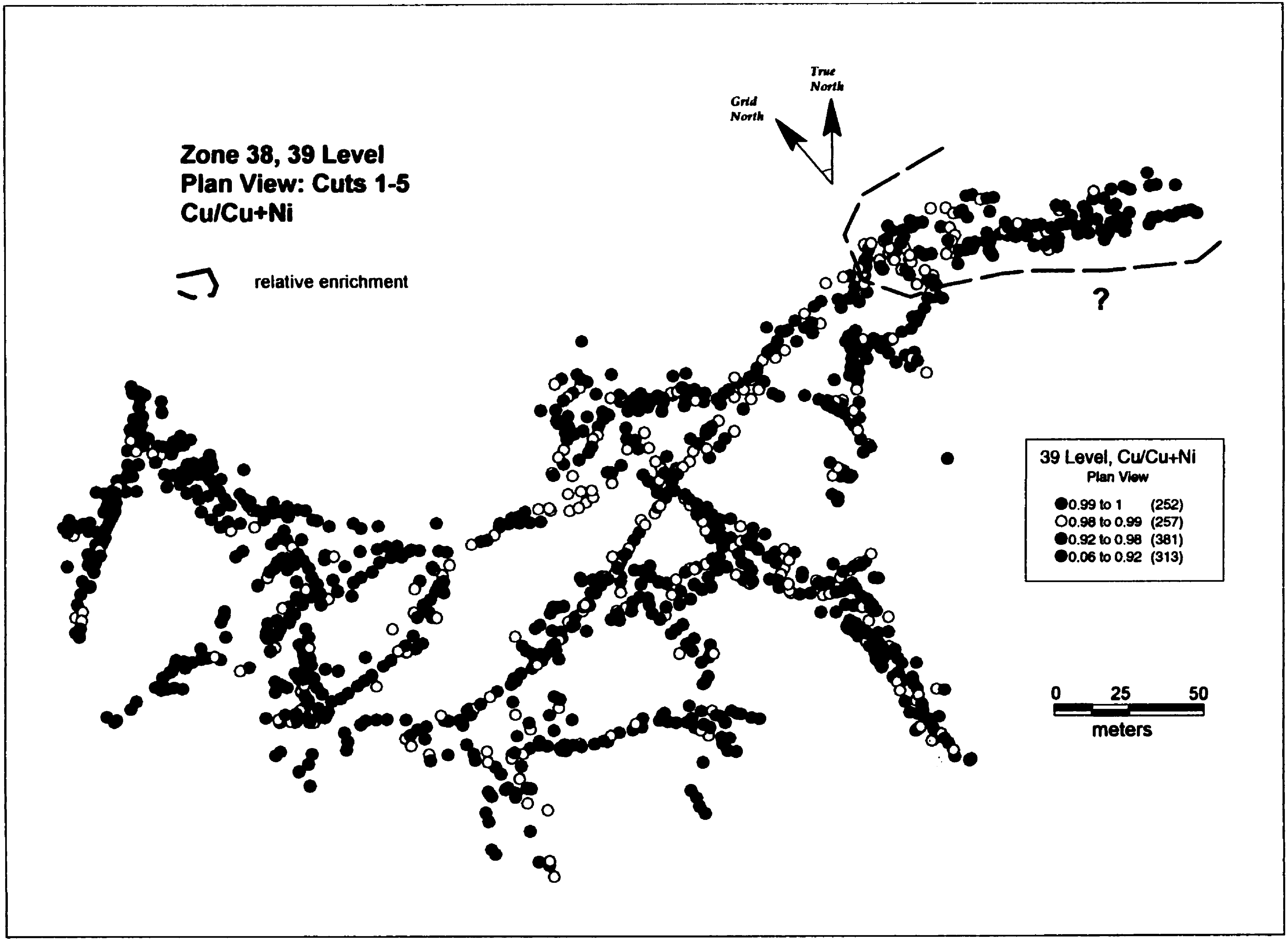
Zone 38, Level 39
Plan View: Cuts 1-5
Ag ppm


Zone 38, 39 Level
Plan View: Cuts 1-5
Pt+Pd, ppm
relative enrichment
True North
Grid North
?
?
39 Level, Pt+Pd ppm
Plan View
● 13.6 to 196 (305)
○ 9.8 to 13.6 (301)
● 6.75 to 9.8 (300)
● 0 to 6.75 (297)
0
25
50
meters

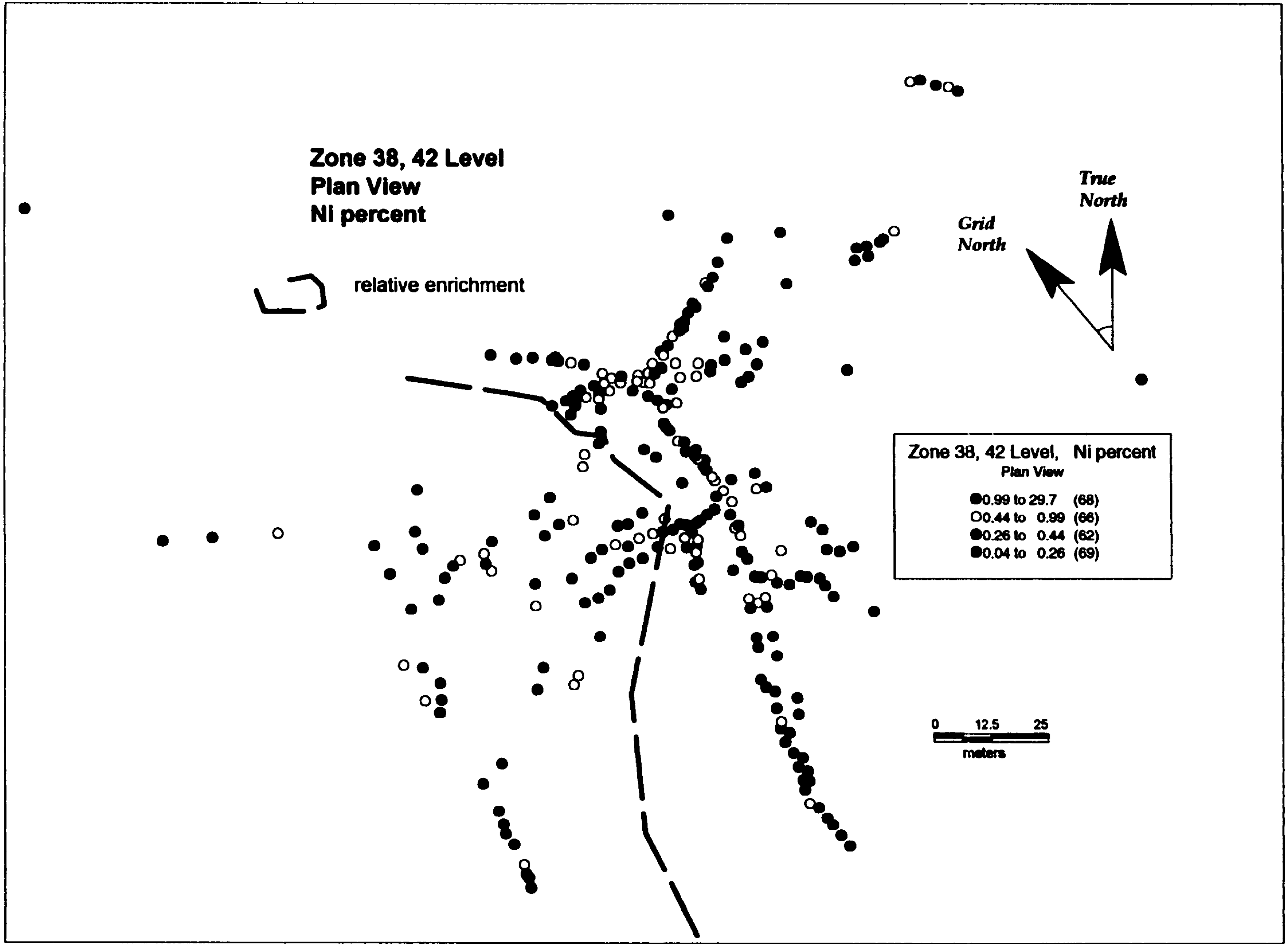


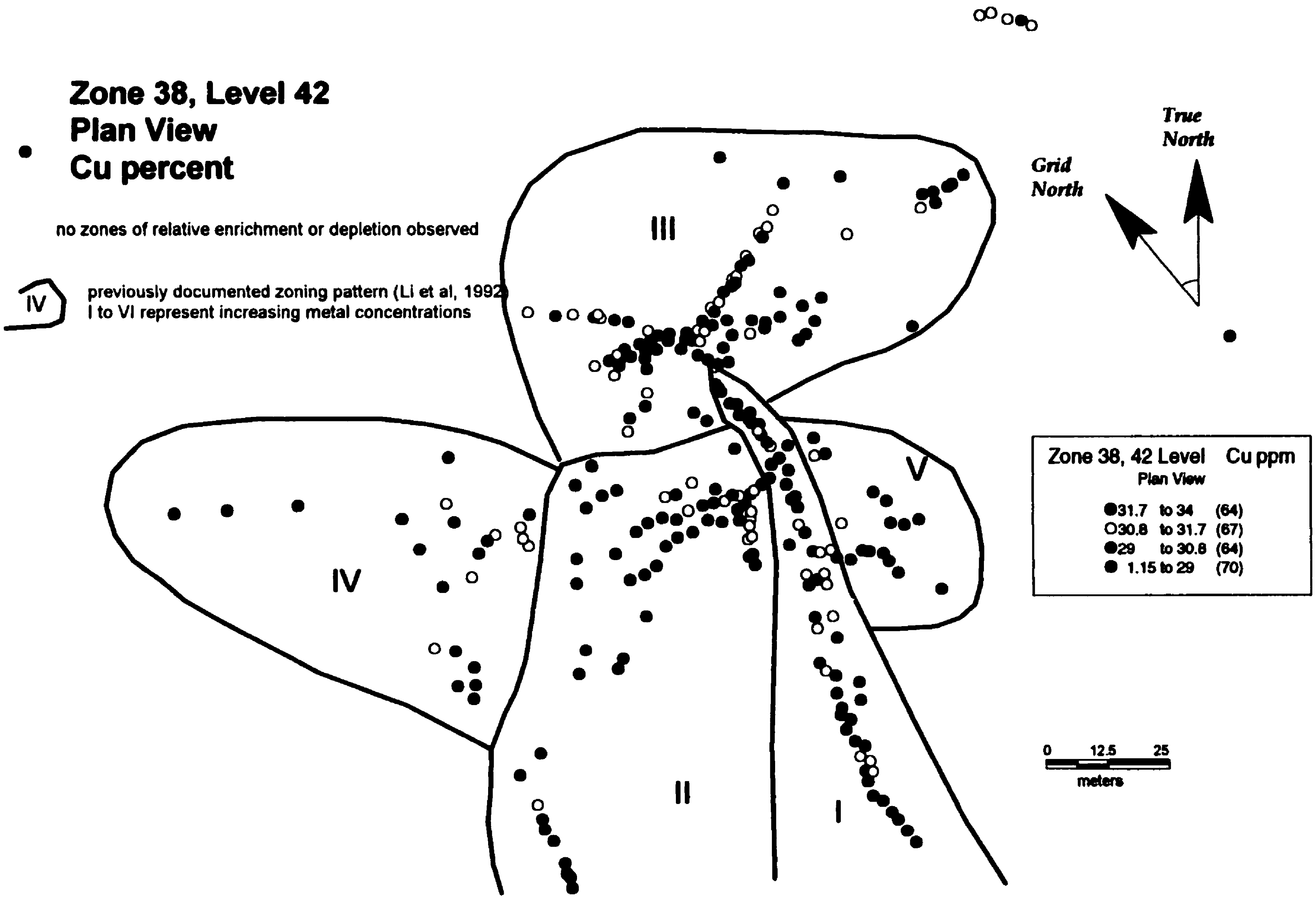
Zone 38, 39 Level
Plan View: Cuts 1-5
Cu+Ni percent

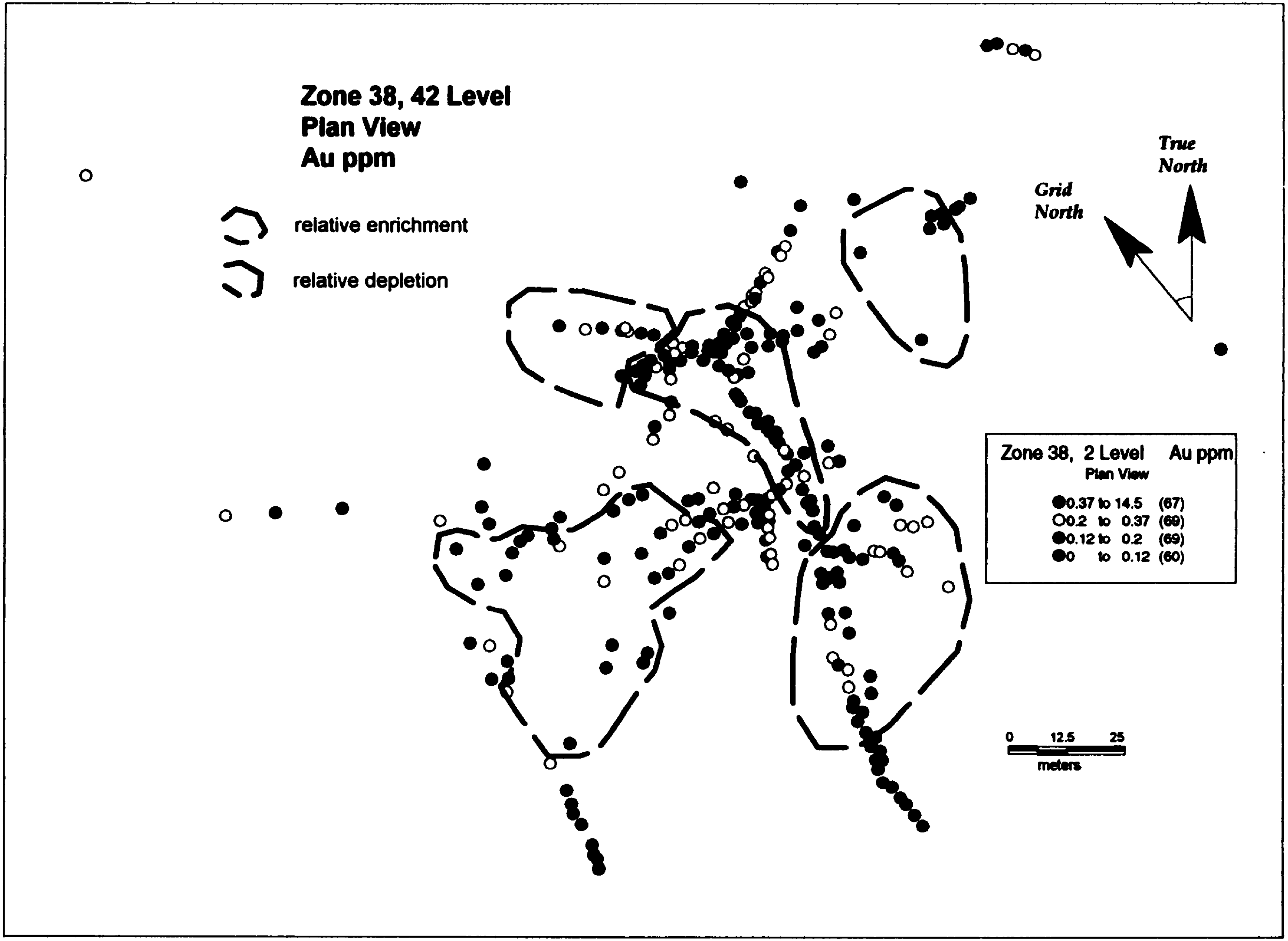

Zone 38, 39 Level
Plan View: Cuts 1-5
Pt/Pt+Pd

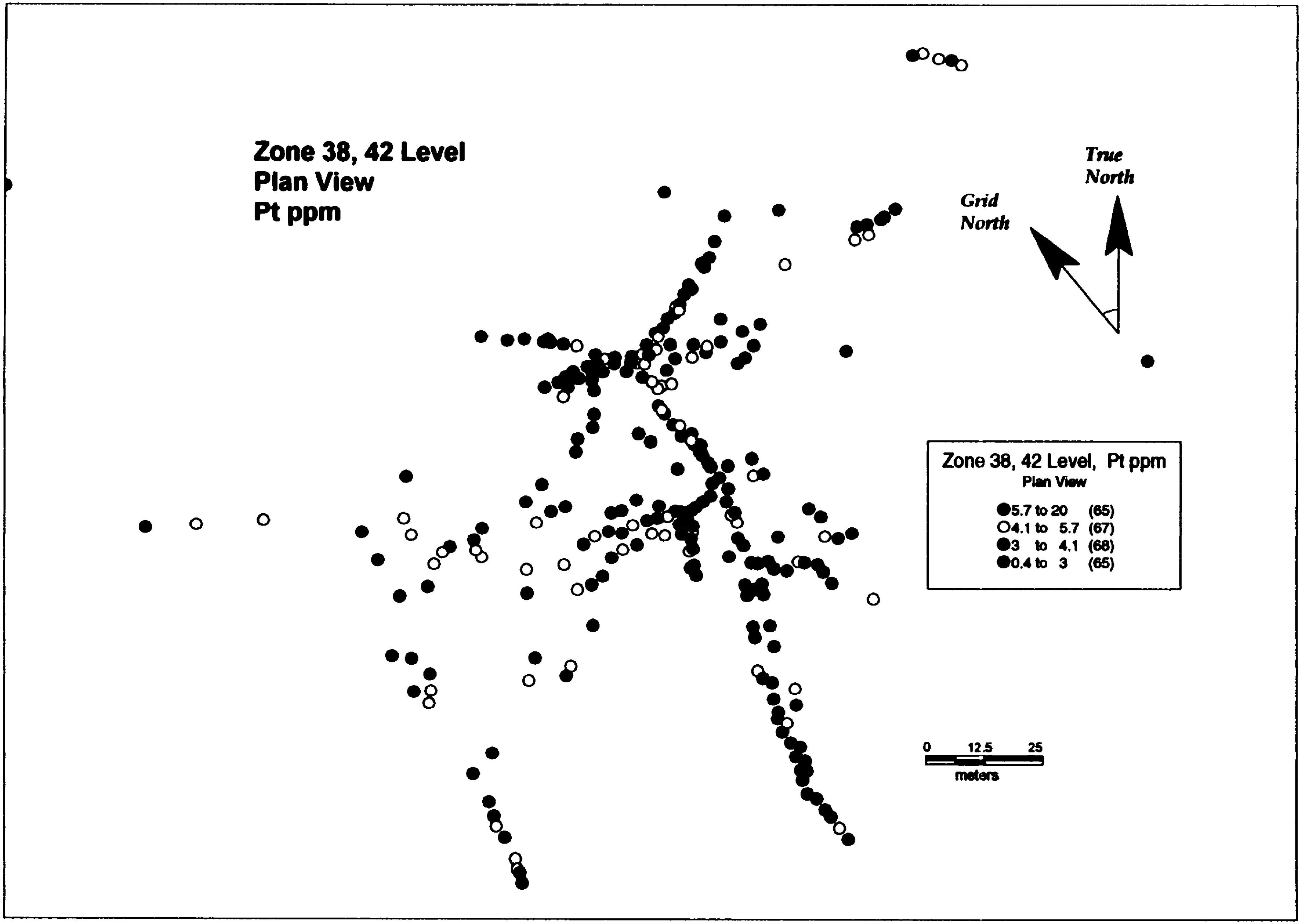

Zone 38, 39 Level
Plan View: Cuts 1-5
Cu/Cu+Ni
relative enrichment
Grid North
True North
?
39 Level, Cu/Cu+Ni
Plan View
●0.99 to 1 (252)
○0.98 to 0.99 (257)
●0.92 to 0.98 (381)
●0.06 to 0.92 (313)
0
25
50
meters

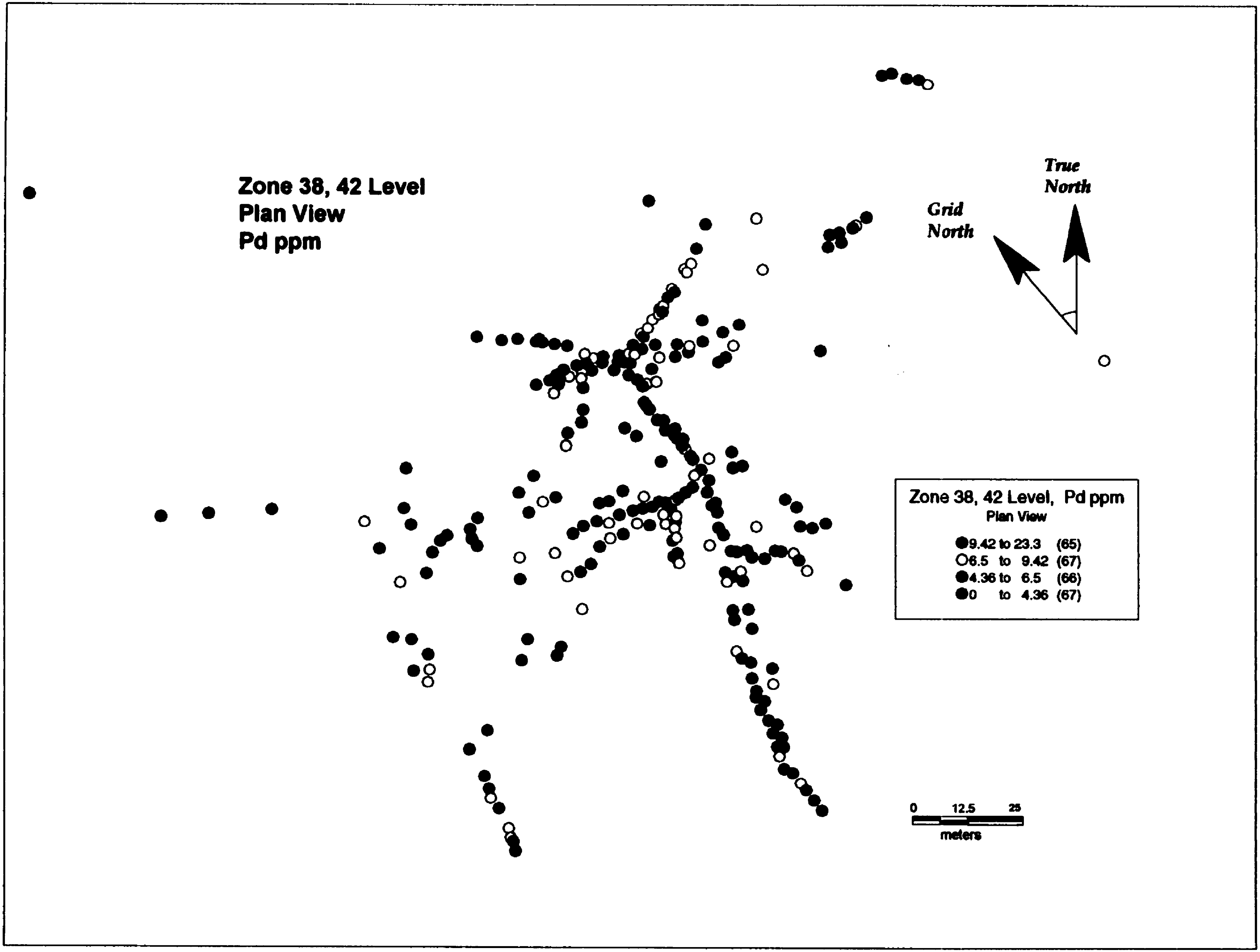
2.0 Level 42 Plans

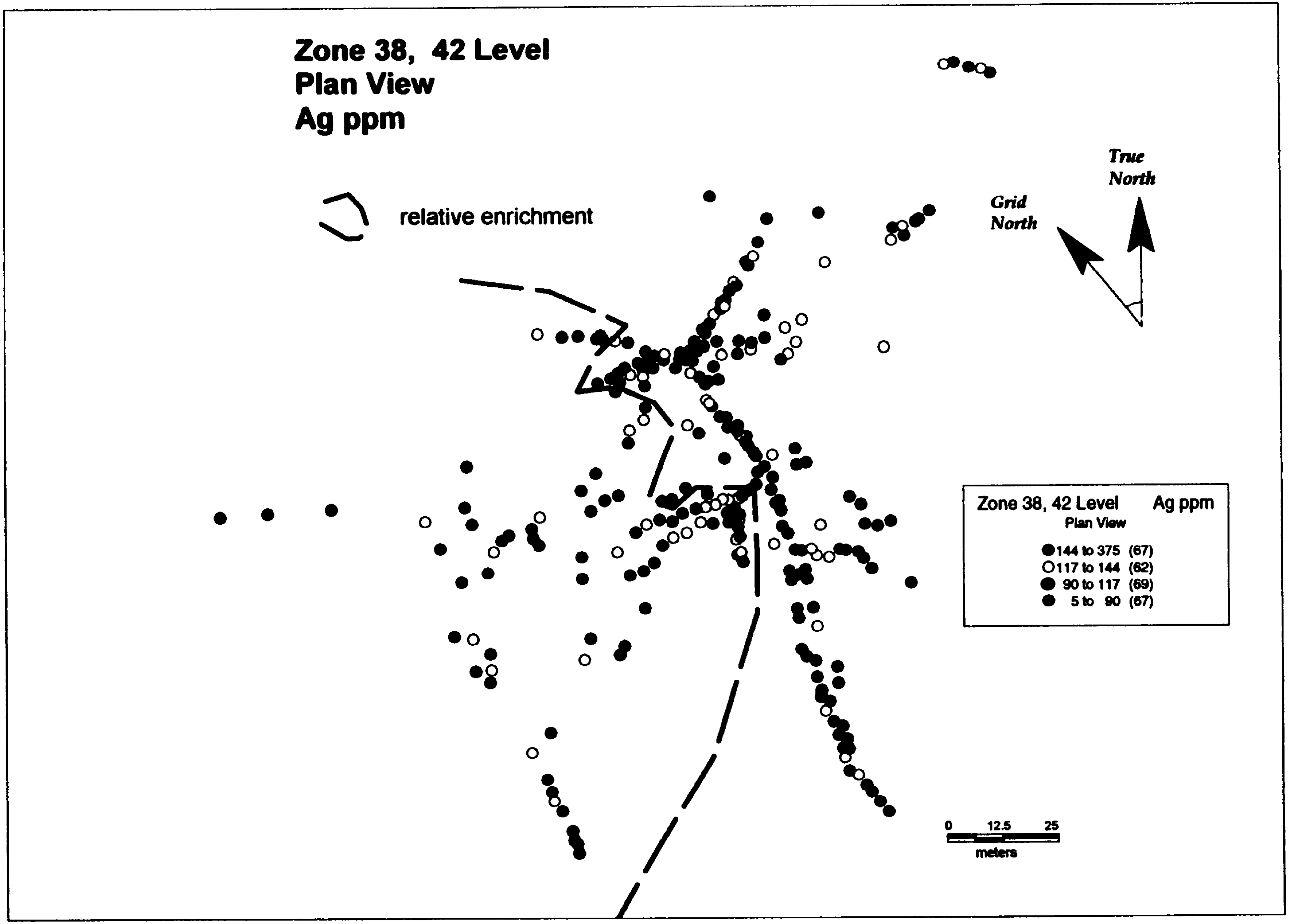

Zone 38, 42 Level
Plan View
Ni percent
relative enrichment
Grid North
True North
Zone 38, 42 Level, Ni percent
Plan View
●0.99 to 29.7 (68)
○0.44 to 0.99 (66)
●0.26 to 0.44 (62)
●0.04 to 0.26 (69)
0
12.5
25
meters

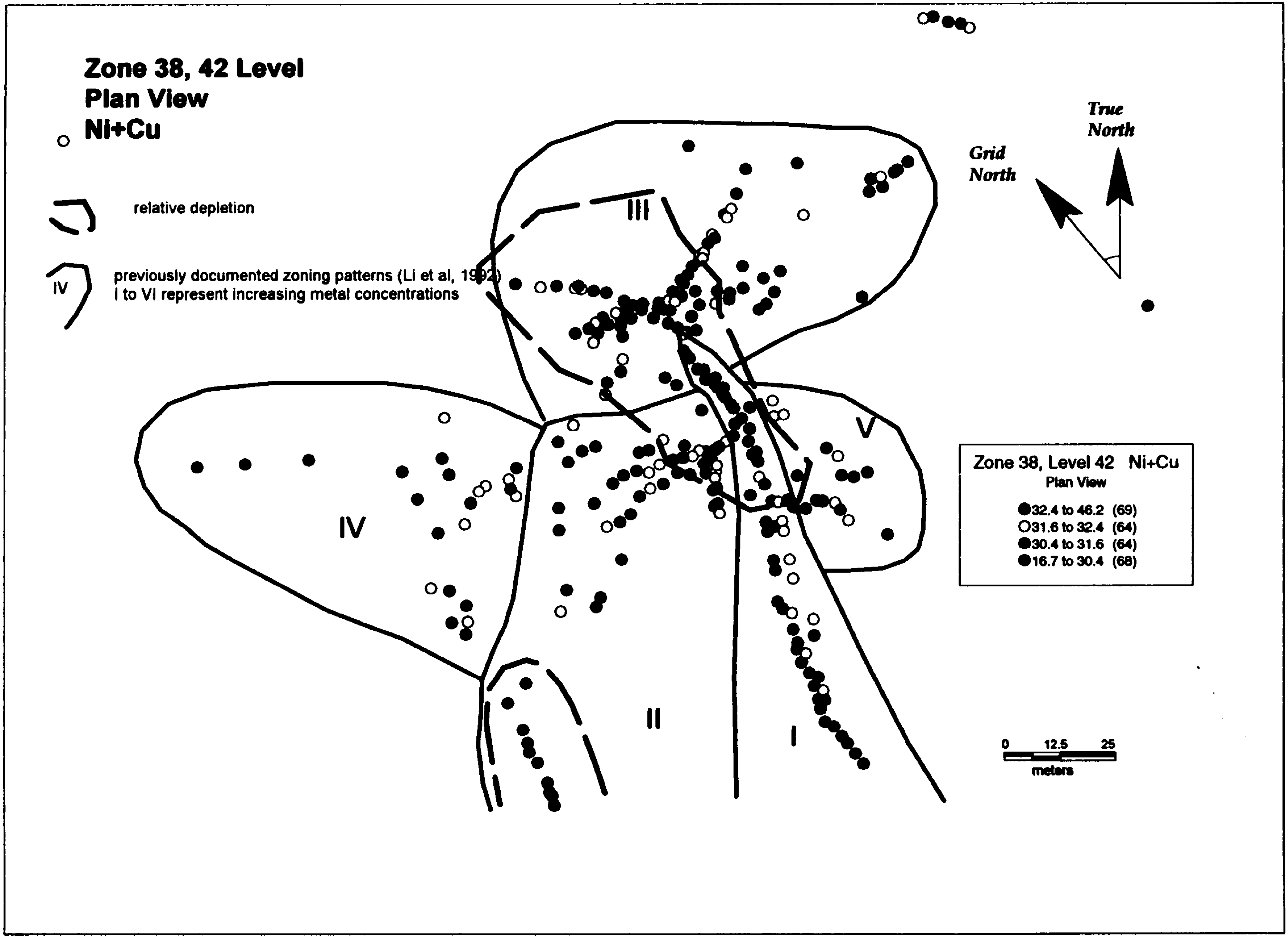


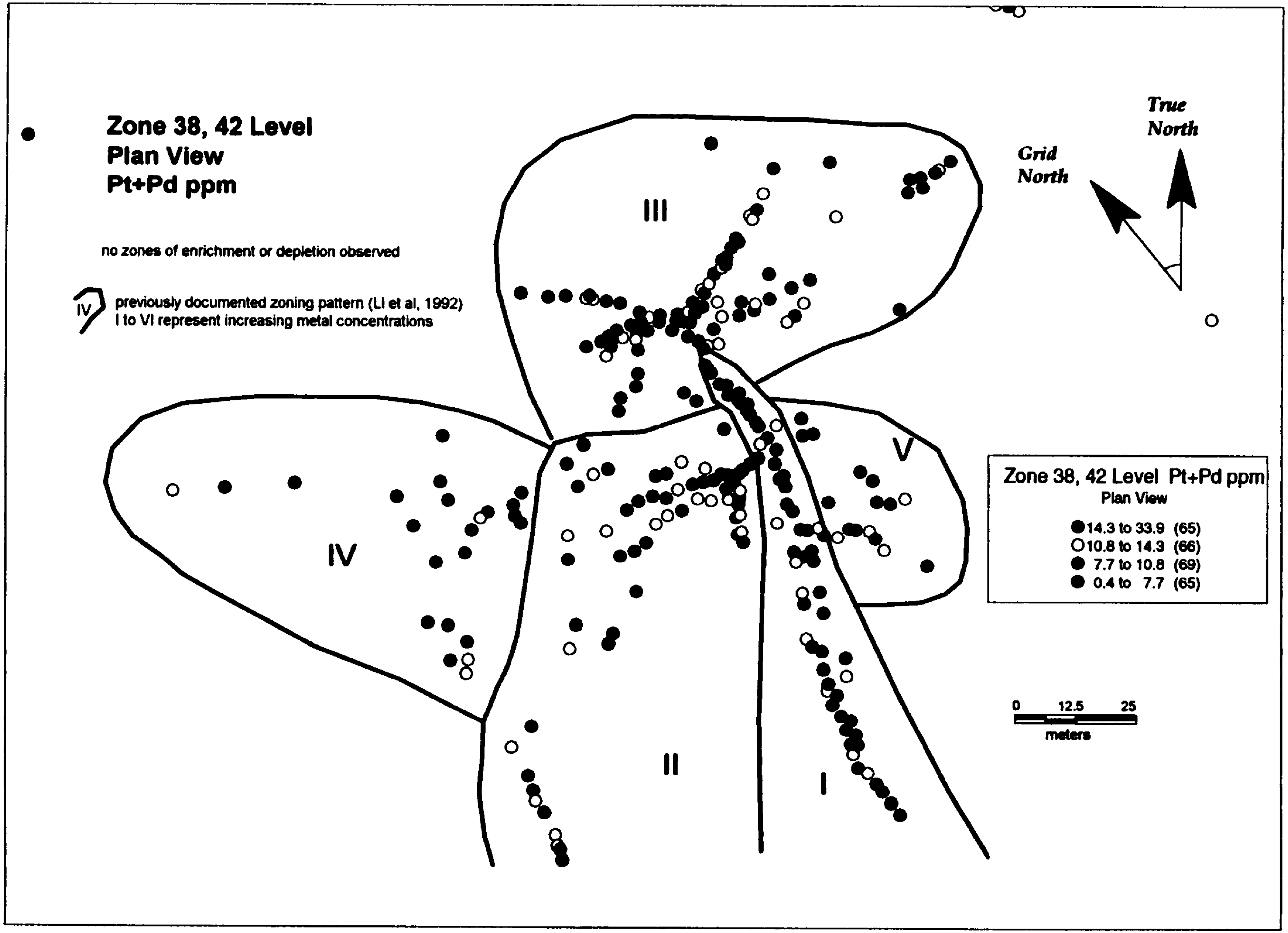

Zone 38, 42 Level
Plan View
Au ppm
relative enrichment
relative depletion
Grid North
True North
Zone 38, 2 Level Au ppm
Plan View
●0.37 to 14.5 (67)
○0.2 to 0.37 (69)
●0.12 to 0.2 (69)
●0 to 0.12 (60)
0
12.5
25
meters

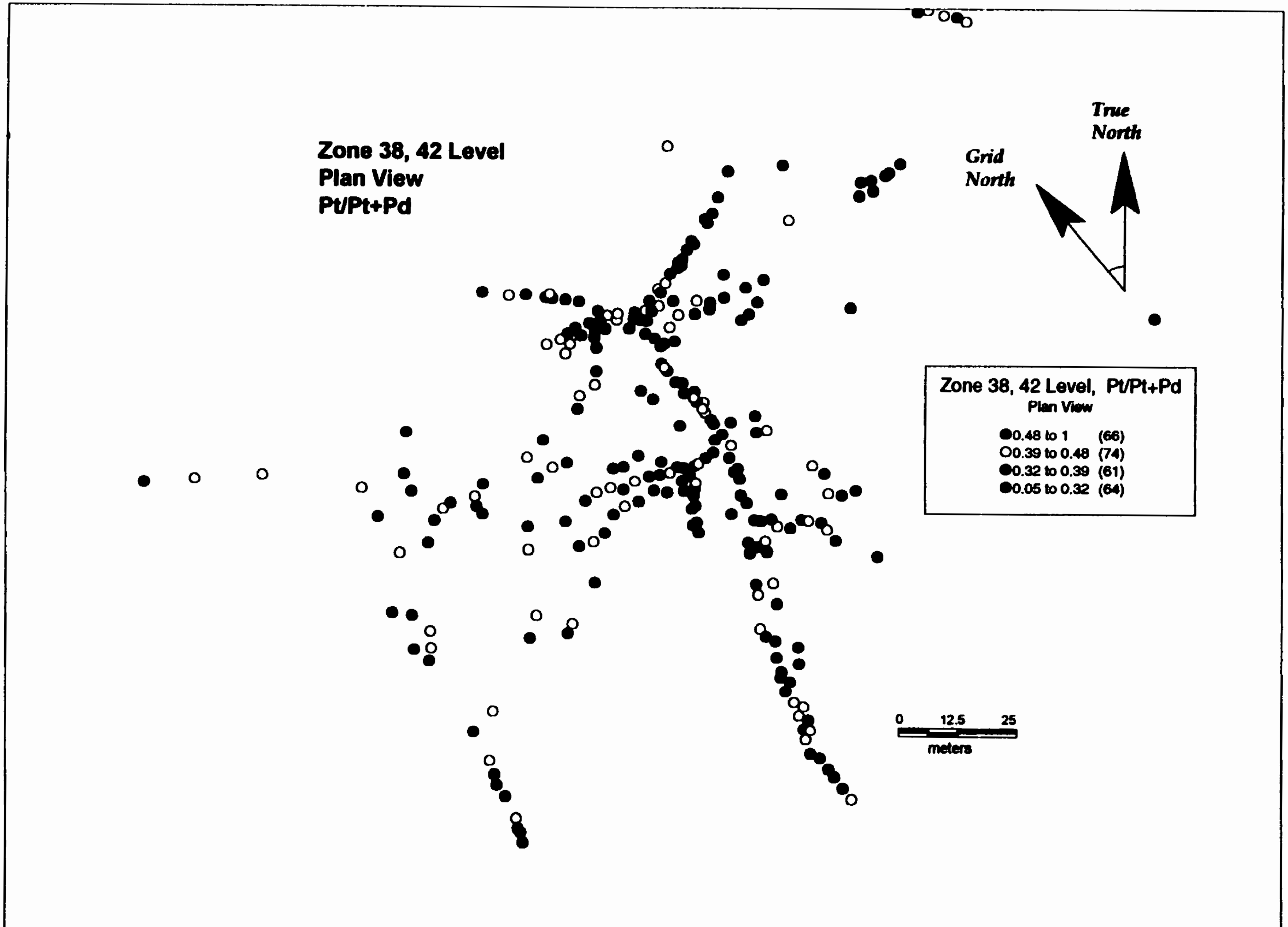

Zone 38, 42 Level
Plan View
Pt ppm
True North
Grid North
Zone 38, 42 Level, Pt ppm
Plan View
●5.7 to 20 (65)
○4.1 to 5.7 (67)
●3 to 4.1 (68)
●0.4 to 3 (65)
0
12.5
25
meters

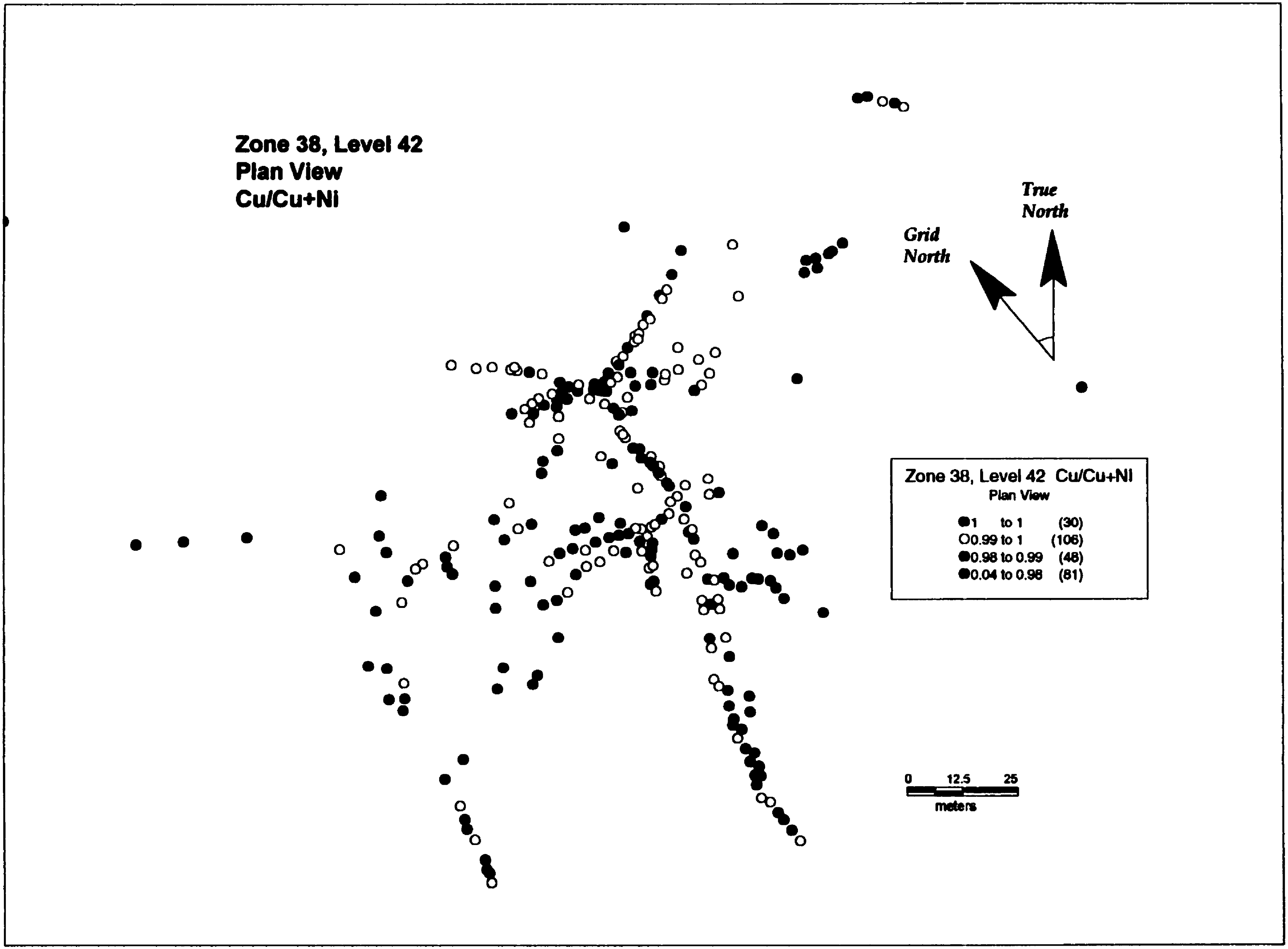

Zone 38, 42 Level
Plan View
Pd ppm
True North
Grid North
Zone 38, 42 Level, Pd ppm
Plan View
●9.42 to 23.3 (65)
○6.5 to 9.42 (67)
●4.36 to 6.5 (66)
●0 to 4.36 (67)
0
12.5
25
meters


Zone 38, 42 Level
Plan View
Ag ppm
relative enrichment
True North
Grid North
Zone 38, 42 Level Ag ppm
Plan View
● 144 to 375 (67)
○ 117 to 144 (62)
● 90 to 117 (69)
● 5 to 90 (67)
0
12.5
25
meters


Zone 38, 42 Level
Plan View
Ni+Cu
relative depletion
IV
previously documented zoning patterns (Li et al, 1992)
I to VI represent increasing metal concentrations
True North
Grid North
III
IV
V
II
I
Zone 38, Level 42 Ni+Cu
Plan View
●32.4 to 46.2 (69)
○31.6 to 32.4 (64)
●30.4 to 31.6 (64)
●16.7 to 30.4 (68)
0
12.5
25
meters


Zone 38, 42 Level
Plan View
Pt+Pd ppm
no zones of enrichment or depletion observed
IV
previously documented zoning pattern (Li et al. 1992)
I to VI represent increasing metal concentrations
True North
Grid North
I
II
III
IV
V
Zone 38, 42 Level Pt+Pd ppm
Plan View
● 14.3 to 33.9 (65)
○ 10.8 to 14.3 (66)
● 7.7 to 10.8 (69)
● 0.4 to 7.7 (65)
0
12.5
25
meters


Zone 38, 42 Level
Plan View
Pt/Pt+Pd
True North
Grid North
Zone 38, 42 Level, Pt/Pt+Pd
Plan View
●0.48 to 1 (66)
○0.39 to 0.48 (74)
●0.32 to 0.39 (61)
●0.05 to 0.32 (64)
0
12.5
25
meters


Zone 38, Level 42
Plan View
Cu/Cu+Ni
True North
Grid North
Zone 38, Level 42 Cu/Cu+Ni
Plan View
●1 to 1 (30)
○0.99 to 1 (106)
●0.98 to 0.99 (48)
●0.04 to 0.98 (81)
0
12.5
25
meters

Appendix VII

Terminology

Mining

Back - Roof of horizontal mining excavation.

Cut - Horizontal excavation of the orebody at a given elevation. In the case of Strathcona Deep Cu zone it implies a 3 metre high by 2 to 11m wide excavation.

Grade - Metal concentration contained in "ore" This may be diluted or un-diluted (in-situ). In the case of the Strathcona Cu zone the un-diluted grade is equivalent to the metal concentration or tenor within a massive sulphide vein.

Statistical

Some of the terms specifically used to help describe variations in metal concentrations are described below. The concepts associated with these terms can be found in introductory typical statistical or applied statistical textbooks. (ex. Volk, W., Applied Statistics for Engineers, 1980).

Accuracy - A term used to indicate the reliability of a measurement, with a system or on a sample, in terms of the closeness of agreement between this estimate and the unknown true value.

Coefficient of Variation - A measurement for random variations between series of measurements, and numerically equal to the standard deviation as a percentage of the mean value for the parameter. Useful in comparing relative spread or variability between data sets.

Comminution - The process of crushing, grinding and pulverizing required to prepare a gross sample to analytical fineness.

Composition Variance - A measure for random variations in composition between individual particles, and thus, for the composition heterogeneity. The sum of the composition variance and the distribution variance constitutes the sampling variance.

Confidence Interval (CI) - The limits that form the boundaries within which 95%, 99% or 99.9% of all measurements fall. For a 95% CI : = standard deviation of the mean (Sd/n$^{1/2)\,*}$z0.95 (the z-value from the normal or gaussian distribution for a symmetrical 95% probability). Confidence ranges (CR) include upper CR and lower CR. They are calculated by adding or subtracting the CI to and from the mean.

Correlation Coefficient - A measure for interdependence between paired measurements, that may vary between -1 and +1 with the intermediate value of zero indicating a complete absence of interdependence.

Degrees of Freedom - The number of independent comparisons that can be made among the set of measurements.

Distribution Variance - A measure for random variations in the distribution of particles of all sizes throughout a sampling unit, and thus, for the distribution heterogeneity.

Error (absolute) - A statistically significant difference between a measurement, or the mean of a series of measurements, and the most reliable estimate of the unknown true value.

Error (relative) - A statistically significant difference between a measurement, or the mean of a series of measurements, and the most reliable estimate of the unknown true value, divided by this estimate for the parameter. (May expressed as a percentage).

F test - A statistical test which is used to determine if the difference between two variances are statistically significant (within a certain confidence level such as 95%)

Geostatistics - A specialized form of applied statistics which accounts for spatial correlations within the data to provide accurate weighted local estimates.

Gross Sample - The entire sample collected for purposes of analysis.

Independence - An assumption used in statistics that a group of data taken in space has no spatial correlation.

Kolmogorov-Smirnov test - A (non-parametric) test that provides the same comparison as the t-test but which does not assume a normal population.

Nugget effect - An effect where a measurement or series of measurements may not be representative due to the presence of low concentrations or isolated grains which may not be included in a large proportion of the measurements. The result may be an underestimation or overestimation (due to outliers) of the true value of mean value. Also used in a geostatistics as a parameter in variography as a measure of the proportion of variance that is random or spatially independent.

Null hypothesis - The hypothesis that the mean difference between identifiably different measurements is statistically equal to zero.

Mean or average - The sum of all measurements divided by the number of measurements. Used as a measure of central tendency for a population. The arithmetic mean is assumed unless otherwise stated. Other examples include a geometric mean or and anti-ln mean which are commonly used for lognormal distributions.

Median - The median is a measure of central tendency defined as the middle value in a series of measurements.

Mode - The most common value in a series of measurements.

Non-parametric - Used in regards to statistical applications that do not use parameters associated with a certain population distribution.

Oultiers - A measurement that appears to be incompatible with other measurements so that its rejection on the basis of statistical criteria should be considered.

Population - The hypothetical set of all possible measurements for a single quantity parameter.

Precision - A term used in reference to the magnitude of random variations between replicate measurements.

Probability - A measure for chance in terms of the ratio between a subset of outcomes for a certain event, and the set of all possible outcomes.

Probability distribution - Type of distribution a population contains. These distributions may be characterized graphically on histograms, cummulative frequency probability graphs. Formulas for statistical parameters will vary depending on the distribution. Assumptions are often made when using statistical parameters and functions that a population is normal.

Normal Distribution - Symmetrical bell shaped histogram.

Poisson Distribution - Strongly positively skewed on histogram where data contains a few very high values. Typical of a group of gold samples. *Lognormal Distribution* - A positively skewed distribution which forms a symmetrical normal distribution when values are transformed to natural logrithms.

Random Variations - Differences between the most reliable estimate for the unknown true value of a parameter and a series of measurements, for which the mean difference is statistically equal to zero.

Repeatability - A measure for the precision of a measurement process under restricted conditions.

Representative Sample - A sample collected and prepared in such a manner that measurements on the sample are significant for the sampling unit (or area of the orbed the sample is being used to represent).

Sample Preparation - The process of airdrying, crushing, dividing, drying, grinding, screening, homogenizing and pulverizing performed on a gross sample for the purpose of obtaining an unbiased test or analysis sample.

Sampling Regime - The sample collection scheme in terms of the mass and number of primary increments, and their spacing.

Spatial Dependency - Data points that have some degree of spatial correlation and that are not independent.

Standard Deviation - A measure for random variations between series of measurements, and numerically equal to the square root of the variance.

Stationarity - Requirement, when applying geostatistical methods, that variations in metal concentrations are constant and that zoning is not present. If zoning or multiple populations are present they are required to be partitioned into different domains before geostatistical methods can be applied.

Subsample - A portion of the gross sample. Various stages of subsamples may be prepared in order to reduce the gross sample to a size required by the analytical method (ie. in a fire assay 10g is the final subsample size)

T-test - Tests whether two groups of samples are drawn from the same population and can be used to test whether the difference between two means are statistically significant (different) within certain confidence levels. This test assumes the populations are normally distributed.

Total Variance - A measure for the precision for the entire process of sampling, sample preparation, and measurement. In this study the total variance includes local natural or intrinsic variance within the veins.

Unknown True Value - A hypothetical value for the parameter of interest for which the measurement process must provide an unbiased estimate.

Variance - A measure for the random variations between series of measurements, and numerically equal to the sum of squared deviations for their mean, divided by the number of measurements minus one, ie. divided by degrees of freedom.

Variance of Analysis - A measure for random variations in the measurement process.

Variance of Preparation - A measure for random variations in sample preparation.

Variance of Sampling - A measure for random variations in sampling.

Variogram - A fundamental tool used in geostatistics to determine parameters relating to spatial correlations.