

33. Results of drilling, Pipers River dam site 12A.

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Site 12A is located downstream of site 12 at an incised bend in Pipers River east of 'Leura' homestead (fig. 55). Eight bore holes were sited in an initial drilling programme to determine whether good foundation conditions existed at the site. Surface mapping revealed basalt soils, boulders and outcrop. However, experience elsewhere along the valley has shown that soil and boulder covered areas may conceal permeable sediments. Holes 1, 2 and 3 were drilled by the Department of Mines and holes 1A, 4, 5, 6 and 7 by James & Co. Holes 1 and 6 are located at TWL and hole 4 at river level.

SUMMARY OF DRILL LOGS

	Depth (m)	Recovery (%)	Log
Hole 1	0- 4.7	16	Basalt boulders and fragments.
	4.7- 6.1	100	Weathered basalt, 30 joints per metre. Limonitic weathering. Some scoria and breccia.
	6.1- 8.7	100	Cemented breccia and some scoriaceous amygdaloidal basalt.
	8.7-14.2	100	Massive unweathered basalt.
	14.2-16.1	100	Basalt, somewhat shattered (35 joints per metre, at 60-90° to core).
	16.1-25.4	100	Massive, amygdaloidal basalt.
Hole 2	0- 6.0	30	Basalt fragments, shattered and with slight iron oxide weathering. 30-50 joints per metre.
	6.0- 7.3	65	Slightly weathered basalt. Calcite sealed joints.
	7.3-10.7	55	Fractured, weathered basalt. 20 joints per metre.
	10.7-21.0	100	Massive basalt. Calcite-sealed joints. Significant weathering at 10.9 m (chlorophaeite) and 18.4 m.
	21.0-21.9	100	Slightly pumiceous cemented breccia.
	21.9-25.0	100	Pumice.
	25.0-28.5	100	Cemented breccia with scoria fragments.
Hole 3	0- 2.0	20	Fragmented basalt. Iron oxide weathering.
	2.0- 4.7	55	Fragmented basalt, 18-30 joints per metre. Iron oxide weathering.
	4.7- 5.3	100	Basalt, thick iron oxide weathering fillings.
	5.3- 7.1	100	Relatively fresh, massive basalt.
	7.1-12.9	100	Massive basalt, 5-10 joints per metre at 45-60° to core. Chlorophaeite in joints.
	12.9-22.9	100	Basalt, calcite and chlorophaeite in joints.
	22.9-25.4	37	Weathered basalt fragments.
Hole 4	0- 1.5	25	Soil.
	1.5- 4.2	100	Amygdaloidal, vesicular basalt. Limited weathering on joints.

Depth (m)	Recovery (%)	Log
4.2-12.3	100	Variably-grained basalt with filled amygdalites, 6 joints per metre.
12.3-19.3	100	Massive basalt. Very slight weathering on joints, with seals of calcite. Joints at 20°, 45° to core.
19.3-21.1	20	Weathered basalt and a derived brown clay.
21.1-25.1	90	White clay.
25.1-27.4	100	White clay. Traces of wood.
Hole 5 0- 5.0	90	Very weathered, reddish slightly brecciated basalt. Thick coatings of iron oxide on joints. Joints at 40-60° to core.
5.0- 6.1	50	Weathered basalt with kernels of fresh material.
6.1- 9.6	100	Massive basalt, generally vesicular with local pumice and scoria zones. Iron oxide on joints; 20 joints per metre, 0-60° to core.
9.5-15.8	100	Fresh, massive basalt with many incipient joints. Joints generally have chloritic coatings although a zone from 11.0-12.7 m has significant iron oxide weathering. Joints 40-60° to core generally although some are to 80°.
15.8-31.2	100	Fresh basalt with up to 100 incipient joints per metre. Shatter zone at 29.8 m.
Hole 6 0- 1.0	33	Soil.
1.0- 1.7	80	Very weathered basalt, 20 joints per per metre, normally at 50° to the core, oxide coated.
1.7- 5.5	100	Relatively fresh basalt with iron oxide weathering restricted to joints. Joints at 70-80° to core.
5.5-30.5	100	Very fine-grained, massive basalt with a large number of incipient joints. Weathering is very slight and only occurs on some joints. Most joints are 0°, 45-60° to the core.
Hole 7 0- 2.0	95	Stiff brown clay.
2.0-20.4	100	Fresh, massive, very fine-grained basalt with oxide and chloritic weathering. A major shatter zone is present at 11.6 m. Many joints at 60-90° to core.
Hole on spillway (1A)		
0- 1.7	80	Scoriaceous, amygdaloidal weathered basalt. 10 joints per metre at about 60° to the core.
1.7- 4.0	100	Joints at 30° to core with weathering restricted to joints. Deep weathering at 3.35 m.

Depth (m)	Recovery (%)	Log
4.0- 4.8	50	Very weathered basalt.
4.8- 5.8	50	Very weathered basalt. State of weathering is such that the material is very like a soil but does retain some of the original rock texture.
5.8- 7.1	50	Weathered rock with stiff brown clay.
7.1- 8.1	50	Deeply weathered basalt.
8.1-11.1	100	Fresh basalt, 15 joints per metre. Joints sealed with calcite at 30°, 60° to core. Large amygdales.

SUMMARY OF WATER PRESSURE TESTS

Hole 1. Apart from the upper weathering zone the only recorded water loss was 2 litres in 10 minutes at a pressure at 345 kPa between 9.6 and 14.0 m.

Hole 2. No recorded losses.

Hole 3. 50 litres loss between 5.2 and 11.3 m and 23 litres loss between 17.5 and 23.5 m.

Hole 4. Insignificant losses. Generally less than 2 litres in 5 minutes at heads of 275-550 kPa. See table of results provided by the drillers:

Depth (m)	Pressure (kPa)	Loss (litres)
6	275	18
	415	9
	550	2.3
9	275	2.3
	415	-
	550	-
13.5	275	2.3
	415	2.3
	550	-
Hole 5 6	275	73
	415	131
	550	86
9.6	275	90
	415	45
	550	27
12.6	275	23
	415	11.4
	550	6.8
15.7	275	18
	415	9
	550	2.3
18.7	275	27
	415	16
	550	6.8
21.8	275	14
	415	6.8
	550	6.8

Depth (m)	Pressure (kPa)	Loss (litres)	Depth (m)
24.9	275	6.8	4.8-4.8
	415	2.3	4.8-4.8
	550	4.5	
27.9	275	9	
	415	4.5	5.8-7.1
	550	2.3	7.1-8.1
28.2	275	6.8	8.1-11.1
	415	nil	
	550	2.3	
Hole 6 6	205	4.5	
	275	2.3	
	415	nil	
9	275	2.3	
	415	nil	
	550	nil	
12	275	2.3	
	415	nil	
	550	4.5	
15	275	nil	
	415	4.5	
	550	6.8?	
18	275	4.5	
	415	2.3	
	550	4.5	
21	275	2.3	
	415	nil	
	550	2.3	
24	275	nil	
	415	2.3	
	550	2.3	
27	275	4.5	
	415	4.5	
	550	nil	
30	275	2.3	
	415	nil	
	550	1.1	
Hole 7 6	275	4.5	
	415	2.3	
	550	2.3	
12	275	-	
	415	2.3	
	550	2.3	

CONCLUSIONS

Site 12A has been shown on foundation and water leakage considerations to be a feasible site for a large dam on Pipers River. No significant deficiencies have been noted and no further drilling is recommended on the dam foundation. However some additional shallow drilling is suggested north of hole 1A on the spillway to confirm the material and its suitability for rock-fill in the dam.

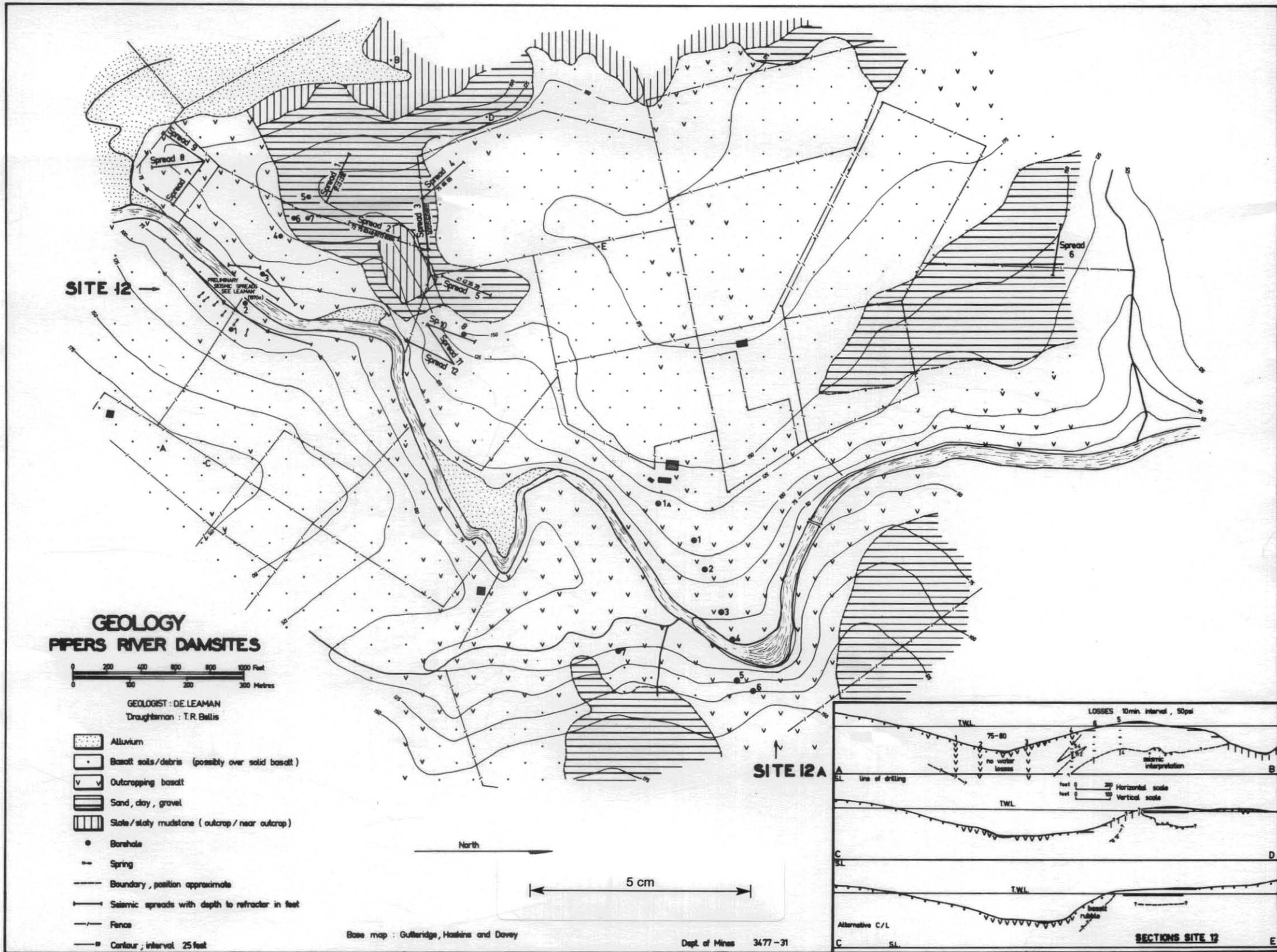


Figure 55.

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