

RECEIVED AUG - 7 1990

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Lee

I want to pass on to you some of the ideas that have arisen from pit mapping in Vangorda. A status map and stereo plots are attached with the relevant data on them. Sorry, no long sections. It would take too much paper. If you want them I can pass on either copies on paper or diskette. I've generated 14 long sections with a 15 metre spacing from cross section 15+00E to 32+00E. I'm presently working on an interpretation of them which is nearly completed.

I have subdivided the present exposed pit into three structural domains based largely on the orientation of S2. Domains are separated by extensional faults.

Domain 1 incorporates phyllites in the southern end of the pit that have dropped down along the Sump Fault. I have now mapped this fault in three locations and am confident of its position and nature. The Sump Fault dips moderately to steeply south. The dip changes somewhat between phyllites and more competent ore rocks.

Folds in Domain 1 are typically isoclinal, shallowly east-west plunging, with a penetrative axial plane cleavage. Locally, S1 is preserved in the hinge region of F2 folds. S2 in Domain 1 is penetrative and everywhere axial planar to F2 folds. S2 (see stereo plot) dips shallowly towards the southwest to northwest.

Domain 2, in the pit wall, consists of footwall ore (4EC) with possibly minor 4L on top of it. Folding in Domain 2 appears to be close to tight, shallowly west plunging, with a axial plane

cleavage only in the hinge zone (the hinge zone is the only place where S1 and S2 can be separated with any confidence). F2 folding in Domain 2 appears to consist of a single, structurally quiet, long limb to the north (from P12 to P15 on the status map) and a hinge zone to the south (P15 to P16). S asymmetries of minor folds indicate that this fold closes towards the south to southwest. The actual fold hinge was mapped at location P29. Here S1 and S2 are at a high angle to each other and have a southwest-plunging intersection lineation. At station P29, the hinge zone is truncated by the Sump Fault, and hangingwall phyllites are juxtaposed against it. Outcrops in the pit floor indicate that the contact between the orebody and overlying phyllites in Domain 2 lies immediately southwest of P29 and runs continuously northwest (?). This contact has been mapped in a drainage ditch and dips shallowly towards the southwest.

S1 and S2 are difficult to differentiate in Domain 2. For the present S1 and S2 are interpreted to be parallel in the long limb, the angle between them increasing towards the hinge zone. In the hinge zone S2 is axial planar to F2. S2 is a coarsely spaced fracture cleavage that dips dominantly towards the northeast (see stereo plot). This is a significant change in orientation between S2 in Domain's 1 and 2.

The criteria for separating Domain 2 from Domain 3 is still tentative but I feel it is strong. For instance, in the pit wall, near station P34, the overburden contact drops sharply and Domain 3 phyllites to the north strike directly into 4EC footwall ore to the south. Also, in cross section, there is a significant change

in structure and in lithology between sections 25+00E and 24+00E. In long section, the change is less obvious. However, it is difficult to correlate lithologies across the proposed fault with any confidence. Further, a 1140 bench plan-view map of the ore horizon shows a distinct break in the ore body across this area (9610 local grid). Assay maps of production drill chips from the 1146 bench show the same pattern. I think the fault dips moderately to steeply northwest.

Domain 3 consists of complexly folded and faulted phyllites overlying footwall ore. F2 folds in Domain 3 are tight to isoclinal, WNW/ESE plunging, with a wave length on the order of 10's of meters. Fold asymmetries indicate Domain 3 is the overturned limb of a macroscopic F2 fold.

S2 is penetratively developed in Domain 3 and is everywhere axial planar to F2. S1 is locally preserved in fold hinges. S2 in Domain 3 forms a rather scattered pole plot but shows the dominant southerly dip direction. Again, there is a significant change in S2 orientation between Domain 2 and Domain 3.

A number of minor (and not so minor?) extensional faults occur in Domain 3. Typically, there is very little movement along these faults, but this is difficult to determine for sure without marker horizons. What is noticeable about these faults is their northwest/southeast dip directions (see stereo plots). In long section, Domain 3 appears has a complex interbanding of phyllites and orebody that may reflect the extensional faulting.

The data presented suggests the presently exposed pit can be divided into three structural domains separated by extensional

faults. Folding is typically tight to isoclinal and doubly plunging. Fold plunge directions are typically W/E to WNW/ESE, slightly more towards east/west than previously thought. The dominant fabric in the rocks is S2. S1 is found locally in F2 fold hinges and is interpreted to be everywhere else transposed into parallelism with S2. The orientation of S2 changes noticeably between domains. Extensional faulting, such as the Sump Fault, appear to play a major role in the present distribution of ore lenses in the pit.

I would appreciate your comments on this interpretation. Any suggestions as to things I should be looking at or not looking at will be also be appreciated.

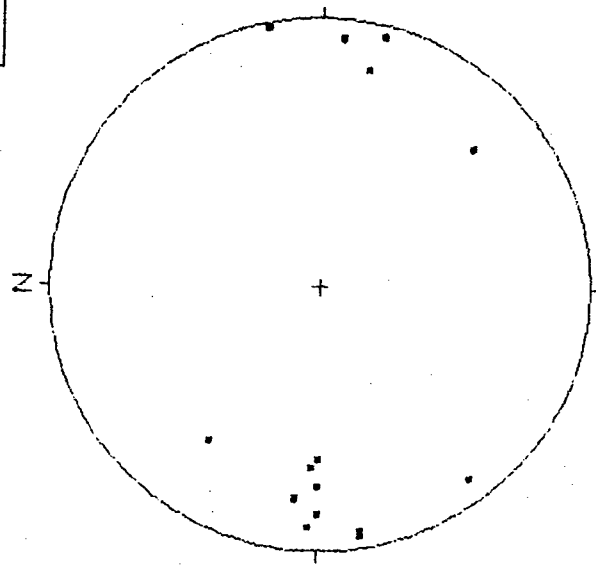
I am presently doing a full long section interpretation from X-sections 15+00E to 32+00E. The Traverse data base is set up but there must be a bug in my definitions somewhere because it will not plot the data on the traverse section. It will plot the section but not the data! Working on it.

I've made up a list of objectives for detailed core logging and some of the preliminary observations that I intended to include here but decided it would be better to do it separately.

Thanks for your time.

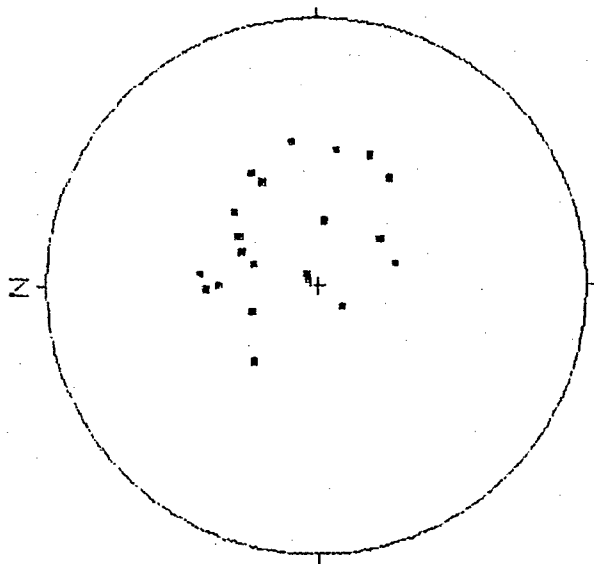
Dennis

DOMAIN 1 L2



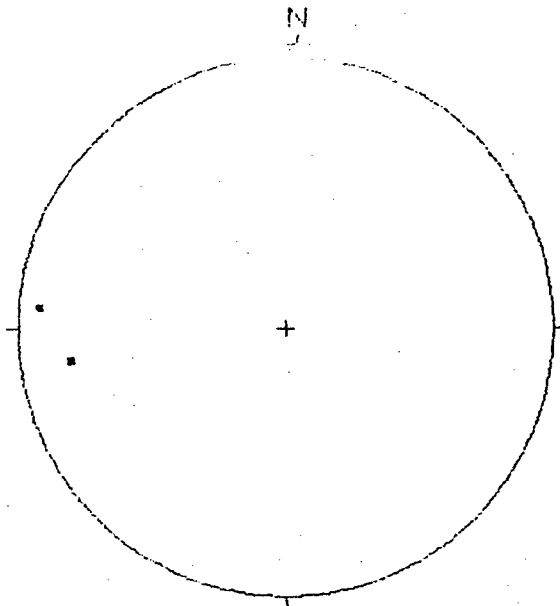
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DOMAIN 1 S2



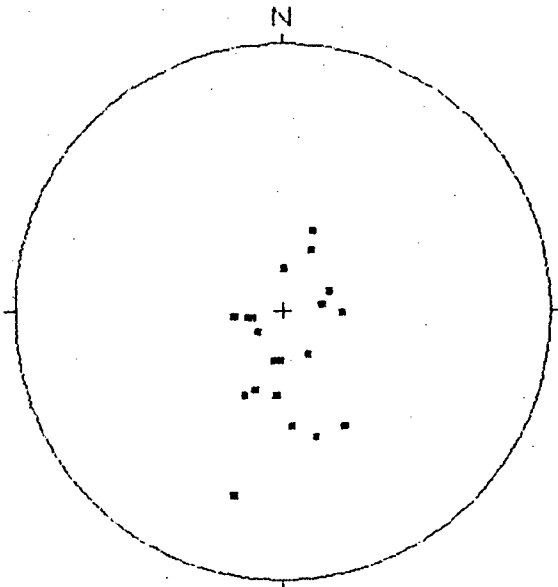
N = 22

DOMAIN 2 L2



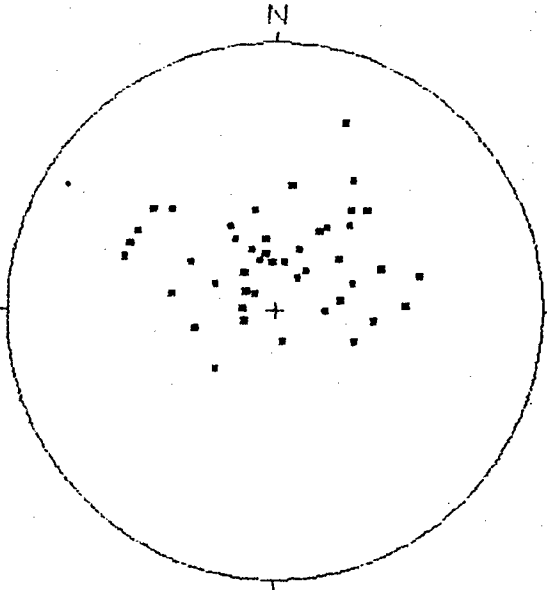
N = 2

DOMAIN 2 S2



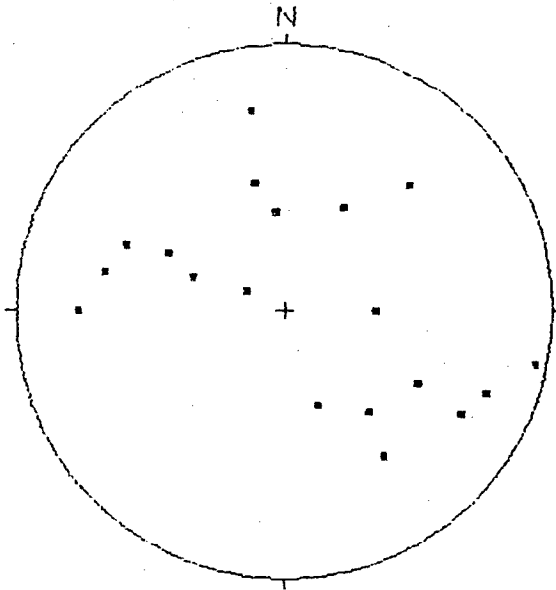
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DOMAIN 3 S2



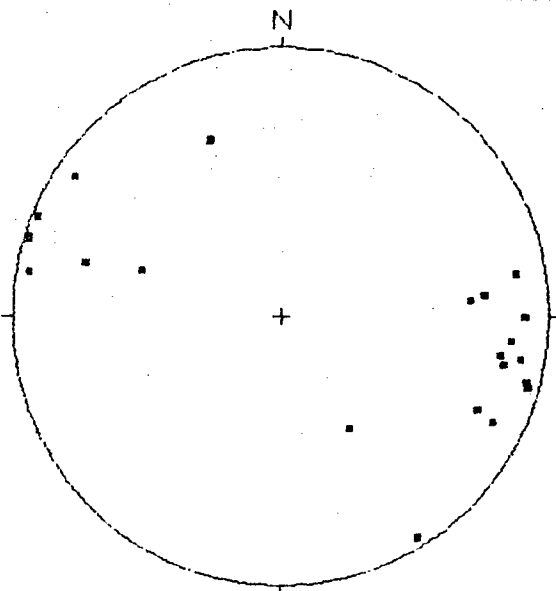
N = 46

DOMAIN 3 FAULTS



N = 19

DOMAIN 3 L2



N = 21

9700 N

9600 N

9500 N

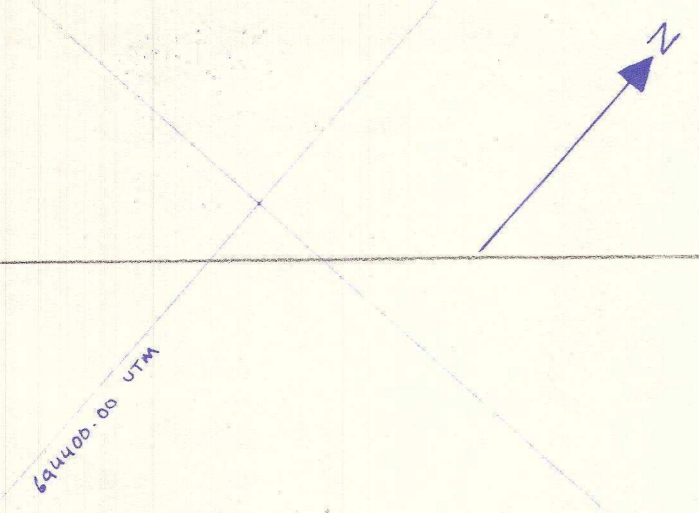
9400 N

930000 E

900000 E

930000 E

970000 UTM



Vanguard Pit
1152 / 1146 Bench Status Map

S₁
 S₂
 L₂
 Geological boundary
 Fault
 S₁ / S₂ form surface trace in Pit wall

31/07/90 DB

Scale 1:500

