

UR1973\_46

Geological report on the Great Forester River and Tomahawk River dam sites 101-121.

W.R. Moore

The majority of the Rivers and Water Supply Commission dam sites 101-120 are located in the Scottsdale basin. This basin is drained by the Great Forester River, Brid River, Coxs Rivulet, Hurst Creek and Tuckers Creek (fig. 1). The Rivers and Water Supply Commission are investigating dam sites on all these rivers but the Brid river sites are not considered in this report as they are included in a separate scheme.

The Scottsdale basin is a down-warped area occupied mainly by Tertiary sediments. In the north, the basin merges with the coastal plain of the Bridport-Waterhouse area. The southern limit of the Scottsdale basin is the Mount Helen and Cuckoo Hill scarp, the western boundary is the Sideling Range and the Tulendeena scarp, Mount Horror and Williams Hill form the eastern boundary. This high country to the east and west is formed by metamorphosed sedimentary rocks of the Mathinna Beds of Palaeozoic age. These sedimentary rocks have been intruded by the granite and granodiorite of Devonian age of the Scottsdale batholith. This batholith forms the high country in the southern portion of the basin, such as Mount Stronach and Kapai and the area south of the boundary scarp of Mount Helen and Cuckoo Hill.

The lower areas of the southern portion of the basin are formed by the granodiorite which may be overlain by Tertiary clay as in the headwaters of the Great Forester River at Springfield, or by very coarse gravel as in the headwaters of the Mackenzie Creek or the Tertiary sand, gravel and basalt as at Scottsdale.

The remainder of the basin is occupied by Tertiary sand, clay and gravel with maximum thickness in excess of 180 m with an average thickness of approximately 60 m. These Tertiary sand, clay and gravel occur beneath Quaternary sand and clay of the coastal plain at Waterhouse.

These Tertiary sand and gravel deposits are the good aquifers in the Scottsdale basin, and are therefore likely to present leakage problems at any dam site at which they occur.

The Tomahawk River sites are in a similar terrain in which granite hills and ridges are separated by areas of Tertiary sediment. The Tertiary deposits are overlain by Quaternary sediment near the coast.

As over 50 bores have been drilled by the Department of Mines in this area for an underground water investigation, a considerable amount of detailed geological information is already available for many of the sites.

The classification of the sites is that used by P.C. Stevenson is previous reports to the Rivers and Water Supply Commission:-

- (A) Geologically suitable.
- (B) Require further geological and, or, geophysical investigation.
- (C) Geologically unsuitable.

#### HURST CREEK AND COXS RIVULET

Site 101. The site is located on Hurst Creek at the cliff line of the upper of the two marine terraces which form the coastal plain of the Bridport-Waterhouse area.

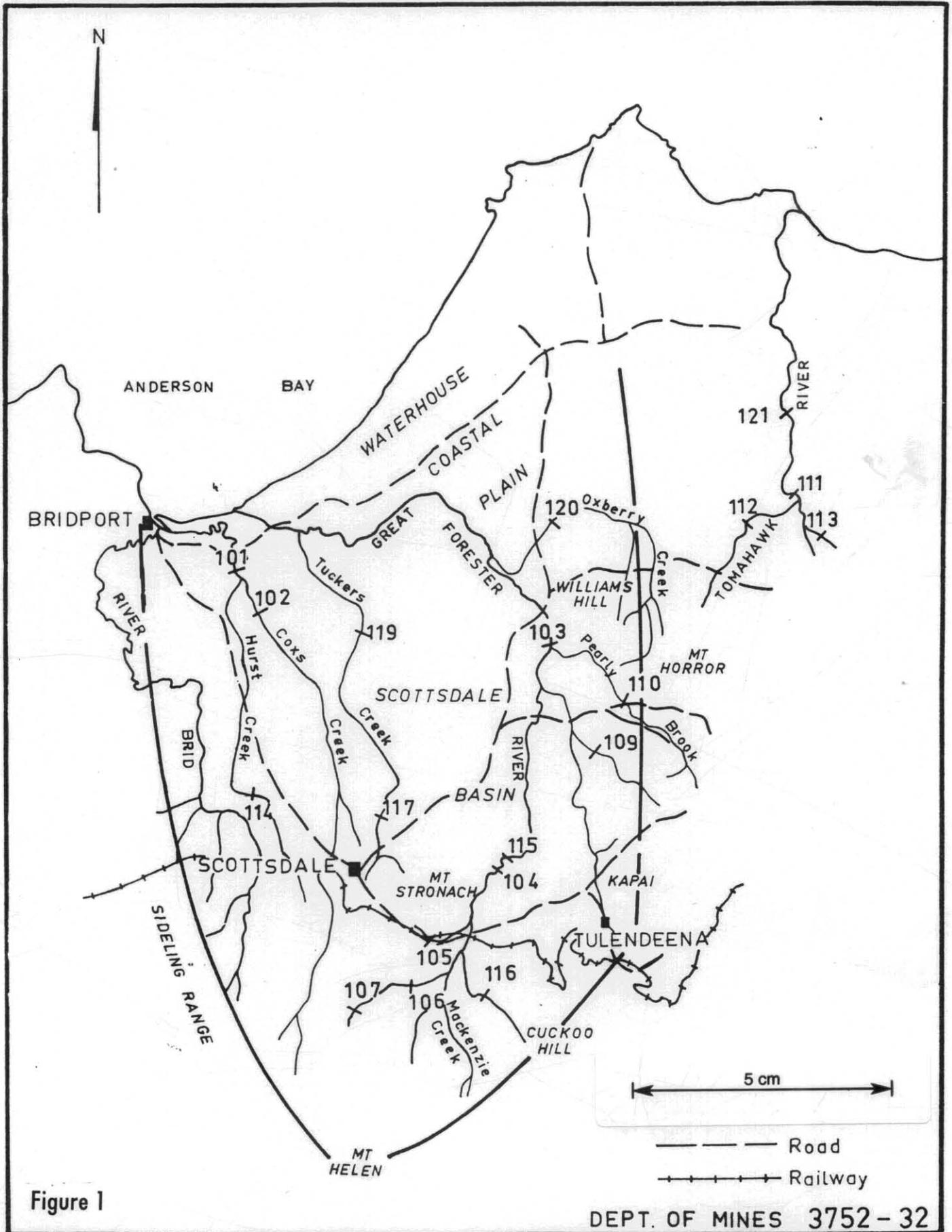


Figure 1

DEPT. OF MINES 3752 - 32

**POSSIBLE DAM SITES (101-121) -  
GREAT FORESTER AND TOMAHAWK RIVERS**

DEPARTMENT OF MINES - TASMANIA

GEOLOGIST W. MOORE

Drawn B. Cook

Date: JUNE 1973

**3752 - 32**

Serious leakage could occur if these sediments are present in the abutment area. This site would require careful geological mapping but could be excellent from a geological point of view. (B)

Site 109 is located on a tributary of the Great Forester River. Granite crops out on both abutments and on the valley floor in the reservoir area. Some Tertiary sand and gravel cap the western ridge forming the dam site but are too high above the valley floor to form a potential leakage zone. (A)

Site 115 is situated on the Great Forester River in the Mount Stronach area. Granite crops out in the abutment area on both banks. The alluvium of the valley floor is underlain by thin deposits of Tertiary gravel and sand overlying granite. The western side of the valley (the lower slopes of Mount Stronach) is composed of granite. The eastern side of the valley is formed of granite capped by Tertiary gravel and clay. The thickness of these sediments varies considerably along this ridge. Towards the dam site the Tertiary deposits contain a considerable amount of clay and the granite itself is very deeply weathered. From borehole data elsewhere along this ridge the Tertiary deposits are known to contain gravel and sand as well as clay. If the water level would be above the granite/Tertiary contact and the Tertiary deposits contain gravel serious leakage could occur. (B)

Site 104 is situated upstream from the Site 115. The western abutment is of granite and the eastern abutment is of granite capped by Tertiary sediments. The same considerations apply as for Site 115. (B)

Site 105 is at Ling Siding on a tributary of the Great Forester River that flows around the southern end of Mount Stronach. The granite of this hill forms the northern abutment at the site. The southern abutment is formed by a low flat plateau area of granite capped by Tertiary sediment. In the reservoir area Recent alluvium and Tertiary sediment is generally less than 4 m thick. Leakage problems could arise if the water level reaches the granite/Tertiary contact on the southern abutment. (B)

Site 106 is located on the Great Forester River near the entrance of the narrow gorge which connects the Springfield and Mackenzie basins. Granodiorite crops out in the stream and on the valley floor. The valley sides on which the abutments are situated are of granodiorite overlain by Tertiary gravel and sand. These sediments cap the low plateau interfluvium which separates the Mackenzie and Springfield basins. The gravel is thought to be situated above the proposed water level but the granodiorite/Tertiary boundary should be accurately located during the investigation of this site. (B)

Site 107 is located on the Great Forester River near the granite/Mathinna Beds contact in the Springfield basin. The abutments if located correctly could be sited on granite avoiding the Mathinna Beds. Granodiorite crops out in the reservoir area along the southern flanks of Walducks Hill. Pleistocene gravel and possibly Tertiary clay overlie the granodiorite in the Springfield basin on the southern section of the reservoir area. This site if carefully located could be geologically suitable for a dam. (B)

Site 116 is located on Cuckoo Creek on the eastern margin of the Mackenzie basin. Granite and weathered granite form the abutment areas and granite outcrops cover much of the reservoir area. Tertiary gravel and clay are known to overlie granite immediately south of the proposed dam site. The thickness and distribution of these sediments is patchy and their exposed thickness no greater than 4.5 m. This site would require careful investigation. (B)

Sediments forming the abutments are unconsolidated Quaternary sand with minor pebble beds. Similar sediments underlie the reservoir area. The Quaternary sand of the upper terrace is 9-12 m thick. A variable thickness of Tertiary sand, gravel and clay underlie the Quaternary deposits. These sediments are underlain by granodiorite which is generally very deeply weathered (6-9 m) in this area. The sediments of the reservoir area and the abutments are very likely to leak and for this reason the site is unattractive geologically. Good supplies of groundwater occur in this area. (C)

Site 102 is located where Coxs Rivulet emerges from the Tertiary plateau area on to the Quaternary sediment of the coastal plain. Tertiary gravel and sand would form the abutments and reservoir area. Their thickness (>60 m) makes this site geologically unattractive. Good supplies of groundwater also occur in this area. (C)

Site 114 is located where Hurst Creek leaves the area where basalt capped hills border the valley to emerge on to the Tertiary sediment area of Scottsdale. Tertiary sand, gravel and clay will form both abutments and reservoir area as in sites 101, 102. These sediments are considered to be geologically unsuitable. Some very productive water bores are situated in the vicinity of this site. (C)

#### TUCKERS CREEK

Site 119 is situated on lower Tuckers Creek near its confluence with Boggy Creek. Both the abutments and reservoir area are formed by Tertiary gravel, sand and clay. Their thickness is in excess of 60 m and they yield reasonable quantities of groundwater in this area. The site is unattractive for the same reasons as the sites previously mentioned.

Site 117 is situated on upper Tuckers Creek. Granodiorite is exposed on the valley floor at the site. The valley sites are formed of granodiorite overlain by thin Tertiary sediments capped by a deep red soil; basalt may also occur. If the height of the abutments exceeds about 6-9 m water may leak through the Tertiary sediments. This site would require detailed geological investigation. (B)

#### GREAT FORESTER RIVER AND ITS TRIBUTARIES

Site 120 is located on Oxberry Creek. The abutments are located on folded and jointed Mathinna sandstone and argillite. The reservoir area is underlain by alluvial sand and clay and some windblown sand overlying Mathinna sedimentary rocks. Bores in the fractured rocks of the ridge on which the dam site is located have yielded 75-150 l/min and consequently some leakage must be expected in this rock type. The amount of leakage would probably not be too great for an agricultural dam but may require pressure testing. The site is otherwise excellent from a geological point of view. (B)

Site 103 is located on the Great Forester River downstream from its confluence with Pearly Brook. Granodiorite crops out in the abutment and reservoir areas. The granodiorite weathers to a red clay and soil and water is unlikely to leak through it. Thin deposits of Tertiary gravel are present on the interfluves but they would appear to be well above the proposed water line. The site would require detailed geological mapping. (B)

Site 110 is situated on Pearly Brook near the entrance to the Kamona valley. The abutments and reservoir area lie mainly in Mathinna sedimentary rocks but some coarse quartz gravel and sand is also present. The distribution of this gravel and sand is very patchy and its thickness is variable.

## TOMAHAWK RIVER

*Site 111, 112, 113, 122.* These four sites have not been visited by the writer and the geology of the area is not known in great detail. Much of the geological information is derived from D.I. Groves' map of the Blue Tier Batholith.

The source of the Tomahawk River is on the slopes of Mount Horror, an area of Mathinna argillite and sandstone. North of the Oxberry road, the Tomahawk River flows to the coast across granite country. Granite is exposed on the ridges, but the button grass meadows of the valleys and basins are underlain by Quaternary and Tertiary sediments. At the coast the granite crops out as low isolated hills draped by windblown sand which rise above the coastal plain. The coastal plain is of Quaternary sediment overlying Tertiary sediment.

The four dam sites are situated where the Tomahawk River or its tributaries pass from a Tertiary sediment-filled basin or valley across a granite rock barrier. The abutments of all four sites are situated on such a rock barrier and outcrops of the porphyritic granite should occur close by. The reservoir areas of all four sites appear to be underlain by Tertiary sediments and Recent alluvium. The depth and composition of these sediments are unknown.

At this level of investigation the four sites appear to be geologically satisfactory but as Tertiary sediments occur at all of them geological mapping and probably geophysical investigation would be necessary. (B)

[27 June 1973]