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ABIGNANO LIMITED

PROGRESS REPORT: APRIL 1982

THE INTERVIEW RIVER (TAS.) TUNGSTEN/TIN AND COPPER MINERALIZATION

EXPLORATION LICENCE NO. 13/81 (PREVIOUSLY E.L. 1/73)

OPEN FILE

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THE INTERVIEW RIVER (TAS) TUNGSTEN TIN AND COPPER MINERALIZATION
EXPLORATION LICENCE 31/81

1. INTRODUCTION

Within E.L. 31/81, a Devonian age granite intrudes Pre-Cambrian meta-sedimentary formations named the Interview Siltstone and the Lagoon River Quartzite. The granite forms part of a north-westerly trending batholith 2km wide and extending some 10km from the Pieman River in the south, through the E.L. to the Lagoon River in the north.

Stress fracturing of the granite (during cooling of the magma) has provided avenues for hydro-thermal solutions with the formation of numerous quartz-tourmaline veins, some of which carry wolframite and scheelite in association with pyrite and arseno-pyrite.

Several quartz-pyrite veins occur in fracture zones and shear zones within the Interview Siltstone in the eastern part of E.L. 13/81.

Copper mineralization in the form of chalcopyrite has been found associated with two of these veins.

2. LOCATION AND ACCESS

E.L. 13/81 lies on the north-west coast of Tasmania and takes in Chimney Creek and the Interview River. The location is best illustrated on the Regional Geology Map (Map No. 7041-3).

Access is by light plane or by four wheel drive vehicle from the north via Murrawah, Sandy Cape and then along the beaches for 20km to the Interview River. During the winter months from June to September, there is no reliable means of access due to wet conditions and flooding of the rivers and creeks which intersect the beaches.

Because of the limited access Abignano Ltd commissioned a report from Stephenson Maunsell & Partners, consultant engineers, on an alternative access track to E.L. 13/81. Details are contained in their report titled "Access Track Construction to Interview River Prospect", September 1981.

Permission from the National Parks & Wildlife Service and the Lands Department has been obtained for construction of this track, should it be considered necessary.

3. PRELIMINARY WORK

Following an initial inspection of the area by G B Brink (Mining and Exploration Manager) and an assessment of the nature of the tungsten occurrences within the E.L., grid lines were surveyed to allow trenching around the known mineralized veins. A baseline was surveyed, bearing 335° magnetic, to link the Cooney's vein system in the south with Kenny's vein system in the north.

3. Preliminary Work (Cont'd)

During October and November 1981, a series of back-hoe trenches were dug at intervals of 40 metres across the baseline as shown on the geological plans (Map No's 7041-1 & 7041-2).

4. GEOLOGY

The exploration licence area contains two major rock types i.e., the Devonian Interview River Granite in the western part and Pre-Cambrian folded Interview Siltstone and Lagoon River Quartzite in the eastern part. A narrow coastal strip of hornfels belonging to the Interview Siltstone flanks the granite along its western contact while quartzites belonging to the Lagoon River Quartzite have been mapped in the north-eastern part of the area.

The granite is covered in most places by a 1 metre thick horizon of residual soil derived from the granite and having a high humus content.

This peat-like horizon obscures the underlying rocks and makes detailed mapping difficult.

The area has the potential for three types of mineral deposit. These are:

- i. Tungsten/tin mineralization in quartz veins within the granite.
- ii. Copper mineralization in veins within the folded Interview Siltstones.
- iii. Alluvial tin deposits in streams draining the granite.

4.1 Tungsten/Tin Mineralization

Wolframite with minor scheelite occurs as mineral "shoots" within quartz/tourmaline/muscovite/pyrite/arseno-pyrite veins. Trenching was conducted with a view to showing extensions of the known mineralized veins and exposing any other mineralization in veins which were obscured by the peat like soil overlying the granite.

Mapping of the trenches has shown the presence of numerous quartz and quartz-tourmaline veins and extensions of the known mineralized vein systems. The veins show two directions of preferred orientation which are related to fracture patterns in the granite caused by compressive stress which existed during and after emplacement of the quartz veins.

The preferred orientations of the veins are:

- i. Veins striking N20°E (with a variance of 10° in either direction);

AND

- ii. fractures, local shear-planes and veins striking N40°W (320°) (with a variance of 10° in either direction).

The vein systems carrying wolframite strike around N20°E and are commonly offset along fractures striking in the N40W direction though the distance of movement along these

4.1 Tungsten/Tin Mineralization (Cont'd)

planes is generally much less than 3 metres.

Surface mapping has shown the existence of four vein systems containing wolframite (with traces of scheelite and tin).

These are:

- a. Cooney's vein system (in the south);
- b. Tungsten Reward vein (central):
- c. Camp Creek vein (300 metres south of Kenny's shaft);
- d. Kenny's vein (in the north).

A. Cooney's Vein System

The shaft at Cooney's workings is approximately 10 metres deep. At the surface the vein varies between 15 to 30cm in width but divides into three separate veins at the base of the shaft, with widths of 30cm, 20cm and 15cm. These veins have produced high grade ore judging by samples taken in the past and by inspection of material on the dumps. Samples of ore taken when the original shaft was sunk, assayed 27% tungstic acid (WO_3) while recent sampling of dump material gave values between 8% and 10% WO_3 . (As ore from the shaft was hand picked, these values are probably lower than the actual grade of ore mined.)

The veins continue southwards from the shaft in an en-echelon fashion for 90 metres as indicated by a series of old trenches and a second shaft. The veins strike between 15° and 30° with dips from $80^\circ SE$ through vertical to $80^\circ NW$. Due to the collapsed state and flooded condition of the old workings south of Cooney's shaft, exposures of veins are limited.

Inspection of the material adjacent to the trenches indicates that local high-grade intersections of wolframite were encountered.

B. The Tungsten Reward Vein

The shaft here is flooded but dump material indicates a vein up to 30cm in width which carried high-grade wolframite.

Assays of dump material show values around 12% WO_3 . The vein strikes between 20° and 25° and dips at 80° to the west. Near the shaft the vein is offset for 3 metres to the north-west along a shear plane which strikes at 320° and dips to 55° to the south-west. Recent trenching has not uncovered extensions of the mineralized vein in trenches to the north and south.

C. The Camp Creek Vein (300 metres south of Kenny's Shaft)

Shallow surface pits and bull-dozing have exposed a quartz vein showing traces of tin and wolframite over a length of 80 metres. The vein averages 40cm in width and strikes between 350° and 10° with dip being vertical. No high-grade ore is visible in the surface workings, and the tin and wolframite observed occurred as small isolated blebs within the quartz vein.

4.1 Tungsten/Tin Mineralization (Cont'd)

D. Kenny's Vein

This vein averages 30cm in width and has a length of approximately 460 metres along a strike of 22°. Dips are from vertical to 80° east.

At Kenny's shaft, material on the dumps indicates the presence of an ore shoot. Samples of dump material show values between 7% and 10% WO₃, which represents material left behind after hand sorting of the ore. An adit 35 metres south of Kenny's shaft has been driven on the vein for 15 metres. According to Mr. M. Munday, who was involved in construction of the adit, a 40cm wide vein containing wolframite was followed for 10 metres where it cut out against a fracture plane striking N40°W. The best ore was apparently obtained from the floor of the adit, but due to back filling, these exposures are now covered.

Other trenches to the south of Kenny's Shaft have collapsed or are flooded and evaluation of veins was not possible.

Summary

The wolframite mineralization appears to occur as discrete lenses or "shoots", (with the strike length of these ore shoots in the order of 5 to 10 metres and grades in the range 10% to 20% WO₃), within the quartz-tourmaline-sulphide veins which are up to 460 metres in length. The locations of known ore shoots are as follows:

Cooney's Vein System

- a. At Cooney's Shaft;
- b. 30-35 metres south of Cooney's Shaft where past records refer to two veins (15cm and 20cm wide) one metre apart which carried high grade wolframite over a strike length of 5 metres.

Kenny's Vein

- a. At Kenny's Shaft; south?
- b. At the adit 35 metres north of Kenny's Shaft.

Other Tin/Tungsten Mineralization

Approximately 100 metres north-west of the camp, traces of tin, pyrite and scheelite occur in thin lcm quartz veins within the granite. The granite in this area is slightly altered with chlorite replacing muscovite.

A series of trenches dug across these veins and the granite showed no evidence of a major vein system. Samples IR - 1 to 7 were taken of the material from the trenches and these showed values which are slightly anomalous (up to 130ppm WO₃ and 760ppm Sn). These values would indicate that the mineralization is confined to the thin quartz veinlets and that the granite, while altered, is not mineralized.

One sample (IR-6) of alluvial wash from a trench, 2 metres deep, adjacent to the creek gave a value of 0.55% tin and old alluvial tin workings extend down stream from this location.

4.1 Other Tin/Tungsten Mineralization (Cont'd)

This area offers some potential for alluvial tin, but little potential for primary mineralization. Location of trenches and samples are shown on Map No 7041-5.

Further exploration should take into account the following factors:

- a. The nature of the wolframite mineralization;
- b. The lack of surface outcrop and flooding in the old workings which prevents extensive sampling and assessment of ore grade and reserves;
- c. The observed tendency for mineralization and vein widths to increase with depths (as evidenced by the veins at Cooney's shaft and at the adit at Kenny's Vein).

Recommendations

As the Cooney Vein system and Kenny's Vein are the most promising of the tungsten veins, detailed sampling of in situ vein material should be carried out on the known ore shoots and adjacent areas where exposures can be obtained. This would involve:

- a. De-watering of Cooney's Shaft and adjacent trenches followed by clearing of debris to allow sampling of veins;
- b. Clearing of old prospecting trenches where possible to expose veins;
- c. Removal of back filled material on the floor of the adit at Kenny's to allow sampling of the vein there.

The sampling should be aimed at delineating those parts of the vein which contain high grade wolframite mineralization and in Cooney's Shaft, should test how the mineralization varies with depth.

4.2 Copper Mineralization

The Interview Siltstone formation crops out in the eastern part of E.L. 13/81 and consists of quartzite and banded siltstones which have been intruded locally by dolerite dykes. The whole sequence, including the dykes, has undergone regional metamorphism close to the contact with the granite.

The Copper Reward shaft lies on the western bank of the Interview River near the eastern boundary of E.L. 13/81 as shown on Regional Geology Map (No. 7041-3). Mineral lease No. 28M/76 held by G. Abignano Constructions Pty Limited covers possible extensions of the mineralization to the east.

A quartz vein containing pyrite and chalcopyrite (with subordinate covellite, azurite and malachite) occupies a shear/fracture zone which intersects banded siltstones which strike around 330° and dip 60° to the north-east. The observed outcrop width is 0.1 metre at the surface, but the Copper Reward shaft (sunk on the lode some 80 years ago)

4.2 Copper Mineralization (Cont'd)

revealed that the vein width increased to 0.6 metre at a depth of 6 metres. A representative sample of ore obtained from the bottom of the shaft assayed 10.5% Cu. The vein at the shaft strikes at 275° and dips at 70° south. An inclined shaft 16 metres to the west of the Reward Shaft intersects the continuation of the shear zone 3 metres below the surface, with some quartz showing pyrite and traces of chalcopyrite. From this shaft the strike of the shear zone changes to 250° and marks the contact between a meta-dolerite dyke and banded siltstones. There are no surface indications of quartz or sulphide mineralization to the west of the inclined shaft, but a surface expression of the shear zone does exist.

From the Copper Reward Shaft the quartz-chalcopyrite-pyrite vein can be traced east for a distance of 15 metres along strike (275°) to the bed of the Interview River. The vein has a surface width of 0.1 metre. On the eastern bank of the Interview River extensive alluvial flats up to 5 metres thick obscure possible extensions of the vein.

Mapping has shown five other quartz-pyrite-haematite veins which occupy major fracture zones striking between 270° and 300° magnetic. These veins are named Copper No. 1 to No. 5 and locations are shown on Map No. 7041-4. Detailed description and sample results for each vein are as follows:

Copper No. 1 Vein

The main vein, 1 to 2 metres wide, consists predominantly of quartz with traces of haematite and limonite (after pyrite) exposed over a length of 800 metres, striking between 275° and 285° magnetic and dipping from vertical to 85° south. Good exposures of this vein indicate it does not carry copper mineralization and this is verified by sample IR-16. A 4 metre deep trench dug on the southern side of the main vein shows a second parallel vein, 10-15cm wide, which consists of quartz-chalcopyrite-pyrite and assayed 1.12% copper. This vein lies 1 metre south of the main vein, and along strike gossanous quartz-haematite rock marks possible extensions of the copper mineralization. Samples of the material showed some anomalous copper values as shown in the table below, but the overall results are not indicative of high grade copper mineralization.

Sample locations are shown on Map No. 7041-4

OVER FOR CHART: "COPPER NO. 1 VEIN ASSAYS"

4.2 Copper Mineralization (Cont'd)

COPPER NO. 1 VEIN ASSAYS

Sample Number	Description of Sample	Sample Width	Assay in ppm		
			Cu	Ag	Au
IR-10	Qtz-chalcopyrite-pyrite vein	0.15m	1.12%	5.7	0.03
IR-11	Qtz-Haematite-Limonite gossan	0.3m	96	0.2	0.01
IR-12	" "	0.3m	530	0.2	0.01
IR-13	" "	0.3m	127	0.2	0.01
IR-14	" "	0.3m	238	0.2	0.01
IR-15	" "	0.3m	166	0.2	0.01
IR-16	Main quartz vein with haematite along fractures	1.0m	24	0.2	0.01
IR-52	Qtz-Haematite-limonite gossan	0.3m	215	0.9	0.01
IR-53	" "	0.3m	65	0.7	0.01
IR-54	Main quartz vein with haematite	1.0m	116	0.6	0.01
IR-55	Meta-siltstone with limonite vughs	0.3m	245	0.6	0.01

Copper No. 2 Vein

This vein ranges in width from 0.6m to 1.0m and strikes around 300° over a distance of 1000 metres. Dip of the vein is vertical. Two adits have been dug on the vein with a trace of pyrite. No copper mineralization is evident. A representative sample of the quartz-haematite material gave the following results:

(IR-56) Cu 315 ppm
 Ag 0.6 ppm
 Au 0.02 ppm

Copper No. 3 Vein

This vein is 0.3 to 0.6 metre wide and is parallel to Copper No 2 vein with dip to the south at 75°. Approximately 100 metres of vein is exposed being mainly quartz with some haematite. Dump material from a shaft shows that at depth, the vein is composed of quartz and pyrite. A sample of the quartz-pyrite material (IR-9) assayed:

(IR-9) Cu 23 ppm
 Ag 0.2 ppm
 Au 0.01 ppm

Copper No. 4 Vein

A 0.3 metre wide quartz-haematite vein runs parallel to the Copper No. 2 and No. 3 veins for a strike length of 60 metres and shows a vertical dip.

4.2 Copper Mineralization (Cont'd)

Dump material near an exploratory shaft shows the vein to comprise quartz and pyrite at depth.

A sample of this material (IR-57) gave the following results:

(IR-57)	Cu	81	ppm
	Ag	0.3	ppm
	Au	0.02	ppm

Copper No. 5 Vein

This vein has a width of 0.6 metre, a vertical dip, and strikes parallel to the No. 2 vein. It comprises mainly quartz with haematite along fractures and a surface sample (IR-70) gave the following assay:

(IR-70)	Cu	103	ppm
	Ag	0.2	ppm
	Au	0.01	ppm

Other Veins

Approximately 1.7km south-west of the Copper Reward on the western side of the Interview River, a 0.5 metre thick quartz pyrite vein is exposed in two shallow pits. The location is shown on Map 7041-5^b. The vein strikes at 195° magnetic and dips at 60° to the west. A sample of the quartz-pyrite material (IR-58) gave the following assay:

(IR-58)	Cu	34	ppm
	Ag	0.4	ppm
	Au	0.06	ppm

In the base of a creek some 900 metres east-south east of the camp, a 0.3 metre wide vein of quartz-chlorite-pyrite occurs in a shear zone within the Interview Siltstones adjacent to the contact with the granite. A sample of the vein material (IR-68) gave the following assay:

(IR-68)	Cu	2350	ppm
	Ag	1.5	ppm
	Au	0.02	ppm
	WO ₃	20	ppm
	Sn	10	ppm

Summary

Sampling of the above veins indicates that the main copper mineralization is confined to the Copper Reward vein and Copper No. 1 vein. Of these two, only the Copper Reward vein has an ore grade which could be considered economic. However, the limited known strike length of 40 metres is insufficient to indicate a viable ore body. As the eastern extension of the vein is covered by alluvial flats, further exploration would involve geophysical prospecting or diamond drilling

4.2 Copper Mineralization (Cont'd)

Recommendations

At this stage, given the dimensions of the known mineralization, the vein does not represent a primary target for future exploration. However, if exploration or mining equipment were to be employed on nearby tungsten mineralization, some additional investigation of the copper mineralization ought to be considered.

4.3 Alluvial Tin

Four creeks which drain the mineralized area of the granite between Cooney's vein and Kenny's vein carry alluvial tin. The source of the tin is in part from the main tungsten-bearing veins and also from other quartz veins which have been observed to contain traces of tin.

The creeks are:

- a. Kenny's Creek,
- b. Race Creek,
- c. Cooney's Creek,
- d. Spencer Creek and its main northern tributary.

The alluvial wash occurs as relatively thin veneers averaging 1 metre in depth along the base of the creeks and ranging from 1 to 3 metres in width. Samples were taken in the interval 0.5 metre to 1 metre depth. Each sample represents one prospecting dish of wash which was panned and the concentrate sent for analysis. From the assays, tin values in kg/m³ were calculated.

Sample locations are shown on Map No. 7041-6.

INDICATED RESERVES

a. KENNY'S CREEK

Sample No.	Grade (Kg/m ³)
IR-19	0.6823
IR-21	1.2343
IR-22	1.9550
IR-24	0.5402
IR-26	0.5135
IR-27	6.0727*

0.6 Kg/m³ ≅ 1.0 lb/yd³.

(*High value due to sluicing of wash upstream?)

Excluding IR-27, the average grade of the wash in the main creek bed is 0.985 kg/m³. The estimated volume of wash between the camp and Kenny's workings is 2000m³ with a further 1000m³ below Kenny's workings to sample location IR-19. Estimated reserves: 3000m³ @ 0.985 kg/m³.

4.3 Alluvial Tin (Cont'd)

Tributaries of Kenny's Creek

Sample No.	Grade (Kg/m ³)
IR-18	0.1541
{ IR-23	0.1163
{ IR-25	0.6047
IR-50	0.8635
{ IR-65	0.8481
{ IR-66	0.0203
IR-67	0.0374

Of these samples, IR-25, IR-50 and IR-65 indicate tributaries which are possible sources of the alluvial tin.

b. RACE CREEK

Sample No.	Grade (Kg/m ³)
IR-28	1.8125
IR-29	2.8693
IR-30	3.0877
IR-31	0.8867
IR-32	2.3361

Average = 2.198 kg/m³

Above sample location IR-32 in the headwaters of Race Creek there is an estimated volume of 1500m³ of wash with an average grade of 2.198 kg/m³.

Estimated reserves: 1500m³ @ 2.198 kg/m³.

c. COONEY'S CREEK & TRIBUTARIES

Sample No.	Grade (Kg/m ³)
IR-33 (Trib)	1.9739
IR-34 (Trib)	4.0913
IR-35	3.0452
IR-48	0.2974
IR-49	1.5634

Due to the distribution of the sample localities it is not possible to average these values. The samples do indicate that grades similar to those at Race Creek (around 2 kg/m³) could be expected. Between Cooney's Shaft and sample

4.3 Alluvial Tin (Cont'd)

location IR-35, there are estimated reserves of 2500m³, (including tributaries).

d. SPENCER CREEK

Sample No	Grade (Kg/m ³)
IR-42	0.7586
IR-43	0.0818
IR-44	0.7546
IR-45	1.0462
IR-46	1.2734
IR-47	0.7342

Average grade = 0.7748 kg/m³

Estimated reserves between sample location IR-43 and IR-47 - 1000m³ @ 0.7748 kg/m³

Main Northern Tributary of Spencer Creek

Sample No	Grade (Kg/m ³)
IR-36	0.0235
IR-37	1.1558
IR-38	2.9242
IR-39	0.2181
IR-40	0.1123
IR-41	0.4401

The only samples to show significant values are IR-37 and IR-38, while values elsewhere along this tributary are below an economic grade. The limited amounts of wash present would indicate that there is little chance of finding a workable deposit on this tributary.

Summary

Indicated tin reserves for each creek are:

- a. Kenny's Creek 3000m³ at 0.985kg/m³ } i.e. approx.
- b. Race Creek 1500m³ at 2.198kg/m³ } 8,000m³ @
- c. Cooney's Creek 2500m³ at 2kg/m³ (est) } 1.5kg
- d. Spencer Creek 1000m³ at 0.775kg/m³ } cassiterite

The reserves are insufficient for any large scale operation but consideration could be given to offering the alluvial tin to Mr M Munday to be worked under a tribute agreement

4.3 Alluvial Tin (Cont'd)

Panning and sampling along the Interview River and other creeks in E.L. 13/81 has shown that the alluvial tin is confined to the four creeks discussed above.

5. PROGRESS REPORT: MAY 1982

THE INTERVIEW RIVER (TAS.) TUNGSTEN/TIN MINERALIZATION
E.L. No. 13/81

Detailed sampling of in situ vein material was carried out from 23rd April to the 8th May 1982. The sampling was centred on the Cooney's vein system and Kenny's vein which are considered to offer the best prospects for tungsten mineralization. Twelve bulk samples (20-30kg) and twenty smaller samples (3-5kg) were obtained. Adverse weather during the field trip hampered the work carried out, but the end result was a series of samples which should allow a more precise assesment of the mineralization at both Cooney's and Kenny's veins.

5.1 SAMPLE INFORMATION AND OBSERVATIONS

Map No. 7041-7 was constructed to show the geological structure of Cooney's vein system, Kenny's vein and the location of all samples. In some locations, where larger samples were taken, it was necessary to use more than one bag to ensure a representative sample was obtained. In these cases the samples were labelled A and B, eg, IR-CT-83A and IR-CT-83B. These samples should be combined before analysis so that a single assay result is obtained for that location, (ie IR-CT-83).

a. Cooney's Shaft

The shaft was pumped out and the loose debris cleared from the base of the shaft. A geological plan was made of the veins exposed in the floor (see inset Map No. 7041-7).

Two parallel veins (approx. 1.2 metres apart) show regular off-sets to the north-west along shear/joint planes which strike at N45°W and dip at 75° and 85° to the south-east. The main vein averages 25cm in width and the second vein 15cm width. Five bulk samples were taken, one from each off-set section of the main vein over a distance of 4 metres. A sixth bulk sample was taken from the second vein and two smaller samples were taken (over 0.6 metre intervals) of the granite between the two veins. Sample locations are shown on the inset of Map No. 7041-7.

The main vein showed quartz - tourmaline - pyrite - arsenopyrite - chalcopyrite and scattered wolframite crystals. The most abundant wolframite was observed in sample IR-CS-79. All samples from the main vein showed evidence of scheelite under the UV lamp

The second vein showed only traces of wolframite and scheelite and does not appear to be mineralized to the same extent as the main vein (at least where exposed in the base of the shaft).

SAMPLE INFORMATION AND OBSERVATIONS

a. Cooney's Shaft (Cont'd)

Sample No.	Description	WO ₃	Sn	Au
IR-CS-74	Main vein - 25cm width All bulk samples	6.5%	65ppm	0.01 ppm
IR-CS-75		2.75	45ppm	0.01 ppm
IR-CS-76		2.25	40ppm	-
IR-CS-77		630ppm	25ppm	-
IR-CS-79		9.65%	110ppm	0.01 ppm

Average =

IR-CS-78	Bulk sample Second vein (15cm)	800ppm	50ppm	-
IR-CS-80	Granite between veins	120ppm	170ppm	-
IR-CS-81	Granite Between veins	240ppm	100ppm	-

b. Cooney's Trenches

The trenches dug along the vein immediately south of Cooney's Shaft were pumped out and two parallel veins were exposed. The western vein averages 30cm width and the second is 15cm wide. The relationship of the veins is similar to that in Cooney's Shaft. Six metres of the main vein were bulk sampled at the northern end of the trench, and included two metres of vein which showed coarse tabular crystals of wolframite up to 10cm in length. A smaller sample was made up from material from the second vein over a length of 7 metres.

Sample No.	Description	WO ₃	Sn	Au
IR-CT-82	Bulk sample 30cm vein	2.60%	200ppm	-
IR-CT-83(A+B)	15cm vein	0.50%	120ppm	-

Other trenches further south in the base of Cooney's Creek and which cut the grid-line 80S were flooded at the time of sampling. Two parallel veins (1 metre apart) were exposed in the northern end of the trenches. The eastern vein averages 20cm width while the western vein averages 15cm width. A bulk sample of the eastern vein was taken over a one metre interval and showed abundant pyrite and some disseminated wolframite (and scheelite).

Sample No	Description	WO ₃	Sn	Cu
IR-CT-84	Bulk sample 20cm vein	240ppm	120ppm	0.01ppm

SAMPLE INFORMATION AND OBSERVATIONSc. Kenny's Adit and Trenches

Backfill material was removed from the easter legs of the portal at Kenny's adit and a vein averaging 40cm in width was exposed. A bulk sample was taken of 2 metres of the vein and showed quartz - tourmaline - pyrite with patches of wolframite adjacent to the margins of the vein. Minor amounts of scheelite occur with this material.

A smaller sample of this vein was taken 5 metres south of the portal within the adit, but no wolframite was observed. Another sample was made of a second narrow quartz-tourmaline vein averaging 10cm wide which outcrops along the roof of the adit and at the end of the tunnel. This vein appeared to be barren.

Sample No.	Description	WO ₃	Sn	Au
IR-KA-85	Bulk sample 40cm vein	4.60%	19ppm	0.01ppm
IR-KA-86 (A,B)	Sample of 40cm vein	2.10ppm	720ppm	0.01ppm
IR-KA-87	Sample of 10cm vein	280ppm	13ppm	0.01ppm

A section of 40cm wide vein was exposed in a trench 10 metres south of Kenny's Shaft and a bulk sample taken over a two metre interval. The vein consists of quartz-tourmaline with numerous elongated tabular crystals of wolframite.

Sample No.	Description	WO ₃	Sn	Au
IR-KT-88	Bulk Sample 40cm vein	5.55%	14ppm	-

A two metre interval of the vein was exposed in a trench between 6 and 8 metres north from Kenny's Shaft. The vein averaged 30cm in width and comprises quartz - tourmaline - muscovite with scheelite and traces of wolframite.

Sample No	Description	WO ₃	Sn	Cu
IR-KT-89 (A+B)	Sample 30cm vein	3.15%	45ppm	-

Where grid line 2040N intersects Kenny's vein, a 20cm wide quartz - tourmaline - muscovite vein is exposed at the surface. Cleaning along the vein showed part of the vein from 0.9 to 1.0 metre south of 2040N was almost solid wolframite. A series of samples were taken along the vein as follows:

.../Table

SAMPLE INFORMATION AND OBSERVATIONS

c. Kenny's Adit and Trenches (Cont'd)

Sample No.	Description	WO ₃	Sn	Au
IR-KT-90	3.5-4.5m south of 2040N	0.34%	18ppm	-
IR-KT-91	2.5-3.5m " "	1.00%	160ppm	-
IR-KT-92 (AB&C)	0.5-1.0m " "	6.95%	35ppm	-
IR-KT-93	0-0.5m " "	0.12%	35ppm	-
IR-KT-94	0-0.5m north of 2040N	360ppm	30ppm	-
IR-KT-95	0.5-1.0m " "	570ppm	30ppm	-

Most of the vein contains abundant tourmaline and muscovite with little evidence of tungsten mineralization except for sample IR-KT-92, which contains 0.1m of high grade wolframite.

Clearing of shallow trenches between 23m to 26m north along the strike of Kenny's vein from 2040N exposed a 40cm wide quartz - tourmaline vein showing scattered coarse wolframite crystals with some local rich accumulations. A bulk sample was taken over the interval.

Sample No.	Description	WO ₃	Sn	Au
IR-KT-96	Bulk sample 40cm vein	2.00%	19ppm	-

From 2080N a 40cm quartz - tourmaline vein was exposed at the surface along strike between 6 and 8 metres to the north of the grid line. The vein shows scattered wolframite with local accumulations near the margins of the vein. Scheelite is also present. A sample from the exposed vein is:

Sample No.	Description	WO ₃	Sn	Au
IR-KT-97 (A,B)	Sample 40cm vein	1.50%	11ppm	-

From 5 to 7 metres north along strike from 2160N, a 15cm quartz - tourmaline - muscovite vein is exposed in a cleared area. No visible wolframite was seen in the interval sampled.

Sample No.	Description	WO ₃	Sn	Au
IR-KT-98	Sample 15cm vein	3.05%	60ppm	-

A similar 15cm wide vein is exposed in the costean at 2200N. The vein here carries wolframite and scheelite. An extension of this vein is exposed in a shallow pit 50 metres north of 2200N along strike. Traces of wolframite were observed in the vein.

Sample No.	Description	WO ₃	Sn	Au
IR-KT-99	15cm vein at 2200N	150ppm	220ppm	-
IR-KT-100	15cm vein 50m north 2200N	2.75%	17ppm	-

SAMPLE INFORMATION AND OBSERVATIONSc. Kenny's Adit and Trenches (Cont'd)

South of Kenny's adit in trenches near 1960N, a 30cm quartz - tourmaline - pyrite - muscovite vein shows coarse tabular crystals of wolframite along its margins.

Sample No.	Description	WO ₃	Sn	Au
IR-KT-101	0-1m south of 1960N	0.89	<10	-
IR-KT-102	11-12m " "	3.00	20	-
IR-KT-103	14-17m bulk sample from south of 1960N	3.80	350	-

In the trench at 1920N, a 30cm wide quartz - tourmaline vein shows traces of wolframite and scheelite. Extensions of the vein are found between 1920N and 1880N. A sample was obtained 25 metres south along strike from 1920N where clearing of the peat layer revealed a 20cm quartz - tourmaline vein with traces of wolframite.

Sample No.	Description	WO ₃	Sn	Au
IR-KT-104	30cm vein at 1920N	3.50	35	-
IR-KT-105	20cm vein 25m S of 1920N	0.70	<10	-

5.2 SUMMARY

From these samples, especially the bulk samples, a clearer understanding of tungsten ore grades along the major veins will be obtained. This will enable decisions to be made on further development of the prospect.

6. TUNGSTEN MINERALIZATION

ANALYSIS OF SAMPLE RESULTS FROM COONEY'S AND KENNY'S VEINS

6.1 Introduction

The sample results from both Cooney's and Kenny's veins illustrate the highly variable nature of the tungsten mineralization (refer Map No. 7041-7). Values of Cooney's vein range from 0.02% to 9.65% WO₃ while Kenny's vein shows values between 0.02% and 6.95% WO₃. When considering the average grade obtained from a series of samples it is advisable to keep in mind the fluctuating nature of the tungsten mineralization. Descriptions of individual samples are contained in the May progress report.

6.2 Cooney's Vein

A series of bulk samples of vein material taken from the base of Cooney's Shaft (from south to north) over 4 metres of strike length showed an increase in values from 0.06% WO₃ to 9.65% WO₃. The mineralization is controlled by several joint planes cutting across the main vein and small scale movements along these joints have produced an en-echelon effect. Samples were taken of the vein between consecutive joint planes and the results are shown in the following table.

Cooney's Shaft: Main Vein

Sample No.	Strike Length	WO ₃ %	Strike Length x Grade
IR-CS-77	1.5 m	0.06	0.09
IR-CS-76	0.5m	2.25	1.12
IR-CS-75	0.75m	2.75	2.06
IR-CS-74	0.75m	6.50	4.87
IR-CS-79	0.5 m	9.65	4.83
TOTAL	4.0 m		12.97

Average grade per metre = $\frac{12.97}{4}$ = 3.24% WO₃

A bulk sample of the main vein over a strike length of 6 metres was taken from the old trench workings immediately south of the shaft and it returned a value of 2.6% WO₃.

Combining the value from the shaft with that from the trench gives an average value of 2.8% WO_3 for a vein width of 0.25 metres over an inferred strike length of 30 metres. A second parallel vein, averaging 0.15 m width, returned values of 0.08% WO_3 from the shaft and 0.50% WO_3 from the trenches south of the shaft.

Further south, trench workings and an old shaft indicate the presence of continuing tungsten mineralization. Two parallel veins, 1 metre apart, are exposed at the northern end of these workings and have widths of 20cm and 15cm. A sample from the 15cm eastern vein showed a value of 0.02% WO_3 . This low value may be due to leaching of the vein by water from Cooney's Creek which flows into the trenches at this location. Due to the water level in the trenches no samples could be taken of the veins in the workings.

Reference is made to these two veins along the base of the creek in two earlier reports. A 1901 report by geologist G.A. Waller titled "A Report on Some Wolfram Sections near Pieman Heads" refers to a shaft in the bed of the creek from which a trench 50 feet long and 6 feet deep was dug to the north exposing two veins which contained high-grade wolfram ore. A 1943 report by geologist Q.J. Henderson titled "Interview River Wolfram Deposits" refers to these same veins and states that one of them "makes a shoot of exceptionally high grade wolfram ore over a length of eleven feet with an average width of 4 inches".

The old workings indicate a known strike length of 90 metres for Cooney's vein system with the possibility of extensions to the north and south along strike. An average vein width over this strike length would be 0.25m, with an indicated grade of around 2.8% WO_3 for the northern end of the vein.

6.3 Kenny's Vein

Tungsten mineralization is known to extend over a total strike length of 460 metres. Most of the older workings are centred around Kenny's Shaft and extend for 100 metres north and south of the shaft along strike. For this 200 metre section the vein maintains an average width of 0.4 metres and the profile created by the creek near Kenny's Shaft shows the width of the vein appears to be constant with increasing depth. Tungsten mineralization is again variable and is best illustrated by samples IR-KT-90 to 95 which were taken along 4 metres of vein material.

Sample No.	Strike Length	WO ₃	Strike Length x Grade
IR-KT-90	1.0 m	0.34	0.34
IR-KT-91	1.0 m	1.00	1.00
IR-KT-92	0.5 m	6.95	3.47
IR-KT-93	0.5 m	0.12	0.06
IR-KT-94	0.5 m	0.03	0.01
IR-KT-95	0.5 m	0.05	0.02
TOTAL	4.0 m		4.9

Average grade per metre = 4.9 = 1.2% WO₃

Bulk Samples from this 200 metre section of the vein gave the following results:

Sample No.	Strike Length	WO ₃ %
IR-KA-85	2.0 m	4.6
IR-KT-88	2.0 m	5.5
IR-KT-90 to 95	4.0 m	1.2
IR-KT-96	2.0 m	2.0
IR-KT-103	3.0 m	3.8

Fiver smaller samples from the same 200 metre section gave the following results:

Sample No.	Strike Length	WO ₃ %
IR-KA-86	1.0 m	0.02
IR-KT-89	1.0 m	0.34
IR-KT-97	1.0 m	1.50
IR-KT-101	1.0 m	0.89
IR-KT-102	1.0 m	3.00

Combining the ten sample results gives an average grade of 2.3% WO₃ to 2.6% WO₃, depending on average being calculated as simple or weighted, for a vein width of 0.4m and a strike length of 200 metres.

Taking the whole strike length of Kenny's vein (460m) and averaging the fifteen sample points gives a grade of 2.2% to 2.3% WO₃. The width of the vein at the surface is 0.3m in the south, 0.4m in the centre, and 0.15m in the northern exposures, giving an average width of 0.3m for the total strike length.

6.4 Summary

Possible ore reserves for Cooney's and Kenny's veins are:-

- A) Cooney's Vein:- Average grade: 2.8% WO₃
Average width: 0.25 metres
Strike length: 90+ metres
Open to the north and south

- B) Kenny's Vein:- Average grade: 2.2% WO₃
Average width: 0.3 metres
Strike length: 460 metres
Open to the north

Subsection:-

200 metre section of vein centred on Kenny's shaft.	Average grade: 2.3% WO ₃
	Average width: 0.4 metres
	Strike length: 200 metres

Other Mineralization

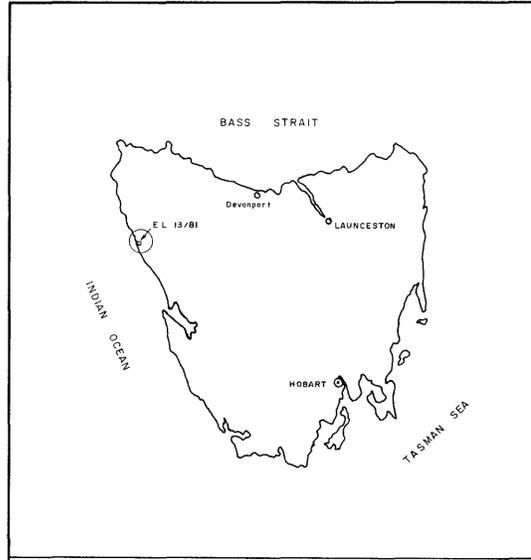
Assays were made for tin on the samples from both veins. Values are generally low and average 86 ppm Sn for Cooney's vein and 92 ppm Sn for Kenny's vein. The highest value obtained was 720 ppm Sn from Kenny's vein. Judging by these results, a wolfram concentrate of 70% WO₃ would contain less than 1% Sn and would not be subject to any penalties in regard to tin content.

Several samples were tested for gold but the results were negative.

Note:

The samples on which the grade have been calculated present only a small proportion of the veins and due to the variable nature of the tungsten mineralization the results give only an indication of the grade rather than measuring a true grade over the entire strike length.

The previous sampling was governed by the condition of the old workings and because of the collapsed and flooded state of the trenches only limited sections of the veins were exposed. To arrive at an accurate value for tungsten grade would involve dewatering the old trenches, cleaning out debris to expose the vein, followed by stripping out the vein along strike to a depth of at least one metre. Vein material from say 10 metre intervals could be crushed on site and split down to 30-50 Kg bulk samples. In this way a true grade could be established at the surface. If an economic grade were proved then drilling would be used to test for extensions of the veins at depth.

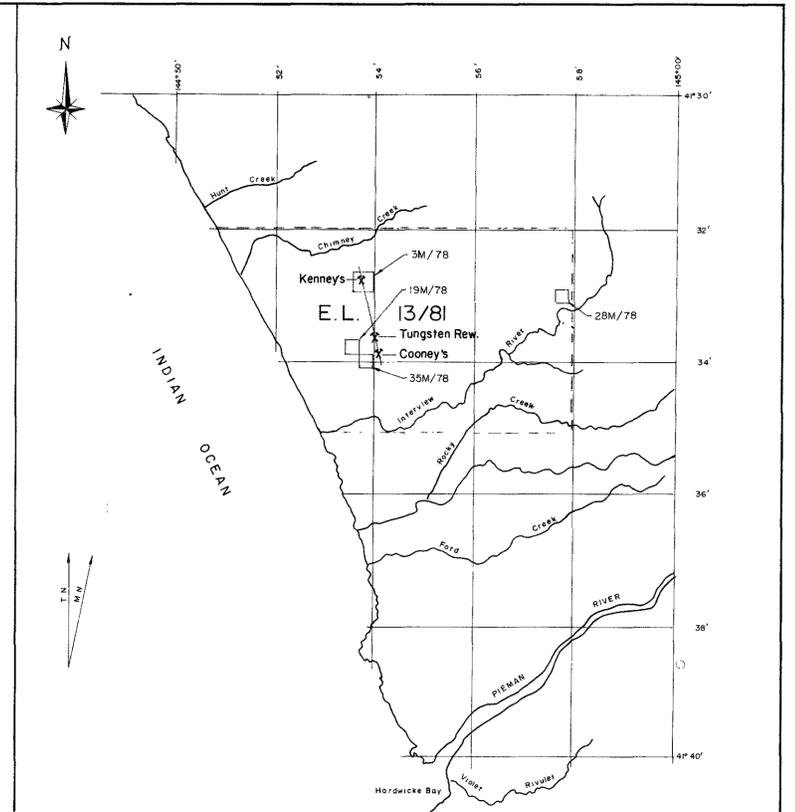


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N T S

LEGEND:

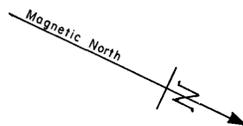
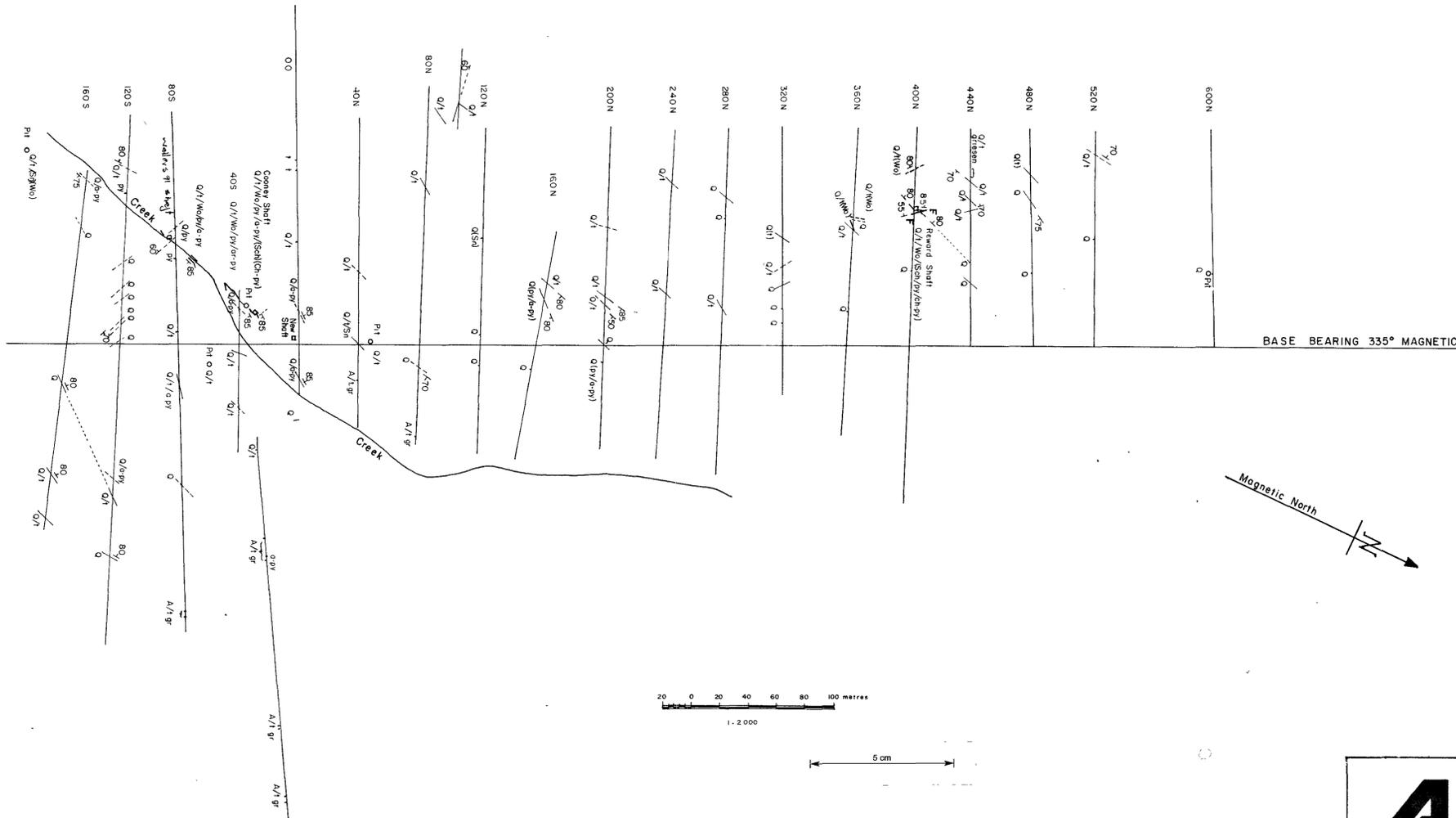
- 1840N ——— New trenches
 - - - - - Veins less than 10cm wide
 - Veins greater than 10cm wide
 - Possible extension of vein
 - gs Strike and dip of vein
 - Q - Quartz
 - t - tourmaline
 - py - pyrite
 - a-py - arsenopyrite
 - ch-py - chalcopyrite
 - sch - scheelite
 - Wo - wolframite
 - Sn - tin
- } Minerals present in veins
- Vein system showing wolfram
 - Shaft
 - Pit
 - Old trenching, bulldozed areas

Note. All veins without dip marked are vertical



LOCATION PLAN

1:100 000

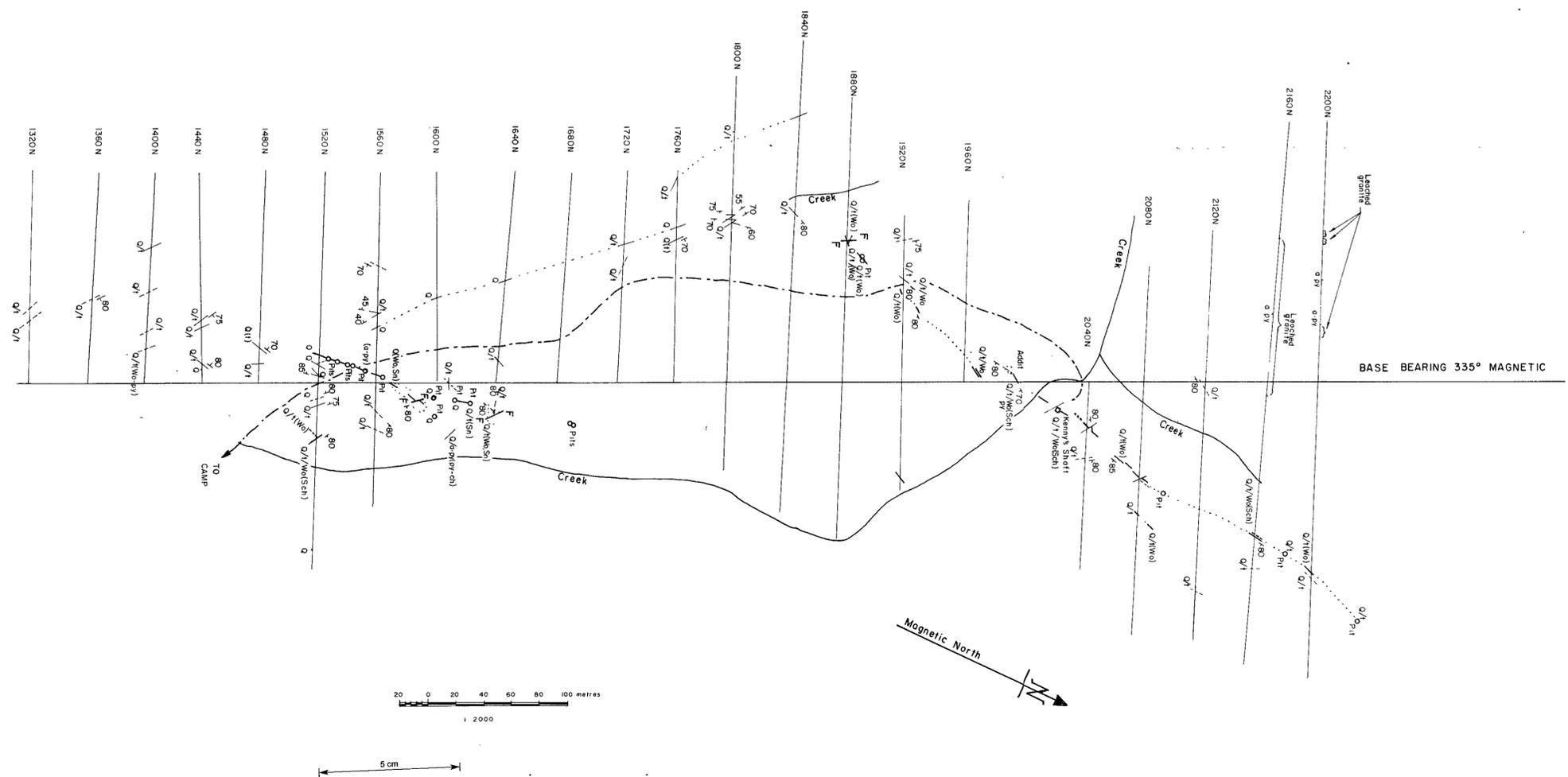


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<p>Abignano Limited</p>	Civil Engineering Contractors 19-21 Bridge Street Pymble NSW 2073 Telephone 02-4493344 Telex 24464		INTERVIEW RIVER EL 13/81 TASMANIA		SCALE	DATE
					1:2000	25-2-82
	COONEY'S AND REWARD GRID GEOLOGICAL INVESTIGATION		DRAWN P G TRACED J. P. CHECKED G. B. B.	DRAWING NUMBER 7041-1		

LEGEND:

- 1840N — New trenches
 - - - Veins less than 10cm wide
 - Veins greater than 10cm wide
 - Possible extension of vein
 - 85 Strike and dip of vein
 - Q - Quartz
 - t - tourmaline
 - py - pyrite
 - a-py - arsenopyrite
 - ch py - chalcopyrite
 - sch - scheelite
 - Wo - wolframate
 - Sn - tin
 - Vein system showing wolfram
 - Shaft
 - Pit
 - Old trenching, bulldozed areas
 - - - Old vehicle tracks
- } Minerals present in veins
- Note: All veins without dip marked are vertical



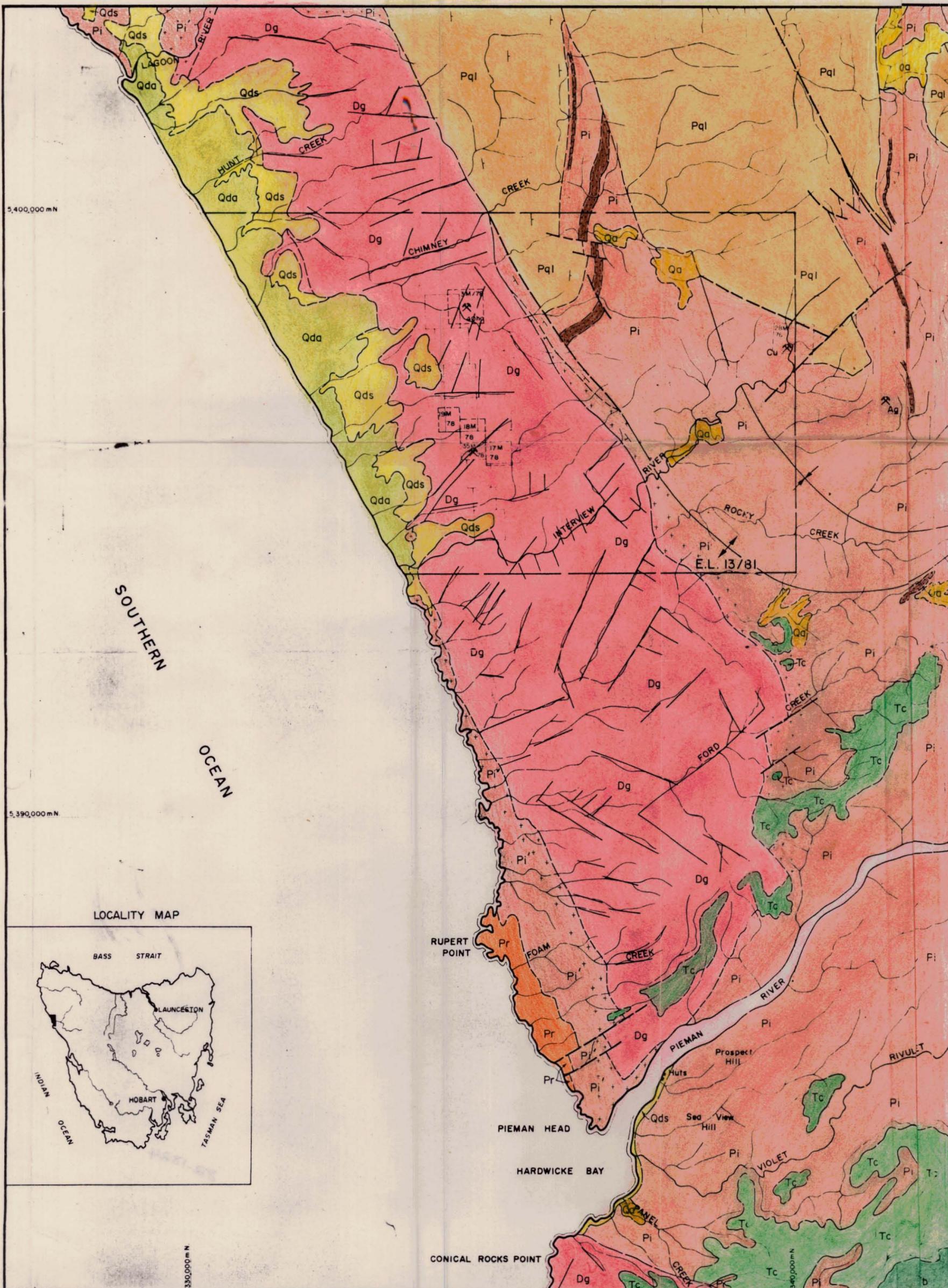
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INTERVIEW RIVER E.L. 13/81 TASMANIA		SCALE 1:2000	DATE 25-2-82
KENNY'S GRID GEOLOGICAL INVESTIGATION		DRAWN P.G. TRACED J.P. CHECKED G.B.B.	DRAWING NUMBER 7041-2

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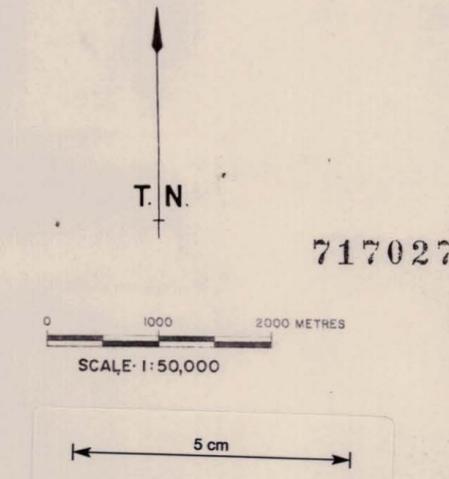
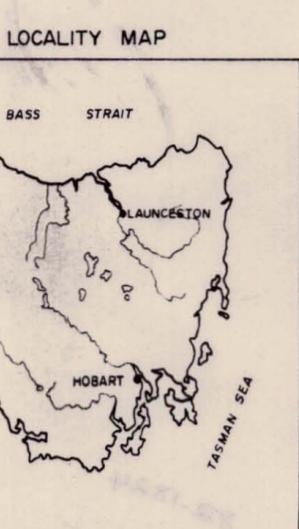
82-1324

1055



- LEGEND:**
- QUATERNARY**
- Qa ALLUVIUM
 - Qda ACTIVE COASTAL DUNES
 - Qds STABILISED COASTAL DUNES
- TERTIARY**
- Tc PEBBLE CONGLOMERATE
- PRECAMBRIAN (PROTEROZOIC)**
- Pr RUPERT BEDS
 - Pi' BLACK MUDSTONE ++ SILTSTONE
 - Pi INTERVIEW SILTSTONE QUARTZITE BEDS
 - Pql LAGOON RIVER QUARTZITE
- IGNEOUS ROCKS**
- Tb TERTIARY BASALT
 - Dg DEVONIAN GRANITE
 - +Dg+ CONTACT ZONE
- GEOLOGICAL BOUNDARY
- GENERAL STRIKE & DIPS
- ↑↓ TREND OF MAJOR FOLD
- FAULT
- LINEAMENT
- ⌘ OLD MINE

SOUTHERN OCEAN



GEOLOGY COMPILED FROM GEOL SURVEY - MINES DEPT MAPPING.

INTERVIEW RIVER AREA

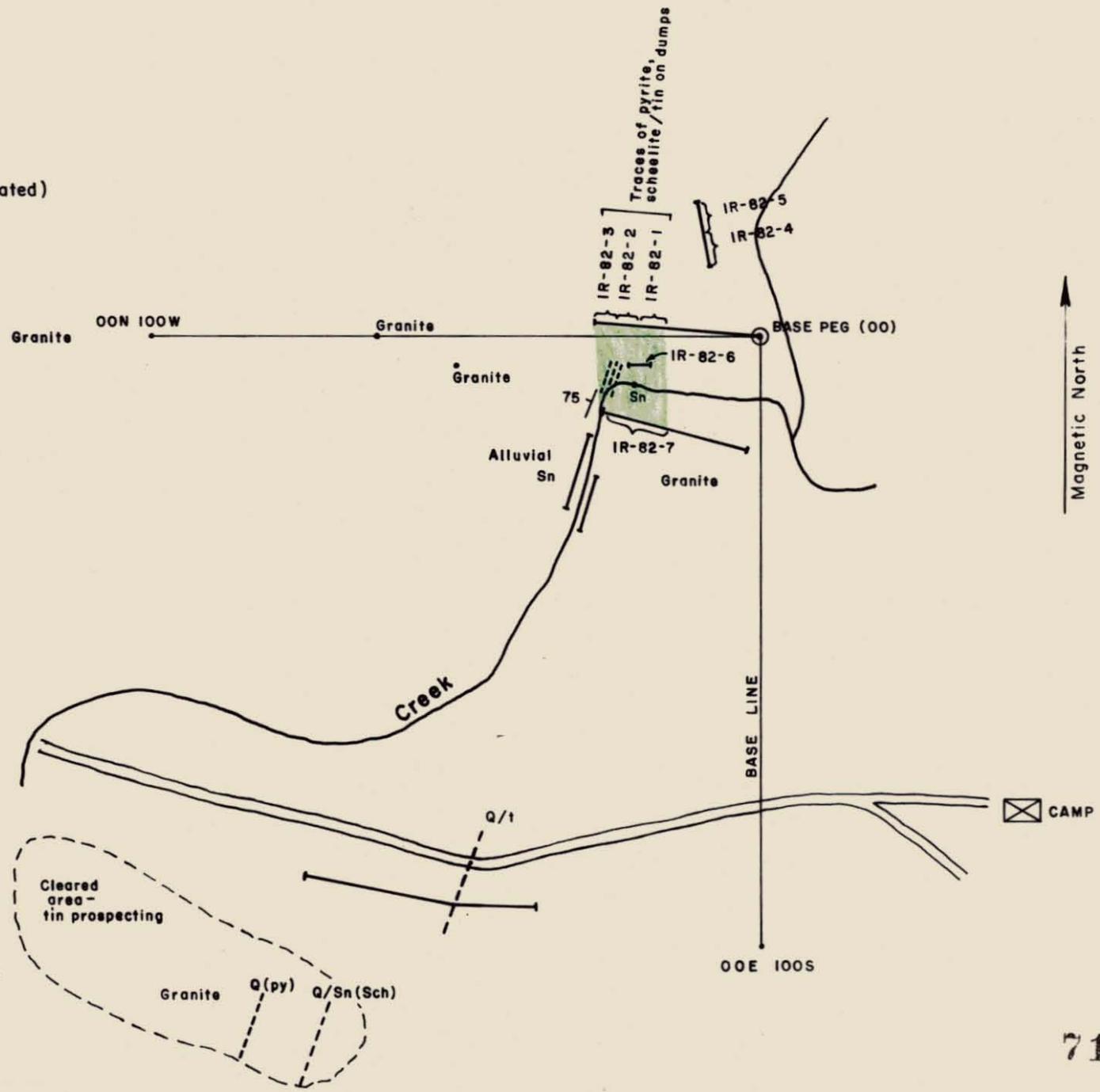
REGIONAL GEOLOGY

DRAWN: C.H.W.	SCALE: 1:50,000	MAP No. 7041-3
TRACED: T.G.D.S.	DATE: July 1981	

82-1824 1055

CAMP GRID

-  Quartz veins less than 10cm. (Minerals indicated)
-  IR-82-3 Sample Location
-  Altered granite ?
-  Trench
-  Track

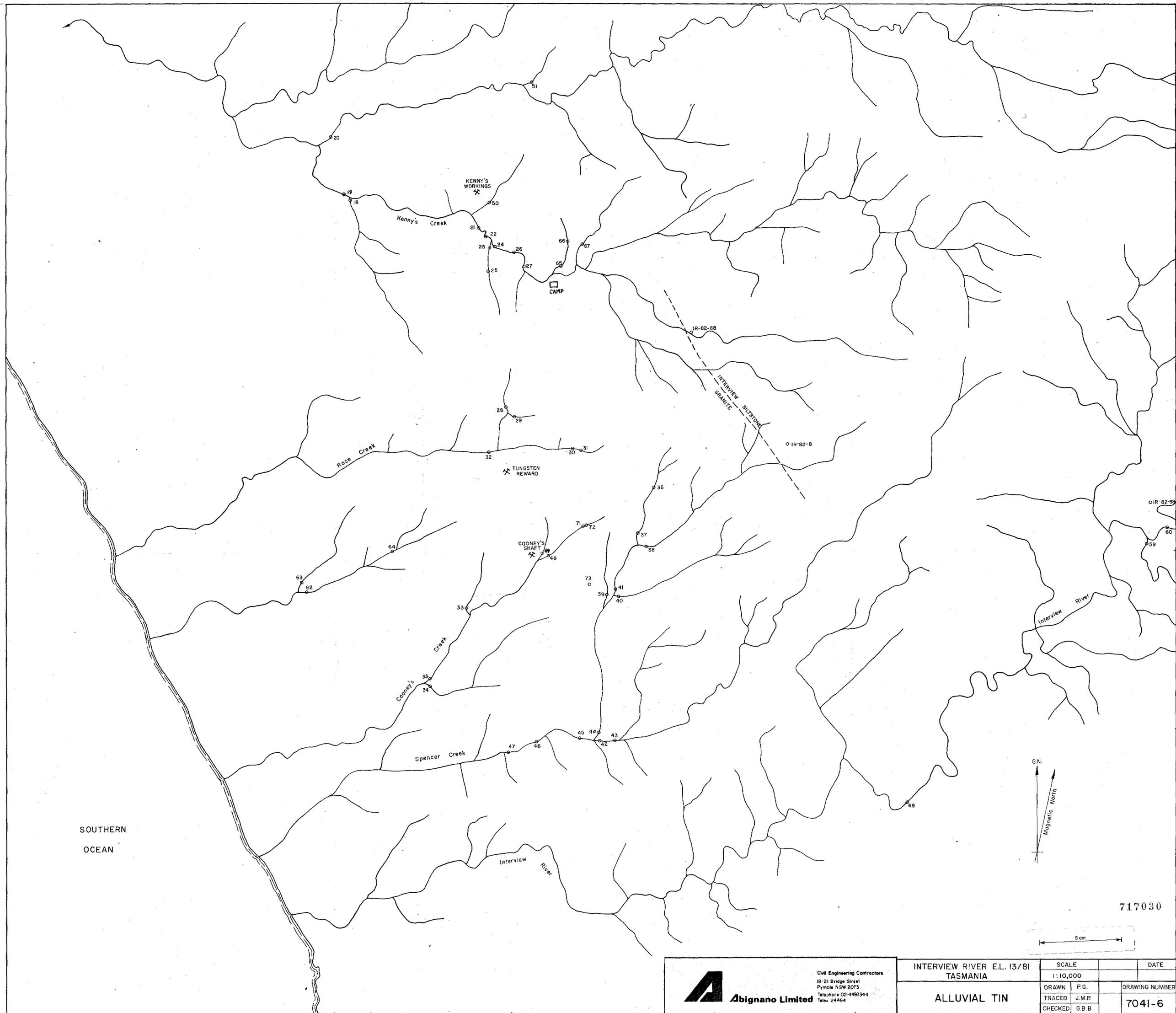


82-1824

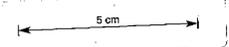
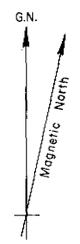
717029

Design : P.G.
Drawn : J.M.P.

SCALE 1:1000 DRG.No. 7041-5



SOUTHERN
OCEAN



717030

 Abignano Limited	Civil Engineering Contractors 19-21 Bridge Street Pymble NSW 2073 Telephone 02-4493344 Telex 24464		INTERVIEW RIVER EL. 13/81 TASMANIA		SCALE	DATE
			ALLUVIAL TIN		1:10,000	
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	CHECKED	G.B.B.			7041-6	

82-1824

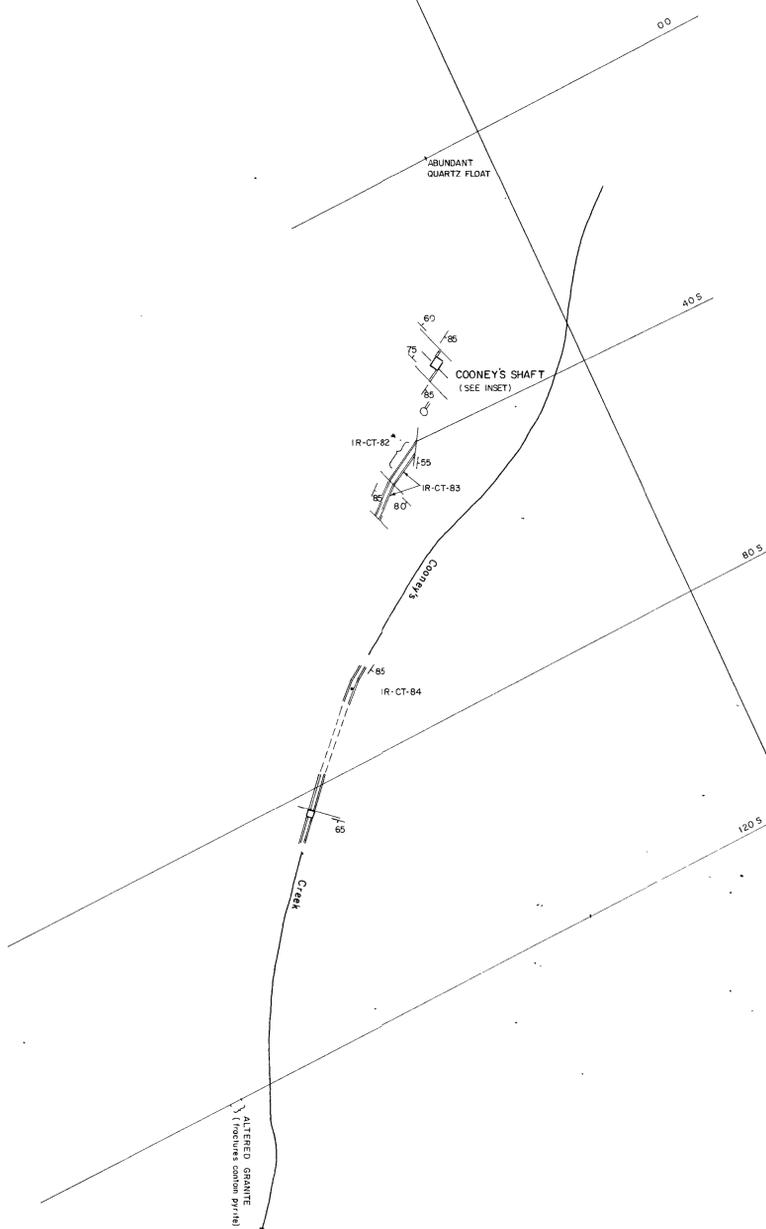
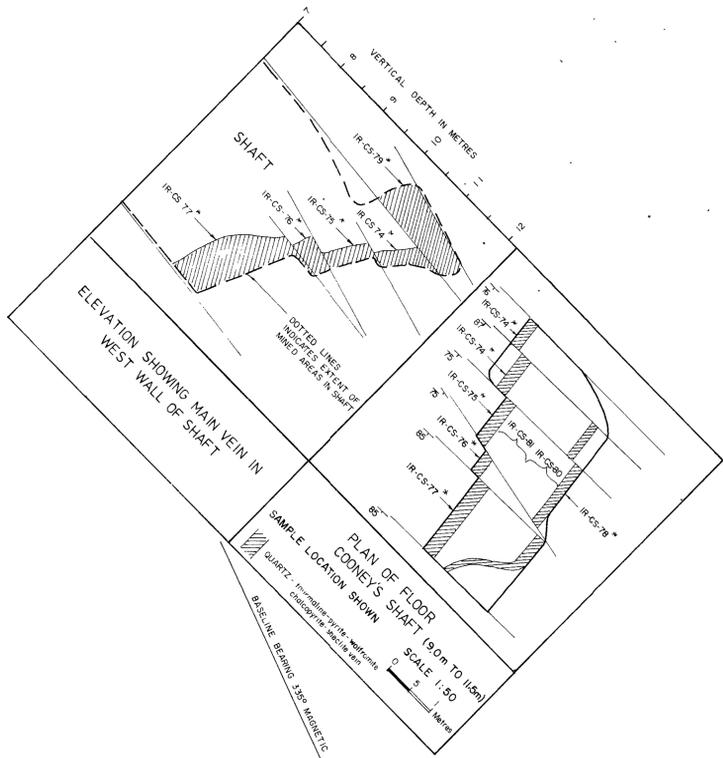
1056

COONEY'S VEIN SYSTEM - SAMPLE LOCATIONS

(THIS MAP SHOWS ENLARGED PLAN OF COONEY'S VEIN FROM MAP 7041-1)

LEGEND :

- QUARTZ - TOURMALINE - SULPHIDE VEIN WITH WOLFRAMITE - SCHEELITE
- STRIKE AND DIP OF VEIN OR JOINT PLANE
- IR-CT-83 SAMPLE LOCATION AND IDENTIFICATION (*BULK SAMPLE)
- SHAFT
- PIT
- CLEARED AREA, TRENCHES

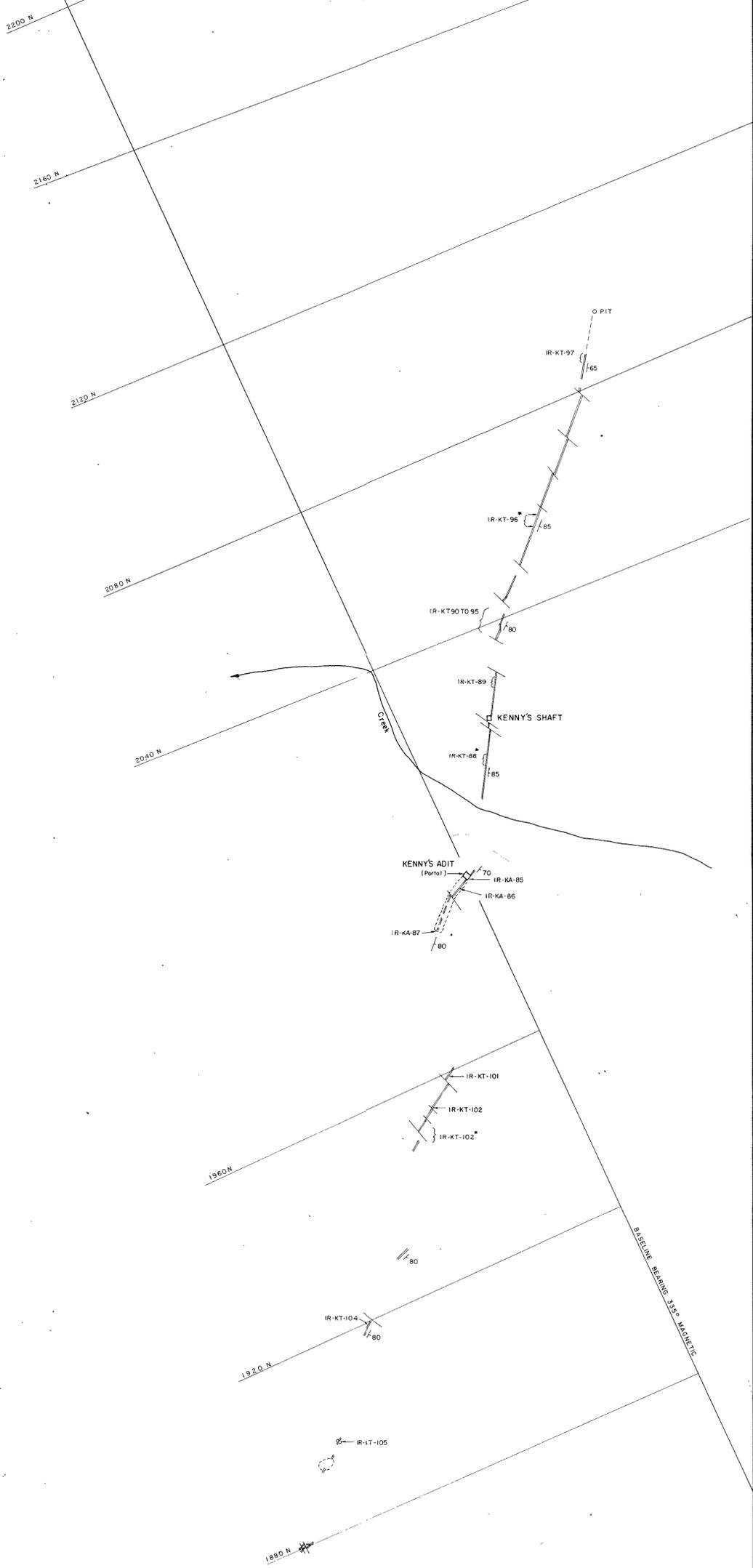


KENNY'S VEIN - SAMPLE LOCATIONS

(THIS MAP SHOWS ENLARGED PLAN OF KENNY'S VEIN FROM MAP 7041-2)

LEGEND :

- QUARTZ - TOURMALINE - SULPHIDE VEIN WITH WOLFRAMITE - SCHEELITE
- STRIKE AND DIP OF VEIN OR JOINT PLANE
- IR-KT-98 SAMPLE LOCATION AND IDENTIFICATION (*BULK SAMPLE)
- SHAFT
- PIT
- CLEARED AREA, TRENCHES



INTERVIEW RIVER EL. 13/81	SCALE 1:500	DATE MAY 1982
SAMPLE LOCATIONS	DRAWN P. G.	DRAWING NUMBER 7041-7
COONEY'S AND KENNY'S VEINS	CHECKED	

717031

