

DEPARTMENT OF
MINERALS AND ENERGY



BUREAU OF MINERAL RESOURCES,
GEOLOGY AND GEOPHYSICS

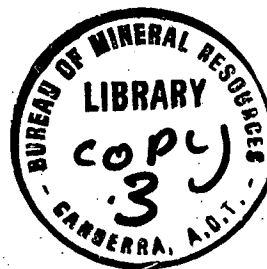
Record 1974/158

GEOLOGICAL INVESTIGATION FOR PROPOSED URBAN

DEVELOPMENT AT ISAACS, WODEN VALLEY, A.C.T.

by

G.A.M. Henderson



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GEOLOGICAL INVESTIGATION FOR PROPOSED URBAN
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SUMMARY

Soils augering in the proposed suburb of Isaacs, A.C.T., has proved extensive slopewash deposits underlying the area. Layers of grey clay within the slopewash have inhibited subsurface percolation of groundwater and caused some swampy areas which require remedial drainage. Excavation difficulties are expected to be minimal, but foundation problems could occur in the areas underlain by clay.

INTRODUCTION

In May 1972 the National Capital Development Commission (N.C.D.C.) requested the Bureau of Mineral Resources (BMR) to carry out a geological survey of the area of the proposed suburb of Isaacs (Fig. 1). A preliminary survey was followed in December 1972 by a program of soils augering to determine the thickness and composition of the soil and weathered rock, and obtain information on subsurface drainage; the augering contract was carried out by ARDEC. Seismic refraction traverses were made by BMR Engineering Geophysics Group (MacDowell, in prep.).

GEOLOGY AND GEOMORPHOLOGY

The suburb of Isaacs will mostly occupy the lower western slopes of the high ridge east of Long Gully; a small part in the south will be west of the gully. Boulders of fresh or slightly weathered massive dacite occur on the eastern margin of the area and on the steep upper slopes farther to the east. Slopewash has accumulated on the lower slopes in the area of the proposed urban development. The slopewash consists of sandy clay and clayey sand derived from the weathered dacite and in places is several metres thick. Clearing of natural eucalyptus forest in historical time has led to extensive gullying, which the planting of radiata pines in the early 1950s was designed to arrest. During an abnormally wet season in the early 1950s a small landslide occurred at the southern end of the area (Plate 1) and the scar is still plainly visible.

AUGERING RESULTS

The augering program comprised 14 undisturbed cored holes (total 107 m) and a further 11 holes that were not cored (total 46 m); disturbed samples were taken from the uncored holes. The locations of the holes are shown on Plate 1. The cored holes were drilled to a maximum depth of 9 m and the non-cored holes to 4.5 m. Logs of the cored holes are given in Appendix 1.

Most of the cored material consisted of slopewash ranging in composition from sandy clay to clayey sand. Layered variations in composition are evident and become more noticeable from east to west. A major variation from the usual composition of the material occurs in the form of layers of grey clay up to 2 m thick. The interpreted distribution of the grey clay is shown on Plate 1 and its position at depth is shown in three cross-sections (Plate 2).

GEOLOGICAL FACTORS IN DEVELOPMENT

Excavations

Excavations for roads and pipes will probably be in soil or slope-wash in all but the eastern margin of the area where some outcrops of dacite indicate that blasting may be necessary in a few places. The ease of excavation will probably vary between wet and dry seasons; some of the slopewash is cemented and could be hard to dig when dry.

Foundations

The strength of the slopewash should be adequate for foundations for structures with small unit loadings, but thorough site investigations for large structures such as multi-storied buildings will be necessary. The grey clay shows swelling characteristics and should be avoided if possible.

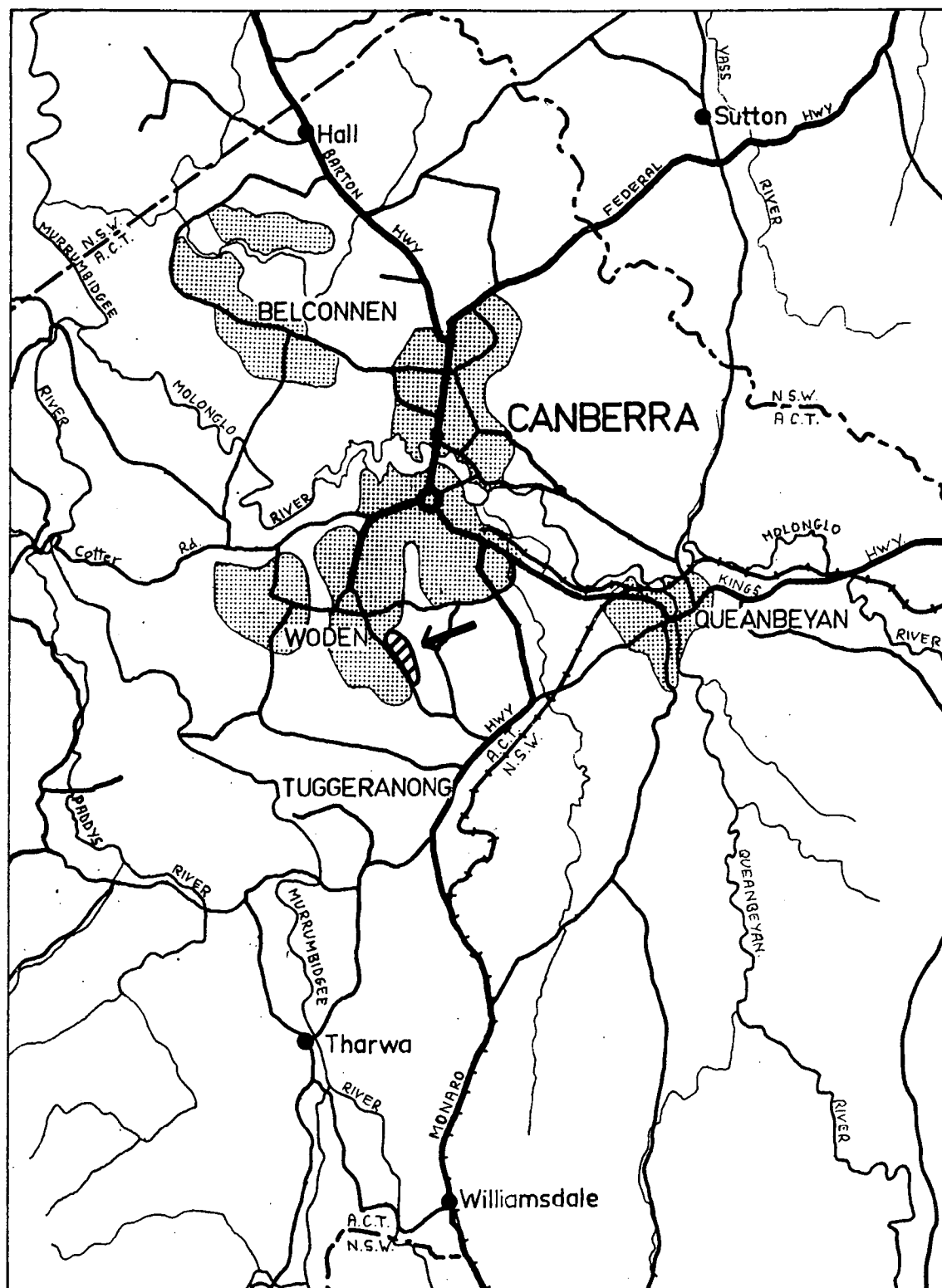
Drainage

Areas of poor drainage are found immediately east of Long Gully, mainly in the south of the area. A small poorly drained area between auger holes B9 and B10 has been artificially created by the placing of fill to the north. A larger poorly drained area occurs south of cross section line AB (Plate 1). Evidence of seepage was found a few metres south of auger hole A15.

The areas of poor drainage are related to the grey clay which was intersected in the auger holes. The grey clay is less permeable than the associated slopewash and inhibits percolation of groundwater and infiltration

ISAACS - LOCALITY MAP

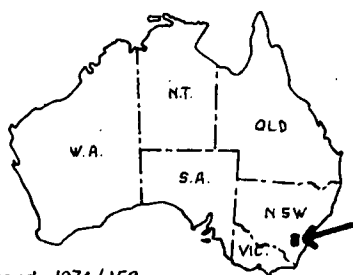
FIGURE 1



N

SCALE 1:250000

5 0 5 10 Km



- Built-up area
- Highway
- Secondary road
- Railway
- Territorial boundary

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of rain water from the surface.

A qualitative estimate of moisture content of the soil cores is given in the logs (Appendix 1). The augering was done during a dry period and after a dry season, so that the moisture content of the soil at the time was probably less than normal.

In discussions with N.C.D.C. before the augering was carried out a proposal was put by N.C.D.C. for a catch drain at the foot of the steep slope east of the area to be developed. A catch drain would improve drainage by diverting surface run-off. However, care should be taken in the design to prevent ponding of water in the catch drain, which could recharge perched sandy aquifers in the slopewash and thereby increase seepage on the lower slopes below the drain. An efficient drainage system would also minimise the possibility of further small landslips such as that which occurred in the early 1950s.

REFERENCE

MACDOWELL, M. (in prep.) - Isaacs urban development seismic refraction survey, A.C.T. Bur. Miner. Resour. Aust. Rec. (unpubl.).

APPENDIX 1

GEOLOGICAL LOGS OF CORED AUGER-HOLES

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HOLE NO.

81

GEOLOGICAL LOG OF AUGER - HOLE

PROJECT Isaacs Geological Survey LOCATION Long Gully PlantationCO-ORDINATES S22050, E31400 (Stromlo Gr.) R.L. OF GROUND 676m (2218ft)

DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
	2" core		Grey - brown	Silt with organic matter	Dry	
	2'0"					
	3'0"		Grey - brown	Clayey silt		
1	4'6"		Orange - brown	Sandy clay		
	5'4"		Orange - grey	Sandy clay		
	6'0"		Mottled orange - grey	Sandy clay		
2	7'0"		Orange - grey	Fine sandy clay		
	8'0"		Mottled orange - grey	Fine sandy clay		
	9'5"		Orange	Sandy clay		
	10'5"		Grey - orange	Clay		
3	11'0"		Orange	Clayey sand		
	11'5"		Grey - brown	Sandy silt		
	11'5"		Very pale grey	Clay		
4	14'0"		Pale red - brown	Sandy silty clay	Slightly moist	
	16'0"					
5	17'8"		Mottled orange - grey	Sandy clay	Dry	
6						
				END OF HOLE 6.1 m		

GENERAL REMARKS

Poor recovery near bottom of hole owing to blockage of outer core-hole digger.

DATE LOGGED 7/12/72

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DRILL TYPE GemcoDRILLER J. HerriesDATE DRILLED 7/12/72LOGGED BY D. Barnes

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GEOLOGICAL LOG OF AUGER - HOLE

HOLE NO.

B2

PROJECT Isaacs Geological Survey LOCATION Long Gully PlantationCO-ORDINATES S21800, E31600 (Strombe Gr) R.L. OF GROUND 678m (2223 ft)

DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
	100					
	1'2"		Pale grey-brown	Sandy silt with organic matter	Dry	
1			Mottled orange-grey	Sandy clay		
	4'8"					
	5'8"		Grey-brown	Clay with grains of white feldspar	Moist	
2	6'8"		Orange	Sandy clay	Dry	
	7'4"		Mottled orange-grey	Sandy clay	Moist	
	8'4"		Mottled red-brown-grey	Clay		
3			Grey	Clay with grains of white feldspar		
	12'5"					
4	12'0"		Mottled orange-blue-grey	Clay		
	14'0"		Pale yellow-brown	Clay		
			Mottled orange-brown-grey	Clayey sand	Dry	
	15'3"					
5	16'0"		Mottled orange-grey	Clay	Moist	
	16'6"		Pale brown	Silty clay		
	17'4"		Orange-grey	Sand		
	18'3"		Mottled red-brown-grey	Sandy clay		
	19'4"		Grey	Sandy clay		
				END OF HOLE 5.9m		

GENERAL REMARKS

DRILL TYPE GemcoDRILLER J. HerriesDATE DRILLED 7/12/72LOGGED BY D. BarnesDATE LOGGED 7/12/72

Record 1974/158

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BUREAU OF MINERAL RESOURCES , GEOLOGY AND GEOPHYSICS
GEOLOGICAL LOG OF AUGER HOLE

HOLE NO.
B3

PROJECT Isaacs Geological Survey LOCATION Long Gully Plantation
 CO-ORDINATES S21550, E31850 (Stromlo Gr) R.L. OF GROUND 683m (2242 ft.)
 DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
1	2'0"		Pale pink-brown	Sandy silt	Dry	
	2'8"		Orange	Sandy clay		
	4'0"		Pink-orange	Sandy silt		
	4'6"		Mottled orange-grey	Sandy clay		
2	6'6"		Mottled orange-grey	Silty clay		
	8'8"		Mottled orange-white	Sandy silt	Slightly moist	
3	9'7"		Yellow-brown	Silty clay		
	12'10"		Mottled red-brown- pale grey	Sandy clay		
4	16'8"		Grey-brown	Clay with grains of white feldspar and nodules of ferruginous clay	Moist	
5	17'10"		Orange-brown	Sandy silt	Dry	
	19'4"		Mottled orange-grey	Sandy clay		
6	24'8"		Mottled brown-grey	Sandy silt with fragments of weathered dacite.	Moist	
7				END OF HOLE 7.5m		

GENERAL REMARKS

DRILL TYPE Gemco
 DRILLER J. Herries, ARDEC
 DATE DRILLED 8/12/72
 LOGGED BY D. Barnes

DATE LOGGED 8/12/72
 Record 1974/158

155/A16/1262

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

HOLE NO.

B4

GEOLOGICAL LOG OF AUGER-HOLE

PROJECT Isaacs Geological Survey LOCATION Long Gully PlantationCO-ORDINATES S21350, E32100 (Strangle Cr) R.L. OF GROUND 688m (2258ft.)

DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
	80 100					
	1'0"		Brown-grey	Sandy silt	Dry	
			Red-grey	Sandy silt		
1	4'2"		Mottled pink-grey brown	Sandy silt	Moist	
	4'8"		Pink-yellow	Sandy silt		
	5'2"		Brown	Silt		
	5'10"		Pale brown	Silt	Dry	
2	6'6"		Brown	Silt with fragments of dacite		
	7'8"		White-grey	Sandy clay		
			Grey-brown	Clay	Moist	
3	9'3"		Red-brown	Sandy clay	Dry	
			Orange-white-grey	Sandy silt		
4	13'4"		Mottled orange-grey	Sandy clay		
	15'0"		Mottled orange-pale brown	Sandy silt		
5	16'0"		Orange-brown	Sandy clay		
	16'6"					
	18'0"					
				END OF HOLE 5.5m		

GENERAL REMARKS

DRILL TYPE GemcoDRILLER J. HerriesDATE DRILLED 8/12/72LOGGED BY D. BarnesDATE LOGGED 8/12/72

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HOLE NO.
B5

HOLE NO.
B5

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
	100					
		0'11"	Dark grey	Silt	Dry	
		2'3"	White - grey	Sandy silt		
1		3'2"	Orange	Sandy clay		
2			Pale pink brown	Fine sandy silt		
		8'0"				
3		10'6"	White - pale brown	Sandy clay with fragments of weathered dacite.		
		12'0"	Mottled orange-grey	Sandy clayey silt		
4		13'2"	Red brown	Weathered dacite. Fragment of fresh rock at bottom.		
				END OF HOLE 4.15m		

155/A16/1264

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GEOLOGICAL LOG OF AUGER - HOLE

HOLE NO.

B6

PROJECT Isaacs Geological Survey LOCATION Long Gully PlantationCO-ORDINATES S19900, E30650 (Stramle Gr.) R.L. OF GROUND 662m (2171ft)

DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
	100					
			Pale grey	Fine-coarse sandy silt	Dry	
	1'8"					
	2'8"		Mottled orange-grey	Clayey fine sand		
1			Orange-brown	Fine sandy silt		
	6'0"					
2			White	Cemented sand		
	7'3"		Grey	Fine sandy clay		
	8'0"					
3			Mottled pale brown	Fine sandy silt		
	11'0"					
4			Brown	Fine sand		
	15'0"					
	16'0"		Mottled orange-grey	Medium to coarse sand		
5			Orange-grey	Sandy clay		
6						
	20'6"		Mottled orange-grey	Sandy clay		
	21'0"		Brown	Med. grained sand		
	21'5"					
7			Mottled orange-grey	Medium to coarse sand		
	24'10"					
	25'9"		Grey brown	Sandy silt		
8			Mottled orange-grey	Clayey sand	Moist	
	28'0"					
9			Orange-grey	Fine-coarse sandy clay		
	30'0"					
				END OF HOLE 9.15m		

GENERAL REMARKS

DRILL TYPE GemcoDRILLER J. HerriesDATE DRILLED 9/12/72LOGGED BY D. BarnesDATE LOGGED 11/12/72

Record 1974/158

155/A16/1265

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF AUGER-HOLE

HOLE NO.

B7

PROJECT Isaacs Geological Survey LOCATION Long Gully PlantationCO-ORDINATES S19850, E30950 (Stromberg) R.L. OF GROUND 667m (2188ft)

DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
	0'8"		Pale yellow-brown	Sandy silt	Dry	
	2'6"		Orange	Sandy clay	Sl. moist	
1	5'0"		Yellow-brown	Clayey silt	Dry	
2	7'6"		Pale brown-white	Sandy clay		
	9'8"		Green-brown	Clay	Moist	
3	10'8"		Mottled grey-brown	Coarse sandy silt	Dry	
	14'0"		Pale brown	Sandy silt		
4	15'8"		Orange-brown	Sandy silt		
	17'0"		Orange-grey	Sandy silt		
5	17'8"		Orange	Sandy silt		
	20'8"		Brown	Sandy silt		
	22'8"		Mottled grey-orange	Sandy silt		
7	24'8"		Pale brown	Sandy silt		
	25'4"		Mottled orange-grey	Sandy clay	Moist	
	27'8"		Mottled grey-brown	Sand	Dry	
8	30'5"		Mottled orange-grey	Sandy silt		
9			Pale brown-white	Sandy silt with pieces of fresh diatite.		
				END OF HOLE 9.2 m		

GENERAL REMARKS

DRILL TYPE GemcoDRILLER J HerriesDATE DRILLED 9/12/72LOGGED BY D BarnesDATE LOGGED 11/12/72

Record 1974/158

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

HOLE NO.

B8

GEOLOGICAL LOG OF AUGER-HOLE

PROJECT Isaacs Geological Survey LOCATION Long Gully PlantationCO-ORDINATES S19750, E31250 (Stromlo Gr) R.L. OF GROUND 675m (2215ft)

DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
	0'8"		Pale pink-brown	Sandy silt	Dry	
	2'5"		Pale yellow-brown	Sandy silt		
1			Orange-yellow	Sandy silt		
	6'0"				Sl. moist	
2	7'0"		Pale brown	Sandy clay (weath. boulder?)		
	8'0"		Yellow-brown	Sandy clay		
	8'6"		Pale brown	Sandy silt	Dry	
			Orange-yellow	Sandy clayey silt	Sl. moist	
3	10'0"				Dry	
	11'0"		Pale grey-brown	Sandy silt		
			Pale grey-orange	Sandy clay (weath. boulder?)		
4	13'4"				Dry	
			White-yellow	Sandy clay		
5	17'4"					
6			Mottled white-mauve	Sandy clay		
7						
8	21'2"					
				END OF HOLE 8.3m		

GENERAL REMARKS

DRILL TYPE GemcoDRILLER J. HerriesDATE DRILLED 8/12/72LOGGED BY D. BarnesDATE LOGGED 11/12/72

Record 1974/158

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BUREAU OF MINERAL RESOURCES , GEOLOGY AND GEOPHYSICS
GEOLOGICAL LOG OF AUGER - HOLE

HOLE NO.
B9

PROJECT Isaacs Geological Survey LOCATION Long Gully Plantation
 CO-ORDINATES S17200, E28900 (Stromlo Gr.) R.L. OF GROUND 635m (2083 ft.)
 DEPTH TO WATER TABLE 1.85m

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
	100					
			Grey	Orangic silt	Dry	
	1'3"		Brown	Fine to med. gr. sandy clay		
	2'0"		Brown	Sandy silt		
1	3'8"		Pale grey-brown	Fine sandy clay	Slightly moist	
			Brown-grey	Sandy silty clay	Moist	
2	6'2"		Grey-brown	Sand	Moist-wet	
	7'0"		Brown-grey	Fine sand		
	8'0"		Brown-grey	Fine sand		
	8'6"		Brown-grey	Fine sand	Wet	
	9'0"		Brown-grey	Fine sand	Moist-wet	
3	10'8"		Brown	Clay	Moist-wet	
			Grey	Clay		
4	12'10"		Brown	Sand and some clay		
	13'9"		Grey	Med. to fine gr. sand		
	14'3"		Grey	Med. to fine gr. clayey sand		
5	17'0"					
	19'0"					
6	20'0"		Grey	Clay	Moist-wet	
	20'8"		Grey	Medium gr. sand	Moist	
			Grey	Fine sandy clay		
	21'10"		Brown	Med. gr. sand	Moist-wet	
7			Mottled orange-grey	Sandy clay	Moist	
	26'0"					
8	27'0"		Grey	Silt	Wet	
			Orange-brown	Med. - coarse sand	Moist	
	28'6"		Brown	Sandy clay		
9	29'0"		Pink-brown	Sandy clay		
	31'0"					
				END OF HOLE 9.45 m		

GENERAL REMARKS

Lack of core recovery between 4.55 and 5.8m due to barrel not locking.

DATE LOGGED 11/12/72

Record 1974/158

DRILL TYPE Gemco

DRILLER J. Herries, ARDEC

DATE DRILLED 11/12/72

LOGGED BY D. Barnes

155/A16/1268

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

HOLE NO.

B10

GEOLOGICAL LOG OF AUGER-HOLE

PROJECT Isaacs Geological Survey LOCATION Long Gully PlantationCO-ORDINATES S17200, E 29200 (Stromlo Gr) R.L. OF GROUND 637m (2095 ft)

DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
	100					
		0'10"	Grey	Med. gr. sandy silt	Dry	
		2'4"	Pale grey	Fine sandy silt		
		3'0"	Mottled red - grey	Sandy clay		
1		4'0"	Pale brown	Sandy silt		
			Mottled orange - grey	Sandy clay		
2						
		8'0"	Grey - brown	Weathered dacite (boulder?)		
		8'6"	Mottled orange - grey	Sandy clay		
3						
		10'3"	Grey	Sandy silty clay		
		10'10"	Brown	Coarse gr. sandy clay		
		11'8"	Mottled orange - grey	Clayey sand	Moist	
		12'6"			Dry	
4			Grey	Sandy clay		
		16'0"				
5			Grey	Fine sandy silt		
		17'0"				
			Grey	Fine to coarse gr. sandy silt with pieces of slightly weathered dacite.		
6						
		22'0"				
				END OF HOLE 6.7m		

GENERAL REMARKS

DRILL TYPE GemcoDRILLER J. Herries, ARDECDATE DRILLED 11/9/72LOGGED BY D. BarnesDATE LOGGED 12/9/72

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF AUGER-HOLE

HOLE NO.

B11

PROJECT Lease Geological Survey LOCATION Long Gully PlantationCO-ORDINATES S17200, E29550 (Strombo G.) R.L. OF GROUND 644m (2114ft.)

DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
	0'6"		Brown	Fine to med. gr. sandy silt.	Dry	
	1'2"		Very pale grey	Coarse sandy silt.		
	2'0"		Mottled red-grey	Sandy clay		
	2'8"		Mottled orange-grey	Sandy clay		
1			Mottled brown-grey	Fine to coarse sandy silt.	Dry	
	5'6"					
2			Pale brown	Fine to med. gr. sandy silt.		
	6'9"					
3			Mottled orange-grey	Fine to med. gr. sandy silt.	Slightly moist	
4						
	14'0"					
			Mottled red-orange- grey	Coarse-med. gr. sandy silt.	Dry	
	16'0"					
5			Mottled orange- grey	Sandy clay		
	20'0"					
6					Dry	
			Pale grey	Sandy silt		
7						
	26'0"					
8			Pale brown	Sandy silt		
9						
	30'0"					
				END OF HOLE 9.15m		

GENERAL REMARKS

DRILL TYPE GemcoDRILLER J. HerriesDATE DRILLED 12/12/72LOGGED BY D. BarnesDATE LOGGED 12/12/72

BUREAU OF MINERAL RESOURCES , GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF AUGER - HOLE

HOLE NO.

B12

PROJECT Isaacs Geological Survey LOCATION Long Gully PlantationCO-ORDINATES S17150, E29850 (Stromlo Gr.) R.L. OF GROUND 653m (2143 ft.)

DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
1			Pale brown-grey	Fine to coarse gr. sandy silt.	Dry	
			Mottled orange-grey	Clayey coarse sand.		
			Grey	Fine to medium gr. sandy silt		
			Mottled pale orange-grey	Sandy silt		
			Grey	Silt		
2						
			Mottled grey-brown	Fine to coarse gr. sandy silt		
3						
4						
			Mottled brown-grey	Fine to med. gr. sandy silt		
5						
			Mottled yellow-orange- grey-brown	Sandy clay		
6						
			Mottled orange-brown	Sandy clay		
7						
			Grey-brown	Sandy clay with pieces of highly weathered dacite.		
8						
9						
				END OF HOLE 9.15 m.		

GENERAL REMARKS

DRILL TYPE GemcoDRILLER J. Herries, ARDECDATE DRILLED 12/12/72LOGGED BY D. BarnesDATE LOGGED 12/12/72

BUREAU OF MINERAL RESOURCES , GEOLOGY AND GEOPHYSICS
GEOLOGICAL LOG OF AUGER - HOLE

HOLE NO.
B13

PROJECT Isaacs Geological Survey LOCATION Long Gully Plantation

CO-ORDINATES S18500, E29850 (Stromlo Gr) R.L. OF GROUND 648 m (2125 ft.)

DEPTH TO WATER TABLE _____

DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY			
	100								
	0'6"		Pale grey	Fine to med. gr. sandy silt	Dry				
	5 cm (2") core		Mottled orange-brown	Sandy clay					
1	4'0"		Pale yellow-brown	Fine to coarse sandy silt					
	4'8"		Mottled orange-brown	Sandy clay					
	5'4"		Brown	Fine to med. gr. sandy clayey silt.					
2			Mottled orange-grey	Clayey med. gr. sand	Moist				
	8'0"				Dry				
	9'6"		Mottled orange-green-grey	Med. gr. sandy clay					
3	10'0"		Mauve	Fine gr. silty clay					
			Brown	Fine to coarse gr. sandy clay					
4	15'6"				Moist				
5			Mottled orange-grey	Sandy clay					
	18'0"								
	19'0"		Pale yellow-green	Clayey sand	Dry				
6			Mottled orange-brown-grey	Clayey fine to med. gr. sand					
7									
	26'0"								
				END OF HOLE 7.9 m					

GENERAL REMARKS

DRILL TYPE Gemco

DRILLER J. Herries, ARNEC

DATE DRILLED 13/12/72

LOGGED BY D. Barnes

DATE LOGGED 13/12/72

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF AUGER - HOLE

HOLE NO.

B14

PROJECT Isaacs Geological Survey LOCATION Long Gully PlantationCO-ORDINATES S18600, E29500 (Stromlo Gr) R.L. OF GROUND 643m (2108 ft)DEPTH TO WATER TABLE 4.3m

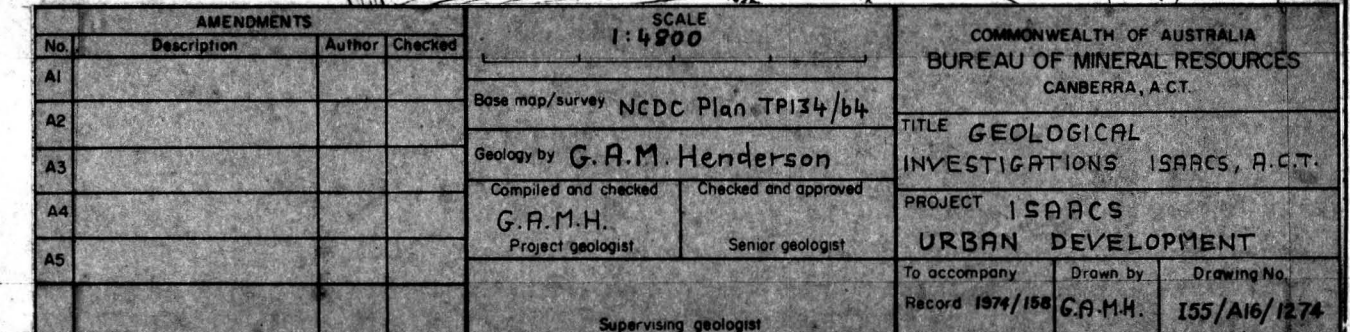
DEPTH (METRES)	% CORE RECOVERY	GRAPHIC LOG	COLOUR	DESCRIPTION	MOISTURE CONTENT	PLASTICITY
0.8"			Dark brown	Silt	Dry	
3.4"			Grey - green	Clay	Moist	
6.0"			Mottled orange- pink - grey	Sandy silt	Dry	
6.5"			Brown	Sandy silt		
8.0"			Pale brown - grey	Fine to med. gr. sandy silt		
11.8"			Grey - brown	Sandy silt	Moist	
13.4"			Brown	Med. to coarse gr. sandy silt		
14.2"			Pale grey	Clay		
15.2"			Brown	Med. to coarse gr. sandy clay		
17.0"			Orange - brown	Coarse gr. sandy clay	Moist-wet	
19.0"			Grey	Fine sandy clay		
20.3"			Brown - grey	Med. to very coarse gr. sandy clay		
21.4"			Brown	Fine gr. sand	Wet	
23.0"			Grey - brown	Fine to coarse gr. sand		
24.0"			Blue-green and pale brown	Fine gr. sandy clay	Moist-wet	
25.0"			Orange - brown	Coarse gr. sandy clay		
26.0"			Mottled orange-white	Sandy clay	Moist	
27.4"			Mottled orange-white	Sandy clay		
28.0"			Brown	Fine to coarse sand	Moist-wet	
			Mottled orange-white	Sandy clay	Moist	
				END OF HOLE 8.55m		

GENERAL REMARKS

DRILL TYPE GemcoDRILLER J. Herries, ARDECDATE DRILLED 13/12/72LOGGED BY D. BarnesDATE LOGGED 13/12/72

Record 1974/158

155/A16/1273

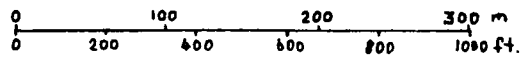


ISAACS CROSS-SECTIONS

(For locations see Plate 1)

PLATE 2

SCALE



$$\frac{V}{H} = 10$$

