COMMONWEALTH OF AUSTRALIA

DEPARTMENT OF NATIONAL DEVELOPMENT

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

RECORD 1965/127

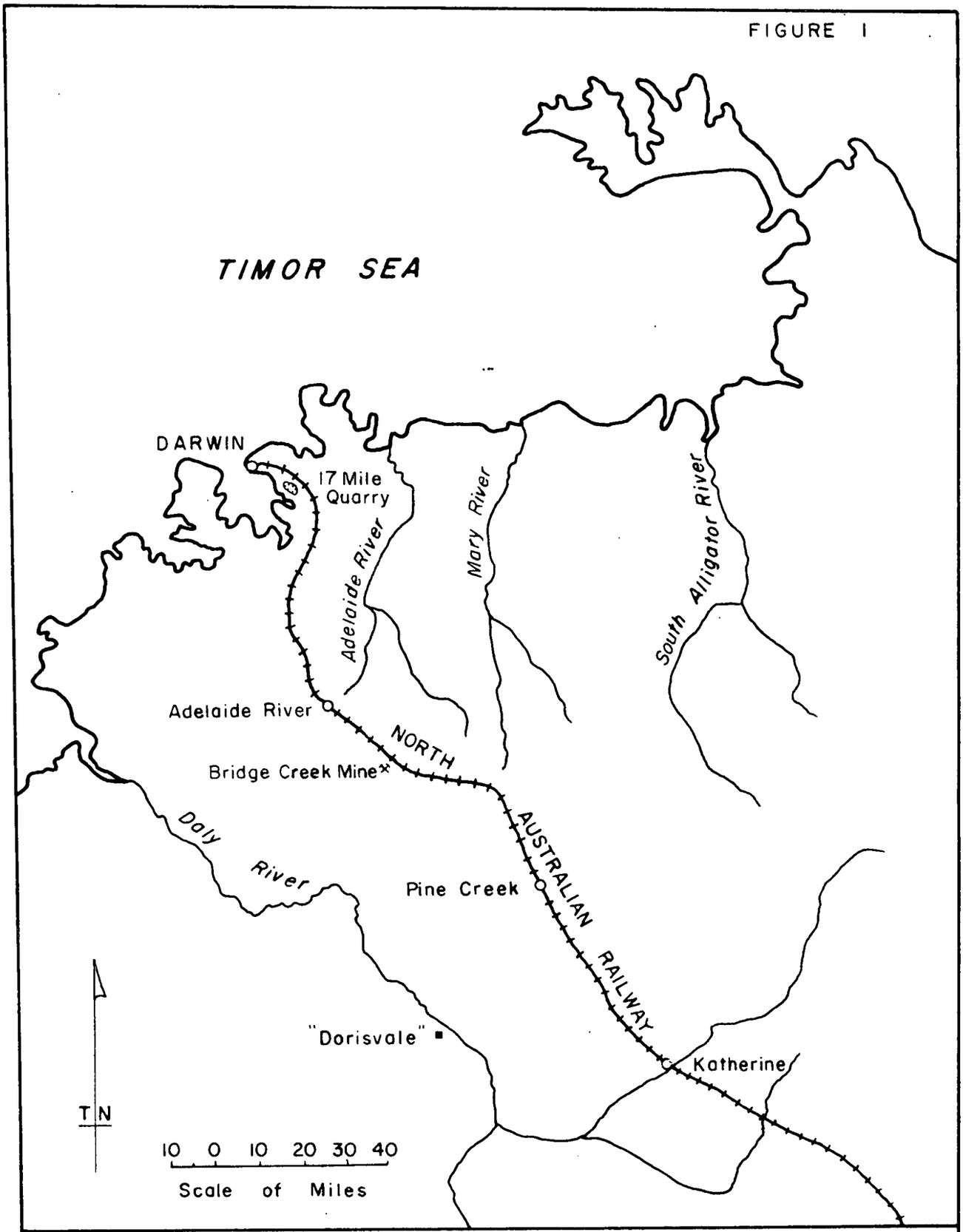
MINOR METALLIFEROUS INVESTIGATIONS - N.T. RESIDENT GEOLOGICAL SECTION

MINOR METALLIFEROUS INVESTIGATIONS - N.T. RESIDENT GEOLOGICAL SECTION

Records 1965/127

CONTENTS

FIGURE 1



LOCALITY PLAN:

Pine Creek
17-Mile Quarry
Dorisvale and
Bridge Creek

Bureau of Mineral Resoures,
Geology and Geophysics
To accompany Record 1965/127 *July 1965*

D52/A8/153

DIAMOND DRILL HOLES 1964/1 AND 1964/2, ENTERPRISE MINE, PINE CREEK

by

A. Vanderplank.

Geology.

The main lode at the Enterprise Mine is a pyrite-arsenopyrite-quartz body which occurs at the contact of a massive quartz body (footwall) and hornfelsic slates (hanging-wall). The lode strikes 145° and dips 60° to the east. Where seen in the drive on the 260 foot level, the lode is laminated parallel to its strike and dip. The laminations are due to the parallel arrangement of components and also to the presence of small, slickened shears which have only been partially cemented.

The lode occurs in the proximity of the sheared and silicified axial plane of a tightly compressed anticline. The axial plane, however, is vertical and strikes 135°; therefore the association between lode and axial plane is probably not direct. It seems more likely that the lode has been emplaced along a shear which has been localised by the hanging-wall of the massive quartz body. The quartz body, in turn, is probably controlled by the intersection of certain beds with the axial plane. Should this be so, we can expect the lode to have a plunge corresponding to that of the anticline. Unfortunately there are few indications as to what the plunge is in the vicinity of the Enterprise Mine. On the 150-ft. level the beds, in the vicinity of the axial plane, have a very shallow dip; a large quartz vein exposed in an open cut on the eastern slope of the hill immediately to the south of the mine plunges 12° at 139°; the plunge in the Kohinoor area is 22°. All this suggests that the anticline plunges at a low angle to the south.

Taking the dip and strike and the general nature of the lode into consideration, the only possible surface expression of the lode is the line of stopes which occurs some 1,500 ft. to the north. This would entail a plunge of 10° to the south.

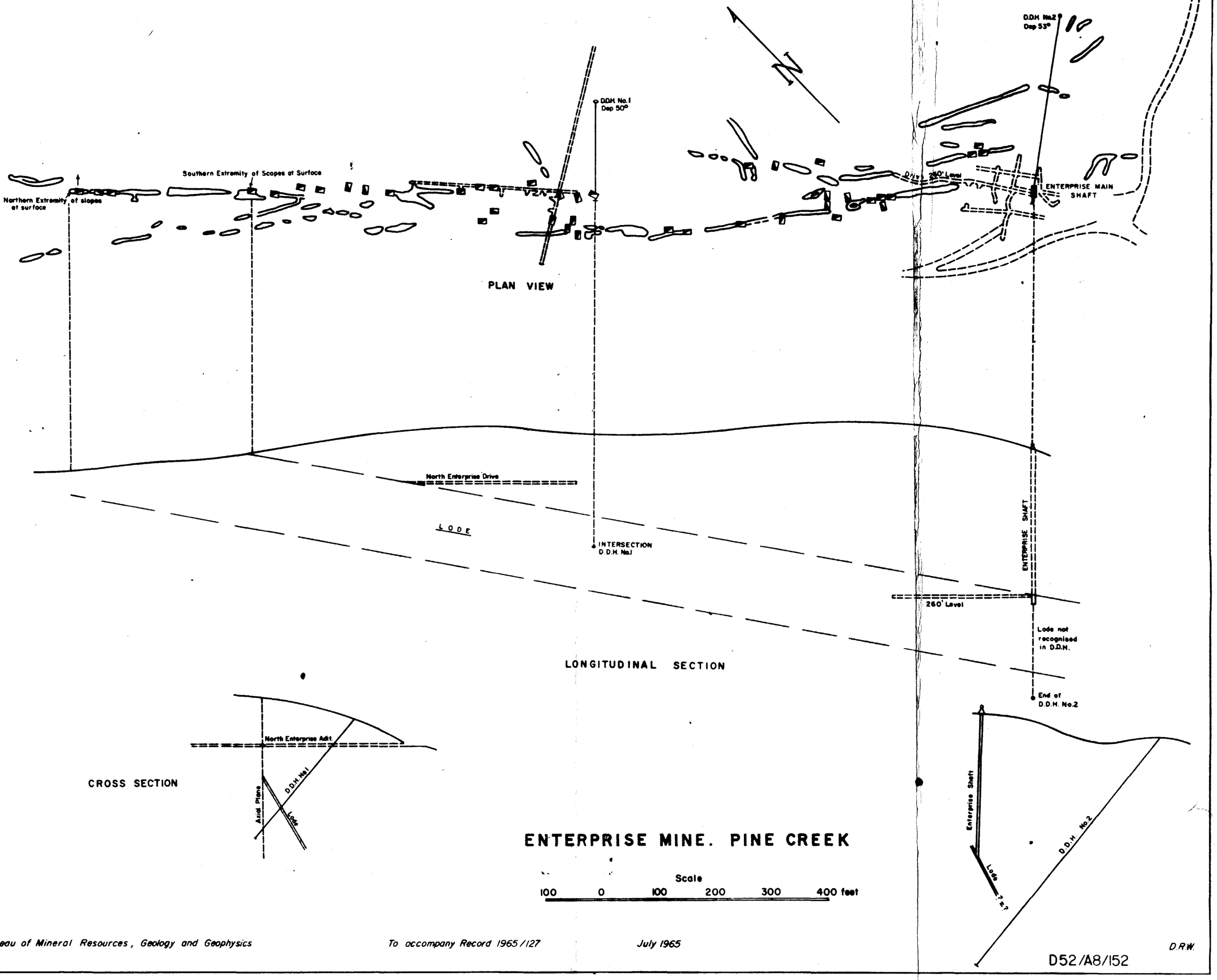
These surface workings can be used to give a tentative picture of the configuration of the lode. The upper edge of the lode is taken as being the line connecting the southern extremity of the surface stopes with the point where the Enterprise shaft intersects the lode - south of the shaft the lode loses its typical characteristics. The lower edge of the lode is presumed to be parallel to the upper edge and is taken to pass through the bottom of the 40 ft. stopes at the northern extremity of the surface workings. This postulated configuration of the lode is shown on the map and sections.

Diamond drill hole No. 1 was designed to test the possibility of the lode being continuous between the 260 ft. level of the main shaft and the stopes at the surface some 1,500 ft. to the north. An intersection strongly mineralised lode material carrying 21.7 dwts. of gold per ton was obtained between 192'6" and 198'2" in this drill hole, and the continuity of the lode in this area may therefore be regarded as proved.

Diamond drill hole No. 2 was designed to test the downward extension of the main lode in the vicinity of the Enterprise shaft.

No significant values were obtained on samples from this hole, and it appears therefore that the lode extends for only a short distance below the 260-ft. level in this area.

PLATE 1



ENTERPRISE MINE. PINE CREEK

Scale

100 0 100 200 300 400 feet

Bureau of Mineral Resources, Geology and Geophysics *To accompany Record 1965/127* *July 1965*

D.R.W.

D52/A8/152

PINE CREEK. D.D.H. 1964/1

Collar: 90 feet south-west of North Enterprise Adit mouth.

Direction: 225°

Depression: 50° at collar.
49° at 180'.

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
0' - 10'	5' 0"	Cuttings and broken core. Mainly weathered shale and slate. Some reef quartz.
10' - 18'	3' 3"	Very broken core. Mainly weathered shale and slate.
18' - 19'	9"	Cuttings only. Fine sand with occasional small slate fragments.
19' - 20'	1' 0"	Broken core. Slate and fine-grained greywacke.
20' - 23'	9"	
23' - 27'	6"	Broken core, including some reef quartz.
	9"	Cuttings only. Fine-grained pale brown sand.
27' - 40'	9"	Broken core. Dominantly reef quartz with remnants of silicified slate.
	2' 0"	Cuttings only. Fine-grained greyish brown sand with small fragments of slate and reef quartz.
40' - 40' 6"	3"	Reef quartz.
40' 6" - 41'	3"	Reef quartz with numerous small limonite-coated cavities.
41' - 41' 6"	2"	Broken core. Reef quartz as above.
41' 6" - 63'	3"	Broken core. Reef quartz with occasional limonite-filled cavities.
	1' 0"	Cuttings only. Fine-grained greyish brown sand with small fragments of slate and reef quartz.
	2"	Broken core, mainly silicified slate and fine-grained greywacke.
	9"	Cuttings only. Fine-grained greyish brown sand as above.
	6"	Silicified slate and fine-grained greywacke with some reef quartz.
	3' 0"	Cuttings only. Fine-grained pale brown sand.
	6"	Reef quartz with occasional limonite-filled cavities.
63' - 67'	6"	Broken core. Mainly silicified fine-grained greywacke.

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
67' - 68'	9")	Very weathered fine-grained igneous rock with strong white efflorescence.
	9")	? lamprophyre.
	1"	Broken core, including some reef quartz.
	6"	Cuttings only. Fine-grained light grey sand, including a high proportion of angular quartz grains.
68' - 72' 6"	3"	Silicified slate and greywacke.
	3"	Cuttings only. Fine-grained reddish brown sand.
	9"	Broken core. Silicified slate and greywacke. Some small quartz veinlets.
72' 6"- 73'6"	1' 0")	Silicified slate and greywacke with minor quartz veins and some limonite-stained cavities. Some bands show spots (? incipient metacrysts) to 1/32" long.
73' 6"- 74' 6"	4")	
	8"	Vein quartz with traces of arsenopyrite.
74' 6"- 77'	2' 6"	Slate and greywacke as above. Bedding-core angle 65°. Some bands show metacrysts of ? chiastolite, up to $\frac{3}{4}$" long.
77' - 80' 4"	4' 0"	Slate and greywacke as above. One slate band contains pebbles of quartzite up to $\frac{3}{4}$" diameter. Pyrite as seams up to 1/32" wide and as disseminated specks in some greywacke bands. Bedding-core angle 70°-90°.
80' 4"- 82' 8"	2' 4"	Slate and greywacke as above. Some quartz veinlets, to $\frac{1}{4}$" wide, at high angles to core axis.
82' 8"- 85' 7"	3"	Broken core, including some reef quartz.
	2' 6"	Dark bluish-grey slate. One quartzite pebble, $1\frac{1}{2}$" diameter. Bedding-core angle 75°. Some jointing sub-parallel to core axis. One $\frac{1}{2}$" band carried about 20% disseminated pyrite.
	3"	Broken core, including some reef quartz.
85' 7"- 86' 4"	10"	Slate and fine-grained greywacke. Some bands with ? metacrysts to 1/16". Bedding-core angle 80°.
86' 4"- 89' 9"	1' 6"	Dark bluish-black slate.
	4"	Reef quartz, including $\frac{1}{2}$" laminated section, carrying 25% finely disseminated pyrite.
	1' 6"	Slate and fine-grained greywacke, including some bands with ? metacrysts to $\frac{1}{4}$". One quartz veinlet, $\frac{1}{8}$", at 25° to core axis.
89' 9"- 93' 8"	3' 0"	Slate and fine-grained greywacke, as above, Bedding-core angle 70°. Some irregular quartz veinlets to $\frac{1}{2}$"

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
	3"	Quartz with traces of disseminated pyrite.
	6"	Slate with small quartz veinlets.
93' 8" - 97' 1"	1"	Broken core. Altered slate.
	3' 3"	Dominantly slate. One band of fine-grained greywacke with ? metacrysts to ¼". Bedding-core angle 70°-75°. Occasional quartz veinlets to ¼".
97' 1" - 101' 3"	4' 0"	Slate and fine-grained greywacke as above. Bedding-core angle 65°-70°.
101' 3" - 105' 9"	3"	Broken core, including some reef quartz, with traces of pyrite and arsenopyrite.
	4' 3"	Slate and fine-grained greywacke. Some bands show ? chiastolite metacrysts to 3/16". Bedding-core angle 70°.
105' 9" - 107' 8"	2' 0"	Slate and greywacke as above. Numerous small shears.
107' 8" - 109' 1"	2"	Broken core. Mainly quartz and silicified slate.
	1' 3"	Slate and fine-grained greywacke.
109' 1" - 112'	1' 6"	Slate and fine-grained greywacke, as above. Rather weathered.
	1' 6"	Slate and fine-grained greywacke, strongly silicified and jointed. Some quartz veinlets to ½".
112' - 116'	3' 9"	Slate and fine-grained greywacke, in part with ? metacrysts to ¼". Some zones of contortion, shearing and minor quartz veining, with manganese staining on shear planes.
116' - 116' 6"	3"	Slate as above.
116' 6" - 118'	1' 6"	Slate as above. One 1" quartz veinlet at right angles to core axis.
118' - 120' 2"	2' 3"	Dark blue-grey slate. Two ½" quartz veins.
120' 2" - 120' 8"	5"	Slate and fine-grained greywacke. Bedding-core angle 90°. Numerous small quartz veins carrying up to 25% pyrite.
120' 8" - 120'10"	2"	Slate, greywacke and quartz as above.
120'10" - 121' 7"	9"	Slate, greywacke and quartz as above. One 2" quartz vein.
121' 7" - 125' 6"	1' 3"	Slate, greywacke and quartz as above. Most quartz veins less than ½", and carrying only small amounts of sulphides.
	2' 9"	Slate, greywacke and quartz as above. Quartz veins make up 25% of rock and carry up to 50% sulphides (mainly pyrite and subordinate chalcopyrite).

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
125' 6" - 127'	1' 6"	Slate, greywacke and quartz as above. Quartz veins progressively decrease in size and number and in contents of sulphides.
127' - 132'	2' 0"	Greyish blue slate with ? metacrysts to $\frac{1}{4}$".
	4"	Zone of minor shearing with some small quartz veinlets.
	2' 3"	Slate and fine-grained greywacke.
132' - 133' 4"	1' 6"	Slate and greywacke. Some bands of medium-grained quartz greywacke, to 2" thick, show graded bedding. Bedding-core angle 65°. Some jointing sub-parallel to axis of core.
133' 4" - 134' 9"	1' 0"	Slate and greywacke, in part with numerous small quartz veinlets. Occasional veinlets to $\frac{3}{4}$" wide.
134' 9" - 135' 3"	5"	
135' 3" - 136' 9"	1' 0"	
136' 9" - 138'	1' 3"	
138' - 139' 6"	1' 3"	
139' 6" - 140' 5"	9"	
140' 5" - 141' 5"	1' 0"	Fine to medium-grained quartz greywacke.
141' 5" - 142' 5"	1' 0"	
142' 5" - 144' 5"	1' 9"	Quartz greywacke with traces of disseminated pyrite and arsenopyrite. One 1" quartz vein at 60° to core axis.
144' 5" - 145' 4"	1' 0"	
145' 4" - 145' 6"	1"	
145' 6" - 146'10"	1' 0"	Greywacke as above. One 1" quartz vein.
146'10" - 148' 8"	9"	
	3"	Slate with small ? metacrysts.
148' 8" - 151'	2' 6"	Slate and greywacke. Bedding-core angle 65°. One 1" quartz vein at 70° to core axis.
151' - 154' 9"	3' 6"	Slate and greywacke as above. Several small quartz veinlets, to $\frac{1}{4}$" wide.
154' 9" - 159' 2"	1' 0"	Slate and greywacke as above. Bedding-core angle 50°.
159' 2" - 160' 4"	6"	Broken core, including quartz vein at least $1\frac{1}{2}$" wide.
160' 4" - 161' 3"	9"	Broken core. Slate and greywacke.
161' 3" - 161'11"	6"	
161'11" - 162' 6"	6"	Slate and greywacke.
162' 6" - 162' 8"	2"	
162' 8" - 163' 0"	6"	

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
163' 6" - 165' 2"	1' 6"	Slate and grey wacke. Bedding-core angle 60°. Several quartz veinlets to ½" wide.
165' 2" - 166' 6"	4"	
	2"	Quartz vein at 70° to core axis. Minor pyrite and arsenopyrite.
	6"	Slate and greywacke.
166' 6" - 168' 6"	4"	Broken core. Fine-grained quartz greywacke.
168' 6" - 172'	4"	Slate and greywacke.
	10"	Slate and greywacke with up to 50% of quartz veins. Veins carry subordinate biotite and up to 50% sulphides, mainly pyrite, arsenopyrite and subordinate chalcopyrite.
	1' 9"	Slate and greywacke with numerous small quartz-sulphide veinlets, up to ¾" wide.
172' - 173' 4"	1' 0"	Slate and greywacke, impregnated with up to 15% of disseminated pyrite. Minor quartz veinlets.
173' 4" - 177'	1"	Broken core. Weathered ferruginous slate.
	1' 0"	Silicified slate and greywacke, carrying up to 10% disseminated pyrite and arsenopyrite. Some sections contain numerous small quartz-sulphide veins, up to ¾" wide.
177' - 177' 7"	3"	
177' 7" - 179' 3"	1' 3"	
179' 3" - 187' 6"	2' 6"	Slate and fine-grained greywacke with disseminated pyrite, arsenopyrite and minor chalcopyrite.
	5' 6"	Vein quartz, carrying 2% to 5% of pyrite and arsenopyrite.
187' 6" - 189' 6"	8"	
	1' 0"	Silicified slate and greywacke with minor quartz veinlets and blebs of pyrite and arsenopyrite.
189' 6" - 190' 7"	6"	Slate, greywacke and quartz as above. Sulphides include minor chalcopyrite. Two largest quartz veins have widths of 2" and 3".
190' 7" - 193' 6"	2' 0"	
	1' 0"	Vein quartz with 10% to 20% of sulphides, comprising pyrite, arsenopyrite and minor chalcopyrite.
193' 6" - 193' 9"	2"	
193' 9" - 194' 1"	5"	
194' 1" - 195'	1' 0"	Vein quartz. Rather less sulphides than above (estimated 2%)
195' - 195' 6"	2"	
195' 6" - 197'	1' 9"	Vein quartz. Some blebs of massive sulphides (pyrite, arsenopyrite and minor chalcopyrite), up to 1" diameter.
197' - 198' 2"	1' 2"	Quartz as above. Some irregular inclusions of silicified slate, to 2" diameter.

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
198' 2" - 203'	1' 6"	Slate and greywacke, carrying 2% to 5% of pyrite and arsenopyrite as small blebs and disseminated grains.
	6"	Vein quartz, carrying about 20% of sulphides, dominantly pyrite.
	1' 6"	Fine to medium-grained quartz greywacke with disseminated pyrite and arsenopyrite. Several quartz veinlets to $\frac{1}{2}$" wide.
203' - 208'	5' 0"	Quartz greywacke as above. Quartz veinlets to 1" wide, but with only minor sulphides.
208' - 213' 6"	2"	Quartz greywacke.
	6"	Vein quartz with blebs of sulphides, dominantly pyrite, up to $\frac{3}{4}$" in diameter.
213' 6" - 216'	4' 9")) 6")	Quartz greywacke with about 2% disseminated pyrite and arsenopyrite. Quartz veinlets to 2" wide, but with only minor sulphides.
	1' 6"	Quartz greywacke, including some bands with ? metacrysts to $\frac{1}{4}$". Bedding-core angle 60°.
	$1\frac{1}{2}$"	Vein quartz, carrying about 30% of sulphides, dominantly pyrite.
216' - 220' 6"	4' 0"	Greywacke and slate. Some bands with ? metacrysts to $\frac{1}{4}$". Bedding-core angle 60°.
	3"	Greywacke as above. 1" quartz vein, carrying about 30% sulphides, dominantly pyrite, sub-parallel to axis of core.
220' 6" - 223'	3"	Vein quartz, carrying about 30% sulphides, dominantly pyrite.
	1' 0"	Greywacke and slate, in part with small ? metacrysts. Traces of disseminated pyrite and arsenopyrite. A few quartz veinlets to $\frac{1}{4}$" wide.
	6"	Vein quartz. About 30% pyrite and arsenopyrite.
	9"	Greywacke and slate. Some quartz veinlets to $\frac{1}{4}$".
223' - 225'	6"	Greywacke. One quartz vein, 1" wide. Some pyrite on joint planes.
225' - 226' 3"	1' 0"	Greywacke. Quartz veinlets to $\frac{1}{2}$".
226' 3" - 227' 6"	4"	Broken core. Greywacke, slate and minor reef quartz.
227' 6" - 230'	2' 3"	Greywacke and slate. Quartz veins to $\frac{3}{4}$" wide carrying up to 10% sulphides, dominantly pyrite.

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
230' - 235' 8"	4' 6")	Greywacke and slate, including some bands with ? metacrysts to $\frac{1}{8}$". Bedding-core angle 65°. Rare quartz veins, to $\frac{1}{4}$" wide, low in sulphides.
235' 8" - 237' 8"	1' 0")	Prominent set of joints sub-parallel to core axis
237' 8" - 239'	9"	Vein quartz with inclusions of partially replaced slate, but only traces of sulphides, dominantly pyrite.
	6")	Fine-grained greywacke. One 1" quartz vein with about 3% pyrite.
239' - 241'	1' 6")	
241' - 242'8"	1' 6")	Slate and fine-grained greywacke. Bedding-core angle 60° - 75°.
242' 8" - 244'	1' 0")	
244' - 249'	5' 0"	Slate and fine-grained greywacke, in part with ? metacrysts to $\frac{1}{8}$" diameter. Several quartz veins, to 2" wide, in part with subordinate blebs of sulphides, dominantly pyrite.
249' - 250' 1"	9"	Slate and greywacke as above. One quartz vein, $1\frac{1}{2}$" wide.
250' 1" - 251' 4"	1' 0"	Slate and greywacke. Bedding-core angle 75°.
251' 4" - 253' 9"	2' 0"	Slate and greywacke as above. One quartz vein, 2" wide. Narrow coatings of sulphides, dominantly pyrite, on some joint planes.
253' 9" - 256'	1' 6"	Slate and greywacke as above. One $\frac{1}{2}$" quartz vein.
256' - 257'	9"	Slate and greywacke as above.
	1"	Vein quartz.
257' - 258' 6"	1' 2"	Vein quartz with remnants of partly replaced slate, but only minor amounts of sulphides.
	6"	Slate and greywacke with quartz veins to $\frac{1}{2}$" wide.
258' 6" - 261'	1' 9"	Slate and greywacke as above.
261' - 267'	3' 0"	Slate and greywacke, including some bands with ? metacrysts to $\frac{1}{8}$" long. Poorly defined structures, ? bedding, at 35° to core axis near beginning of interval, at 65° to axis near end. One quartz vein 1" wide.
267' - 271' 6"	2' 0"	Slate and grey wacke, as above, Rather broken core. A few quartz veins, to 1" wide.

ASSAY RESULTS

MINES BRANCH D.D.H. 1964/1.
ENTERPRISE MINE, PINE CREEK

INTERVAL	SAMPLE NO.	GOLD. dwts/ton	COPPER %
40' - 42'	145801	2.0	
62' 6" - 63'	145802	5.2	
72' 6" - 73'10"	145803	0.8	
73'10" - 74' 6"	145804	0.7	
87'10" - 88' 2"	145805	0.9	
92' 9" - 93'	145806	1.4	
101' 3" - 101' 6"	145807	0.8	
120' 2" - 122'10"	145808	1.4	
122'10" - 127'	145809	3.9	
129' - 129' 4"	145810	Trace	0.1
168'10" - 170'	145811	1.0	0.05
170' - 172'	145812	Trace	
172' - 173' 4"	145813	0.2	
173' 5" - 179' 3"	145814	Trace	
179' 3" - 181' 9"	145815	Trace	0.15
181' 9" - 188' 3"	145816	1.2	
188' 3" - 192' 6"	145817	1.1	0.05
192' 6" - 198' 2"	145818	21.7	0.15
198' 2" - 203'	145819	0.7	
203' - 208'	145820	0.5	
208' - 213' 6"	145821	0.5	
213' 6" - 216'	145822	0.6	
216' - 220' 3"	145823	0.4	
220' 3" - 225'	145824	5.4	
225' - 230'	145825	1.9	
237' 8" - 238' 6"	145826	0.8	
256'11" - 258' 6"	145827	0.5	

ooOoo

PINE CREEK, D.D.H. 1964/2

Collar: 311 feet north-east of Enterprise shaft.

Direction: 233°

Depression: 53° at collar.
51° at 200 feet.
50.2° at 400 feet
48° at 500 feet.

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
5' - 11'	2' 0"	0'-9' - Broken fragments of massive, brick red siltstone, containing a few small quartz veins up to 1" in width.
11' - 13'	1' 0"	9'-15'9" - Massive greywacke, generally pallid but red brown in patches. A few small quartz veins with some ferruginous gashes leading off the quartz.
13' - 15'	½"	
15' - 16'	8"	15'9"-16' - Quartz and ferruginous greywacke fragments.
16' - 17' 3"	8"	16'-21' - Massive greywacke with some non-ferruginous quartz veins.
17' 3" - 18' 7"	1' 9"	
18' 7" - 20' 3"	1' 8"	
20' 3" - 21' 9"	1' 3"	
21' 9" - 24'	1' 0"	21'-32' - Highly sheared, bleached phyllites, with a few greywacke beds which were generally more resistant to mechanical deformation.
24' - 25'	8"	
25' - 29' 3"	3' 3"	
29' 3" - 32'	1' 3"	
32' - 34' 3"	3"	32'-41'3" - Angular fragments of phyllitic hornfels. A few thin quartz veins.
34' 3" - 36' 3"	1' 3"	
36' 3" - 41' 3"	1' 8"	
41' 3" - 47'	6"	41'3"-48'6" - Small, sub-rounded quartz and phyllitic hornfels fragments.
47' - 48'	4"	
48' - 49' 6"	1' 3"	48'6"-51' - Sheared phyllite with fragmentary quartz veins and ferruginous blebs.
49' 6" - 53' 6"	1' 0"	
53' 6" - 56'	9"	51'-59' - Massive greywacke which has been sheared in a few places.
56' - 57'	1' 3"	
57' - 59' 9"	1' 9"	
59' 9" - 61' 9"	1' 3"	59'-59'6" - Highly sheared, kaolinitic phyllite.
		59'6"-62' - Fragments of cellular hematite, quartz and some greywacke.
61' 9" - 71' 3"	1' 0"	62'-82' - Bleached, porous greywacke. Little evidence of mechanical deformation. A few small quartz veins.
71' 3" - 74' 5"	2' 0"	
74' 5" - 76'10"	10"	
76'10" - 82' 3"	2' 0"	
82' 3" - 91' 4"	11"	82'-91'4" - Sheared phyllite fragments with some quartz and greywacke. Not much ferruginous material.
		91'4"-93'9" - Bleached massive greywacke, fine- to medium-grained, with minor iron staning.

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
91' 4" - 93' 9"	1' 0"	93'9"-94' - Stained quartz fragments.
93' 9" - 97' 2"	9"	94'-106'6" - Massive greywacke with small quartz veins. Greywacke is generally bleached but
97' 2" - 106'	2' 3"	heavily stained adjacent to the quartz.
106' - 107' 6"	1' 0"	106'6"-108'6" - Sheared phyllite, both stained
107' 6" - 108' 6"	9"	and bleached. Minor quartz veining.
108' 6" - 109' 7"	1' 0"	108'6"-113' - Highly broken, fine-grained
109' 7" - 113'	1' 6"	greywacke, mottled white and dark brown.
113' - 121'	1' 0"	113'-126' - Highly leached greywacke fragments.
121' - 125'	1' 8"	Minor amounts of ferruginous material.
125' - 137' 3"	4' 0"	126'-131'3" - Bleached greywacke with a few small veins of quartz and iron-oxides. These veins intersect and offset each other. One of the veins contains appreciable amounts of chloritic material.
137' 3" - 141'	2' 0"	131'3"-141' - Fine-grained greywacke, irregularly bleached and stained.
141' - 148'	4' 8"	141'-144'8" - Bleached, porous phyllite, fine-grained greywacke and some stained quartz fragments.
		144'8"-148' - Massive, bleached porous greywacke with some quartz fragments, low in iron.
148' - 149'	9"	148'-156'5" - Bleached phyllite and greywacke with
149' - 156'5"	1' 6"	minor stained quartz.
156' 5" - 164' 6"	2' 9"	156' 5"-160' - Finely banded, dark brown argillite with fragments of bleached phyllite and quartz.
		160'-163' - Bleached phyllite fragments with a few thin quartz veins and associated staining.
		163'-164'6" - Sheared, porous phyllite fragments. Generally bleached but some chloritic remnants.
164' 6" - 167' 4"	10"	164'6"-171' - First unweathered rock. Dark green
167' 4" - 168'	6"	phyllitic hornfels, broken into small, angular
168' - 169'	9"	fragments. Occasional slickensides. A few quartz
169' - 170' 6"	1' 0"	fragments.
170' 6" - 171'	1' 0"	
171' - 171' 6"	6"	171'-171'6" - Massive greywacke.
171' 6" - 172' 9"	3"	171'6"-171'9" - Dark green phyllitic hornfels.
172' 9" - 173' 9"	1' 0"	171'9"-173' - Massive, fine-grained siliceous greywacke with some slickened surfaces.
173' 9" - 175'	1' 0"	173'-176'5" - Dark green phyllitic hornfels fragments
175' - 176' 5"	1' 3"	with some small quartz veins and pyrite.
176' 5" - 181'	3' 9"	176'5"-180' - Massive fine-grained greywacke with some phyllite lamellae.

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
181' - 185'	3' 0"	180'-183'6" - Phyllitic hornfels, with up to 1" thick seams of chloritic material containing rounded arsenopyrite (?) grains, Minor paint-pyrite along fracture planes. A few small quartz veins. 183'6"-185' - Massive quartz with first 6" mineralised by minor amounts of arsenopyrite and pyrite.
185' - 187'	2' 0"	185'-187'3" - Phyllitic hornfels with minor quartz.
187' - 189'	1' 9"	187'3"-187'6" - Porous, bleached phyllite.
189' - 190' 9"	1' 0"	187'6"-192' - Impure quartzite and siliceous phyllitic hornfels. Secondary chlorite along fractures contains small arsenopyrite grains.
190' 9" - 192' 9"	1' 9"	
192' 9" - 194'	1' 3"	192'-194'9" - Broken phyllite with minor seams of porous, bleached material containing scattered remnants of chlorite plates.
194' - 196'	1' 3"	194'9"-199'5" - Glassy argillite which has been slightly bleached. Remnants of chlorite in the rock, which is also chloritised along fracture planes.
196' - 198'	2' 0"	
198' - 199' 5"	1' 5"	
199' 5" - 202' 9"	9"	199'5"-218' - Predominantly glassy argillite. Rocks tend to be massive and break into angular fragments. A few siliceous and fine-grained greywacke variants interspersed in the sequence. Some examples of graded bedding amongst the greywackes. No mineralisation.
202' 9" - 206' 6"	3' 0"	
206' 6" - 207'	4"	
207' - 207' 3"	1"	
207' 3" - 209' 3"	1' 9"	
209' 3" - 210' 6"	1' 4"	
210' 6" - 211' 8"	1' 0"	
211' 8" - 212' 8"	7"	
212' 8" - 214' 3"	1' 3"	
214' 3" - 214' 6"	1"	
214' 6" - 215'	5"	
215' - 218'	3' 0"	
218' - 220'	1' 3"	218'-219' - Fine-grained impure quartzite. 219'-221'3" - Fine-grained hornfels with one ½" band containing disseminated sulphides.
220' - 223'	2' 0"	221'3"-222' - Fine-grained quartzite with about 5% disseminated pyrite. 222'-223' - Fragmented hornfels.
223' -227'	2' 0"	223'-227'6" - Spotted hornfels. Spots and blotches of darker coloured material tend to be confined to certain bands. The spots, however, indent the boundary of non-spotted bands.
227' - 230' 6"	2' 3"	227'6"-239'6" - Slightly banded hornfels. Spotted in places.
230' 6" - 232'	2"	
232' - 234'	1"	
234' - 236' 6"	1"	
236' 6" - 237' 9"	9"	
237' 9" - 240' 6"	1' 0"	

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
240' 6" - 242'	1' 0"	239'6"-241' - Quartzitic hornfels with small contorted fracture surfaces, some of which are filled with calcite.
242' - 243'	9"	241'-265'3" - Hornfels with minor pyrite along
243' - 244'	1' 0"	fractur planes and, less commonly, arsenopyrite
244' - 245' 8"	1' 0"	in small broken quartz bands. Spotted in places.
245' 8" - 247' 5"	1' 0"	Fracturing tends to be irregular.
247' 5" - 250'	2' 0"	
250' - 250' 6"	6"	
250' 6" - 254' 4"	3' 0"	
254' 4" - 256' 6"	2' 0"	
256' 6" - 262' 3"	3' 6"	
262' 3" - 265'	1' 9"	
265' - 265' 6"	3"	265'3"-265'6" - Granular pyrite-quartz rock. 60% pyrite. Slightly cavernous.
265' 6" - 267' 6"	1' 6"	265'6"-271' - Dark hornfels which tends to break
267' 6" - 269' 9"	1' 4"	into small angular fragments. Parting planes
269' 9" - 271'	1' 0"	contain both chloritic and opalescent white coatings.
271' - 273' 5"	2' 0"	271'-272' - Light coloured, rather glassy hornfels with black, oval spots up to $\frac{1}{4}$" long.
273' 5" - 278' 3"	4' 0"	272'-280' - Quartzitic hornfels with irregular fractures which have been partially recemented
278' 3" - 280' 3"	1' 7"	and in places filled with calcite. Minor, very faint mottling.
280' 3" - 281' 7"	9"	280'-284' - Irregularly brecciated hornfels, in
281' 7" - 284' 4"	2' 8"	places a crumbled chlorite-carbonate rock.
284' 4" - 286' 9"	1' 6"	284'-307' - Hornfels, dark green, irregularly
286' 9" - 288'	10"	fractured and broken into angular fragments.
288' - 289' 6"	1' 0"	Some sections of the core are paler, glassy
289' 6" - 290' 2"	9"	and spotted. Some small carbonate veins.
290' 2" - 292' 9"	2' 6"	
292' 9" - 298' 8"	3' 3"	
298' 8" - 300' 3"	1' 3"	
300' 3" - 301' 3"	1' 0"	
301' 3" - 302' 3"	9"	
302' 3" - 305'	9"	
305' - 305' 3"	2"	
305' 3" - 306' 3"	1' 0"	
306' 3" - 307' 6"	6"	
307' 6" - 309' 9"	3"	307'-314' - Brecciated hornfels, very chloritic,
309' 9" - 312' 9"	2' 0"	with some quartz blebs.
312' 9" - 314'	1' 3"	
314' - 315' 4"	1' 4"	314'-318' - Rather chloritic hornfels which has
315' 4" - 316' 4"	1' 0"	been heavily fractured. Minor pyrite on fracture
316' 4" - 317' 6"	1' 0"	planes.
317' 6" - 319' 3"	1' 6"	318'-318'9" - Spotted, light grey-green, glassy hornfels.
319' 3" - 320' 5"	6"	318'9"-321' - Hornfels, slightly broken, containing
320' 5" - 321' 5"	1' 0"	quartz and quartz-chlorite veins 1/16"-$\frac{1}{4}$" thick. Veins tend to have diffuse contacts.

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
321' 5" - 323' 9"	2' 0"	321'-326' - Hornfels with particularly hard, smooth fracture planes.
323' 9" - 324' 6"	9"	
324' 6" - 326'	1' 0"	
326' - 327' 9"	1'10"	326'-332'3" - Glassy hornfels with chloritic segregations in veins and in small specks.
327' 9" - 331' 9"	3' 0"	
331' 9" - 334' 8"	2'10"	332'3"-333'6" - Brecciated, glassy hornfels with unmineralised quartz veins and fragments.
334' 8" - 336' 4"	1' 0"	333'6"-341' - Highly fragmented, sheared and friable chloritic hornfels. Much of this appears to be fault gauge.
336' 4" - 339' 4"	2' 6"	
339' 4" - 340' 3"	10"	
340' 3" - 343' 4"	1' 4"	341'-361' - Quartz-filled brecciated chloritic hornfels rock. Pyrite blebs and stringers are erratically disseminated and comprise about 2% of the section. Minor chalcopyrite. Anhedral pink feldspar masses closely associated with sulphides. Some of the pyrite contains paper-thin seams of grey sulphide.
343' 4" - 345' 4"	1' 0"	
345' 4" - 349' 4"	2' 3"	
349' 4" - 352'	1' 9"	
352' - 354'	10"	
354' - 357'	1' 6"	
357' - 360'	1' 3"	
360' - 362'10"	1'10"	
362'10" - 364' 9"	1' 0"	361'-363' - Chloritic hornfels, somewhat sheared but cemented by chlorite. Minor quartz veins and schlieren.
364' 9" - 366' 6"	9"	363'-365'3" - Very white vein quartz with some chloritic veins. Only traces of pyrite.
366' 6" - 368' 6"	6"	365'3"-371' - Hornfels, rather fragmented, and veined by quartz. Some of the hornfels is fairly well ingrained by diffuse silicification and sulphide blebs and stringers. Sulphides comprise about 5% of the rock. Minor amounts of chalcopyrite disseminated throughout the section with a particularly impressive lacework of chalcopyrite at 370'; also a thin seam of galena.
368' 6" - 378' 6"	6' 0"	371'-372'6" - Cement.
		372'6"-379'6" - Quartz-chlorite (sheared, chloritised hornfels) breccia. 5% pyrite; one 6" piece of core almost pure pyrite. Disseminated chalcopyrite about ½%.
378' 6" - 383' 3"	1' 6"	379'6"-389' - Chlorite-quartz breccia, somewhat sheared. Sulphides comprise 2%, mainly pyrite with minor amounts of chalcopyrite.
383' 3" - 384' 8"	6"	
384' 8" - 390'	2' 6"	
390' - 396'	2' 6"	389'-415' - Quartz-chlorite breccia. A few pyrite blebs comprise about 1% of the rock. Rare specks of chalcopyrite.
396' - 398'	1' 0"	
398' - 400' 6"	9"	
400' 6" - 404' 6"	2' 0"	
404' 6" - 406' 6"	1' 4"	
406' 6" - 408'	6"	
408' - 409' 6"	10"	
409' 6" - 412'	1' 6"	
412' - 415'	1' 6"	
415' - 417'	1' 3"	415'-422'6" - Hornfelsic greywacke containing some quartzitic bands with gradational contacts.
417' - 418'	1' 0"	
418' - 418' 8"	8"	
418' 8" - 419' 8"	1' 0"	

INTERVAL	CORE RECOVERY	DESCRIPTION OF CORE
419' 8" - 420'10"	1' 2"	
420'10" - 422' 9"	1'11"	
422' 9" - 425' 3"	2' 6"	422'6"-429' - Small platy fragments of chloritic
425' 3" - 428' 1"	2'10"	material - sheared hornfels.
428' 1" - 429' 1"	1'	
429' 1" - 432'10"	3' 9"	429'-432'6" - Hornfelsic greywacke somewhat brecciated but cemented by chloritic material.
432'10" - 436' 4"	3' 6"	432'6"-435'8" - Brecciated chlorite.
		435'8"-436'4" - Brecciated impure quartzite with chloritic infilling and sulphide blebs. 5% pyrite with minor chalcopyrite.
436' 4" - 440' 8"	4' 4"	436'4"-445'6" - Hornfelsic greywacke, slight banding
440' 8" - 441' 3"	1' 7"	of mafic and leucocratic components.
441' 3" - 443'	1' 9"	
443' - 444' 3"	1' 3"	
444' 3" - 445' 6"	1' 3"	
445' 6" - 447'	1' 6"	445'6"-461'9" - Greywacke, coarser grained than above,
447' - 448'	1' 0"	with progressive increase in grain size towards 461'9".
448' - 451'	3' 0"	
451' - 456'	1' 2"	
456' - 460'	4"	
460' - 462'	2' 0"	
462' - 465'	3' 0"	461'9"-465' - Fine-grained greywacke.
465' - 470'	5' 0"	465'-470'6" - Medium-grained greywacke in places altered to a glassy rock in which original granularity has largely been destroyed.
470' - 472'	2' 0"	470'6"-474'9" - Spotted greywacke, sheared and changed
472' - 473'	1' 0"	to a rather glassy rock
473' - 474'	1' 0"	
474' - 478'	2' 7"	474'9"-484' - Fine-grained greywacke, only slightly
478' - 482'	4' 0"	sheared. Isolated groups of coarse spots developed.
482' - 484'	1' 9"	
484' - 488'	4' 0"	484'-491' - Fine-grained greywacke. Some small quartz
488' - 490'	2' 0"	veins (up to 2"), with minor pyrite mineralisation.
490' - 491' 2"	10"	
491' 2" - 492' 8"	1' 3"	491'-505' - Green-grey, rather glassy hornfelsic
492' 8" - 493' 6"	10"	argillite, with small, irregular fractures which are
493' 6" - 499' 5"	4' 9"	not readily visible but which still control the
499' 5" - 501' 3"	1' 6"	fracturing of the rock. The fractures have black or
501' 3" - 508' 2"	4' 0"	grey coatings.
		505'-505'9" - Quartz with angular chloritic inclusions. Minor pyrite.
508' 2" - 510'	6"	505'9"-510' - Rounded fragments of rather crumpled chloritic rock.

ASSAY RESULTS

D.D.H. 1964/2

ENTERPRISE MINE, PINE CREEK.

INTERVAL	GOLD Dwts/ton.
221' 3" - 222'	1.7
265' 3" - 265' 6"	1.4
341' - 345' 4"	1.9
345' 4" - 349' 4"	3.7
349' 4" - 354'	2.9
354' - 357' 4"	1.1
357' 4" - 361'	0.4
361' - 363'	0.3
363' - 365' 3"	Trace
365' 3" - 369'	1.1
369' - 371'	0.8
372' 6" - 374' 6"	1.1
374' 6" - 377'	0.8
377' - 379' 6"	0.3
379' 6" - 383' 3"	0.4
383'3" - 386'	0.6
386' - 389'	3.5
389' - 392' 6"	1.0
392' 6" - 396'	1.2
396' - 400' 6"	2.5
400' 6" - 406' 6"	1.2
406' 6" - 410'	2.7
410' - 415'	0.9
435' 8" - 436' 4"	3.9

Trace of silver in all samples.

AMETHYST OCCURRENCE
17 MILE QUARRY, DARWIN

by

P. Rix.

INTRODUCTION

An occurrence of amethyst was discovered by Mr. Jim Witte during quarrying operations at his Blue Metal Quarry, 17 miles south of Darwin. The locality was visited on 9th April, 1964.

GEOLOGY

The quarry, situated approximately 2½ miles west of the Stuart Highway, at the 17-mile, is sited on a low quartzite ridge. A zone of brecciated quartzite about 30 yards wide occupies most of the quarry. Near the centre of this zone a narrow band containing amethyst and smoky quartz with some morion was encountered. Hand specimens show that the amethyst occurs as veins having sharp contacts with quartzite and also as amethyst breccia, the matrix of which comprises fragments of quartzite, white quartz and white clayey material.

The quartzite breccia that forms most of the zone comprises quartzite and white quartz in a matrix of secondary silica. It seems that there have been repeated movements along the shear zone and the amethyst has been introduced subsequent to the main period of movement and has then been partially brecciated by a later one.

ECONOMICS

A price of 4/6d per ounce is obtainable for unfractured amethyst. The stone seen in this quarry was fractured, mainly by blasting, and may only yield small unfractured pieces. A small quantity of amethyst-bearing material had already been recovered from the quarry, but the likely extent of the amethyst-bearing zone is not known because at the time of the visit its outcrop was obscured by rubble.

INVESTIGATION OF A GALENA-BARITE OCCURRENCE AT DORISVALE CATTLE STATION, N.T.

by

J. Hays

INTRODUCTION

A reported lead occurrence on Dorisvale Cattle Station was examined on October 10th, 1961.

Dorisvale homestead is near the centre of the Fergusson River 4 mile area. Access is by the Stuart Highway for 16 miles southeast from Pine Creek and then southwest by graded road for 60 miles. The reported lead occurrence is about 10 miles west of the homestead and is reached by following the Wombungee track southeast for 8 miles from Dorisvale and then by following a tributary of Bradshaw Creek upstream for 8 miles.

GEOLOGY

Several parallel barite lodes crop out on the side of a hill that is capped by lateritized Cretaceous sandstone.

The sandstone appears to rest unconformably upon the lodes but the contact is obscured by scree. Fragments of siltstone and sandy limestone occur in the lodes which are brecciated. The country rock appears to be ferruginous sandstone of the Waterbag Formation in which lenses of limestone and siltstone are known.

The main lode, striking at 320°, can be followed continuously for 200 feet, and has a maximum thickness of 15 feet. Another outcrop of barite, 20 feet thick and 70 feet long occurs 300 feet north along the line of the main lode and may be an extension of it. The intervening ground is covered by scree.

A second lode, 200 feet long, crops out 20 feet east of the main lode, and extends 180 feet south of the most southerly outcrop of the main lode. Its maximum thickness is 12 feet.

A third lode, 20 feet wide and 70 feet long, crops out 90 feet west of the main lode.

Galena was observed at the southern end of the eastern lode.

RESERVES AND RECOMMENDATIONS

The outcrops are partly obscured by scree and the average width cannot be measured. If the observed thicknesses are typical, the estimated reserves of barite are between 500 and 1000 tons per vertical foot. As the deposit is 75 miles from the line of rail and then 170 miles by rail from Darwin, it is unlikely that production would be economic at current prices. Nevertheless, the deposit is potentially big enough to warrant further exploration should the price improve or should local development result in an improvement in transport facilities. The amount of galena in the barite is too small to warrant treatment.

COPPER PROSPECT, 10 MILES SOUTH OF PINE CREEK

by

P. W. Crohn

GEOLOGY

A small copper prospect about ten miles south of Pine Creek township was examined by P. Crohn and A. Vanderplank on June 2nd, 1964, at the request of Mr. Palmer of Pine Creek. The prospect is situated a quarter of a mile west of the railway line, three quarters of a mile south of the 155-mile peg, and can be reached by a bush track which leaves the Stuart Highway about twelve miles south of Pine Creek.

A quartz-filled shear, 36 inches wide, has been exposed in a pit about ten feet deep, and shows patchy malachite and ? cuprite mineralisation with some boxworks. This shear strikes at 300° magnetic, dips 60° to the south-west, and in the pit it forms the contact between indurated sedimentary rocks to the south-west and quartz-feldspar porphyry to the north-east. Another pit, about four feet deep, has been sunk on the same shear zone about forty feet to the north-west, but the width of the quartz-impregnated zone at this point is only about 24 inches, and the proportion of visible copper minerals is less. Another forty feet along the strike in both directions, the quartz-filled shear zone is again exposed at the surface, but only as networks of minor quartz veins and stringers in indurated sedimentary rocks, and not containing any visible copper minerals.

A chip sample taken across the full 36 inch width of the mineralised zone in the deeper pit was assayed at the Government Battery, Tennant Creek, and was found to contain 7.4% copper. The sample was also found to be weakly radioactive, but a check carried out in the Darwin laboratory of the Bureau of Mineral Resources showed that this radioactivity was essentially due to thorium minerals.

RECOMMENDATIONS

On present indications the presence of a mineralised shear zone with a maximum width of 36 inches has been established, and it appears that the deeper pit was sunk at the point where both the width of the zone and the intensity of mineralisation are at a maximum. If any further testing of the occurrence is to be carried out, it is recommended that the outcrop of the shear zone be continuously exposed for say 100 feet in both directions from the 10-foot pit, in order to reveal any other patches of relatively high-grade mineralisation. Over most of this distance, this will only involve stripping a few inches of soil and rubble. Also, the pit should be deepened to say 30 or 40 feet, provided that values persist, and drives put out along the shear zone from the bottom in order to establish the strike length of the payable shoot at that level.

However, it should be emphasised that even if widths and values can be shown to persist to a depth of say 40 feet over a strike length of say 50 feet, this will only result in establishing reserves of some 400 tons of secondary copper ore, so that major capital expenditure is not warranted at this stage.

RECENT PROSPECTING AT THE FORMER BRIDGE CREEK GOLD MINE, N.T.

by

J. Barclay

INTRODUCTION

The former Bridge Creek Gold Mine is reached from Darwin by way of the Stuart Highway to the 110 mile-post; thence by bush track northwards for a distance of 6 miles.

An Authority to Prospect, No. 1128, is held around the old mine by Mr. J. White, with whom Duval Holdings Pty. Ltd. has an agreement to prospect the lease.

The old workings and recent prospecting activities were examined on 23rd September, 1964, at the request of and in company with Mr. E. Underwood who is acting on behalf of Duval Holdings Pty. Ltd. After discussions at the site, it was decided to curtail the prospecting programme to one additional costean and to the sampling of all costeans and exposed quartz veins.

GEOLOGY

The former workings consist of numerous shallow open-cuts and costeans, some inaccessible underground mining and extensive alluvial diggings.

The main shaft, open-cuts and costeans are situated on a low, broad hill while the alluvial workings are in the low-lying ground to the north.

Siltstone of the Lower Proterozoic, Golden Dyke Formation crops out on the low hill and strikes 330° magnetic with a westerly dip of 60°. Mining on the hill was on several concordant quartz veins, concentrated over a width of about 50 feet. Strike lengths of the individual veins range up to about 300 feet and thicknesses up to 2 feet. Pyrite is fairly common in the quartz veins and there are rare occurrences of galena.

The depth and degree of weathering vary considerably. Near the group of quartz veins the siltstone retains clear evidence of bedding, probably through silicification, whereas in the costeans, and on the part of the hill where quartz veins are few, weathering has softened the siltstone and obliterated all trace of bedding.

RECENT PROSPECTING AND RECOMMENDATIONS

The work carried out by Duval Holdings Pty. Ltd., at the time of the inspection, consisted of 3 costeans, each about 100 feet long and up to 10 feet deep, put in by bulldozer at the foot of the hill on the northern side. Two of the costeans run approximately east-west where the northern extension of the group of quartz veins was expected. The third costean, trending north-west, was intended to intersect a north-easterly striking quartz vein occurring in one limb of a drag fold exposed in a shallow pit near the main shaft. This costean did not intersect any quartz veins, but four quartz veins were exposed in the first two costeans. These veins were up to 1 foot thick and one of them contained galena.

It was agreed that further prospecting should be restricted to 1) the sampling of the quartz veins exposed on the hill and in the costeans, and 2) the sampling of the walls of an east-west costean to be made in the alluvial area.