D.M.177/48



DEPARTMENT OF MINES

SOUTH AUSTRALIA

# FINAL REPORT

# ON A

# GEOLOGICAL INVESTIGATION OF THE MYPONGA DAM SITE (LOWER SITE No. 2)

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Plans to accompany this report:

Plan showing location of Bore Sites drilled and Geological Sections along Lines E & F. 50-352

Scale 1" - 50 feet.

# FINAL REPORT ON A GEOLOGICAL INVESTIGATION OF THE MYPONGA DAM SITE (Lower Site No. 2)

In his detailed preliminary report (D.M.177/48) dated 8/3/49, the writer discussed the geological conditions at three alternative sites on the Myponga River - the Upper Site and Lower Sites Nos. 1 and 2 - for the construction of a dam to impound water for reticulation to the Metropolitan Area. Of these the Lower Sites were favoured on the grounds of superior reservoir capacity and recommendations for test drilling of both the Lower Sites were submitted. A boring programme providing for a total of 80 vertical holes to depths from 50 to 100 feet and involving a total of 6,675 feet of drilling was prepared.

It was shown that on purely geological considerations the Lower Site No. 1 was to be preferred as the disposition of the foundation bed was such as to retard any tendency to leakage whilst at Lower Site No.2 the attitude and the chemical composition of the rock was such that leakage across the dam might well be enhanced. However, the Lower Site No. 2 was topographically far more favourable, it being possible to obtain a far shorter minimum crest length for a dam of the same height (RL 800 ft.) than at Site No. 1; and other things being equal it would be possible to build a dam of the same height far more cheaply at Site No. 2 than at Site No. 1.

Consequently after discussion with officers of the Engineering and Water Supply Department it was agreed to investigate the Site No. 2 first by diamond drilling. Should this drilling show that the condition of the rock was unsuitable for a dam foundation, test drilling of Site No. 1 could be undertaken.

Plans were prepared for a modified boring programme involving some 39 boreholes with a total footage of about 3,325 feet of drilling.

The bore sites were disposed in the form of three lines (D, E and F) making a grid with 50 feet centres, on the eastern abutment (about 29 holes) and a centre line with a short grid on the lower levels of western abutment. The sites were surveyed and pegged by B.S. Glasgow, Departmental Surveyor and Chief Draftsman.

Drilling of this programme has now been completed and all cores have been examined and logged. Geological sections indicating the

actual distribution of rock types along the centre lines of the dam site (Lower Site No. 2) (Line E and F) have been prepared and are submitted with this report. Selected representative rock core material from the bores was obtained by officers of the Engineering and Water Supply Department, and is being tested in the laboratory attached to the Engineering Design Branch of that Department.

The following report is a summary of the geological results of the drilling and includes the writer's final conclusions regarding the suitability of Lower Site No. 2 as the site for construction of a dam.

## DIAMOND DRILLING

In all 37 bore sites were drilled. These were distributed such that on the eastern abutment 26 holes were drilled to depths of approximately 100 feet on three lines, D, E, and F, at approximate 50 ft. centres. Actual sites drilled were D (0 - 7 inclusive); E (0 - 8 incl.), and F (0 - 8 incl.). On the western abutment 6 bores were drilled, each to a depth of 50 feet, at E 11-15 incl, and F 11. Within the foundation area 5 holes were drilled, three (D9, E9, F9) on the eastern bank of the river to depths 75 feet, and two on the western bank (E10, F10) each to 50 feet. (See Plan).

Drilling commenced in September, 1949, following upon the excavation of drilling benches on the steep slopes by Engineering and Water Supply Department personnel, and was carried on continuously until completion of the programme in August, 1950. Full details of the drilling operations are contained in a separate report by C.M. Willington, Supervisor of Boring Operations (D.M.566/49, 30/8/50).

Total footage drilled was 3,241'4" and core recovered by 2,651'8" or 81.8% of the footage drilled. This figure does not allow for footage drilled through surface soil.

Log of Bores.

Following is a tabulated list of the logs of the bores, arranged in geographical order, starting from the top of the eastern abutment and moving westerly, i.e. geologically in ascending stratigraphical order:

TABLE I.

| Bore No. |
|---|
| D0 |
| E0 |
| F0 |
| D1 |
| E1 |
| F1 etc. |

## TABLE I.

## LOGS OF BORES DRILLED AT LOWER DAM SITE No. 2, MYPONGA RIVER

Bore DO — Bore Serial No. DD 105/49

Coords Lime D.O. — Dip 90°

Drilling Commenced 19/9/49. Completed 26/9/49. Driller K.D.Bottger

| | | | |
|---|---|---|---|
| 0 | - | 7'8" | Fresh med-fine grained streaky banded dark grey slaty limestone - infrequent fractures. |
| 7'8" | - | 10' | Calcareous slate greenish slightly weathered with leached fractures. |
| 10' | - | 28'6" | Dense fine-grained dark grey banded calcareous slate - occasional scattered stained fractures and a few quartz stringers up to 1" thick. Grades to banded slaty limestone. |
| 28'6" | - | 54'8" | Dense finegrained buff-grey streaky slaty limestone or calcareous slate - stained fractures between 30 and 31 ft. and 37 ft. |
| 54'8" | - | 61' | Dense fine-grained light grey slaty limestone locally rather soft and friable at 55'2" - 6", 57'6". |
| 61' | - | 71' | Mainly rather decomposed and locally soft friable calcareous slate or slaty limestone. |
| 71' | - | 77'4" | Hard slaty limestone with broken zone at 73'6". |
| 77'4" | - | 82'6" | Rather decomposed slaty limestone - but still hard and massive. Broken zone at 82'4-6". |
| 82'6" | - | 100'1" | Mainly hard dense fine-grained streaky banded slaty limestone - rare fractures. |

END OF BORE AT 100 ft. 1 in.

MYPONGA

Bore No. E0 Bore Serial No. DD 106/49

Coords Line E,0 Dip 90°

Drilling Commenced 7/9/49, Completed 16/9/49 Driller K.D. Bottger

| | | |
|---|---|---|
| 0 | - 8' | Irregularly leached and weathered dark grey to buff slaty limestone with scattered highly leached fractures |
| 8' | - 20' | Mostly hard dark grey slaty limestone or calcareous slate with stained leached fractures, several quartz veinlets. |
| 20' | - 24'6" | Weathered pale buff grey slightly friable calcareous slate, stained fractures. |
| 24'6" | - 60' | Hard dark grey streaky banded calcareous slate, dense, massive, infrequent fractures, leached and stained. Grades locally to massive ? dolomotic limestone. Much weathered friable zone at 42'10" - 44'5". |
| 60' | - 65'6" | Light grey-buff weathered slaty limestone, locally fractured and leached. |
| 65'6" | - 95' | Mainly dark grey streaky banded slaty limestone, infrequent clean fractures - partially weathered buff-coloured zones at 87' - 89'9". |
| 95' | - 96'6" | Stained, weathered dark buff-grey slaty limestone streaky banded. |
| 96'6" | - 100'4" | Fresh dense fine-grained grey banded slaty limestone. |

END OF BORE AT 100 ft. 4 ins.

Bore No. FO | Bore Serial No. D.D. 107/49

Coords Line F,O | Dip 90°

Drilling Commenced 19/8/49, Completed 2/9/49 | Drillers D.F. Moloney K.D. Bottger

| | | | |
|---|---|---|---|
| 0 | - | 17' | Banded very calcareous slate - green-grey locally stained and fractured, leached. |
| 17' | - | 23'9" | Very leached permeable zone. |
| 23'9" | - | 58'6" | Streaky banded slaty limestone - mostly fresh but with local stained slightly weathered zones. Dark grey dense slate or silty slate bands up to 9". |
| 58'6" | - | 62'7" | Slightly weathered to weathered stained - fractured calcareous slate. |
| 62'7" | - | 65'9" | Fresh grey streaky limestone. |
| 65'9" | - | 74' | Slightly stained griding to much weathered friable slaty limestone. |
| 74' | - | 86' | Mainly fresh slaty limestone - locally stained fractures. |
| 86' | - | 90' | Slightly weathered slaty limestone - with several quartz calcite veinlets. |
| 90' | - | 101'1" | Fresh unweathered slaty limestone - unfractured. |

END OF BORE AT 101'1"

Bore No. D1 Bore Serial No. D.D.110/49

Coords Line D.1 R.L.804.3 ft. Dip 90°

Drilling commenced 27/9/49 Completed 30/9/49 Driller K.D. Bottger

| | | | |
|---|---|---|---|
| 0 | - | 31'3" | Dense massive dark grey streaky, slaty limestone. Intercalated slate bands from paper streaks to 1½" width. Hard rarely fractured. |
| 31'3" | - | 33'10" | Dark grey slaty silty limestone grading to calcareous slate, dense massive unfractured. |
| 33'10" | - | 35'5" | Leached weathered friable banded silty calcareous slate. |
| 35'5" | - | 37'6" | Slightly weathered calcareous slate grading to slaty limestone. |
| 37'6" | - | 71'5" | Predominantly banded slaty limestone - grey dense massive fresh unfractured. Grades locally into more silty limestone. |
| 71'5" | - | 72'8" | Zone of faulted streaky slaty limestone, fault planes sealed with quartz veinlets. |
| 72'8" | - | 100' | Light-dark grey silty and slaty limestone - dense hard, unfractured. |

END OF BORE AT 100 ft.

Bore E1 Bore Serial No. DD.109/49

Coords Line E.1 R.L.801.9 Dip 90°

Drilling commenced 13/10/49 Completed 19/10/49 Driller D.P.Moloney

| | |
|---|---|
| 0 - 7' | Mainly hard but locally broken, travertinised slaty limestone, grey-buff coloured (4 ft.core) |
| 7' - 9'3" | Fresh light grey dense fine-grained streaky limestone. |
| 9'3" - 51' | Greenish grey partly weathered calcareous slate with harder bands of slaty limestone. Many stained fractures and bedding planes, and occasional veinlets of quartz or quartz-calcite; soft and friable zones at 33'6-9", 34'6"-40', (2'6" recovered), 41'6" - 45'6". |
| 51' - 101'6" | Hard dense massive fresh dark grey thin banded slaty limestone - rare stained leached fractures and occasional quartz veins up to 1½" thick. |

END OF BORE AT 101'6"

Bore No. F1 Bore Serial No. DD 108/49

Coords Line F.1 RL 799.0'

Drilling Commenced 3/10/49 Completed 6/10/49 Driller K.D. Bottger

| | |
|---|---|
| 0 - 8' | (2'6" core recovered) Dark grey slaty limestone somewhat broken and leached, travertinised along fractures. |
| 8' - 19'5" | Streaky banded dark grey slaty limestone fresh, dense massive with scattered stained fractures and occasional quartz veinlets. |
| 19'5" - 33'5" | Buff to grey slightly weathered slaty limestone - dense hard. |
| 33'5" - 76' | Hard fresh grey slaty marble grading locally to calcareous slate - fractures rare. Occasional quartz veinlets well sealed to the country rock. |
| 76' - 79'2" | Slightly weathered buff to grey slaty limestone, hard massive. |
| 79'2" - 100'5" | Hard massive unfractured fresh grey slaty limestone. |

END OF BORE AT 100 ft. 5 ins.

Bore No. D2 Bore Serial No. DD 16/50

Coords Line D2 RL 793.3 ft. Dip 90°

Drilling Commenced 20/2/50 Completed 1/3/50 Driller D.P. Moloney

| | |
|---|---|
| 0 - 7' | Greenish grey slightly weathered streaky banded calcareous slate - slightly broken. |
| 7' - 20' | Dark green grey dense massive hard slaty limestone locally grading to dark buff coloured limestone. Occasional ironstained fractures - also some quartz veinlets. |
| 20' - 31' | Mainly calcareous slate dark green grey hard massive, locally streaky banded. Weathered zone, slightly friable at 27'9" - 31'. |
| 31' - 52'6" | Streaky banded fine grained dense slaty limestone. Leached porous fracture at 31'10" - 32'2". Mainly fresh hard. |
| 52'6" - 56'8" | Mainly rather decomposed green calcareous slate, locally fractured. |
| 56'8" - 66'6" | Fine grained banded slaty limestone, dense massive fresh. |
| 66'6" - 70'1" | Rather decomposed limestone. |
| 70'1" - 72'10" | Alternating zones of decomposed and fresh slaty limestone. |
| 72'10" - 81'8" | Decomposed slaty limestone - soft, friable. |
| 81'8" - 100'3" | Mainly fresh hard grey slaty limestone locally slightly decomposed and fractured. |

END OF BORE AT 100 ft. 3 ins.

Bore No. E2 Bore Serial No. DD 121/49

Coords Line E.2 RL 791.8 ft. Dip 90°

Drilling commenced 7/11/49 Completed 16/11/49 Driller D.P. Moloney

| | |
|---|---|
| 0 - 16'6" | Light grey-buff slightly weathered and leached slaty limestone grading to calcareous slate. Scattered leached fractures and bedding planes. |
| 16'6" - 35'8" | Dark grey dense fine-grained banded slaty limestone, mainly hard but with local stained leached fractures fairly abundant. Scattered quartz veinlets. |
| 35'8" - 69' | Weathered and locally fractured friable slaty limestone - buff-yellow - many vertical or steep angled fractures leached and stained. |
| 69' - 100'3" | Fresh (unweathered) grey streaky banded slaty limestone - rare stained fractures. |

END OF BORE AT 100' 3"

Bore No. F2 Bore Serial No. DD 111/99

Coords Line F.2 R.L.789.4 ft. Dip 90°

Drilling commenced 25/10/49 Completed 3/11/49 Driller D.P.Moloney

| | |
|---|---|
| 0 - 7' | Interbedded calcareous slate and slaty limestone, weathered top 2 ft. Mostly unbroken. |
| 7' - 16'6" | Fresh light grey slaty limestone - streaky banded several quartz and quartz-calcite veinlets. |
| 16'6" - 21' | Mainly streaky banded dark green calcareous slate (unweathered but several stained leached fractures). |
| 21' - 37'6" | Streaky banded dense slaty limestone - scattered quartz veinlets - grey to dark buff and grading locally to calcareous slate. |
| 37'6" - 40'10" | Buff to green grey slightly stained calcareous slate with stained fractures. |
| 40'10" - 83'5" | Dense fresh grey streaky banded limestone local stained and slightly leached zones at 45'10" - 47'6", 48'8" - 49'2", 62-63 ft., 64'6" - 66', 75'8" - 77' - scattered quartz veinlets. |
| 83'5" - 84' | Broken stained zone with quartz calcite veinlets, somewhat streaky banded slaty limestone with scattered veinlets of quartz well sealed to country rock. |

END OF BORE AT 101 ft. 8 ins.

Bore D3 Bore Serial No. DD 15/50

Coords Line D.3 R.L. 781.2 ft. Dip 90°.

Drilling Commenced 8/2/50, Completed 16/2/50. Driller D.P. Moloney

| | |
|---|---|
| 0 - 7' | Superficially fractured but predominantly hard massive. |
| 7' - 27' | Dense fine grained massive or locally streaky banded grey limestone and slaty limestone, unfractured, fresh, occasionally carrying quartz veinlets. |
| 27' - 36' | Mainly calcareous silty slate with silty limestone. All dense massive but liable to fracture locally. Quartz - calcite veinlet at 36 ft |
| 36' - 63' | Dense fresh grey streaky limestone. Hard massive 3" quartz vein at 48'6" - 41'10". |
| 63' - 69'1" | (15" core recovered) Leached decomposed and porous calcareous slate. |
| 69'3" - 69'4" | Hard silty calcareous slate. |
| 69'4" - 71'3" | Leached porous limestone. |
| 71'3" - 73'1" | Hard unweathered streaky limestone. |
| 73'1" - 81'2" | Rather broken and leached dark green slate. |
| 81'2" - 83'3" | Fresh dark green massive slate. |
| 83'3" - 83'9" | Leached broken porous zone in slate. |
| 83'9" - 96'8" | Dark green massive and banded slates, unleached and relatively unfractured. |
| 96'8" - 100'3" | Streaky slaty limestone grey, hard dense and unfractured. |

END OF BORE AT 100 ft. 3 ins.

Bore E.3 Bore Serial No. DD 132/49

Coords Line E.3 R.L. 781.0 ft. Dip 90°.

Drilling Commenced 28/11/49, Completed 2/12/49 Driller D.P. Moloney

0 - 7' (18" core recovered) Dense dark grey limestone with intercalated slate bands.

7' - 62' Dense fine grained streaky banded grey limestone with scattered green calcareous slate bands. Infrequent and fairly widely spaced leached partings usually parallel to the bedding (2'8" core loss between 12'8" and 19'). Broad yellowish oxidised zones between 35'3" and 42'8". Scattered small quartz veinlets ⅛" wide and occasional veins of calcite.

62' - 89'4" do. Oxidised zones less frequent but scattered quartz veins usually leached and iron stained more common, i.e. 73'11" 77'6-9", 80'7", 82'5", 83'6", 84'2", etc.

89'4" - 98'6" Mainly calcareous slate frequently leached and broken. (8" core recovered 91'8" - 96'11").

98'6" - 100'2" Dense fine grained streaky grey thin bedded limestone.

END OF BORE AT 100 ft. 2 ins.

Bore No. F3 Bore Serial No. DD 123/49

Coords Line F.3 R.L. 779.8 ft. Dip 90°

Drilling commenced 18/11/49, Completed 24/11/49. Driller D.P. Molone

0 - 8' (2 ft. core) Dark grey locally leached and fractured slaty limestone.

8' - 14'6" Buff grey to dark grey slates and slaty limestone relatively unfractured.

14'6" - 17'6" Broken zone carrying long leached and iron stained joints.

17'6" - 45'10" Fresh hard slaty limestone - unbroken except for occasional stained fractures - scattered zones up to 2 feet width of slightly buff coloured.

45'10" - 49' Buff coloured, mainly rather leached and fractured slaty limestone with several quartz veinlets (well sealed).

49' - 53' Fresh dense grey slaty limestone.

53' - 58'7" Mainly rather weathered slaty limestone - slightly leached on fractures.

58'7" - 89' Mainly fresh grey streaky banded slaty limestone with rare scattered fractures - numerous quartz veins and quartz calcite well sealed to country rock. 2½" wide at 76'2". Pure slate band at 74'3" - 75'3", 88'5" - 89'.

89' - 97'10" (2 ft. core) Rather decomposed calcareous slate with local leached zones.

97'10" - 100'8" (15" core) Leached friable calcareous slate or slaty limestone - much decomposed - permeable.

END OF BORE AT 100'8".

Bore D4 Bore Serial No. DD 9/50

Coords Line D.4 R.L.768.6 ft. Dip 90°

Drilling Commenced 17/1/50 Completed 26/1/50 Driller D.P. Moloney.

| | |
|---|---|
| 0 - 7' | (3 ft. core recovered) Dense banded calcareous slate dark green unweathered. |
| 7' - 14'6" | Very decomposed soft porous calcareous slate. |
| 14'6" - 14'9" | Quartz vein. |
| 14'9" - 20' | Massive dense hard little weathered slaty limestone pale grey with one or two small quartz veins. |
| 20' - 45'8" | Well banded fine grained slaty limestone with alternating bands of fine banded slate. Scattered stained fractures but relatively unweathered. Occasional quartz veinlets. |
| 45'8" - 78'6" | Leached decomposed zone in fine banded slaty limestone (about 5 ft. core recovered). |
| 78'6" - 89' | Partly weathered dense thin banded grey slaty limestone. |
| 89' - 99'9" | Unweathered dense grey streaky banded unfractured limestone. |
| 99'9" - 100'2" | Slightly weathered slaty limestone. |

END OF BORE AT 100 ft. 2 ins.

Bore E4 Bore Serial No. DD 141/49

Coords Line E.4 R.L.769.1 ft. Dip 90°

Drilling commenced 14/12/49 Completed 21/12/49 Driller D.P.Moloney

| | |
|---|---|
| 0 - 7' | (17" core recovered) Decomposed much broken thin bedded slaty limestone. |
| 7' - 13'8" | Dark green grey calcareous slate with intercalated yellow grey limestone bands. All limestone rather oxidised and slate contained scattered leached parting planes. |
| 13'8" - 14'9" | Dense fine grained slightly leached buff coloured ? dolomitic limestone. |
| 14'9" - 15'2" | Dense fine grained green slate. |
| 15'2" - 19'10" | Thin bedded dense buff slaty limestone. |
| 19'10" - 27'2" | Pale green rather decomposed slate - scattered leached fractures and quartz veins. |
| 27'2" - 43'2" | Dense fine grained thin bedded streaky grey limestone leached and broken zones infrequent. |
| 43'2" - 83'3" | Dense fine grained streaky limestone with scattered rather decomposed slaty zones (52' - 52'8") (53'5" - 11") (67') etc. |
| 83'3" - 90' | Very calcareous thin bedded slate, dense fine-grained with two quartz-calcite veinlets. |
| 90' - 92'2" | Dense massive fine grained streaky banded limestone. |
| 92'2" - 96'3" | Decomposed slaty limestone (12" core recovered) broken with quartz vein on fracture. |
| 96'3" - 101'5" | Very slaty limestone, massive dense unfractured slate, free limestone band at 99'-100'1". |

END OF BORE AT 101'5".

Bore F4 Bore Serial No. DD 133/49

Coords Line F.4 R.L. 769.6 ft. Dip 90°

Drilling commenced 6/12/49 Completed 13/12/49 Driller D.P. Moloney

| | |
|---|---|
| 0 - 6'3" | Thin bedded dense massive streaky grey slaty limestone (fresh rock). |
| 6'3" - 9'9" | Thin bedded calcareous slate, dense massive. |
| 9'9" - 12'5" | Calcareous slate thoroughly decomposed and leached. |
| 12'5" - 22' | Thin bedded streaky slaty limestone grading to alternating bands of green slate. Quartz veins ½ - 1½" wide frequently cutting parallel to bedding. All hard dense and relatively unweathered. |
| 22' - 26' | Dense streaky banded limestone. Leached calcite lined only at 24'10". |
| 26' - 31'3" | Mainly streaky slate. |
| 31'3" - 32'10" | Leached decomposed zone in limestone. |
| 32'10" - 35' | Streaky dense massive limestone grading to |
| 35' - 44'3" | Mainly streaky slate with alternating bands (up to 8" of streaky limestone). Dense massive few fractures. |
| 44'3" - 55'1" | Mainly streaky limestone with alternating thin bands of calcite - massive dense unbroken. |
| 55'1" - 58'4" | Broken somewhat decomposed calcareous slate (13" core recovered) |
| 58'4" - 80'11" | Streaky very slaty limestone - mainly massive dense with scattered broken zones. |
| 80'11" - 84'3" | Light grey dense limestone, dense massive. |
| 84'3" - 95' | Rather decomposed limestone - buff coloured broken in places (87' - 87'9"), (91' - 92'3"). |
| 95' - 100'6" | Massive dense light grey streaky limestone. |

END OF BORE AT 100 ft. 6 ins.

Bore D5 Bore Serial No. DD 14/50

Coords Line D.5 R.L.752.3 ft. Dip 90°

Drilling Commenced 27/1/50 Completed 6/2/50 Driller D.P. Moloney

| | |
|---|---|
| 0 - 7' | (18" core) Broken weathered calcareous slate. |
| 7' - 15'6" | Slightly weathered grey green thin bedded slate infrequent fractures. |
| 15'6" - 16'5" | Leached friable and porous calcareous zone. |
| 16'5" - 19' | Dense grey streaky slaty limestone. |
| 19' - 28'4" | Streaky banded dense light grey calcareous slate - rare leached fractures. Becoming buff coloured. |
| 28'4" - 32'9" | Buff slaty dolomitic ? limestone grading to streaky grey limestone. 1" quartz veinlet at 32'9". |
| 32'9" - 39' | Slaty limestone grading to calcareous slate, buff to grey dense streaky banded. |
| 39' - 66'6" | Dense fine even grained grey slaty limestone with occasional zones of predominant slate. 6-9" leached broken zone at 51'-52'. |
| 66'6" - 68'5" | Yellow leached and porous slaty and silty limestone and dolomitic limestone. |
| 68'5" - 89'10" | Grey dense hard massive streaky, slaty limestone. Occasional quartz veinlets. |
| 89'10" - 92' | Dark grey green calcareous slate. Dense massive. |
| 92' - 100'9" | Grey dense hard silty and slaty limestone, streaky and banded. |

END OF BORE AT 100 ft. 9 ins.

Bore No. E5 Bore Serial No. DD 112/49
Coords Line E. 5 R.L. 755 ft. Dip 90°

Drilling Commenced 31/10/49, Completed 12/11/49 Driller M.R. Obst

| | |
|---|---|
| 0 - 20'2" | Partly weathered broken stained calcareous slate rather soft and friable in places. |
| 20'2" - 36' | Dark grey banded slaty limestone - dense hard but with local leached zones and stained fractures. |
| 36' - 48'6" | Thin streaky banded slaty limestone grey, fresh unstained with rare fractures. |
| 48'6" - 62'3" | Slightly stained buff-grey calcareous slates with several soft friable zones (51'8" - 52', 57'-57'2"). |
| 62'3" - 101'5" | Dense, hard fresh very fine grained grey slaty limestone. Very rare ironstained fractures - occasional calcite and quartz veinlets. |

END OF BORE AT 101 ft. 5 ins.

Bore No. F5 Bore Serial No. 122/49

Coords Line F.5 R.L. 756.1 ft. Dip 90°

Drilling Commenced 14/11/49, Completed 25/11/49 Driller M.R. Obst.

| | |
|---|---|
| 0 - 8'7" | Massive streaky banded grey slaty limestone grading to completely leached and porous limestone. |
| 8'7" - 20'4" | (3' core) Weathered calcareous slates with thoroughly leached zones. |
| 20'4" - 45'8" | Mainly grey hard slaty limestone and calcareous slate locally broken, stained and leached. Scattered quartz veinlets. Grades to more weathered slaty rock. |
| 45'8" - 50'1" | (2' core) Mainly weathered calcareous slate - dark green with ironstained fractures, slightly leached. |
| 50'1" - 61'3" | Mainly dense grey slaty limestone locally fractured and ironstained - leached at 53', 60'9". |
| 61'3" - 100'7" | Fresh dense massive grey slaty limestone very infrequent stained fractures. Scattered quartz-calcite veinlets. Soft decomposed zone at 95'-95'10". |

END OF BORE AT 100 ft. 7 ins.

Bore No. D6 Bore Serial No. DD 143/49

Coords Line D.6 R.L.729.7 ft. Dip 90°

Drilling commenced 16/12/49, Completed 24/1/50 Driller W. O'Donoghue

| | |
|---|---|
| 0 - 9'2" | Light grey slaty limestone - mainly hard massive only slightly weathered - scattered leached fractures. |
| 9'2" - 11'6" | Mainly calcareous, streaky banded slates grading locally to limestone. Hard massive fine grained. |
| 11'6" - 30'6" | Slightly weathered calcareous banded slates scattered stained fractures, mainly hard but grading to slightly friable buff coloured do. Leached fractures fairly common. |
| 30'6" - 37'5" | Dense fine grained banded slaty limestone - light grey grading to locally weathered, buff coloured leached. |
| 37'5" - 50' | Rather weathered yellowish grey slate and slaty limestone with soft friable leached fractures (39'2") (41'2") (49'-50'). |
| 50' - 82' | Dense fine grained light grey fresh limestone and streaky slaty limestone with local short slightly oxidised zones and fractures. Occasional quartz veins. Soft leached zone at 74'-74'6". |
| 82' - 88'8" | Dense massive very fine grained unbanded light grey limestone. |
| 88'8" - 89'10" | Chloritic slate or schist - well banded. |
| 89'10" - 94' | Dense massive fine grained light grey limestone. |
| 94' - 100'3" | Soft friable yellow decomposed limestone (C Dolomite |

END OF BORE AT 100 ft. 3 ins.

Bore No. E6 Bore Serial No. DD 142/49

Coords Line E.6 R.L. 733.9 ft. Dip 90°

Drilling commenced 8/12/49 Completed 15/12/49 Driller M.R. Obst

| | |
|---|---|
| 0 - 16'6" | Grey slightly weathered dense banded slaty limestone scattered stained fractures. |
| 16'6" - ?18' | Buff grey friable weathered calcareous slate or slaty limestone. |
| ?18' - 25' | (9" core recovered) Very leached soft friable zone - very permeable - decomposed limestone. |
| 25' - 34' | Hard fresh grey dense banded slaty limestone containing occasional leached iron-stained fractures. |
| 34' - 41' | Slightly weathered and friable calcareous slate or slaty limestone. Stained veinlet of calcite on fractures at 38'6", 39'2". |
| 41' - 100'10" | Mostly massive streaky banded slaty limestone unweathered, light grey coloured, rare stained fractures. Calcite veinlets and pyrite crystals at 50' - 51'6"; 53'2"-8", and leached zones at 62'5" and 64'6" - 65'. |

END OF BORE AT 100'10".

Bore No. F6 Bore Serial No. DD 124/49

Coords Line F.6 R.L.740.1 ft. Dip 90°

Drilling commenced 29/11/49, Completed 6/12/49 Driller M.R. Obst.

| | |
|---|---|
| 0 - 8'5" | (5'5" core recovered) Hard dense grey streaky banded limestone. Minor leached broken zone at 3'6". |
| 8'5" - 50'2" | Dense fine grained sandy slaty limestone with alternating thin slate layers. Rather porous leached zones at 16'2", 36' (5") and minor stained fractures at 36', 45'2". |
| 50'2" - 72' | Dense hard and very fine grained slaty limestone, fresh rare broken zones (1'8" core recovered between 56'8" and 62'11"). |
| 72' - 78'6" | do. with several weathered, water leached zones at 76'2", 77'4", 78'2". |
| 78'6" - 100'0" | Fresh hard dense fine grained streaky grey slaty limestone unfractured. |

END OF BORE AT 100 ft. 0 ins.

Total footage core recovered 84'6".

Bore No. D7 Bore Serial No. DD 23/50

Coords Line D.7 R.L. 689.0 ft. Dip 90°

Drilling Commenced 31/1/50 Completed 15/2/50 Driller W. O'Donoghue

| | |
|---|---|
| 0 - 8' | Streaky banded dense massive pinky-grey dolomitic limestone - slightly weathered but hard and locally fractured or foliated. |
| 8' - 27'2" | do. but unweathered. Locally grades to calcareous or dolomitic slate. |
| 27'2" - 28'9" | Rather decomposed streaky banded slaty dolomite. |
| 28'9" - 100' | Pink and grey streaky - foliated slaty dolomite streaky and foliated but fresh unbroken with only rare stained fractures. |

END OF BORE AT 100 ft.

Bore No. E7 Bore Serial No. DD 24/50

Coords Line E.7 R.L. 694.6 ft. Dip 90°

Drilling commenced 20/2/50 Completed 1/3/50 Driller W. O'Donoghue

| | |
|---|---|
| 0 - 10' | Dense massive unbanded cream buff dolomitic limestone, hard rare fractures. |
| 10' - 12'1" | Greenish calcareous slate with small brecciated band at 12 ft. (sealed). |
| 12'1" - 15' | Pale grey white - buff dolomite, dense massive. |
| 15' - 67' | Foliated slaty dolomite or dolomitic slate - fresh unstained. Banding marked by green chloritic layers. Contains intercalated bands of dense cream white dolomite. Core broken but stained fractures rare and weathered. |
| 67' - 100' | Foliated slaty dolomite grading to calcareous or dolomitic foliated slate. Dense white massive dolomite at 78'6" - 79(10", 81'6" - 82'7". Core broken but not stained on bedding faces. Hard impermeable. |

END OF BORE AT 100 ft.

~~Bore No. F7 Bore Serial No. DD 25/50~~

~~Coords Line F.7 R.L. 700.7 ft. Dip 90°~~

Bore No. F7 Bore Serial No. DD 25/50

Coords Line F.7 R.L. 700.7 ft. Dip 90°

Drilling commenced 7/3/50, Completed 23/3/50 Driller A.F. Leschen

| | |
|---|---|
| 0 - 10' | Mostly weathered rather friable and locally broken dolomite limestone. Yellowish coloured. A few quartz and calcite stringers. |
| 10' - 15'6" | Pale cream-grey dolomite - mostly hard, but locally porous and decomposed over short lengths (3-4"). |
| 15'6" - 100'1" | Greenish grey to pink grey streaky banded and foliated slaty dolomite - hard fresh unbroken. Oxidised pyrite crystals at 17', 17'9". Rare decomposed zones at 53'4", 86'8". |

END OF BORE AT 100 ft. 1 in.

Bore No. E8 Bore Serial No. DD 38/50

Coords Line E.8 R.L.669.6 ft. Dip 90°

Drilling commenced 12/4/50, Completed 28/4/50 Driller A.F. Leschen.

| | |
|---|---|
| 0 - 13' | Foliated green calcareous slate or schist, greenish white with local weathered bands (buff coloured). |
| 13' - 45' | Well banded foliated calcareous slates - alternating bands of chloritic slate and silty white dolomite mainly fresh, core much broken but rock not fractured. Minor local yellow stained zones. |
| 45' - 79'5" | Fresh foliated green and white calcareous slates. |
| 79'5" - 80'9" | Dense fine grained white dolomite limestone. |
| 80'9" - 81'2" | Green slate. |
| 81'2" - 81'7" | Dense fine grained white dolomite - limestone (contact 30° to axis of bore). |
| 81'7" - 100'3" | Fresh green banded calcareous slates with thin bands of dense white dolomite. |

END OF BORE AT 100 ft. 3 ins.

Bore No. F8 Bore Serial No. 49/50

Coords Line F.8 R.L.676.7' Dip 90°

Drilling commenced 3/5/50 Completed 15/5/50 Driller A.F. Leschen

| | |
|---|---|
| 0 - 6'5" | Rather broken weathered calcareous, foliated slate (dip vertical). |
| 6'5" - 22' | Very steeply dipping calcareous (dolomite) foliated slate or chloritic schist - rather weathered and locally stained. |
| 22' - 32'9" | Locally crumpled but mainly dense hard foliated calcareous slate or schist. |
| 32'9" - 42' | Mainly rather weathered and locally stained calcareous foliated slate or schist. Soft almost friable zones at 34'9" - 35'; 41' - 41'6". |
| 42' - 50'5" | Foliated calcareous slate grading to local bands of dense ? dolomite - core broken but not stained. |
| 50'5" - 57'6" | Mainly dense white massive fine grained ? dolomite with rare slate streaks. |
| 57'6" - 66'11" | Streaky foliated calcareous slate with some massive banded white ? dolomite zones. |
| 66'11" - 68' | Dense white slightly banded ? dolomite. |
| 68' - 87' | Streaky or foliated green and white slate fresh unbroken. |
| 87' - 89' | Massive white ? dolomite limestone. |
| 89' - 100' | Green foliated slate with local narrow bands (up to 5" width) of white dolomitic limestone. |

END OF BORE AT 100 ft.

Bore No. D9 Bore Serial No. DD 65/50

Coords Line D.9 R.L.653.6 ft. Dip 90°

Drilling commenced 21/6/50 Completed 30/6/50 Driller A.F. Leschen

| | |
|---|---|
| 0 - 14'8" | Dense fine grained cream-white ? dolomitic limestone hard massive. |
| 14'8" - 16'4" | Green chloritic schist, crumpled - contact with limestone vertical. |
| 16'4" - 30'3" | Dense fine grained buff-white dolomite limestone, streaky banded in part, rare leached zones. |
| 30'3" - 33' | Contact dense dolomitic limestone and chloritic schist. |
| 33' - 50' | Fresh green crumpled chloritic schist or slate streaky banded with dense limestone and occasional bands up to 3" wide. |
| 50' - 75'7" | do. becoming more evenly banded. |

END OF BORE AT 75 ft. 7 ins.

Bore No. E9 Bore Serial No. DD 64/50

Coords Line E.9 R.L. 653.8 ft. Dip 90°

Drilling commenced 7/6/50, Completed 20/6/50 Driller A.F. Leschen

| | |
|---|---|
| 0 - 35' | Foliated, steeply dipping green chloritic schists or slate mainly fresh with interbedded dense limestone bands. |
| 35' - 35'10" | Dense fine grained white limestone. |
| 35'10" - 44' | Fresh green grey foliated slate locally broken core and contains lenses of dense fine grained grey white dolomite limestone. |
| 44' - 75'2" | Well banded calcareous slates - fresh green-grey coloured occasional broken core, but no stained fractures. |

END OF BORE AT 75 ft. 2 ins.

Bore No. F9 Bore Serial No. DD 53/50

Coords Line F.9 R.L. 654.0 ft. Dip 90°

Drilling commenced 18/5/50, Completed 6/6/50 Driller A.F. Leschen

| | |
|---|---|
| 0 - 13'9" | Mainly fresh and locally slightly broken foliated green and cream coloured slate or schist. |
| 13'9" - 18' | Rather weathered, locally slightly friable do. scattered stained joint fractures. |
| 18' - 19'6" | Dense white dolomitic limestone. |
| 19'6" - 44'9" | Foliated green calcareous slate - core locally broken but rock unstained - scattered bands of white dolomitic limestone up to 2 inches thick. |
| 44'9" - 76'5" | Even banded greenish chloritic slate or schist with intercalated calcareous layers - fresh unfractured or jointed. |

END OF BORE AT 76 ft. 5 ins.

Bore No. E 10 Bore Serial No. DD 75/50

Coords Line E.10 R.L. 653.7 ft. Dip 90°

Drilling commenced 3/8/50 Completed 9/8/50 Driller A.F. Leschen

0 - 14' (8' core) Slightly weathered dense banded calcareous slate, with limestone bands. Leached 0-?5'.

14' - 50'4" Dense fine grained streaky banded calcareous slate with intercalated limestone bands - fresh unbroken (Slightly leached 36', quartz vein at 40'6").

END OF BORE AT 50 ft. 4 ins.

Bore No. F 10 Bore Serial No. DD 77/50

Coords Line F.10 R.L. 654.3 ft Dip 90°

Drilling commenced 14/8/50, Completed 17/8/50 Driller A.F. Leschen

0 - 5' Slightly broken and weathered streaky banded calcareous slate.

5' - 50'6" Dense fresh greenish streaky banded calcareous slate rare stained fractures, grades locally into banded slaty limestone.

END OF BORE AT 50 ft. 6 ins.

Bore No. E 11 Bore Serial No. DD 68/50

Coords Line E.11 R.L. 683.8 ft. Dip 90°

Drilling commenced 27/7/50, Completed 2/8/50 Driller A.F. Leschen

0 - 8' (2' core) Rather broken and somewhat stained streaky banded, foliated slate.

8' - 18' Grey streaky foliated calcareous slate with numerous intercalated narrow bands of dense grey limestone.

18' - 50'2" do. with dense limestone bands up to 2" thick. Stained fractures infrequent.

END OF BORE AT 50 ft. 2 ins.

Bore No. F 11 Bore Serial No. DD 66/50

Coords Line F.11 R.L. 678.8 ft. Dip 90°

Drilling commenced 24/7/50 Completed 26/7/50 Driller A.F. Leschen

| | |
|---|---|
| 0 - 10'5" | Green-grey foliated and banded calcareous slate weakly stained on fractures. |
| 10'5" - 11'5" | Streaky banded pinkish slaty limestone - dense fine-grained. |
| 11'5" - 14'6" | Mainly streaky foliated calcareous slate. |
| 14'6" - 16'4" | Very calcareous streaky slate with abundant intercalated dense limestone. |
| 16'4" - 50'7" | Streaky banded calcareous slate hard dense, rare stained fractures. Locally banded with dense grey limestone up to 2" wide. Rare fractures. |

END OF BORE AT 50 ft. 7 ins.

Bore No. E 12 Bore Serial No. DD 78/50

Coords Line E.12 R.L. 726.8 ft. Dip 90°

Drilling commenced 14/8/50 Completed 17/8/50 Driller K.E. Jennings.

| | |
|---|---|
| 0 - 6' | Weathered and rather broken foliated calcareous slate locally soft decomposed zone (at 5'). |
| 6' - 19'9" | Slightly weathered streaky banded, foliated calcareous slate carrying intercalated limestone bands up to 1½" thick - slightly leached in places. |
| 19'9" - 20'8" | Streaky banded slaty limestone grading to |
| 20'8" - 24' | Calcareous slate well banded with intercalated limestone - all weakly leached. |
| 24' - 40' | Mainly dense streaky banded calcareous slate, unweathered. |
| 40' - 43' | Slightly leached streaky banded slaty limestone with ½" leached quartz vein at 42' - 42'6". |
| 43' - 50'1" | Dense streaky banded very calcareous slate, unweathered. |

END OF BORE AT 50 ft. 1 in.

Bore No. E 13 Bore Serial No. DD 76/50

Coords Line E.13 R.L. 764.8 ft. Dip 90°

Drilling commenced 4/8/50, Completed 14/8/50, Driller K.E. Jennings.

| | |
|---|---|
| 0 - 4'5" | Broken weathered foliated slate. |
| 4'6" - 11'6" | Streaky banded foliated calcareous slate, stained on fractures. |
| 11'6" - 25'6" | Streaky banded calcareous slate carrying intercalated limestone bands up to 2" thick. Fractures infrequent. |
| 25'6" - 26'9" | Slightly leached calcareous, banded slate. |
| 26'9" - 50' | Dense well banded calcareous slate - limestone bands up to 2½" wide. Unbroken. |

END OF BORE AT 50 ft.

Bore No. E 14 Bore Serial No. DD 69/50

Coords Line E.14 R.L. 799.3 ft. Dip 90°

Drilling commenced 27/7/50, Completed 1/8/50 Driller K.E. Jennings.

| | |
|---|---|
| 0 - 7'6" | (3' core recovered) Weathered and slightly broken banded calcareous slate. |
| 7'6" - 35'6" | Slightly weathered and leached streaky banded calcareous slate with abundant intercalated limestone - slightly leached. |
| 35'6" - 50'9" | Dense streaky banded calcareous slate relatively fresh, unweathered - no leached fractures. |

END OF BORE AT 50 ft. 9 ins.

Bore No. E15 Bore Serial No. DD 67/50

Coords Line E.14 R.L. 799.3 ft. Dip 90°

Drilling commenced 24/7/50 Completed 25/7/50 Driller M.R. Obst.

| | |
|---|---|
| 0 - 50'1" | Dark green grey and brownish slightly weathered well banded slate shows some preferential leaching on bands, throughout resulting in a slightly friable rock in places. Similar material throughout the bore - hardening slightly at 48-50'. |

END OF BORE AT 50 ft. 1 in.

## GEOLOGY

The drilling has confirmed the writer's interpretation of the geological structure of the bedrock described in his preliminary report (8/3/49) quoted above. It has, however, outlined more clearly the fact that the contact between the grey-green banded calcareous slates (Tapley's Hill Slates) and the adjoining banded slaty blue grey limestone (Brighton Limestone) is gradational, and that the boundary indicated on the plans and sections is an arbitrary one. In the same way there is no sharp line of demarcation between the blue-grey slaty limestone and the stratigraphically higher buff-grey slaty dolomitic limestone. On the other hand the boundary between the buff dolomitic limestone (i.e. the top of the Brighton Limestone Series) and the green foliated or schistose slates (Purple Slate Series) is reasonably sharp and well defined. It was found from the cores that the latter series of foliated phyllitic slates which constitute all of the foundation area and the north western abutment is markedly calcareous and carries an unsuspectedly large number of thin bands ranging from a fraction of an inch up to about 10 feet thick, of dense white fine grained massive or streaky banded, probably dolomitic, limestone. These dolomitic limestone bands are characteristically hard and fresh and well sealed to the contiguous layers of slaty or phyllitic material.

Thin stringers or veinlets of quartz and/or calcite are not uncommon in the rocks of all four of the major subdivisions mentioned above. In the more weathered sections these veinlets may be somewhat leached and ironstained, suggesting that they have acted as solution channels, but in much of the unoxidised rock the quartz is well cemented on to the walls of adjacent country rock. In several of the bores a scattered sprinkling of pyrite crystals was found, usually associated with quartz veins, in the foliated phyllite-slates, but no pyrite was noticed within unoxidised rocks of the Brighton Limestone and Tapley's Hill Slate series.

Physical Condition of the Bedrock.

The drilling has demonstrated that depth of weathering and decomposition of the bedrocks although somewhat variable and ill defined is arranged in a specific pattern. Deepest weathering occurs in the centre of the divide, i.e. on the highest ground on the south-eastern abutment - in the banded calcareous slates of the Tapley's Hill series. Here oxidised and partly weathered zones and strips of rock occur to depths of over 70 feet. As we progress westerly the depth of weathering diminishes rapidly corresponding with the increase in limestone proportion at the arbitrary boundary between the Tapley's Hill Slates and the Brighton Limestone Series. Below the lower slopes of the abutment and in the foundation, the rocks are relatively fresh and unweathered almost to the surface, despite the fact that the foliated phyllitic slates of the foundations are frequently crumpled and rather schistose. This indicates that the rate of mechanical erosion by the Myponga River is greater than the rate of chemical weathering in force within the area. This is in full accord with the youthful topographic profiles exhibited by the river valley at this locality.

The approximate lowest boundary of weathering is shown in the accompanying geological sections along lines E and F (See Fig. 1).

It is significant that the general depth of weathering is less within the harder, denser more calcareous zones than in the adjacent more slaty rock. Leaching and weathering by the action of circulating meteoric water along cracks, fractures joints and bedding planes in the abutment rocks is surprrisingly rare in the banded calcareous and dolomitic rocks of the south-eastern abutment, and the drilling has revealed no evidence of continuous solution cracks or cavities such as would be a serious source of leakage, and such as might well have been expected to be a common feature of the Brighton Limestone Series in this area. Occasions when the return water was lost during drilling - indicating the intersection of an open fracture - were comparatively few.

An analysis of the core recoveries recorded from the bore drilled, Table II, confirms the impression that the rocks in depth are seldom friable or broken, or in other ways structurally weak.

TABLE II - Core Recoveries Myponga Dam Site Bores

| Bore | Depths | % Core Recovered | Geological Formation |
|---|---|---|---|
| D0 | 0 - 8' | 62.5 | Tapley's Hill Slates (Banded calcareous slate) |
| | 8 - 13 | 94 | " |
| | 30 - 31'10" | 70 | " |
| | 31'10"- 54'8" | 85 | " |
| | 54'8" - 75'10" | 83 | " |
| | 75'10"- 88' | 87 | " |
| | 88' - 100'1" | 100 | " |
| E0 | 0 - 14' | 67 | " |
| | 14' - 22' | 100 | " |
| | 22' - 38'5" | 90 | " |
| | 38'5" - 67'2" | 97 | " |
| | 67'2" - 90'9" | 97.5 | " |
| | 90'9" - 100' | 100 | " |
| F0 | 0' - 8'6" | 82 | " |
| | 8'6" - 36' | 71 | " |
| | 36' - 60'3" | 98 | " |
| | 60'3" - 80'3" | 87.5 | " |
| | 80'3" - 101'1" | 98 | " |
| D1 | 0' - 8'3" | 69 | " |
| | 8'3" - 54'3" | 93 | " |
| | 54'3" - 100' | 100 | " |
| E1 | 0' - 10'7" | 67 | " |
| | 10'7" - 29' | 98 | " |
| | 29' - 55'9" | 64 | " |
| | 55'9" - 101'6" | 100 | " |
| F1 | 0' - 8' | 30 | " |
| | 8' - 27'11" | 98 | " |
| | 27'11 - 57'11" | 97 | " |
| | 57'11 - 76'6" | 94 | " |
| | 76'6" - 100'5" | 100 | " |
| D2 | 0' - 27'9" | 85 | " |
| | 27'9" - 67'9" | 99 | " |
| | 67'9" - 85'3" | 46 | " |
| | 85'3" - 90'3" | 100 | " |
| | 90'3" - 96'7" | 9 | " |
| | 96'7" - 100'3" | 23 | " |
| E2 | 0' - 7' | 75 | " |
| | 7' - 21' | 80 | " |
| | 21' - 32'9" | 91 | " |
| | 32'9" - 48'7" | 65 | " |
| | 48'7" - 60'5" | 55 | " |
| | 60'5" - 67'5" | 21 | " |
| | 67'5" - 75'9" | 97 | " |
| | 75'9" - 83'1" | 95.5 | " |
| | 83'1" - 100'1" | 100 | " |

| Bore | Depths | % Core Recovered | Geological Formation |
|---|---|---|---|
| F2 | 0' - 20'6" | 89 | Tapley's Hill Slates (banded calcareous slate) |
| | 20'6" - 76'10" | 100 | " |
| | 76'10"- 92'1" | 95 | " |
| | 92'1" - 101'8" | 100 | " |
| D3 | 0' - 7' | 39.5 | " |
| | 7' - 53'9" | 100 | " |
| | 53'9" - 71'9" | 66 | " |
| | 71'9" - 81'2" | 23 | " |
| | 81'2" - 89'6" | 75 | " |
| | 89'6" - 100'3" | 22.5 | " |
| E3 | 0' - 24'10" | 78 | " |
| | 24'10" - 73'1" | 100 | " |
| | 73'1" - 90' | 80 | " |
| | 90' - 100'2" | 52 | " |
| F3 | 0' - 8' | 22 | " |
| | 8' - 24'5" | 88 | " |
| | 24'5" - 40'4" | 93 | " |
| | 40'4" - 60'2" | 87 | " |
| | 60'2" - 76'9" | 98.5 | " |
| | 76'9" - 100'8" | 55 | " |
| D4 | 0' - 7' | 53.5 | " |
| | 7' - 20'11" | 55 | " |
| | 20'11" - 35'9" | 59 | " |
| | 35'9" - 42' | 100 | " |
| | 42' - 78' | 21.5 | Brighton Limestone (banded |
| | 78' - 86'7" | 100 | " slaty limestone) |
| | 86'7" - 100'2" | 78.5 | " |
| E4 | 0' - 11'8" | 53 | Tapley's Hill Slates (banded calcareous slate) |
| | 11'8" - 25'6" | 85 | " |
| | 25'6" - 43'2" | 100 | " |
| | 43'2" - 52'4" | 64 | Brighton Limestone (banded slaty limestone) |
| | 52'4" - 79'7" | 35 | " |
| | 79'7" - 92'6" | 90 | " |
| | 92'6" - 101'5" | 70 | " |
| F4 | 0' - 13' | 77 | Tapley's Hill Slates (banded calcareous slate) |
| | 13' - 32'8" | 80 | " |
| | 32'8" - 55'5" | 100 | Brighton Limestone (Banded slaty limestone) |
| | 55'5" - 76'2" | 39 | " |
| | 76'2" - 87'9" | 77 | " |
| | 87'9" - 100'6" | 43 | " |
| D5 | 0' - 9'6" | 3.5 | " |
| | 9'6" - 21'3" | 86 | " |
| | 21'3" - 35'6" | 100 | " |
| | 35'6" - 56' | 86.5 | " |
| | 56' - 81'9" | 83 | " |
| | 81'9" - 100'9" | 100 | " |

| Bore | Depths | % Core Recovered | Geological Formation. |
|---|---|---|---|
| E5 | 0' - 8' | 27 | Brighton Limestone (banded slaty limestone) |
| | 8' - 20'2" | 21 | " |
| | 20'2" - 33'9" | 11 | " |
| | 33'9" - 54'7" | 86 | " |
| | 54'7" - 69'4" | 89 | " |
| | 69'4" - 89'3" | 88 | " |
| | 89'3" - 101'5" | 100 | " |
| F5 | 0' - 8'5" | 53 | " |
| | 8'5" - 30'1" | 55 | " |
| | 30'1" - 41'11" | 85 | " |
| | 41'11"- 54'10" | 60 | " |
| | 54'10"- 64'6" | 64 | " |
| | 64'6" - 100'7" | 100 | " |
| D6 | 0' - 8'1" | 86 | " |
| | 8'1" - 14'6" | 100 | " |
| | 14'6" - 25'6" | 68.5 | " |
| | 25'6" - 37'5" | 88 | " |
| | 37'5" - 54'1" | 48 | " |
| | 54'1" - 55'9" | 51 | " |
| | 55'9" - 66'7" | 82.5 | " |
| | 66'7" - 71'4" | 100 | " |
| | 71'4" - 81'10" | 97 | " |
| | 81'10" - 100'8" | 75 | " |
| E6 | 0' - 22'11" | 72 | " |
| | 22'11" - 40'3" | 85 | " |
| | 40'3" - 48'1" | 27 | " |
| | 48'1" - 58'8" | 95 | " |
| | 58'8" - 74'11" | 94 | " |
| | 74'11" - 93'2" | 86 | " |
| | 93'2" - 100'10" | 96 | " |
| F6 | 0' - 17' | 81 | " |
| | 17' - 37'11" | 76 | " |
| | 37'11" - 56'8" | 96 | " |
| | 56'8" - 72' | 63 | " |
| | 72' - 82' | 92 | " |
| | 82' - 100' | 100 | " |
| D7 | 0' - 5'3" | 100 | Brighton Limestone (Dolomitic slaty limestone) |
| | 5'3" - 14'3" | 90 | " |
| | 14'3" - 27'2" | 92 | " |
| | 27'2" - 40' | 91.5 | " |
| | 40' - 52'4" | 42 | " |
| | 52'4" - 63'2" | 57.5 | " |
| | 63'2" - 77'7" | 90 | " |
| | 77'7" - 95'9" | 80.5 | Purple Slate Series (Calcareous foliated phyllitic slates) |
| | 95'9" - 100' | 74.5 | " |

| Bore | Depth | % Core Recovered | Geological Formation |
|---|---|---|---|
| E7 | 0' - 16'2" | 61 | Brighton Limestone (Dolomitic slaty limestone) |
| | 16'2" - 30' | 76.5 | " |
| | 30' - 46' | 60 | " |
| | 46' - 56' | 100 | " |
| | 56' - 66'7" | 93 | " |
| | 66'7" - 82'7" | 83 | " |
| | 82'7" - 90'9" | 76.5 | Purple Slate Series (Calcareous foliated phyllitic slate |
| | 90'9" - 100' | 97 | " |
| F7 | 0' - 7' | 48 | Brighton Limestone (Dolomitic slaty limestone) |
| | 7' - 20'3" | 87 | " |
| | 20'3" - 33' | 80 | " |
| | 33' - 42'9" | 92 | " |
| | 42'9" - 55'9" | 97 | " |
| | 55'9" - 61'1" | 81 | " |
| | 61'1" - 80'4" | 91 | " |
| | 80'4" - 82'3" | 74 | " |
| | 82'3" - 90'2" | 69 | " |
| | 90'2" - 100'1" | 81 | " |
| E8 | 0' - 2' | 75 | Purple Slate Series (Calcareous foliated phyllitic slate |
| | 2' - 13'1" | 81 | " |
| | 13'1" - 35'4" | 89 | " |
| | 35'4" - 48'1" | 98 | " |
| | 48'1" - 57'2" | 96 | " |
| | 57'2" - 67'3" | 91 | " |
| | 67'3" - 79'6" | 100 | " |
| | 79'6" - 89' | 81 | " |
| | 89' - 94'8" | 90 | " |
| | 94'8" - 100'3" | 82 | " |
| F8 | 0' - 6'8" | 35 | " |
| | 6'8" - 22'3" | 98 | " |
| | 22'3" - 37' | 99 | " |
| | 37' - 47'10" | 86 | " |
| | 47'10" - 58'4" | 83 | " |
| | 58'4" - 70' | 94 | " |
| | 70' - 80'4" | 100 | " |
| | 80'4" - 90'4" | 90 | " |
| | 90'4" - 100' | 51 | " |
| D9 | 0' - 9'1" | 22 | " |
| | 9'1" - 40'1" | 100 | " |
| | 40'1" - 49'5" | 83 | " |
| | 49'5" - 59'11" | 80 | " |
| | 59'11" - 75'7" | 82.5 | " |
| E9 | 0' - 6'8" | 52 | " |
| | 6'8" - 20'1" | 97 | " |
| | 20'1" - 27'8" | 96 | " |
| | 27'8" - 30'3" | 90 | " |
| | 30'3" - 43'7" | 65 | " |
| | 43'7" - 56'2" | 82 | " |
| | 56'2" - 64' | 86 | " |
| | 64' - 75'2" | 100 | " |

| Bore | Depth | % Core Recovered | Geological Formation. |
|---|---|---|---|
| F9 | 0' - 14'4" | 62 | Purple Slate Series (Calcareous foliated phyllitic slates) |
| | 14'4" - 27'9" | 54 | " |
| | 27'9" - 33'8" | 71 | " |
| | 33'8" - 49'5" | 98 | " |
| | 49'5" - 59'8" | 100 | " |
| | 59'8" - 62'10" | 79 | " |
| | 62'10"- 76'5" | 99.5 | " |
| E10 | 0' - 4'6" | 33 | " |
| | 4'6" - 7'2" | 56 | " |
| | 7'2" - 19'11" | 98 | " |
| | 19'11" - 50'4" | 100 | " |
| F10 | 0' - 7' | 64 | " |
| | 7' - 18'9" | 99 | " |
| | 18'9" - 37'4" | 97 | " |
| | 37'4" - 50' | 80 | " |
| E11 | 0' - 8' | 12.5 | " |
| | 8' - 26'9" | 100 | " |
| | 26'9" - 39'4" | 99 | " |
| | 39'4" - 50'2" | 95 | " |
| F11 | 0' - 23' | 80 | " |
| | 23' - 45'5" | 100 | " |
| | 45'5" - 50'7" | 89 | " |
| E12 | 0' - 4' | 62.5 | " |
| | 4' - 16'4" | 73 | " |
| | 16'4" - 36'4" | 100 | " |
| | 36'4" - 50' | 95 | " |
| E13 | 0' - 11' | 32 | " |
| | 11' - 42' | 100 | " |
| | 42' - 50' | 58 | " |
| E14 | 0' - 22'2" | 79 | " |
| | 22'2" - 35'2" | 100 | " |
| | 35'2" - 50'9" | 84 | " |
| E15 | 0' - 28' | 73 | " |
| | 28' - 50'1" | 100 | " |

From this table it can be seen that much of the core loss occurs in the first few feet of drilling and that there are very few bores where an excessive loss occurs over a narrow zone at depth. No strict quantitative comparison can be made between the logs of individual bores - due to the fact that at least three different types of drilling plants were used, different types of core barrel were employed; and there was a considerable number of changes in the

drilling personnel during the course of the programme - allowing for a considerable variation in operating skill. However it is considered that the core recovery figures do give some indication of the physical condition of the bedrock and the fact that the average core recovery is reasonably high (82%) and that the lowest average recovery for any one bore is 55%, whilst core recoveries of less than 50% over lengths of 5 ft. or more are very uncommon, all point to the conclusion that the bedrock everywhere in both abutments and foundation is sound, and capable of withstanding considerable bearing pressures.

## CORE TESTING

Samples of typical core from various depths in the bores have been taken by officers of the Engineering and Water Supply Department for testing in their new laboratories attached to the Design section of that Department. It is understood that standard tests both in compression and in double shear of both the dry samples and of samples soaked in water for a considerable time, are to be undertaken. The final results of this testing will not be forthcoming for some time and are outside the scope of this report.

## SUMMARY AND CONCLUSIONS

A programme of diamond drilling of the abutments and foundation at the Lower Dam Site No. 2, Myponga River, has been completed. The logs of these bores are given in this report and the geology reviewed as a result of the information revealed by the boring. The physical condition of the bedrock as seen in the cores has been discussed. Samples of typical core material are being tested in the laboratories of the Engineering and Water Supply Department.

As a result of the additional geological information obtained, the following conclusions regarding the suitability of the selected site for carrying an effective dam structure, have been drawn by the writer.

1. Drilling has confirmed the writer's previously expressed view that the Lower Site No. 2 will prove structurally sound and have ample bearing power to support a high level (crest line RL 800 ft.) narrow base type of dam structure either straight gravity or arch dam.

2. Rock forming the south eastern abutment (banded calcareous slate) is partly weathered and oxidised to a depth of over 50 feet on the extreme edge of the abutment but depth of weathering decreases towards the centre of the valley. The denser more highly calcareous zones are as a rule rather less weathered. The green calcareous foliated slate or phyllite of the foundation and north western abutment is almost entirely unweathered in the foundation zone. No deep excavation will be required to expose sound rock in the cut-off trench.

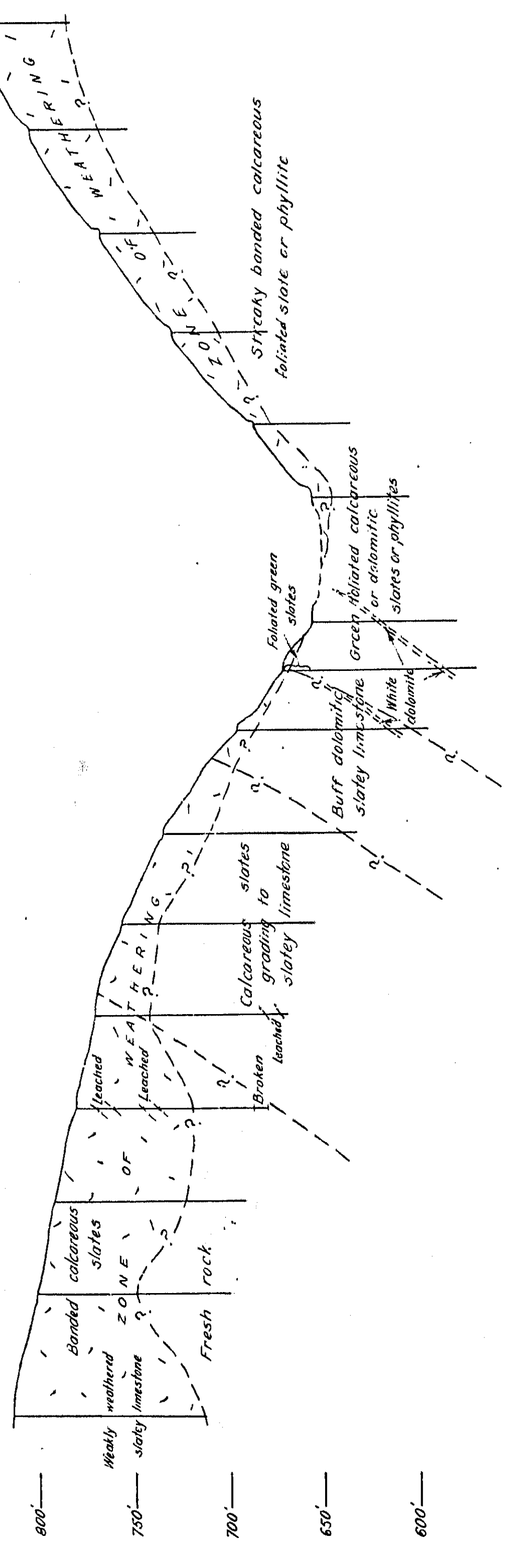
3. Contrary to expectations, no evidence of major solution cavities or strongly leached open fractures in the slaty limestones of the south eastern abutment has been revealed by the boring. Consequently it is considered that with the assistance of artificial sealing measures such as cement grouting, leakage across the dam will be negligible. The fresh rock is almost impermeable and joints and fractures are uncommon.

4. It is therefore concluded that the site known as the Lower Site No. 2 is geologically sound and suitable for the construction of a dam to impound water up to a level as high as RL 800 ft.

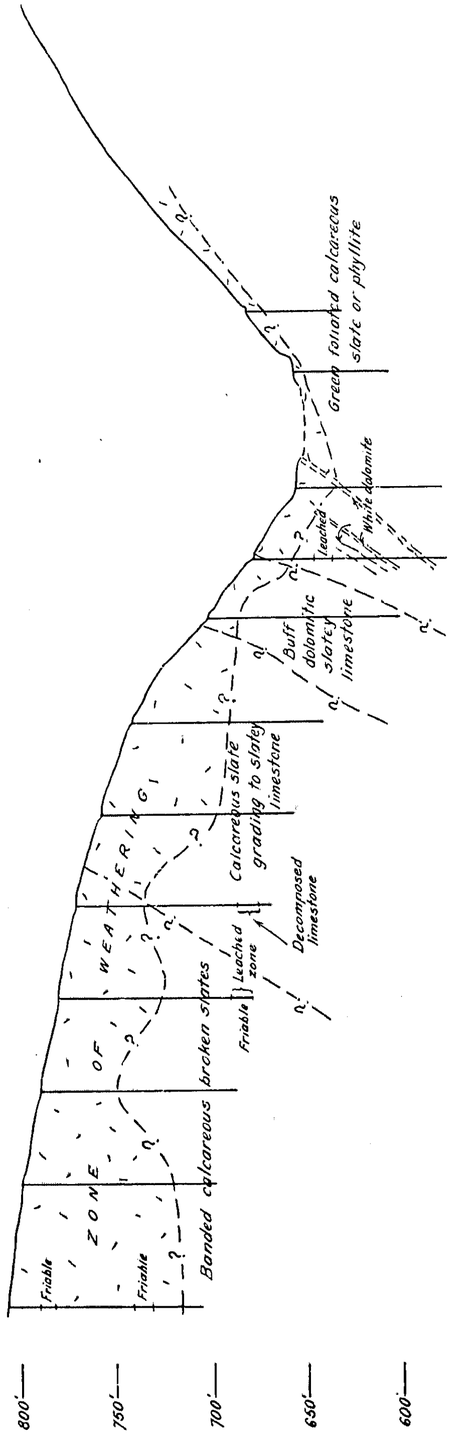
(Sgd.) K.R. MILES

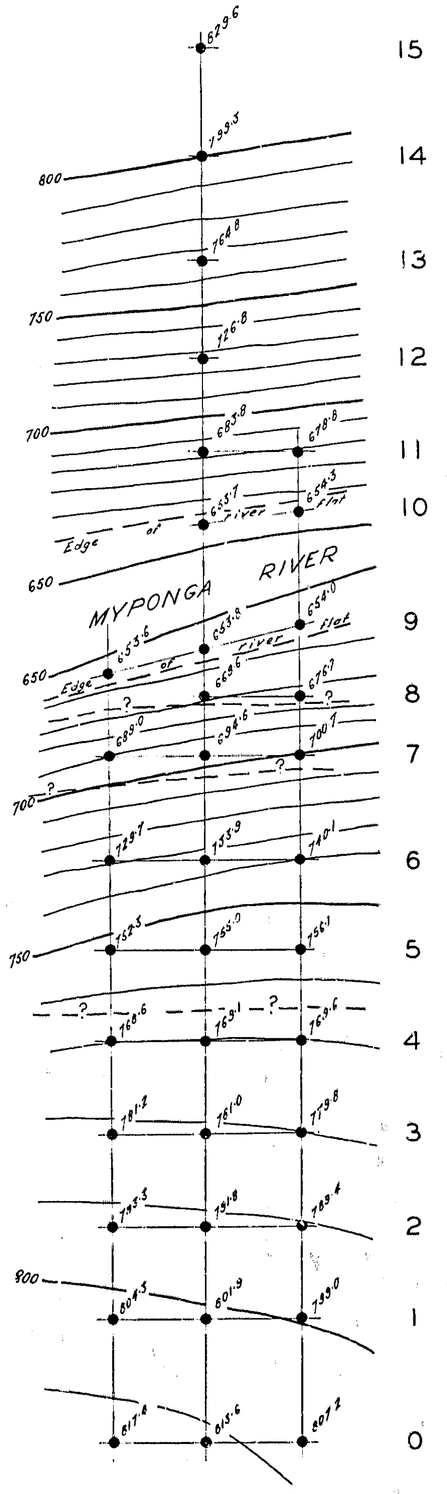
25/9/50. SENIOR GEOLOGIST

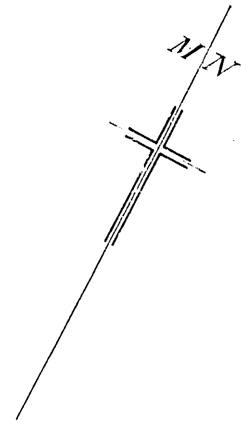
SECTION ALONG LINE E




SECTION ALONG LINE F




## —LEGEND—

PURPLE SLATE SERIES
Phyllitic slate

BRIGHTON LIMESTONE SERIES
Dolomitic limestone
Blue-grey "

TAPLEYS HILL SLATE SERIES
Calcareous slates

Bore
Contours at intervals of 10 feet (datum assumed) — 750
Approximate Geological Boundary

— SCALE —
FEET 50 0 50 100 150 200 FEET

K. R. Miles
Senior Geologist.

# S.A.G. DEPT. OF MINES

## MYPONGA RIVER
## LOWER DAM SITE Nº 2
## GEOLOGICAL PLAN & SECTIONS
## SHOWING BORES

| Associated Drawing | No. | No. | Amendment | Exd. | Date |
|---|---|---|---|---|---|
| | | | | | |

Req. No.
D.M.
Compiled from Dr. K.R. Miles originals

| Approved | Passed |
|---|---|
| L. A. Bonython, Director of Mines | 8/5/50 |

Drn.
Tcd. M.B.L.
Ckd.
Exd.

Scale 50 feet to 1 inch
50 - 352
Date 15 - 9 - 50 | H c 4