ANVIL MINING CORPORATION LIMITED

MEMORANDUM

TO: W. KRATS FROM: P.M. PETTIGREW

SUBJECT: The occurrence of massive pyrite within Zones 1 and 3 DATE: September 26, 1972.

INTRODUCTION

Massive sulphides composed largely of pyrite with, in many cases, anomalously low lead and zinc values occur within difinable horizontal and vertical limits with respect to orientation of Zones 1 and 3. These lower values have been observed previously but have not been associated with a specific pyrite "unit".

Some attempt is made at a generalized zonation of the ore body (1 & 3). This is done in terms of the massive pyrite occurence and some previous observations concerning grade distribution.

Finally and most importantly some conclusions are derived in terms of recommendations for further delineating the problem zone.

DISCUSSION

A. Description and correlation of the pyrite "unit"

There has been observed in the pit (since late 1971) and in core drilled in 1970 and 1972 fairly continuous lenses of sandy-textured pyrite concordantly enclosed within the ore body. This massive pyrite tends to be anomalously low in lead and zinc values (usually $<2\%$ combined). There appear to be no reaction haloes around them and in fact they seem to constitute a horizon of pyrite sands having varying degrees of welding and/or cementation. The welding seems to be caused by diagenetic pyrite and the cement is largely a white mineral resembling barite. This latter mineral

could be syngenetic with the pyrite in the postulated sea in which these sediments are said to have been deposited.

Enough of these same characteristics were quite clearly observed in the pre-1970 D.D.H. logs that a correlatable horizon (containing bands of more lead and zinc rich sulphides within it) can be separated out as a "unit" of varying homogeneity. An isopach map of equal thicknesses of sulphides influenced by massive pyrite and defined as being within the horizon described is included as Figure 1.

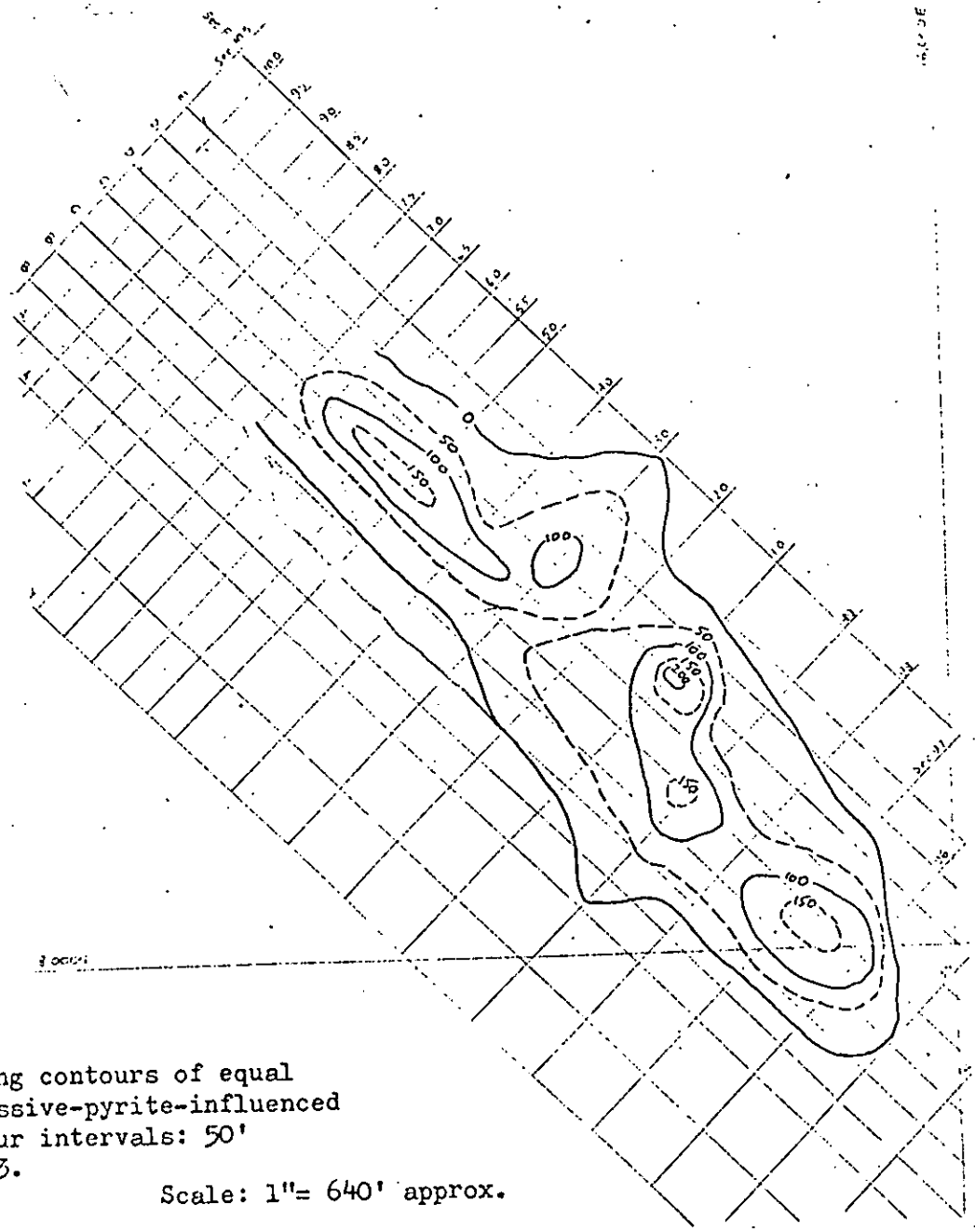

Figure 1

Isopach map showing contours of equal thicknesses of massive-pyrite-influenced sulphides. Contour intervals: 50'
Faro Zones 1 and 3.

Scale: 1"= 640' approx.

Thus the mass appears to be approximately 3000' long x 600' wide x 75' thick amounting to around 16 million tons of sulphides in some way affected by the presence of massive pyrite. This "unit" is enclosed within the main body of ore such that that overlying is of approximately equal thickness to that underlying.

To give a three-dimensional picture of the "unit" an isometric projection is included (Figure 2). This shows correlation lines between D.D.H. traces which are interpreted as intersecting the massive-pyrite-containing horizon. The solid black bands within the horizon are the bands of "good ore" within it; "good ore" being any 5' intersection of $\geqslant$5% Pb + Zn. The diagram is also shaded to show those portions of the massive pyrite unit below 3750' and above 3510' bench elevations.

The writer has been for some time revising the sulphide intersections on the Faro Zones 1 and 3 longitudinal and transverse cross-sections in terms of editing out any $<$5% (Pb + Zn) sulphides and thereby modifying the full- and half-bench outlines previously shown on the bench plans. This has already reduced the ore reserve tonnages but it is anticipated that there will be a concurrent upgrading of (Pb + Zn) %.

B. Structural implications

Consideration of the second isopach map (Figure 3) is worthwhile at this point because a structural relationship seems to exist between the pyrite unit and the configuration of the sulphides as a whole. The thickest part of the sulphides is vertically 50% to 100% contributed by the pyrite.

There is a hint of an en echelon structure which may or may not be generated by the incompetent-competent-incompetent sandwhich that composes the sulphide mass. The enclosing sulphides are

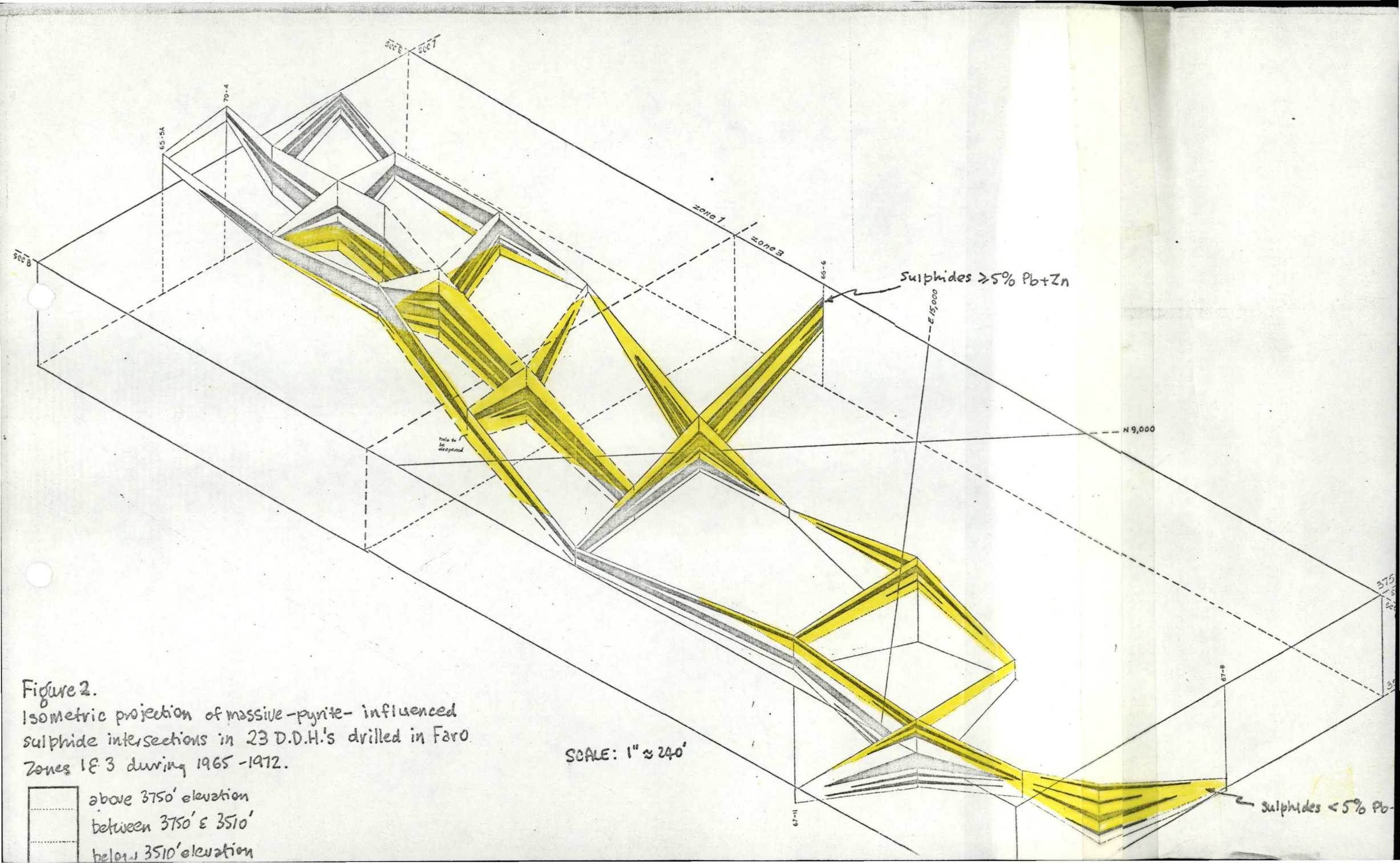

Figure 2.
Isometric projection of massive-pyrite- influenced sulphide intersections in 23 D.D.H.'s drilled in Faro Zones 1 & 3 during 1965 -1972.

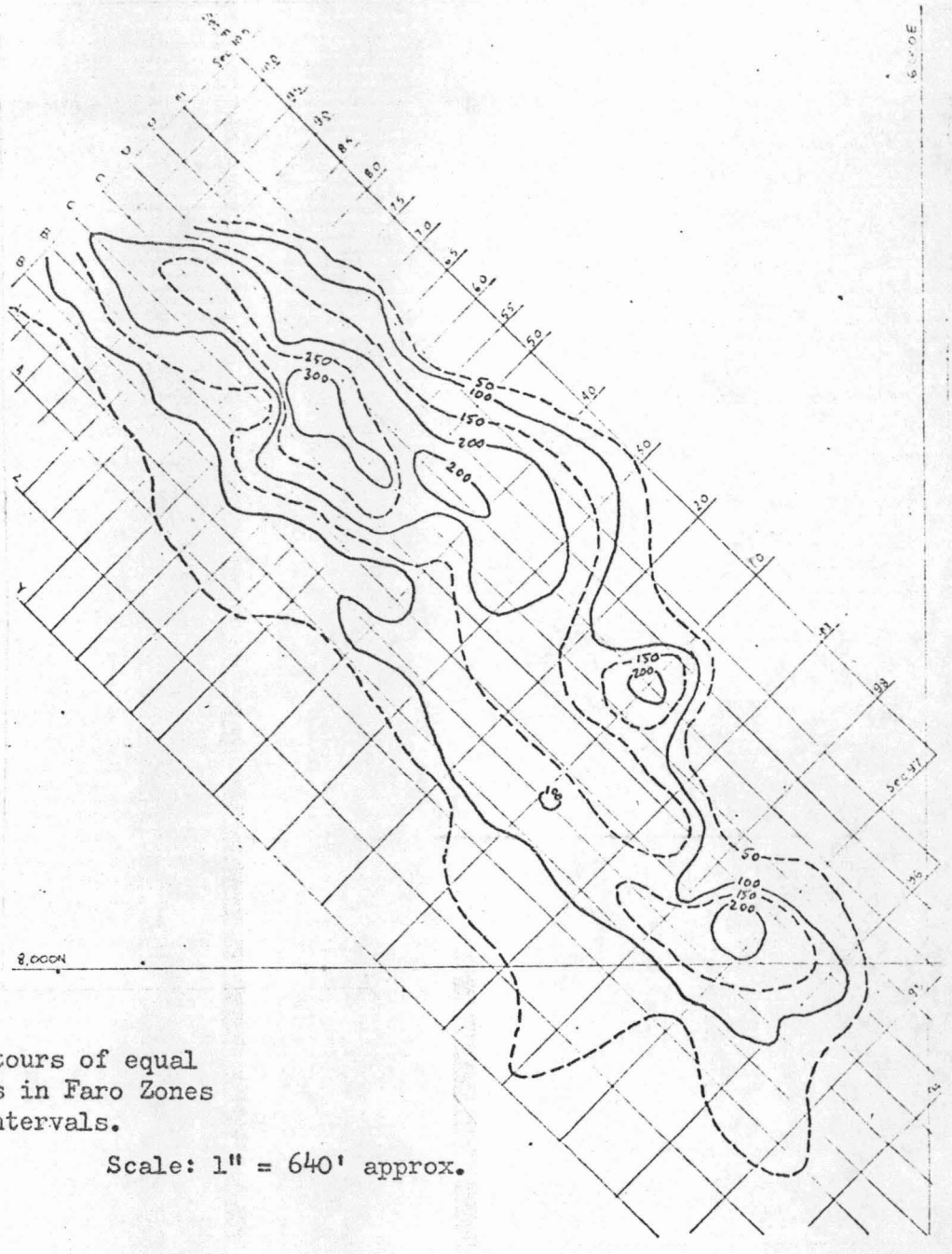

Figure 3

Isopach map showing contours of equal thicknesses of sulphides in Faro Zones 1 and 3. 50' contour intervals.

Scale: 1" = 640' approx.

fine-grained and are composed of a higher percentage of softer minerals (galena, sphalerite, pyrrhotite) while the enclosed pyrite is on the whole coarser grained and significantly harder. Thus on a large scale one has the potential for a boudinage mechanism. This could be the source of the pinchings and swellings that occur along the somewhat contorted axis of the sulphide mass. It could also be in some way the cause of the failure or whatever along the so-called Faro Fault.

C. Sub-zonation of Faro Zones 1 and 3

A suggested mineralogic sub-zonation of Zones 1 and 3 partially generated by the isopach maps considered above is shown in Figure 4 and postulates four sub-zones as follows:

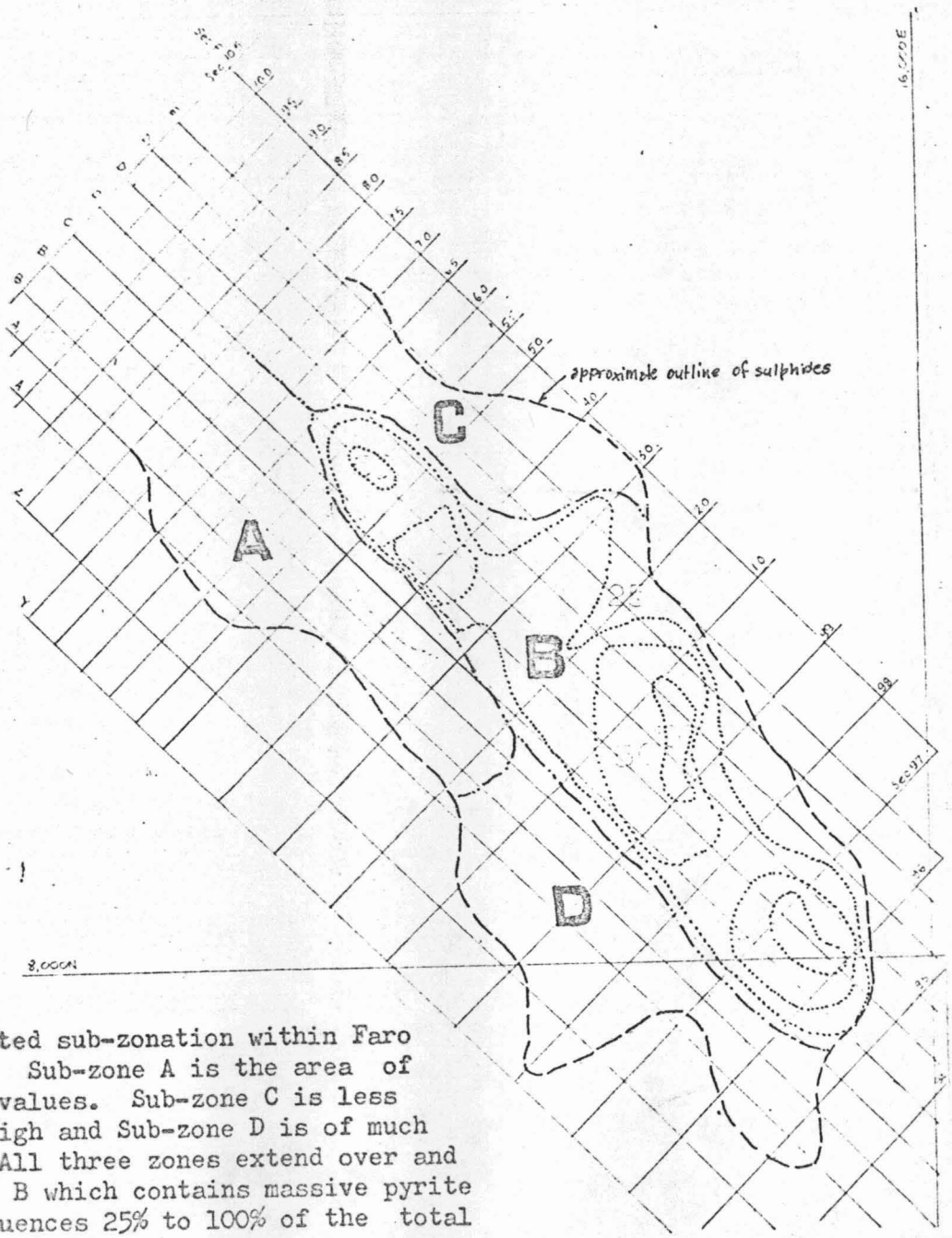

Figure 4

Showing suggested sub-zonation within Faro Zones 1 and 3. Sub-zone A is the area of highest Pb+Zn values. Sub-zone C is less consistently high and Sub-zone D is of much lower grade. All three zones extend over and below Sub-zone B which contains massive pyrite and which influences 25% to 100% of the total sulphide thickness there.

Scale: 1"= 640' approx.

Sub-zone A is the core of the highest grade ore in the sulphide mass. This is particularly well-developed along longitudinal Section B and, as far as is presently drilled, along Section B'. It may be of significance to note that sub-zone A appears to be somewhat higher in pyrrhotite content than elsewhere. This coupled with the higher than normal grades may suggest remobilization of the lead and zinc along Section B as an axis.

Sub-zone B is the area enclosing the pyrite "unit" and is overlain and overlies parts of the other three zones. The area outlined is approximately 25% or more contributed in overall thickness by the pyrite-influenced sequence. The two areas to the south which are 100% pyrite-influenced are not included in ore reserve estimates.

Much less consistent but also of higher grade is Sub-zone C. High grade blocks in this zone have so far been fairly unreliable as mining progresses.

Finally, Sub-zone D is a very low grade zone and may be of dubious economic significance on considering also its depth and thickness.

RECOMMENDATIONS

The writer would suggest that the following be done:

1. That the occurrence of the pyrite unit be delineated on the bench plans;

2. Any future ore reserve listing should make mention of the presence of significant pyrite;

3. That no drilling programme need be drawn up specifically for detecting the pyrite but that the 300'-centre drilling be completed and that a limited number of 150'-centre holes be drilled next year for ore control purposes. Most of these holes would give further data on the pyrite sands.

4. Composite samples from 1972 and future drilling representing 40' - 50' sections of ore will routinely be tested in the laboratory for pyrite/pyrrhotite content as well as that of Ba, etc. Such data will further quantify statements concerning ore-types and will help in defining areasof "good" ore and areas in which sorting problems are anticipated to reduce the pyrite content of mill feed. If sorting is not possible the mill will be informed in advance and adjust their grinding requirements accordingly.

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