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MRP Report 107

**Mineral investigations near Bodmin,  
Cornwall, Part 6  
The Belowda area**

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Technical Report WF/89/11

Mineral Resources Series

## **Mineral investigations near Bodmin, Cornwall**

### **Part 6 The Belowda area**

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*Cover illustration*

A banded carbonate/sphalerite/marcasite/galena vein from the Gwynfynydd Gold Mine, near Dolgellau in North Wales

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## DATA PACKAGE

This report contains a summary of geochemical surveys, trenching and drilling carried out in the Belowda area of mid-Cornwall. A more comprehensive data package is available at a current (1989) cost of 400 pounds sterling plus VAT. This includes:

- A Consultation with available staff of the British Geological Survey who were involved in the investigations.
- B A detailed data package containing the items listed below.
  - 1 Internal report on the geochemical and trenching investigations, including full analyses of all the samples collected.
  - 2 Internal report upon the diamond drilling carried out in this area, including detailed lithological logs of the cores.

## SUMMARY

A series of soil sampling traverses were made across the Belowda Beacon Granite and across slates of the Meadfoot Beds for a distance of 1.7km east of the granite outcrop. These traverses were designed to test the extensions of known and formerly worked mineralisation. In two areas gridded auger sampling was undertaken. All samples were analysed for tin and its common associates, copper, zinc, uranium, arsenic and boron.

At the sites of Brynn Tye Mine and Wheal Tregoss, which had been severely disturbed by mining activity, trenching was employed to investigate the geochemistry of the area. The bedrock was examined for tin using a hand-held portable radioisotope fluorescence analyser; significant mineralisation was channel sampled for laboratory assay.

The geochemical work revealed anomalous tin values in one of the two gridded areas indicating extensions to two veins which may have been previously worked in a small way. Trenching at Brynn Tye Mine demonstrated that tin mineralisation is associated most commonly with quartz-tourmaline veining and alteration of the slates. Two wide zones of low-grade ore were defined by the sampling, one of which was recognised in two trenches, thus defining a limited strike length. Two inclined diamond drillholes tested the depth continuity of this mineralisation.

## INTRODUCTION

Despite a geological situation which might be interpreted as favourable for hypothermal mineralisation, the area north of the St. Austell Granite outcrop has supported only intermittent and small-scale mining activity. Significantly continuous high-temperature veins have been rarely found in the district and the common pattern of mineralisation appears to be one of macro-stockwork, sheeted vein or disseminated deposits, worked exclusively for tin. These types of deposit tend to be of relatively low grade but of considerable tonnage; for example the large excavation at Mulberry [SX 020658]. Wolframite has been reported in association with the cassiterite in several mines, where its presence was regarded as irksome in the preparation of high-grade concentrates.

It may be that such factors have acted as a deterrent to mineral exploration within this district; certainly there would seem to be a tacit acceptance that major, high grade, tin or wolfram deposits are unlikely. It is reasonable, however, to presume that further low-grade tin deposits might occur in the vicinity either unrecognised or, because of their wolframite content, disregarded by the old miners. Albeit that such deposits are likely to be relatively limited in size, the area is sufficiently compact to permit scattered small producers to feed to a central milling plant. It was with this philosophy that the Mineral Reconnaissance studies were undertaken.

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\* Localities mentioned in this report lie within National Grid squares identified by the letters SW and SX; the former is recognisable by an initial 9 and the latter by an initial 0 in the grid reference.



For convenience the area to the north of the St. Austell Granite was sub-divided into several separate study areas, each dealing with specific types of deposit. The Belowda area is the last of these, the others having been previously reported (Bennett et al., 1981; Beer et al., 1986a; Beer et al., 1986b). Regional geophysics, described in a separate report (Tombs, 1978), encompassed a much wider area. The Belowda district as originally conceived extended from the western end of the Belowda Beacon Granite outcrop near Higher Trenoweth [960619] eastwards to the vicinity of Brynn Farm [990630], and from Belowda China Clay Works [967627] in the north to the Par-Newquay railway line in the south (Fig. 1). An apparent lack of mineralisation along the western contact of the Belowda Granite reduced this area somewhat, to that shown in Figure 2. Attention was finally focussed on a small tract of rough land close to the road leading to Demelza [977638].

Stockwork and sheeted deposits typically are of relatively small areal extent and, although they relate to small areas of highly developed brittle fracture systems, their locations bear no constant relationship to larger scale structural or igneous features. In consequence there are no definitive geological criteria to guide the search for virgin deposits. Hosking (1969) depicts this type of mineralisation as occurring above, flanking, or within cusped and ridge culminations in the granite roof and, though this model may not be universally applicable, gravimetric surveys were employed as an initial step to define the concealed granite roof (Tombs, 1977 and 1978). This approach was augmented by geochemical soil sampling close to both granite and elvan margins and in areas where extensions of tin mineralisation might be presumed from the evidence of former mining.

Macro-stockworks may be defined as consisting of several wide mineral veins of distinctly differing strike attitude and which intersect to form an angular network pattern. As at Parka Mine [912589], the ore mineral may additionally be locally disseminated into the host rock; the Parka deposit appears to be located on the flank of an unexposed granite ridge. The possibility that macro-stockworks could exist on the southern and south-eastern flanks of the Belowda Granite is suggested by the disposition of known veins and the local abundance of "old men's" trial pits. A combination of soil geochemistry, mechanical trenching and diamond drilling was utilised to survey this area.

The Belowda district was also included within a regional airborne geophysical coverage designed to examine the possibility of sulphide ore concentrations either in the form of veins or in association with metasomatic calc-silicate horizons (Tombs, 1978).

#### GEOLOGICAL SETTING

The geological setting of the Belowda area is shown in Figure 1, and for the more limited study area in Figure 2. Recent geological researches into the stratigraphy, sedimentology and structure of the Devonian succession in south-west England have by-passed this area and the only comprehensive account of the geology is the Geological Survey Memoir (Ussher et al., 1909).



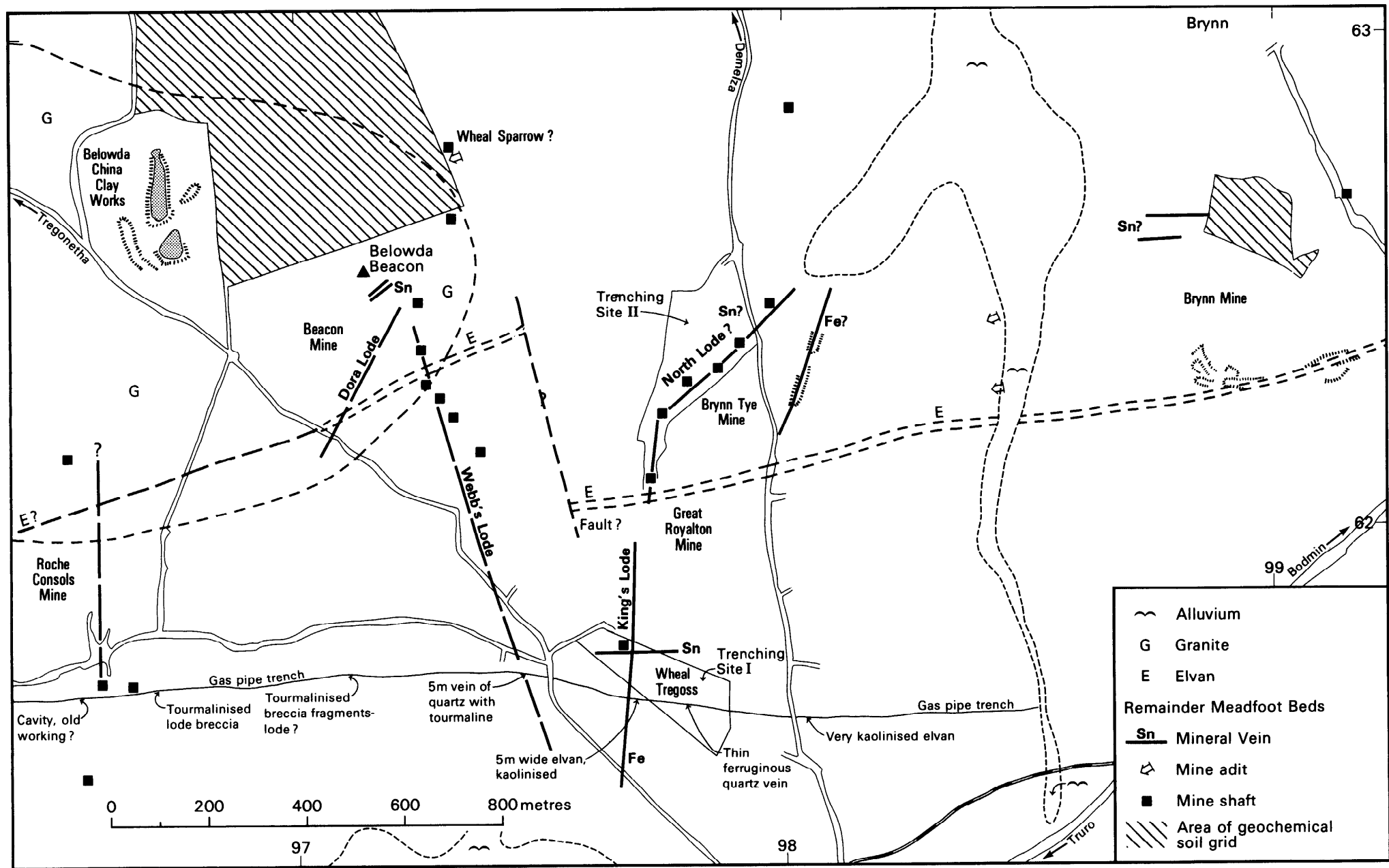


Fig.2 The Belowda area

The Lower Devonian Meadfoot Beds comprise mainly grey, silty and slightly calcareous slates which are commonly partly hematized and locally intensely so. Sandstones and silty sandstones are scattered through the sequence with individual units reaching a thickness of one or two metres. Although wide zones of interbedded calc-silicate rocks and siliceous slates have been mapped (Fig. 1) for example passing westwards through Tregonetha [956639] and running westwards from Tregoss [966605], no such rocks are known to occur within the study area (Fig. 2).

Intruded into this sequence are the Belowda and Castle-an-Dinas granites, both of which mark the northern margin of the roof of the St. Austell pluton. Their connection to the main St. Austell mass is demonstrated by the gravity measurements of Tombs (1977), the intervening cover of slates reaching a maximum thickness of only 1km just east of Ruthvoes (Fig. 3). In his account of the granites, Davison (1918) describes clearly the differences between the two granites but specifically suggests that they are merely endocontact variants of a single main granite phase. It is commonly accepted nowadays that the Castle-an-Dinas Granite is a late phase of the intrusion, a belief supported by evidence from both mining (Dines, 1956) and from litho-geochemistry (Beer and Ball, 1987).

Both granites contain primary and secondary tourmaline and the latter is also widely developed within the thermally metamorphosed slates. In its most extreme form this alteration produces a striped rock consisting of thin alternations of black tourmaline and white quartz. Commonly, fine acicular tourmaline lines the walls of major joints and may be disseminated into the wall rocks. Only the Belowda Granite shows any significant kaolinisation which previously was exploited in a small way.

The final igneous phase, intrusion of elvan (granite-porphyry) dykes, is prominently represented in the study area. Whether the scattered distribution of outcrops to the south and east of the Belowda Granite relate to two dykes as shown in Figure 1 or to one dyke offset by a fault as shown in Figure 2 is uncertain. A narrow northerly trending dyke further south-east towards Roche, was found in a gas pipe trench and may be a spur off the east-west dyke. Sporadically along its length the elvan is affected by kaolinisation, tourmalinisation or hematization, either singly or in combination.

A broad swathe of high-level alluvium forms the flat expanse of Goss Moor, to the south of the A30 road (Fig. 1). The sediments have been worked over several times in the exploitation of detrital cassiterite.

#### MINERALISATION AND FORMER MINING

Cassiterite, usually associated with some wolframite, and various iron oxides have been the only mineral products of this area. Metal sulphides are generally of rare occurrence and even arsenopyrite, an almost ubiquitous associate of cassiterite, appears to be poorly represented in most of the veins. The tin mineralisation is always accompanied by tourmaline and commonly also by hematization, both of which are particularly common as haloes in the host rocks. Similar

haloes of hematization inevitably surround the iron veins.

Within the granite recorded mineralisation (Dines, 1956) is exclusively in the form of fissure vein fillings, associated with usually massive, white quartz, tourmaline and locally chlorite. The elvan dykes seem to play host to a more disseminated type of ore in the form of closely spaced, narrow, tourmaline-cassiterite veinlets; wider, "normal" veins have also been recorded. In slate lithologies the form of mineralisation is commonly as quartz-tourmaline veins and lenses developed in and around jointing, particularly zones of intense jointing, and cut by narrow and discontinuous veinlets of cassiterite, usually with finely acicular black tourmaline and irregular blebs of dark green chlorite.

Close to the western margin of the study area there are shaft sites both north and south of Belowda village [966618] which mark the former Roche Consols Mine (Fig. 2). Dines (1956) suggests this mine worked only eluvial (shode) cassiterite and never explored for veins underground. However, the surface evidence and the discovery of a cavity (which required considerable filling) in digging the gas pipe trench both indicate the presence of sub-surface workings, albeit of limited extent and very shallow depth. Veinstuff of brecciated quartz-tourmaline found in the gas pipe trench immediately south-east of Belowda contained a small amount of tin; this material may represent the ore type from Roche Consols.

The Beacon Mine, also known under various other titles, lies a short distance south of the Belowda Beacon trigonometric point [971626] and was the largest working in the area (Fig. 2). Two converging north-trending lodes are believed to have been worked to a maximum depth of about 66m. The mine was intermittently active between 1872 and 1902 but returned very little concentrate. It is recorded as receiving attention as late as 1935 but was not restarted. The lodes are described (Dines, 1956) as hard, coarsely crystalline tourmaline-rock cut by several quartz veins, the whole melange set in a granite which is altered and softened, locally greisenised. Cassiterite occurs sporadically in and between the quartz veins, this distribution no doubt accounting for the poor and discontinuous production. Small amounts of wolframite seem to have been a universal constituent of the veins, but none was sold. In the gas pipe trench a similar quartz-tourmaline vein structure on strike with the easterly (Webb's) lode shows a width of 5m.

Just outside the granite contact north-east of Belowda Beacon a shallow adit and two shafts probably mark the location of the former Wheal Sparrow, a property about which virtually nothing is known apart from the name. It would seem that these workings explored the northerly extensions of the lodes in Beacon Mine.

To the west of the Demelza road (Fig. 2) is an intersecting set of veins which have supported no less than four small mines, the names of which cause some confusion. One set of titles is given by Dines (1956) and these are used in Figure 2; alternative names ascribed by Hamilton Jenkin (1964) are offered below in parentheses. The major vein is a north-south one, shown on most maps to consist of iron oxides, and probably known as King's Lode. An openwork on this structure was reported by Dines (1956) to show parallel narrow

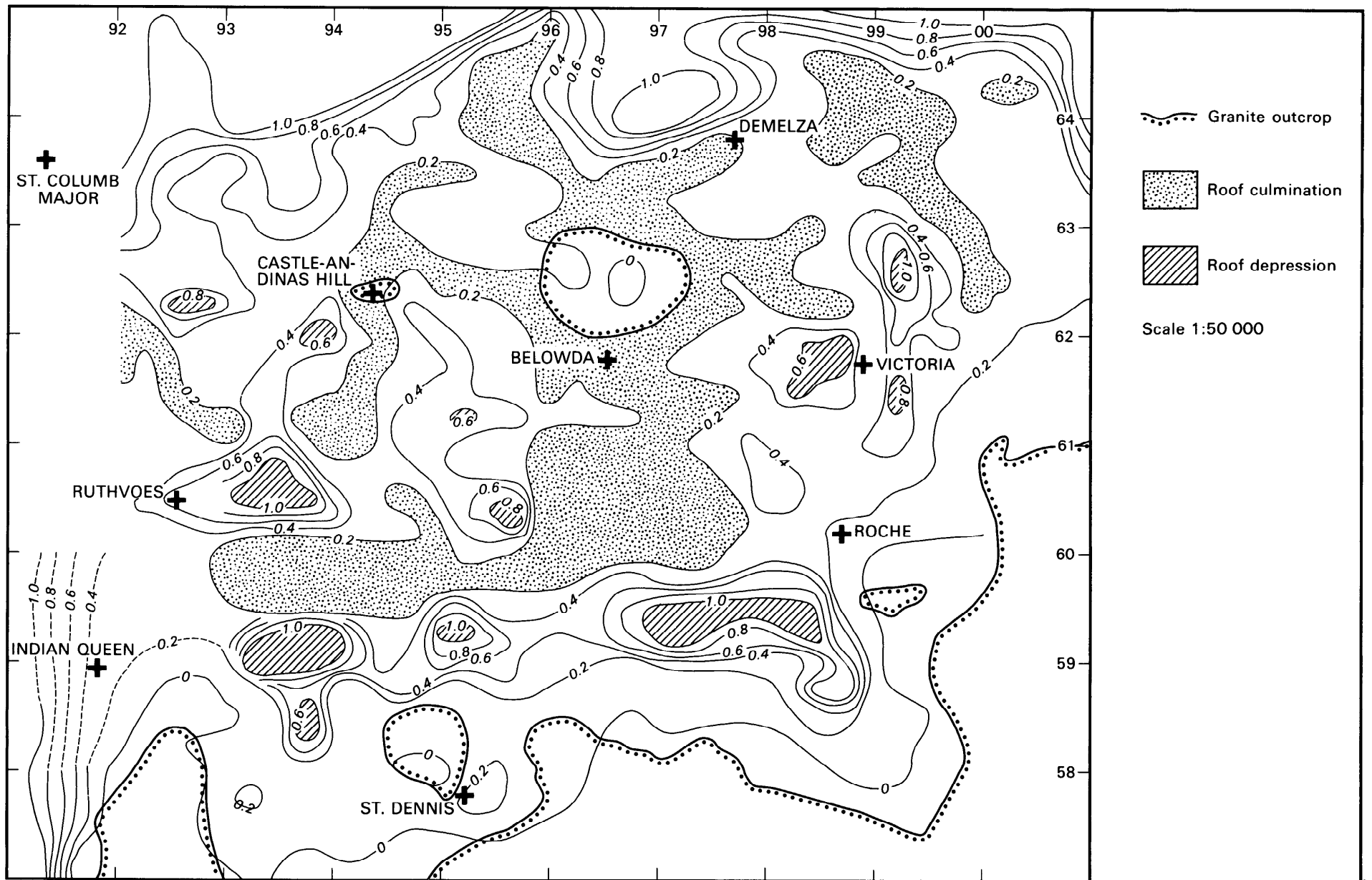


Fig.3 Depth of granite roof in kms below sealevel (after Tombs, 1977)



veinlets of tourmaline-quartz veinstuff, with some cassiterite, enclosed in red hematized slates which are bleached at the margins of the veins. At a 20fm Level this lode was said to be 6m wide but at a 32fm one it was only 2m. It is almost bisected by a short east-west vein, said to have been for tin. Both lodes were worked in a property known as Wheal Tregoss (Brynn Royalton Consols). What is presumed to be a northern continuation of the same lode crosses the elvan and extends for some 150m farther north, this structure seemingly worked in Great Royalton Mine (Wheal Tregoss). Beyond this mine the lode (the same lode?) trends north-eastwards and here is believed to have been named North Lode, said to be 1.3m wide. It appears that this lode, presumably together with a sub-parallel vein said to be for iron on the opposite side of the Demelza road, were worked as Brynn Tye Mine.

In the valley to the east of Brynn Tye Mine there are two adits driven west towards the mine, with indications of shallow shafts close by. If these are in fact a part of Brynn Tye Mine then some of the workings may reach a considerable depth.

The most easterly working in the Belowda area is that of Brynn Mine (Great Brynn Mine), a property which appears to be in at least two parts and with two differing forms of tin mineralisation. Openworks along the strike of the elvan are said by Dines (1956) to have sought cassiterite in sheeted narrow tourmaline stringers which are directed north-south and cut through the elvan and its slate walls. This form of mineralisation is almost identical to that seen in the elvan at Old Castle-an-Dinas Mine, near Royalton Farm (Beer et al., 1986b). Some 400m to the north-west are two east-west tin veins which have been explored by shallow opencast workings and, presumably, also by a shaft on the edge of the lane leading to Brynn Farm [990630].

#### SOIL GEOCHEMISTRY

Geochemical investigations were undertaken in two consecutive phases. The first phase comprised a series of soil sampling traverse lines laid out to intersect the granite and the elvan dyke, together with most of the known mineralised structures or their presumed extensions. Lines I and II lay in the Blackacre-Royalton area of Figure 4. Line I was designed to examine the elvan in an area where it was expected to be cut by extensions of the Castle-an-Dinas Wolfram Lode (Beer et al., 1986a), and Line II crossed the elvan immediately east of the stanniferous openworks at Royalton Farm [950616] (Beer et al., 1986b). Because these areas have already been described (op. cit.), results from the two lines have been used only for comparative purposes. The remaining traverses and their relationships to geology and mineralisation are shown in Figures 5 and 6.

Throughout these traverses samples were collected by hand auger at intervals of 20m and, wherever possible, from a depth of about 1m, this ensuring penetration of the "C" soil horizon. After oven drying they were disaggregated and screened, the -60 BSS mesh fraction being sub-sampled and prepared for geochemical analysis. Uranium was determined by delayed neutron activation analysis at A.E.R.E., Aldermaston. All other elements were determined by the Analytical Chemistry Unit of the British Geological Survey; B, Be, Co, Fe, Mn,



Mo, Ni, Sn and Zr by optical emission spectrography; Cu, Pb and Zn by atomic absorption spectrometry; and As and W by colorimetric methods.

The results are treated by areas, these being outlined in Fig. 4, and statistical summaries are listed in the following three tables. It is particularly informative to compare all three areas element by element thereby deriving an impression of the effects of the Belowda Granite and its associated metasomatism and some indication of the relative importance of hydrothermal mineralisation in the distribution of some of the common ore metals.

Table 1. Statistical summary; western area (Fig. 4), Blackacre-Royalton soils (in ppm)  
n = 45

Element	Range	Mean	S.D.	Median
As	15-500	141.8	105.0	100
B	841-2449	1518	299.6	1504
Be	2-12	4.044	1.563	4
Co	4-13	7.444	1.758	7
Cu	5-140	48.78	26.08	40
Fe	9169-48182	26334	7350	26770
Mn	59-579	200.0	94.01	186
Mo	0-3	1.156	0.595	1
Ni	8-44	17.51	6.476	16
Pb	0-90	7.978	16.16	10
Sn	61-609	200.5	117.7	157
U	2.6-4.5	3.247	0.346	3.2
W	20-120	55.44	26.89	50
Zn	0-60	10.89	10.50	10
Zr	226-1034	482.3	160.3	439

Table 2. Statistical summary; central area (Figs. 4 and 5), granite contact soils (in ppm)  
n = 140

Element	Range	Mean	S.D.	Median
As	0-120	32.20	18.24	30
B	28-1489	708.1	285.5	639
Be	1-11	2.801	1.526	2
Co	1-56	8.241	4.696	8
Cu	0-440	14.50	37.09	10
Fe	11556-61062	24591	5958	24850
Mn	107-623	316.8	111.4	312
Mo	0-3	1.390	0.593	1
Ni	3-48	17.52	8.121	16
Pb	0-110	10.07	12.41	10
Sn	10-530	60.43	58.85	46
U	2.7-8.9	3.617	0.742	3.4
W	5-100	18.51	13.67	15
Zn	0-50	20.64	11.56	20
Zr	104-893	380.2	120.5	387

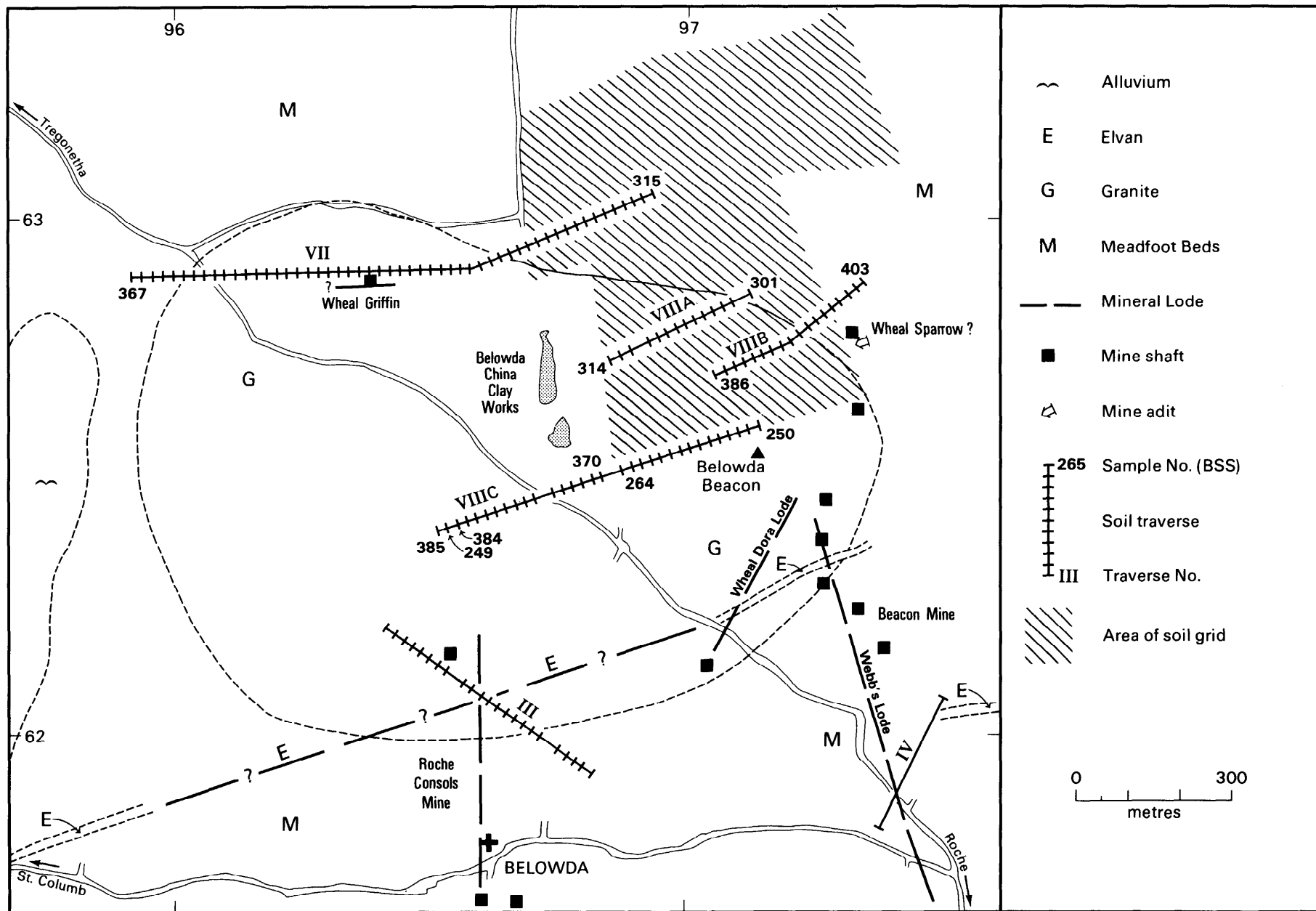


Fig.5 Belowda Beacon Granite soil traverses

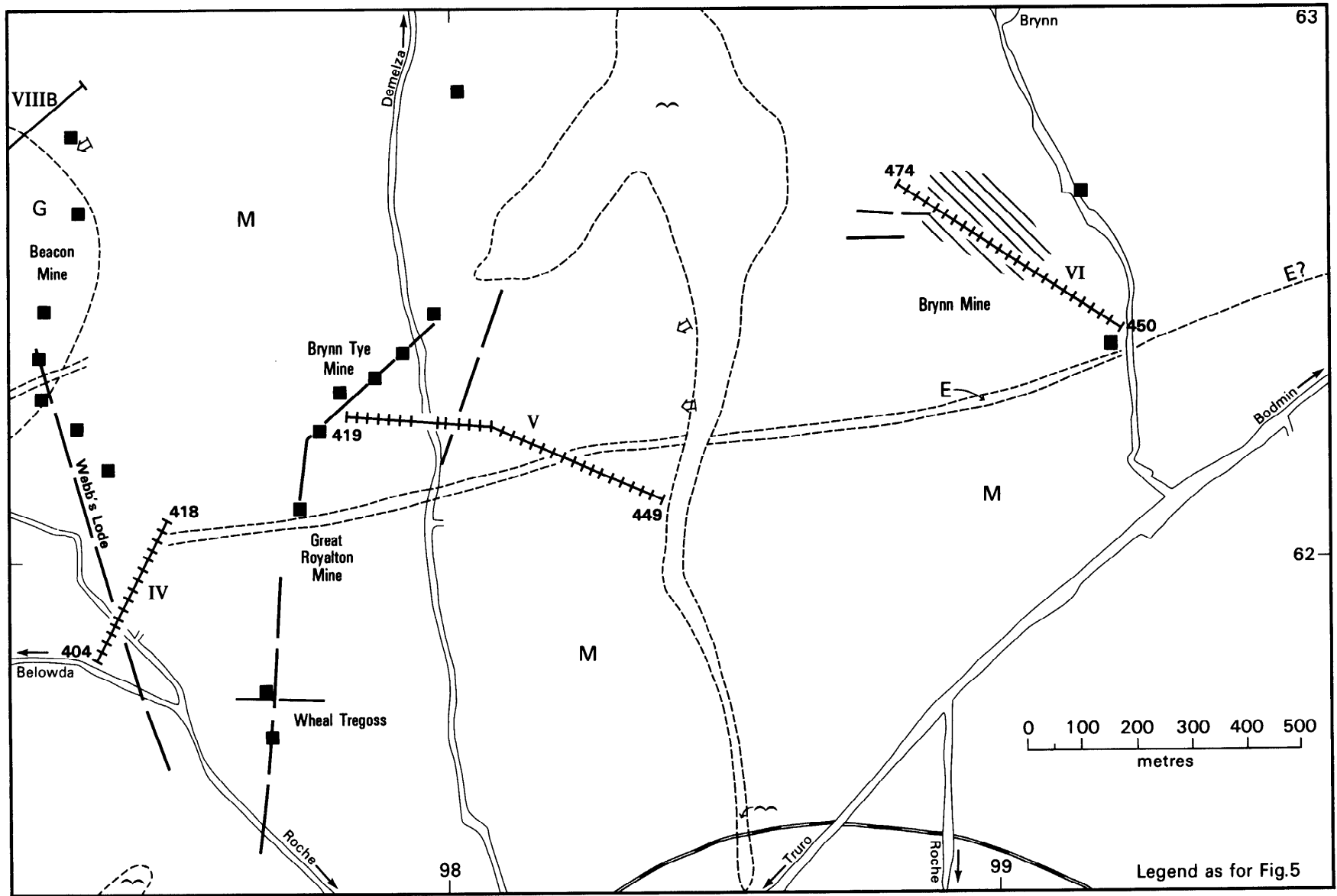


Fig.6 Brynn area soil traverses

Table 3. Statistical summary; eastern area (Figs. 4 and 6), eastern slate soils (in ppm)  
n = 71

Element	Range	Mean	S.D.	Median
As	0-60	24.65	11.49	25
B	25-1635	536.6	352.3	455
Be	1-7	2.986	1.169	3
Co	3-25	10.51	4.927	9
Cu	15-145	41.97	20.27	40
Fe	14512-46591	30825	6852	30783
Mn	40-1192	350.1	230.5	277
Mo	0-6	1.197	0.762	1
Ni	11-86	38.00	19.61	31
Pb	0-130	12.82	15.85	10
Sn	15-817	107.3	106.4	77
U	1.7-7.5	3.400	0.892	3.3
W	0-40	7.817	5.977	5
Zn	10-110	41.27	32.97	30
Zr	201-809	377.6	101.1	361

Even a cursory examination of these tables shows that tin and tungsten are at their highest in the westernmost traverses and reach levels well above those in the other areas. It can be seen, however, that tungsten values in Table 2 are more than double the "background" levels of Table 3, suggesting that small amounts of wolframite may be associated with the lodes in, or adjacent to, the granite but none accompanies the mineralisation around Brynn (eastern area, Fig. 6). In the latter area, however, tin and copper levels are slightly anomalous, indicating perhaps that veinlets in this area may carry some sulphide content. However, the low arsenic levels indicate insignificant quantities of arsenopyrite.

The logical second phase of soil traversing was to soil sample on a grid pattern those areas which appeared to possess anomalous levels of the ore metals. Because of delays in reporting the chemical analyses it was not possible to select grid areas on that basis and it was decided to cover the areas which might be expected to possess mineral potential because of their proximity to known mineralisation. In fact, only two such areas were suitable for auger sampling, one close to the Belowda China Clay Works (Fig. 5), the other round the northern part of Brynn Mine (Fig. 6). The sampling intervals vary between the sites; details of the grids are shown in Figures 7 and 8.

After preparation the -60 BSS mesh sub-samples were analysed for a range of elements more restricted than the previous batch. Cu for both areas and Pb for Brynn only were determined by atomic absorption spectrometry; B, Fe, Mn, Mo (for Belowda Works area only), and Sn by optical emission spectrography; W by a colorimetric method; loss on ignition gravimetrically; and U by delayed neutron activation analysis (at A.E.R.E.). Statistical summaries for the two areas are given in Tables 4 and 5, the loss on ignition being omitted. Because each of these areas contains some of the soil traverses, it is pertinent to compare the ranges, mean and median values in the appropriate tables;

Table 4 with 2 and Table 5 with 3.

Table 4. Statistical summary (in ppm), Belowda Works soil grid (Fig. 7)  
n = 190

Element	Range	Mean	S.D.	Median
B	181-1411	633.9	206.8	620
Cu	5-75	20.05	10.13	15
Fe	9686-40275	26572	5379	26196
Mn	104-609	273.2	86.89	266
Mo	0-3	0.726	0.551	1
Sn	14-120	52.42	21.64	49
U	1.3-7.6	4.866	4.300	3.3
W	0-70	20.03	13.65	15

Table 5. Statistical summary (in ppm), Brynn soil grid (Fig. 8)  
n = 57

Element	Range	Mean	S.D.	Median
B	92-577	259.0	87.84	248
Cu	10-160	44.91	31.46	40
Fe	14811-66208	39124	10198	39112
Mn	105-1596	503.6	207.5	480
Pb	20-60	28.60	7.118	30
Sn	28-598	164.6	99.73	145
U	2.0-3.9	2.658	0.441	2.6
W	0-15	5.614	2.661	5

Such a comparison reinforces the distribution picture derived from the first phase of soil traverses and, particularly in the case of the Brynn soil grid, illustrates differences related to the specific geological setting. Boron, for instance, is distinctly lower in the soil grid than in the combined traverses of the eastern slate area due, it may be adduced, to increased distance from the granitic source. Uranium also behaves in this manner, though the difference is less marked. Manganese, on the other hand, is higher in the gridded area, a feature probably related to specifics of the lithological mineralogy.

Comparison of Table 4 against Table 5 strongly confirms the conclusions previously drawn from comparing the traverse results. Boron is significantly lower than in areas close to the granite, as is uranium. Of the ore metals tungsten is very low, indeed accords with the "background" level determined for a range of Cornish slates (Beer and Ball, 1986). Tin in Table 5 is distinctly higher than in any of the other three and approaches the level found in Table 1: this finding encourages a belief that, like the Blackacre-Royalton area, that around Brynn Mine might be strongly mineralised. It is also of interest to note that the copper values in this grid are high, though not significantly above the "background" level for Cornish slates.

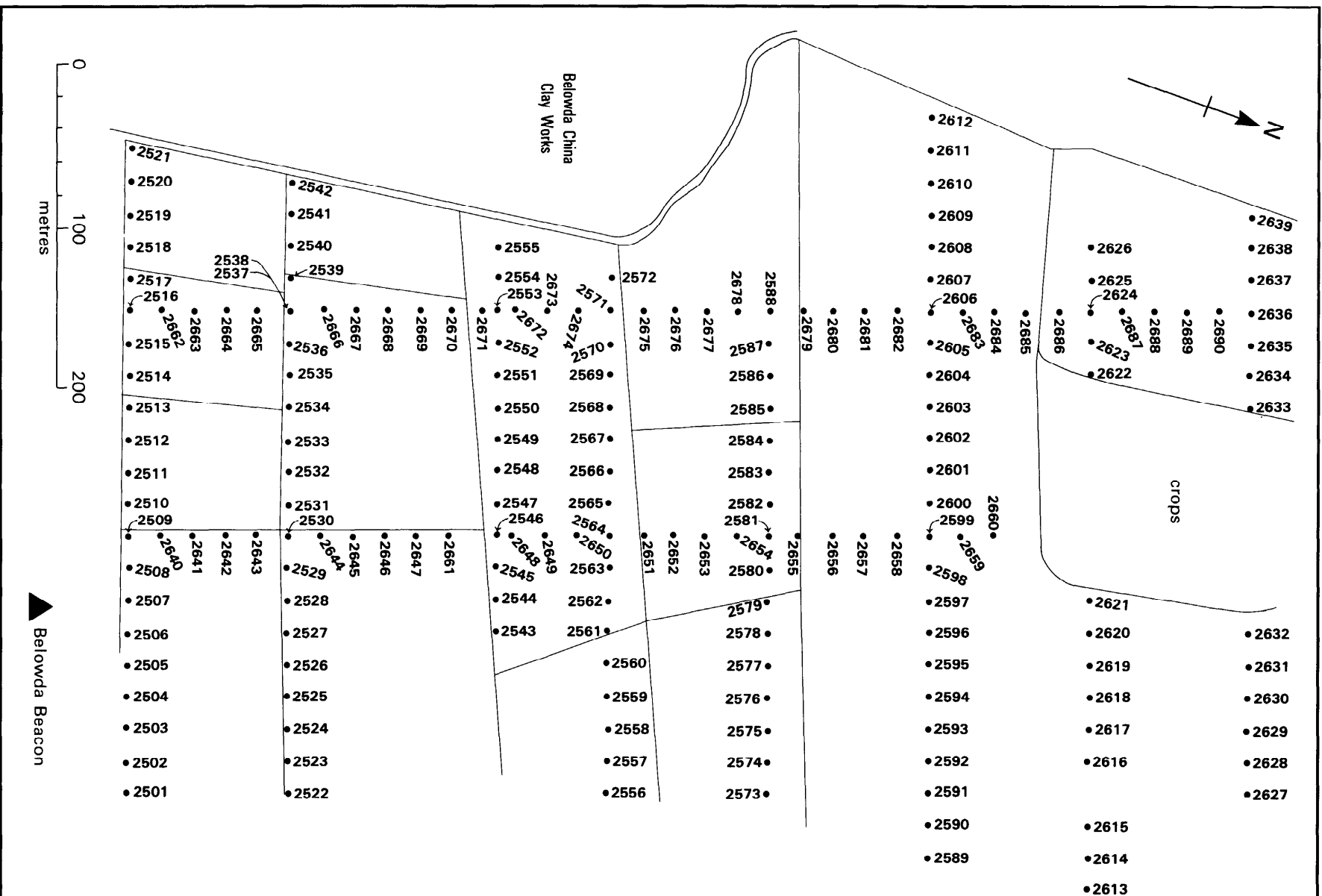


Fig. 7 Soil sampling grid, Belowda Works area

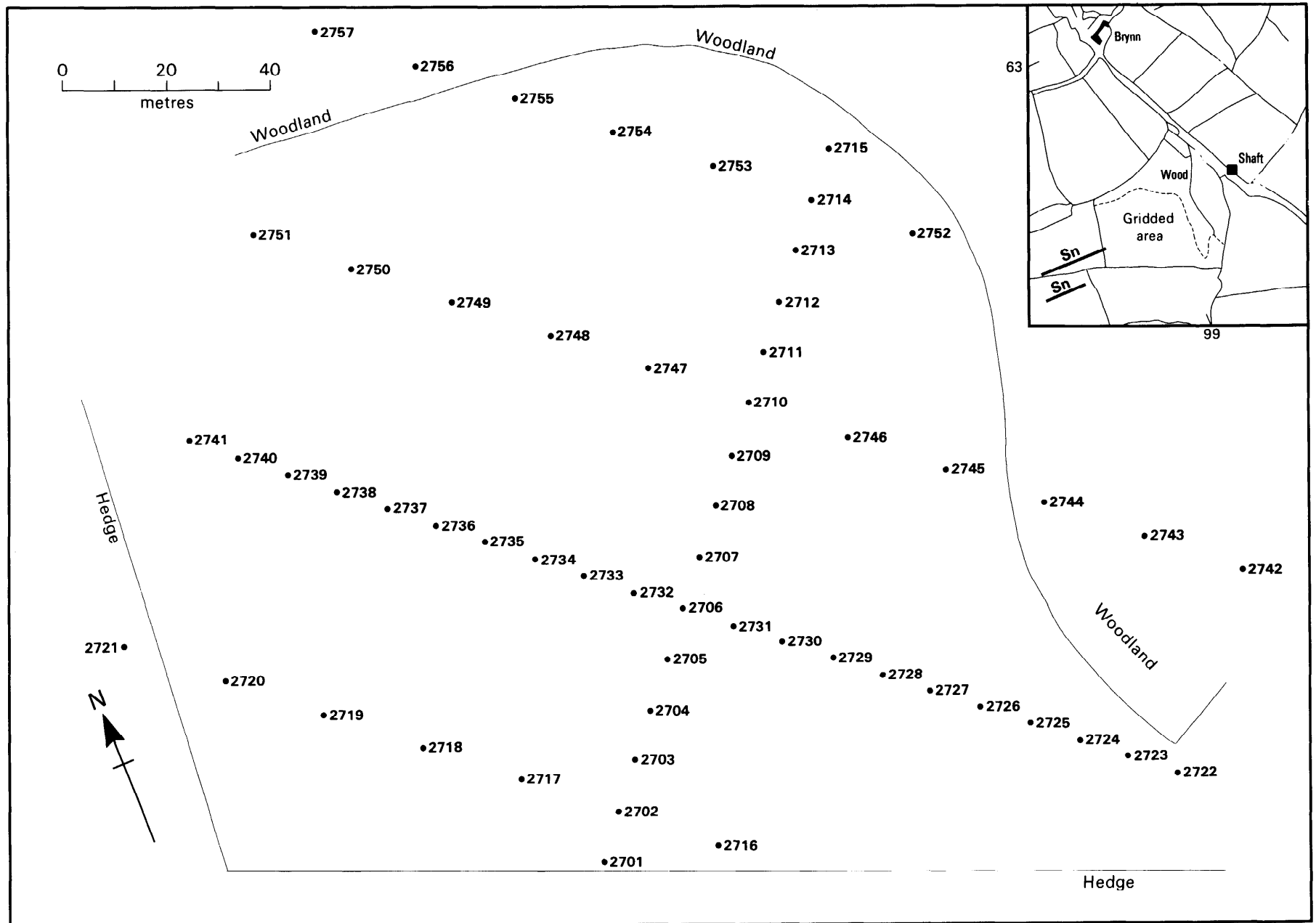


Fig. 8 Soil sampling grid, Brynn area

## TRENCHING

The sites of Brynn Tye Mine and its two neighbours to the south are so disturbed by former activity that a gridded lay-out could not be achieved, nor would soil augering have been meaningful in terrain which had been turned over. Consequently, the further examination of these vicinities was undertaken by trenching with a back-acting digger. Two areas were selected, one in the south encompassed the intersecting lodes of Wheal Tregoss, the other in the north examined the intensely pitted surface area adjacent to the ?North Lode of Brynn Tye Mine (Fig. 9).

At Site I, one long (177m) and three short trenches were excavated in positions designed to avoid the obvious dangers of former workings. As a result they were not ideally directed to intersect the assumed trend of the mineral veins. In fact, a narrow quartz structure which possibly correlates with the north-south ?King's Lode was uncovered in two trenches. There was, however, no recognisable representation of the east-west Tregoss Lode. Even at trench depths in excess of 2m it was not possible to achieve full exposure of the bedrock. All the rock which was exposed was probed by portable radioisotope fluorescence analyser (PIF) to define sections bearing anomalous tin values. Channel and chip sampling was carried out wherever possible and these samples were crudely crushed for on-going field tin assays by PIF. At five points where tin mineralisation was indicated, specific channel sampling was undertaken and this material was returned to BGS in London for laboratory X-ray fluorescence (XRF) determination of tin.

The host rock is almost exclusively a weathered, soft, friable, grey, silty slate which is variably ferruginised. Notably there is little or no obvious development of acicular black tourmaline in the slates, even along the well defined cleavage. This generally dips steeply to the north. Most of the recorded joints have a northerly strike, but in part this may be a bias imposed by the trenching directions. Many are surrounded by a halo of hematization and some are lined or filled by veinlets of quartz, quartz-tourmaline or quartz-chlorite, any of which may contain seams of later earthy red hematite. An unexpected discovery in this trenching was an elvan dyke which, from two intersections, has a minimum width of 6m and strikes almost due north. This intrusion clearly correlates with the elvan recorded in the gas pipe trench (Fig. 2) a short distance to the south.

In Site II the problem again was to align trenches so as to miss any old shafts. As a result the long (200m) north-easterly trench which passes down the centre of the site has a central dog-leg. Of the three short trenches one is a spur off, and perpendicular to, the main trench. The others were placed, one near to the Demelza road and the other towards the north-west corner of the site. All were dug about a metre deep and the exposure obtained was almost complete, albeit rather highly fractured in some parts. The exposures were probed by PIF, and continuous channel sampling over lengths of 2.5m provided material for rough crushing and field tin assay by PIF. This identified zones of tin mineralisation from which the channel samples were sent for laboratory assay. One of the 2.5m lengths, in which cassiterite veining was clearly visible, was subdivided for



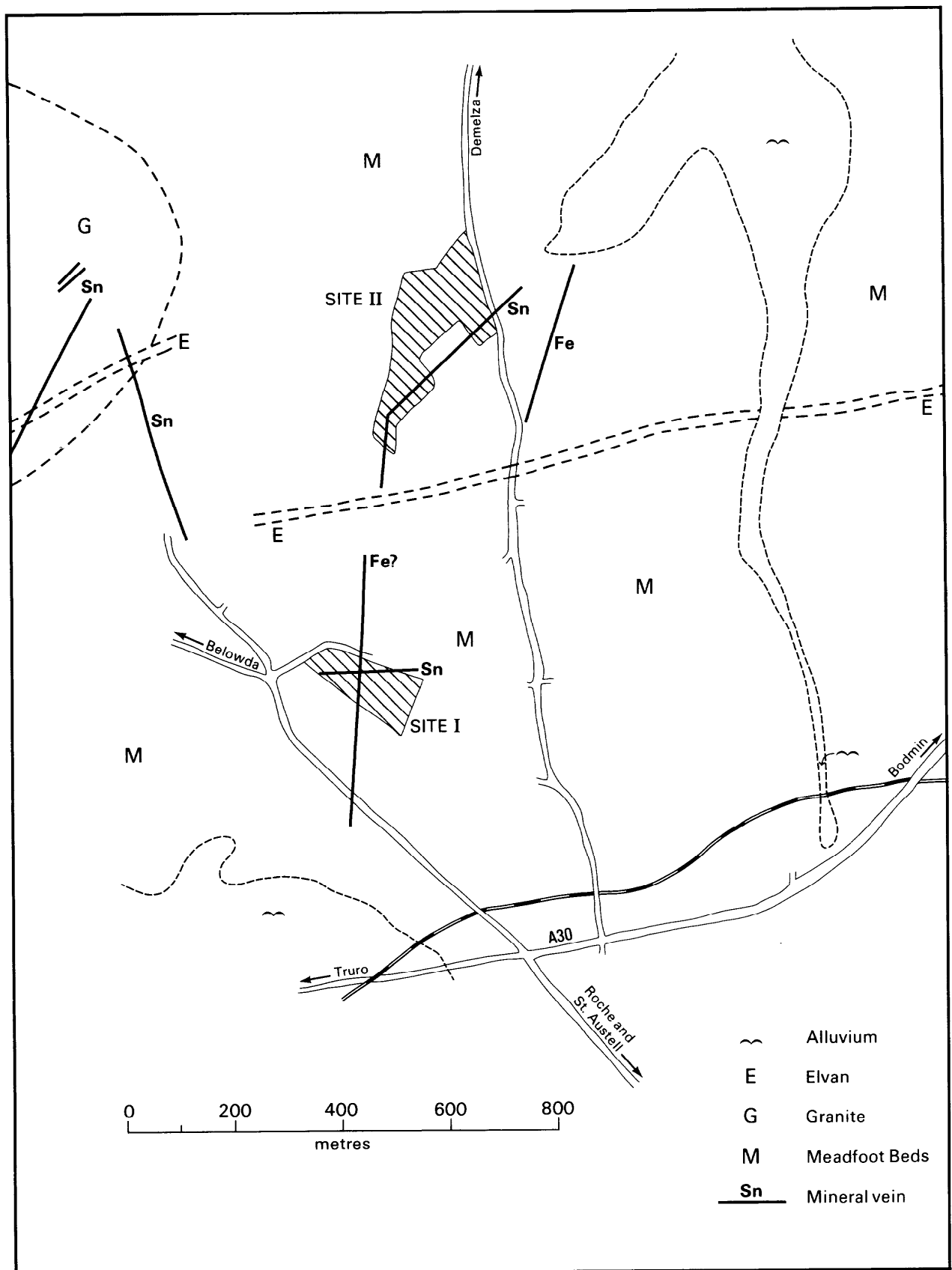


Fig.9 Trenching sites in the Brynn Tye area.

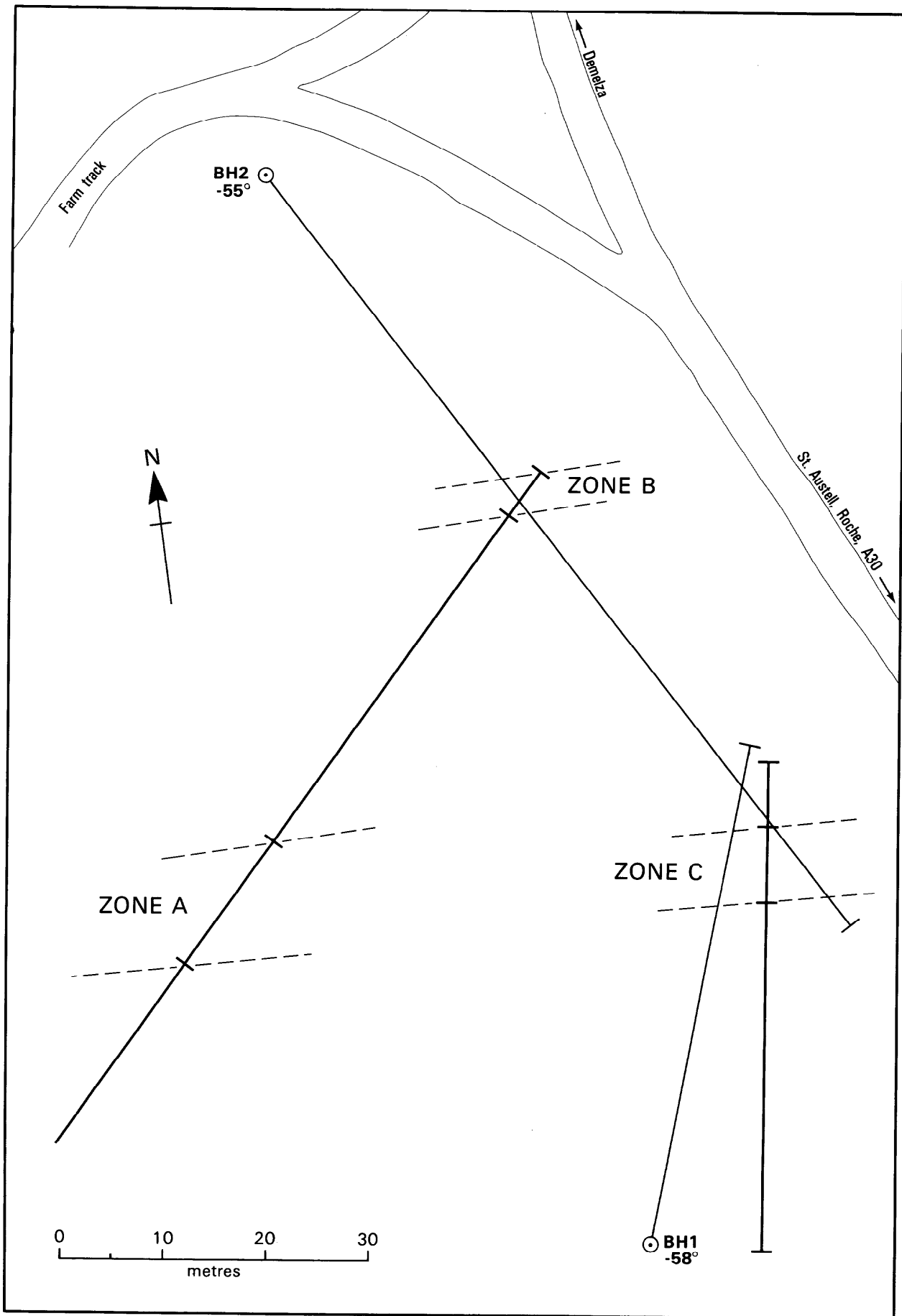


Fig.10 Drilling sites

detailed sampling which was also assayed by laboratory XRF.

The bedrock revealed in Site II differs markedly from that of Site I, though the same slate sequence is involved. Firstly, the slates are considerably more indurated, commonly they are heavily hematized but throughout they tend to be visibly tourmalinized. The most spectacular difference is the intense amount of veining, this especially so towards the northern end of the site. There are a variety of vein types with quartz, tourmaline, chlorite, hematite and greisen in differing combinations. The veins tend to cut one another in random fashion and no age relationship can be deduced. Locally cassiterite is visible as coarse crystalline masses or as narrow irregular veinlets. Two broad zones of tin mineralisation, defined essentially by the assays, appear to have an easterly trend; one of these is intersected in two trenches.

#### DRILLING

Although the narrow vein samples from Site I showed some tin values in excess of 1%, none of the structures were wide enough or packed close enough to present an attractive drilling target. However, information from the former mines suggested that the prospect may improve at depth.

In Site II the two mineralised zones which had been defined at surface seemed to offer targets which were easily attainable with a diamond drilling programme limited to two holes. The sites and drilling directions are shown in Figure 10. BH 1 achieved an inclined length of 104.54m and BH 2 reached 170.78; as is evident from Figure 10, both drillholes reached their respective target areas.

In neither drillhole does the intensity or proximity of veining intersected match that found in the trenches. Nor is the same degree of tin mineralisation represented within those veins which were cored. Without these common features, and in the absence of any lithological markers, it is not possible to make any positive correlations between the drillhole geology and that at surface.

#### CONCLUSIONS

Within this very restricted investigation it has been possible to recognise by geochemical soil sampling one area which has apparent mineralisation potential. The primary target here is tin veining which appears to have been tried further to the west in a pair of parallel opencast workings. The geochemistry shows that wolframite is unlikely to be present, but there may be a little copper sulphide.

Trenching has recognised at least two broad east-west zones of low-grade tin mineralisation in the north of the Brynn Tye Mine area but it failed to find the north-easterly vein (?North Lode) mentioned by Dines (1956) as being 1.3m wide. It is not certain whether this is the lode which was reported as exposed in 1837 and unsuccessfully tried thereafter (Collins, 1912, p.426).

A limited drilling programme below these mineralised zones failed

to find depth continuations either to the intensive veining or to the cassiterite distribution. However, further drilling is clearly desirable to fully elucidate the extent in depth of any mineralisation.

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