

TR17-17-24

3. Alluvial tin lease, Corduroy Creek.

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S.T. Kerrison of Scottsdale has a 4 hectare lease (102M/69) between Pioneer and South Mt Cameron, north of Corduroy Creek and east of the main road. The lease covers the bank rising north of the creek and includes a small area of permanent water in the south-east corner, part of an old dredged lagoon on Corduroy Creek. Subsequently Mr Kerrison has acquired a further 1.6 hectare lease adjacent to the southern boundary of lease 102M/69.

TEST PROGRAMMES

The area was tested successively by auger drill, back-hoe and percussion drill, and information from each programme was provided by the operators in the form of labelled freehand sketches based on the original auger drill hole survey. The 61 m (200 ft) contour crosses the lease in a NE-SW direction and collar-heights of the auger holes from the B.M.I. Mining Pty Ltd survey have been referred to this. The land rises gently to the north-west from water level at about 58 m in the south-east. The NE-SW diagonal of the lease coincides with a bank of moderate slope dividing a low area (about 61 m and below) in the south-east from a high terrace in the north-west at 67 m to 70 m. Even after prolonged relatively dry weather water seepage is evident on this slope.

Option over the lease by the B.M.I. company has lapsed but during their tenure Mono Pumps Pty Ltd was commissioned to sink twelve auger drill holes to bedrock. These were of wide but irregular distribution and ranged in depth from 3.5 m to 9.0 m, with one hole reputedly sunk to 24 m in 'kaolin', suggesting that extremely soft, weathered, granite bedrock was encountered (see table 1, fig. 3).

After B.M.I. relinquished the lease, Mr Kerrison employed a tractor with a back-hoe to sink fourteen pits, some of which reached 5.5 to 6.5 m below the surface (fig. 3). At the time of inspection most of these had filled with water to within 1.2 m of surface and some were overflowing. Information on pit sites provided by Mr Kerrison was compiled with information of the lithological sections and is given in Table 2. A diagrammatic representation of auger hole information has also been attempted and is presented in Figure 4. Three percussion drill holes were subsequently bored with a drill hired from the Storeys Creek Tin Mining Co. (Dorset Tin Division), Gladstone at the locations shown in Figure 3.

*Lithology from auger holes and pits*

Mr Kerrison's testing indicates that the tin content is poor throughout the soil and fine-wash overburden. A higher tin content is found in the shingle which auger drilling has indicated, forms a persistent bed 2.4 to 3.0 m in thickness below 56.3 m in the south-east quadrant of the lease. The lens of shingle rises and thickens from south to north (fig. 4).

In the central and northern areas of the lease the matrix of the shingle contains a greater proportion of clay, and the top of the shingle bed rises to about 64 m. No comments are recorded on the nature of the bottom in the auger holes. A number of anomalies appear which may reflect inadequate sampling or recording, or may indicate irregularities in the deposit. Hole 74 might strike shingle if continued. Hole 85 recorded no shingle while Pits 12 and 13, immediately to the south, located shingle with tin content of better than 300 g/m<sup>3</sup> before 3 m in depth. Pits 7, 9 and 10 all located shingle before 3 m in depth while Hole 80 records shingle only below 7.3 m

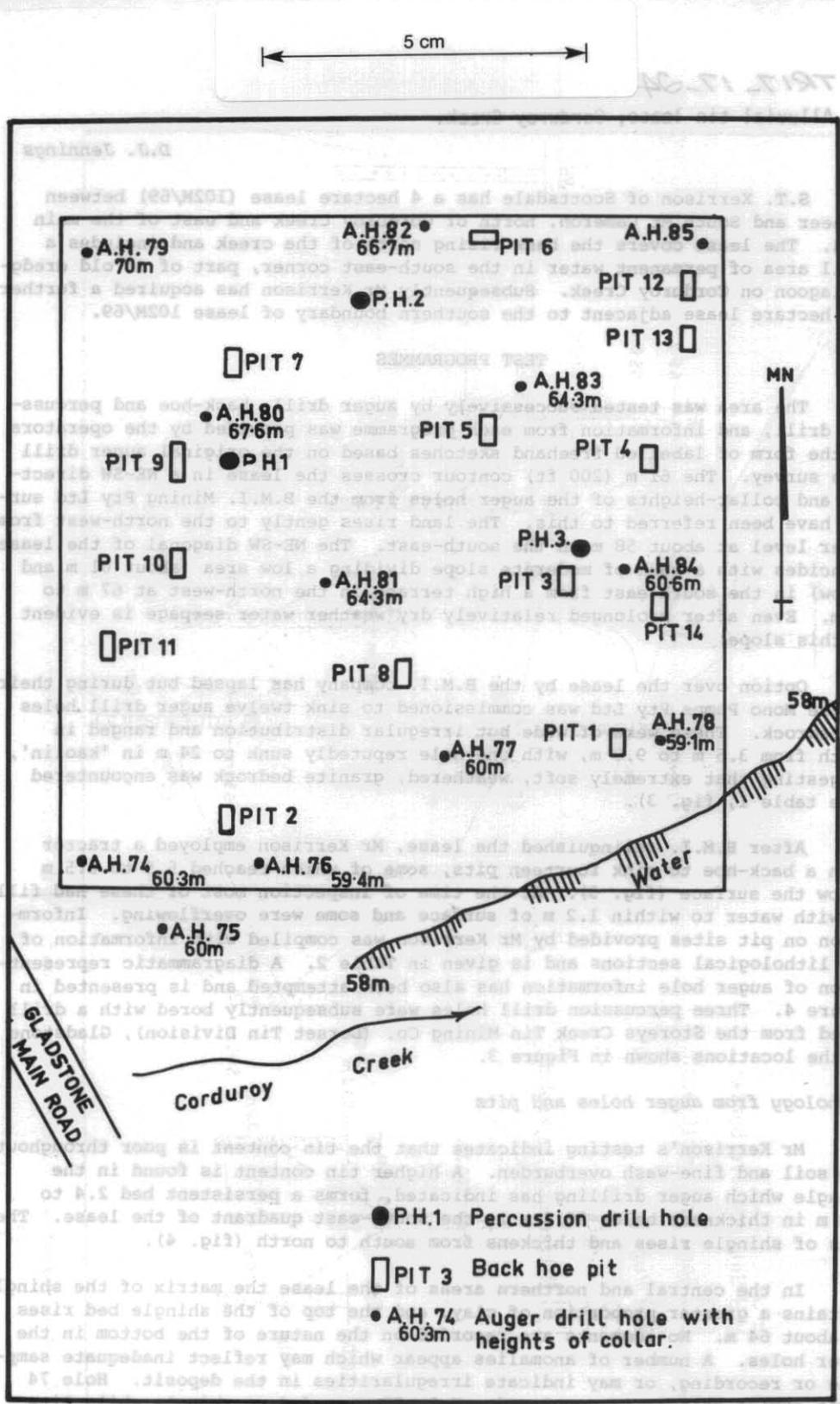


Figure 3. The position of drill holes and back-hoe pits, Corduroy Creek.

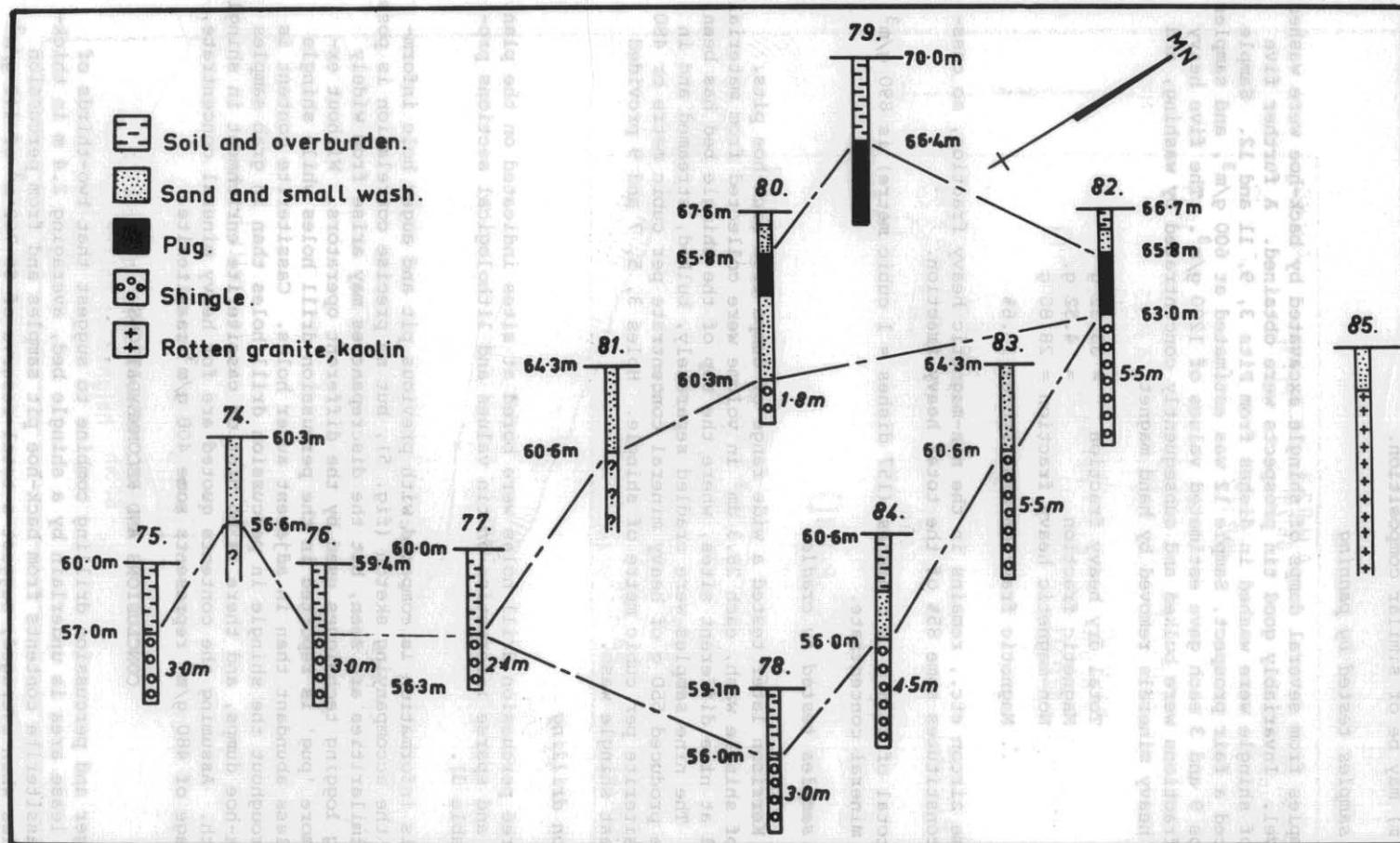


Figure 4. A comparative representation of auger hole sections, Corduroy Creek.

in depth. In this hole material recorded as gravel (3.6-7.3 m) and shingle (7.3-9.1 m) may be of similar composition.

#### *Back-hoe samples tested by panning*

Samples from several dumps of shingle excavated by back-hoe were washed on a shovel. Invariably good tin prospects were obtained. A further five samples of shingle were washed in dishes from Pits 3, 9, 11 and 12. Sample 11 produced a fair prospect, Sample 12 was estimated at  $600 \text{ g/m}^3$ , and samples from Dumps 9 and 3 each gave estimated values of  $1200 \text{ g/m}^3$ . The five heavy mineral fractions were bulked and subsequently concentrated by washing, and magnetic heavy minerals removed by hand magnet.

|                             |   |         |
|-----------------------------|---|---------|
| Total dry heavy fraction    | = | 33.32 g |
| Magnetic fraction           | = | 4.52 g  |
| Non-magnetic heavy fraction | = | 28.80 g |

∴ Magnetic fraction constitutes 13.6%

Some zircon etc., remains in the non-magnetic heavy fraction, so cassiterite constitutes some 85% of the total heavy fraction.

A total of 28.8 g in 5 dishes (157 dishes = 1 cubic metre) is  $890 \text{ g/m}^3$  of heavy mineral concentrate.

#### *Back-hoe samples tested by cradle*

Mr Kerrison later tested a wide range of dumps from back-hoe pits. Samples of shingle wash, each  $28.3 \text{ dm}^3$  in volume were collected from material excavated at nine different sites, where the top of the shingle bed has been located. The nine samples were cradled separately, bulked, streamed and in aggregate produced 550 g of heavy mineral concentrate per cubic metre or 480 g of cassiterite per cubic metre of shingle. Holes 3, 5, 7 and 9 provided the richest shingle wash.

#### *Percussion drilling*

Three percussion drill holes were bored at sites indicated on the plan, (fig. 3) and sparse information on tin values and lithological sections provided (table 3).

This information is compared with previous pit and auger hole information in the accompanying sketch (fig. 5), but no precise correlation is possible. Similarities are seen, but the discrepancies may arise from widely differing logging techniques used by the different operators. Without exception more 'pug' is reported in the percussion drill holes while shingle appears less abundant than in adjacent auger holes. Cassiterite content is lower throughout the shingle in percussion drill holes than in grab samples from back-hoe dumps, and there is no hint of cassiterite enrichment in shingle with depth. Assuming the contents quoted are for heavy mineral concentrate, the average of  $480 \text{ g/m}^3$  represents some  $400 \text{ g/m}^3$  cassiterite.

#### CONCLUSIONS AND RECOMMENDATIONS

Auger and percussion drilling combine to suggest that two-thirds of the 4 ha lease area is underlain by a shingle bed, averaging 2.4 m in thickness. Cassiterite contents from back-hoe pit samples and from percussion drill holes when averaged, suggest a total reserve of  $65\,762 \text{ m}^3$  of  $440 \text{ g/m}^3$  shingle, beneath about 3 m of overburden.

5 cm

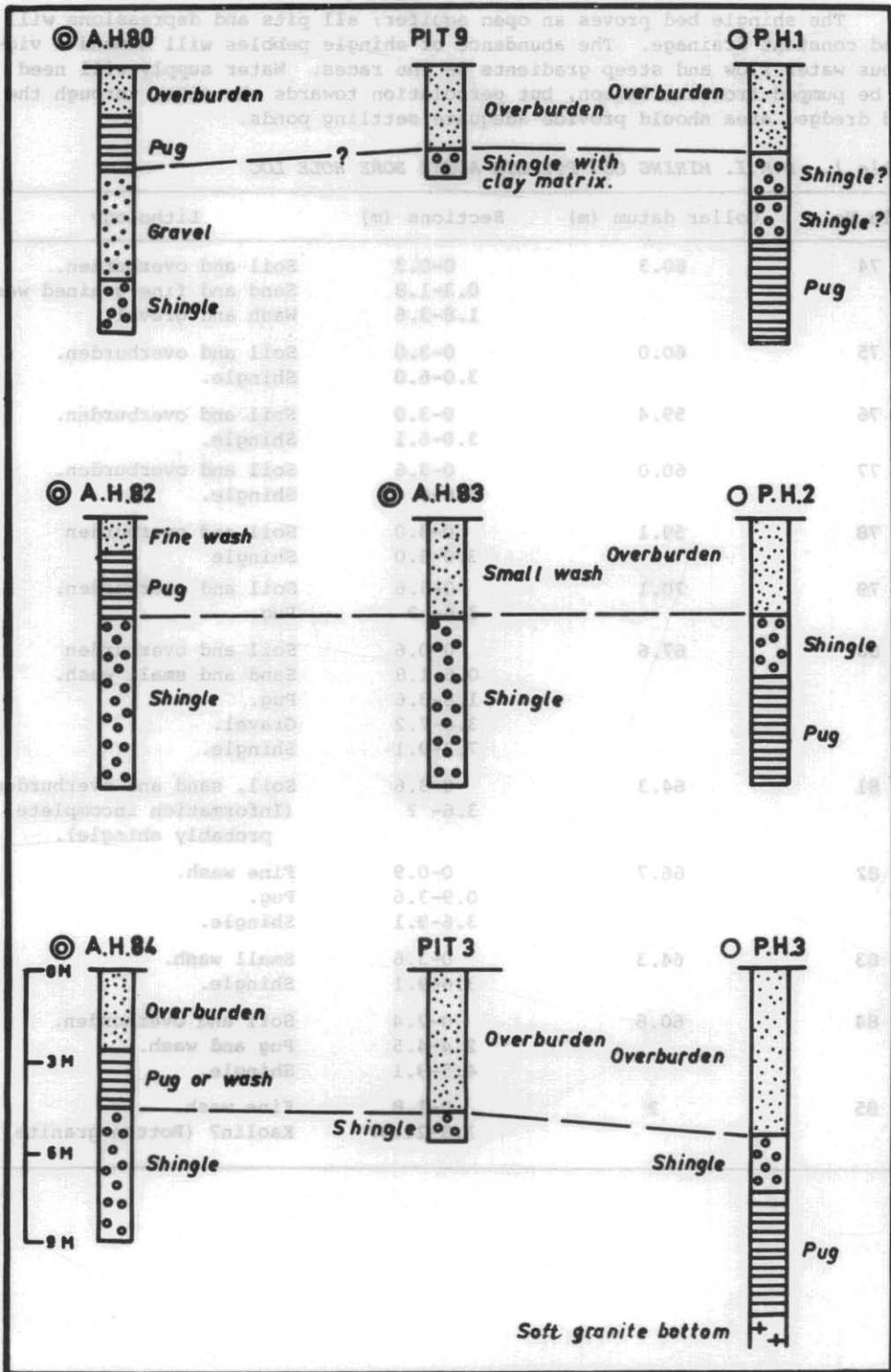


Figure 5. Comparative sections of auger holes, back-hoe pits and percussion drill holes, Corduroy Creek.

The shingle bed proves an open aquifer; all pits and depressions will need constant drainage. The abundance of shingle pebbles will demand a vigorous water flow and steep gradients in the races. Water supply will need to be pumped from the lagoon, but percolation towards the river through the old dredged area should provide adequate settling ponds.

Table 1. B.M.I. MINING CO. PTY LTD AUGER BORE HOLE LOG

| Hole No. | Collar datum (m) | Sections (m) | Lithology                                   |
|----------|------------------|--------------|---|
| 74       | 60.3             | 0-0.3        | Soil and overburden.                        |
|          |                  | 0.3-1.8      | Sand and fine-grained wash.                 |
|          |                  | 1.8-3.6      | Wash and gravel.                            |
| 75       | 60.0             | 0-3.0        | Soil and overburden.                        |
|          |                  | 3.0-6.0      | Shingle.                                    |
| 76       | 59.4             | 0-3.0        | Soil and overburden.                        |
|          |                  | 3.0-6.1      | Shingle.                                    |
| 77       | 60.0             | 0-3.6        | Soil and overburden.                        |
|          |                  | 3.6-6.0      | Shingle.                                    |
| 78       | 59.1             | 0-3.0        | Soil and overburden                         |
|          |                  | 3.0-6.0      | Shingle                                     |
| 79       | 70.1             | 0-3.6        | Soil and overburden.                        |
|          |                  | 3.6- ?       | Pug.  |
| 80       | 67.6             | 0-0.6        | Soil and overburden                         |
|          |                  | 0.6-1.8      | Sand and small wash.                        |
|          |                  | 1.8-3.6      | Pug.  |
|          |                  | 3.6-7.2      | Gravel.                                     |
|          |                  | 7.2-9.1      | Shingle.                                    |
| 81       | 64.3             | 0-3.6        | Soil, sand and overburden.                  |
|          |                  | 3.6- ?       | (Information incomplete, probably shingle). |
|          |                  |              |   |
| 82       | 66.7             | 0-0.9        | Fine wash.                                  |
|          |                  | 0.9-3.6      | Pug.  |
|          |                  | 3.6-9.1      | Shingle.                                    |
| 83       | 64.3             | 0-3.6        | Small wash.                                 |
|          |                  | 3.6-9.1      | Shingle.                                    |
| 84       | 60.6             | 0-2.4        | Soil and overburden.                        |
|          |                  | 2.4-4.5      | Pug and wash.                               |
|          |                  | 4.5-9.1      | Shingle.                                    |
| 85       | ?                | 0-1.8        | Fine wash.                                  |
|          |                  | 1.8-24.3?    | Kaolin? (Rotten granite)?                   |

Figure 5. Comparative sections of auger holes, back-hoe pits and percussion drill holes, Condamine Creek.

Table 2. S.T. KERRISON'S BACK-HOE PIT LOGS

| Pit No. | Depth (m)            | Sections (m) | Lithology   |
|---------|----------------------|--------------|---|
| 1       | 5.8 (unbottomed)     | 0-3.0        | Overburden.   |
|         |                      | 3.0-5.8      | Shingle.  |
| 2       | 4.5 (unbottomed)     | 0-3.6        | Overburden  |
|         |                      | 3.6-4.5      | Shingle.<br>(Good: est. 300 g/m <sup>3</sup><br>ground).                          |
| 3       | 5.8 (unbottomed)     | 0-4.8        | Overburden.   |
|         |                      | 4.8-5.8      | Shingle.<br>(Est. rich 1800 g/m <sup>3</sup><br>ground).                          |
| 4       | 6.4 (unbottomed)     | 0-6.4        | Overburden. (Clayey-quartz-grit, colour of tin only).                             |
| 5       | 3.6 (unbottomed)     | 0-1.8        | Overburden. Pug band dips north.  |
|         |                      | 1.8-3.6      | Shingle. (Good values).   |
| 6       | Shallow and infilled | -            | Hard pug at shallow depth.  |
| 7       | 3.6 (unbottomed)     | 0-3.0        | Overburden.   |
|         |                      | 3.0-3.6      | Shingle with clayey matrix.<br>(Good values).                                     |
| 8       | Shallow, abandoned   | 0-0.9        | Overburden.   |
|         |                      | 0.9-1.2      | Iron pan.   |
| 9       | 3.6 (unbottomed)     | 0-2.7        | Overburden.   |
|         |                      | 2.7-3.6      | Shingle with clayey matrix dips north. (Rich: est. 1800 g/m <sup>3</sup> ground). |
| 10      | 3.0 (unbottomed)     | 0-1.8        | Overburden.   |
|         |                      | 1.8-3.0      | Shingle. (Good values).   |
| 11      | 3.0 (unbottomed)     | 0-1.8        | Overburden.   |
|         |                      | 1.8-3.0      | Shingle. (Poor values).   |
| 12      | 3.0 (unbottomed)     | 0-2.7        | Overburden.   |
|         |                      | 2.7-3.0      | Shingle. (Good prospect).   |
| 13      | 3.0 (unbottomed)     | 0-2.7        | Overburden.   |
|         |                      | 2.7-3.0      | Shingle. (Good prospect).   |
| 14      | 3.0 (unbottomed)     | 0-2.7        | Overburden.   |
|         |                      | 2.7-3.0      | Shingle. (Good prospect).   |

Table 3. PERCUSSION DRILL HOLE LOGS.

| Hole No.         | Section (m) | Lithology                                     | Ref. No. |
|------------------|-------------|---|----------|
| 1<br>(W Central) | 0-3.0       | Overburden.                                   | 1        |
|                  | 3.0-4.5     | Assumed shingle 750 g/m <sup>3</sup> .        | 2        |
|                  | 4.5-6.0     | Assumed shingle 450 g/m <sup>3</sup> .        | 3        |
|                  | 6.0-9.7     | Pug.  | 4        |
| 2<br>(N Central) | 0-3.6       | Overburden.                                   | 1        |
|                  | 3.6-5.2     | Shingle and sandy wash 450 g/m <sup>3</sup> . | 2        |
|                  | 5.2-9.1     | Pug.  | 3        |
| 3<br>(SE)        | 0-5.8       | Overburden.                                   | 1        |
|                  | 5.8-7.6     | Shingle and fine wash 370 g/m <sup>3</sup> .  | 2        |
|                  | 7.6-11.5    | Pug, bottomed on rotten granite.              | 3        |
| 5                | 0-1.8       | Overburden.                                   | 1        |
| 6                | 1.8-3.6     | Shingle.                                      | 2        |
| 7                | 3.6-5.4     | Shingle with clayey matrix.                   | 3        |
| 8                | 5.4-9.1     | Shingle, shaly.                               | 4        |
| 9                | 9.1-12.8    | Shingle with clayey matrix.                   | 5        |
| 10               | 12.8-16.5   | Shingle.                                      | 6        |
| 11               | 16.5-19.2   | Shingle.                                      | 7        |
| 12               | 19.2-22.9   | Shingle.                                      | 8        |
| 13               | 22.9-26.6   | Shingle.                                      | 9        |
| 14               | 26.6-30.3   | Shingle.                                      | 10       |