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GEOLOGICAL REPORT ON THE FEASIBILITY AND DESIGN INVESTIGATION OF CORIN DAMSITE, COTTER RIVER, A.C.T. 1964-1965

by

E.J. BEST

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The information contained in this report has been obtained by the Department of National Development as part of the policy of the Commonwealth Government to assist in the exploration and development of mineral resources. It may not be published in any form or used in a company prospectus or statement without the permission in writing of the Director, Bureau of Mineral Resources, Geology and Geophysics.

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SUMMARY.

Corin Damsite, previously known as Upper Cotter Damsite B, has been selected as the site for the construction of an earth and rockfill dam, 258 feet high and with a crest length of 926 feet.

The detailed feasibility investigation of the damsite included 3,000 feet of diamond drilling, 2,600 feet of which were water pressure tested; geological mapping of the reservoir area and the immediate vicinity of the damsite; and sluicing of selected areas of the damsite foundations, followed by detailed geological mapping. The design investigation, which commenced immediately after it was decided to construct an earth and rockfill dam, consisted of 3,365 feet of diamond drilling with some water pressure testing, and geological mapping of the spillway, tunnel portals and possible quarry sites.

The country rock at the damsite consists dominantly of folded beds of quartzite, silicified sandstone and siltstone, and laminated siltstone. All beds strike north-westerly, and most dip more steeply than 50°. This sequence is terminated about 1,000 feet to the west of the river by the Cotter Fault, which is a major regional structure; at the damsite, the sequence described above is faulted against older rocks, dominantly phyllite, to the west.

The sequence of rocks present at the damsite also crops out over much of the reservoir area. In addition, extensive areas of the river valley are underlain by dacite porphyry which has been intruded along the Cotter Fault zone. No potential leakage paths from the reservoir have been located, other than in the immediate vicinity of the damsite.

The folding and jointing at the damsite are consistent with regional compression in an east-north-east/west-south-west direction. The folds located at the damsite plunge at 20° to the south-east. On the west bank, a joint system parallel to the Cotter Fault is also developed.

The major faults located at the damsite all strike north, north-west, but dips vary from 40° to the west to near-vertical.

The soil and scree cover over the damsite is generally less than 5 feet thick, but thicknesses of up to 15 feet have been recorded near the river. Beneath the overburden, the zone of weathered bedrock is quite shallow, (much of the rock is fresh at the surface) except in well-jointed and broken zones where weathering extends, in places, to depths of greater than 100 feet.

The foundations of the proposed rockfill dam consist dominantly of thickly bedded, silicified sandstone, which is a hard, strong, well-cemented rock, and in places, grades to very hard and very strong quartzite. Laminated siltstone is present over the remainder of the foundation area. Apart from an extensive outcrop in the core of an anticline on the east bank, it generally occurs as interbeds, less than 8 feet thick, in the silicified sandstone. The siltstone is soft, but moderately strong as it is highly compacted. These rock types provide amply strong foundations for a rockfill dam and little foundation excavation will be necessary, except along fault zones and possibly in areas where extensive dip slopes occur at the surface.

Three major fault zones have been located in the dam foundations, and the presence of at least one other is strongly suspected. Two of the faults exposed by sluicing will not require extensive treatment. Rock along the third fault, which dips gently downhill and upstream on the east bank, is extensively weathered and the overlying rock is very broken. Considerable excavation and treatment will consequently be necessary, particularly as the fault crops out below the impermeable core of the dam.

Water pressure testing of drill holes has emphasised the open jointing which is prevalent in the sandstone and quartzite. Area grouting below the impermeable core will need to be carefully planned to seal all the major joints close to the surface. Curtain grouting on the west bank will be necessary to depths ranging from 120 feet close to the river to 200 feet high up on the abutment, while on the east bank the curtain should range in depth from 90 to 170 feet. Grout consumption is expected to be low to moderate in the siltstone and interbedded sandstone and siltstone, but the thickly-bedded sandstone and quartzite will take large

quantities of grout. The grout curtain will need to be extended for 100 feet east of the limit of the dam on the east bank, while on the west bank, the curtain will need to be extended for at least 250 feet, and possibly 500 feet, beyond the dam axis.

The foundations for the proposed spillway chute have been exposed for much of the spillway length; they consist of thickly-bedded silicified sandstone and well-bedded quartzite. The excavation for the overflow channel will be in sandstone and quartzite also, and the joint systems in this area are so oriented that a steep batter is possible on the western wall of the excavation, without the danger of rockfalls due to an adversely-dipping set of joints.

The portals of the diversion tunnel will be established in a sequence of interbedded siltstone and sandstone. The tunnel will be excavated mainly in laminated siltstone; silicified sandstone interbeds will also be encountered. Joints in the rock are generally tight and large inflows of water into the tunnel are not expected, except possibly where fault zones are intersected. At least three major fault zones are likely to be encountered during tunnelling, and steel sets may be required for support in these areas. Some overbreak should be expected during tunnel excavation, but it is unlikely to cause serious construction difficulties.

Several sources of material suitable for use as rockfill have been located, but only one of them, the Cotter quarry site, is large enough to provide the 1.32 million cubic yards required for the dam. The Cotter quarry site is located in a sequence of quartzite and silicified sandstone, with some silty interbeds, which crops out as a prominent cliff slightly less than a mile upstream of the damsite, on the eastern side of the Cotter valley. The site is topographically well-suited to the development of a free-draining quarry. The quartzite in the quarry area should also be suitable for use as concrete aggregate when crushed.

An extensive programme of overburden sampling in the Cotter valley upstream of the dam has been carried out by the Commonwealth Department of Works, and an adequate supply of impermeable core material (340,000 cubic yards is required in the dam) and filter zone material

(110,000 cubic yards required), has been proved by back-hoe pits and augering. The bulk of the impermeable core material will be derived from slope-wash material on the west bank of the Cotter River, supplemented by some decomposed dacite porphyry. The main borrow area for core material is on the west side of the Cotter valley, directly opposite the proposed quarry for rockfill.

INTRODUCTION

Corin Damsite, previously known as Upper Cotter Damsite E, is one of two alternative sites for a dam to impound sufficient water to supply the needs of a population of a quarter of a million in Canberra; the other site is on the Queanbeyan River, and is known as Googong Damsite. Geological investigations, including diamond drilling and water pressure testing, were carried out at both damsites in 1961 (Best and Hill, 1962; Burton, 1963). It was decided in 1963, by planning authorities, that Corin Damsite was preferable to Googong Damsite.

The detailed investigation of Corin Damsite commenced in January, 1964, with the initiation of a programme of diamond drilling and water pressure testing, based on the conclusions and recommendations set out in the report of the preliminary investigation. It was also proposed that the foundations should be stripped of all soil and scree, and the exposed bedrock washed by high pressure hoses. Because of difficulties in installing and operating the sluicing equipment, washing of the foundations did not commence until August, and the area to be sluiced was therefore considerably reduced. The programme of sluicing continued until the end of 1964.

A decision as to the type of dam most suited to the site was postponed until November, 1964, in order that the maximum amount of information would be gathered from the programme of diamond drilling, water pressure testing, and sluicing of foundation rock. Three types of dams were considered; a multi-arch dam, a rockfill dam with an earth core, and an earth dam. A provisional cost estimate indicated that the multi-arch and rockfill designs were of comparable cost and cheaper than the earth dam. Then in October, 1964, the sluicing of the east bank exposed a fault zone containing up to two feet of very broken rock and clay. The fault is exposed along the line of the dam axis for over 100 feet on the lower slopes of the



Fig. 1: View of west bank of Cotter River, showing cleared area and the two sluiced areas (one along the dam axis and the other 65 feet downstream) at the damsite. Upstream of the damsite is the alluvial flat at the junction of the Cotter River and Kangaroo Creek.



Fig. 2: View of east bank of Cotter River, showing cleared area and the extent of sluicing at the damsite. A bluff of Tidbinbilla Quartzite, above top water level, is visible in the top left corner of the photograph. The footwall of a fault, which dips 40° south-west and crops out adjacent to the dam axis, can be seen in the centre of the photograph.

east bank, and dips obliquely upstream at 40°. Insufficient time was available to determine the exact location, attitude and nature of the fault at depth, and this was a major factor in the decision of November, 1964, to design and construct a rockfill dam, 258 feet high.

Design investigations were initiated as soon as the type of dam had been decided, and continued until July, 1965. By January 1965, it had been decided that the spillway be located on the west bank and the diversion tunnel on the east bank. The location of sources of construction materials proved more difficult than anticipated, and several possible quarry areas for rockfill were drilled before a suitable quarry site was located. By July 1965, the spillway, tunnel portals and valve tower shaft had been investigated by diamond drilling; the fault on the east abutment had been penetrated in three locations by drill holes; an adequate supply of rock suitable for use as rockfill had been proved by drilling; and systematic augering and testing of slopewash material and decomposed dacite in the Cotter valley by the Department of Works had located sufficient material suitable for use in the impermeable core of the dam.

LOCATION AND ACCESS.

The proposed dam axis at Corin Damsite is located 200 feet downstream from the junction of Kangaroo Creek with the Cotter River (Military grid reference 855112); this is 16 miles from the source of the Cotter River and 9 miles upstream from the Bendora Dam (Plate 1).

A new access road to Corin Damsite is currently under construction from a point on the Tidbinbilla Road, 200 yards west of the Gibraltar Creek bridge; the new section of the road, totalling 14 miles, will be tar-sealed. The distance from Canberra to Corin Damsite will be 39 miles via the Monaro Highway and 40 miles via the Cotter Road.

MAPPING.

During April and May, 1964, geological mapping of the Kangaroo Creek-White Sands Creek divide was carried out by D.F. Maggs. There were numerous exposures in the road cuttings, and most of the mapping was done at a scale of 100 feet to 1 inch by plane table tacheometry. The less accessible areas and the creek beds were mapped by tape, compass and Abney

level traverses which closed onto plane table survey stations.

At the same time, W. Oldershaw was engaged in mapping the Cotter Fault zone near the damsite by tape, compass and Abney level traverses. The object of this investigation was to examine the nature of the Cotter Fault zone and the possibility that it would provide a leakage path around the dam; the investigation is the subject of a separate Record (1965/86). The results of this mapping were combined with the mapping carried out by D.F. Maggs, and re-compiled at 400 feet to 1 inch (Plate 2).

During May and June, 1965, the geology of the reservoir area was mapped by D.F. Maggs at 400 feet to 1 inch (Plate 3). A base map had been prepared at this scale from low level air photographs, and many of the more prominent rock outcrops were indicated on this map; other outcrops were plotted by compass and pacing from recognisable features on the base map. This map also incorporates the mapping of the Cotter Fault zone by W. Oldershaw.

From October to December, 1964, the author was engaged in mapping the areas of the damsite foundations cleaned down by sluicing. Mapping was done at a scale of 10 feet to 1 inch, with close plane table control and sketching-in of geological detail (Plates 5 and 6). Each rod station was marked and numbered on the rock surface with paint to facilitate correlation with later mapping of foundations; a total of 821 plane table rod stations were surveyed and marked during the mapping. Control stations on the damsite for the plane table survey were provided by a Department of Interior surveyor.

Geological mapping by the author and G.A.M. Henderson was continued through the period of the design investigations; work was mostly concentrated on the associated features of the project, (such as spillway, inlet portal and outlet portal), and on the search for a suitable quarry site for rockfill. Details are given in the chapters concerned with the engineering geology of appurtenant structures and construction materials.

SLUICING.

In view of the complex geological structure revealed during the preliminary investigation, and the paucity of outcrop, it was decided, in

October 1963, that the foundations of the damsite should be stripped of soil and scree by bulldozers, and the exposed rock washed by high pressure water jets. This technique was made possible by the early installation of the water supply for the construction camp which was to be sited on the crest of the Kangaroo Creek-White Sands Creek divide. A 25,000 gallon storage tank, sited 620 feet vertically above the river, is supplied from Kangaroo Creek by two submersible electric pumps through a four-inch pipeline. For sluicing, a three-inch pipeline was laid to the damsite from a T-junction at a suitable point in the supply line; the water jet was formed by a one-inch fire hose nozzle, swivel-mounted on a tripod. The gravity head from the tank was sufficient for the resultant jet of water to dislodge blocks of rock up to 18 inches across. It was found necessary to remove, by bulldozer, the piles of rock that accumulated as sluicing progressed.

As effective sluicing of the foundations did not start until August 1964, there was insufficient time available to clean down the entire foundation area. It was therefore proposed that an area 20 to 30 feet wide be cleaned down along the dam axis, and a similar strip of rock 60 feet downstream of the axis be sluiced also. This was done, and it was found that the geology of the two sluiced areas on the east bank could not be correlated. The intervening area was also sluiced, and it was here that the fault which dips obliquely upstream at 40^{o}, was discovered.

This technique of sluicing has been of great value in the Corin Damsite investigation. About 40,000 square feet of foundations have been sluiced, and geologically mapped at 10 feet to 1 inch; this has greatly facilitated the interpretation of the structure and the lithology at the site. It has also provided a representative sample of the foundations for inspection by engineers and prospective tenderers, thus providing a sound basis for the evaluation of the foundation treatment necessary. The location, during the feasibility investigation, of the faulted area on the east bank was invaluable, as it was an important factor in deciding the type of dam to be constructed. Had the fault not been discovered until the preparation of foundations during construction, additional investigation and treatment, with consequent costly delays, would have been inevitable.

DIAMOND DRILLING.

Diamond drilling for the detailed investigation of the damsite commenced in January, 1964, and continued until the middle of June; during that time, 15 holes, of total length 3,001 feet, were drilled. Ten of the holes were drilled to test the damsite foundations and abutments, one was drilled to test the Cotter Fault close to proposed top water level, one hole was drilled high up on the east bank as a water table observation hole, two holes were drilled along the proposed spillway line, and one hole was drilled to test a possible source of concrete aggregate or rockfill ¼ mile up Kangaroo Creek.

The design drilling programme was carried out between January and June, 1965; 27 drill holes totalling 3365 feet were drilled during this period. The search for a suitable quarry site for rockfill material formed the major part of this phase of the investigations, four possible quarry sites being tested by 2350 feet of diamond drilling. The remaining thousand feet of drilling was carried out during the testing of the sites of appurtenant structures to the dam, i.e. the spillway, stilling basin, tunnel portals, and valve tower shaft.

Drilling was carried out by Snowy Mountains Hydro-Electric Authority drillers, using Boyles drilling machines owned by the Authority. A triple tube core barrel with a stationary split inner tube was used in all holes, and gave virtually 100 percent core recovery in bedrock. The size of core barrel used throughout was NMLC, except in the lower section of D.D.41 where BMLC was used owing to a lack of NMLC bits.

WATER PRESSURE TESTING.

Water pressure tests were carried out in 12 of the drill holes in the detailed investigation of 1964. Special techniques and equipment were developed during the programme of testing to obtain reliable results despite the high leakage rate.

The water pressure test results of the preliminary investigation indicated that the capacity of the drill circulation reciprocating pumps was quite inadequate, so a centrifugal pump with a capacity of 140 gallons per minute (g.p.m.) was used. In order to stabilise the test section and perform tests at various pressures, water storage facilities were necessary at

the drill sites; two 2,500 gallon galvanised iron tanks were made up for this purpose, and were continuously supplied from the river by reciprocating pumps. Drill holes D.D. 1 to 4 were satisfactorily tested in this manner, water losses of up to 55 g.p.m. being obtained.

However, difficulty was experienced in moving the tanks intact from one drill site to another, and the centrifugal pump (the only one available), was in continual need of adjustment. It was therefore decided to locate the tanks permanently well above top water level, one on each river bank, and to use the gravity head from these tanks for building up the various pressures required in the test sections. The tanks were located 440 feet and 400 feet above the river on the east and west banks respectively, and water was pumped to them continuously, using reciprocating pumps and a 3-inch pipe line. (the large diameter of the supply line was to reduce to negligible amounts pipe friction during testing). This system proved to be very successful, obviating the need for a centrifugal pump and eliminating fluctuations of the pressure gauge.

The down-hole arrangement of the water pressure testing gear also required modification owing to the high water losses. Because of the narrow internal diameter and constrictions at each coupling, high friction losses prevented the use of N-size drill rod above the packer. Flush coupled EX casing, with an internal diameter of 1½ inches, was therefore used throughout, and a special 2-foot length was modified to take the pressure gauge at the intake end of the supply line. N-size mechanical packers with 20 feet of perforated drill rod were used in preference to B-size hydraulic packers as the pressure losses through the packer are thereby minimised. Mechanical packers with four rubbers were used to reduce the possibility of water leaking past the packer.

The calculation of the corrected water pressure test results are shown in Appendix 6 and the results are presented graphically in Plates 25 to 28. The gauge pressures are corrected for hydrostatic head, friction in the supply line, and losses due to constrictions in the packer. The packer losses were calculated from graphs based on packer calibration tests conducted during the investigation. The corrected results were then used to calculate the permeability, in feet per year, of each test section, using a

formula derived by the Snowy Mountains Hydro-Electric Authority.

REGIONAL GEOLOGY.

The general geology of the Cotter valley has been described in some detail in two Records by L.C. Noakes (1946/12 and 1946/26); the following is a brief summary.

On the western side of the valley, metamorphic rocks are dominant; they consist mainly of sericite phyllite with some interbedded sheared quartzite. The regional structure of these beds is consistent along the Cotter valley - northerly strike with an average dip of 60° to the west - but there are some lithological changes. In the Kangaroo Creek area, a greater number of sandy and possibly tuffaceous phases occur than in downstream areas. The succession is regarded as Ordovician, but no fossils have been found in the area. Farther downstream, Upper Ordovician (Eastonian) graptolites have been found in rocks of similar lithology.

On the downthrow or eastern side of the Cotter Fault in the region of Kangaroo Creek, the rock types range from quartzite and sandstone to finely banded shale and slate; siltstone is an important component. Some of the quartzite and sandstone have been sheared, and the succession has been deformed into a series of pitching folds. The degree of contact metamorphism is low, despite the proximity of the Murrumbidgee Granite. The relationship of these rocks to those on the western side of the Cotter Fault is not clear. Before faulting took place, they may have belonged to the same sequence.

The Tidbinbilla Quartzite crops out mainly on the eastern side of the river, and in places is seen to rest unconformably upon the underlying succession. It consists of thick quartzite beds with occasional silicified shaly bands. In the Kangaroo Creek area, the formation occurs in outliers standing out as prominent bluffs, but their relationship with the underlying rocks has been obscured by normal faulting. The dominant rock type is a buff coloured, massive, impure, partially silicified sandstone or quartzite; the beds strike northerly and dip from 15° to 35° to the west.

Four separate areas of granite have been located in the region; the rock type in each is biotite granite with little or no other ferromagnesian minerals. Because their inter-relationships have not been clearly established and each forms a discrete outcropping body, a formal name has

been given to each granite body, but it is probable that they are all related at depth.

The dominant structural feature of the area is the Cotter Fault, which has been traced southwards from 2 miles north of Bendora Dam to a point two miles south of Corin Damsite. The fault extends into the granite country at the head of the Cotter River, where it is less prominant than in the metamorphic rocks downstream. It is considered to be a high angle reverse fault, and the main movement appears to have occurred at about the time of the granite intrusion in late Silurian time. The throw of the fault has not been determined, but the fact that no Tidbinbilla Quartzite has yet been found in the Cotter valley west of the fault suggests a large throw.

RESERVOIR AREA.

GEOLOGY.

The oldest outcropping rock sequence in the reservoir area is a succession of interbedded quartzite, slate, and sericite phyllite with a regional dip of 60° to the west. Only a few exposures of this succession, which occurs on the western side of the Cotter valley, are present in the reservoir area (Plate 3).

On the downthrow or eastern side of the Cotter Fault, a folded succession of interbedded quartzite, sandstone and siltstone is present; the country rock at the damsite is part of this sequence. Where the siltstone crops out in the valley floor, it is generally sheared and silicified due to nearby faulting. Thick beds of sandstone and quartzite generally crop out as prominant bluffs, but most are very openly jointed at the surface.

The other main rock type which occurs in the reservoir area is a quartz-feldspar porphyry. It is generally deeply weathered, and outcrops are restricted to low-lying, scattered blocks and boulders. Every observed contact between porphyry and metasediments, on the east side of the Cotter Fault, is faulted along north-north-west trending fault planes. Detailed mapping of the area upstream of the damsite has shown that these faults are truncated by the main Cotter Fault; the intrusion of the porphyry and the faulting which has brought it against the sediments must therefore have preceded the main movement on the Cotter Fault.

The reservoir area contains numerous faults and shears trending

north-north-west, or parallel to the Cotter Fault. The banded siltstone is profoundly affected by this faulting, and in places contains small, elongated lenses of porphyry lineated parallel to the cleavage in the siltstone. The Cotter Fault crops out in the reservoir area for one mile upstream from the damsite. A detailed description of the geology and faulting of the area upstream of the damsite is given in Oldershaw (1965), together with petrological descriptions of the main rock types.

The Kangaroo Creek portion of the reservoir consists of a folded succession of interbedded silicified sandstone and siltstone. Much of the sandstone is thickly bedded, but few beds are thicker than 20 feet (for definition of thickly bedded, see Appendix 1). The siltstone is generally laminated, and in many outcrops, is well cleaved.

LEAKAGE.

There are three possible paths of leakage from the reservoir area, other than through the foundations: 1. through the spur between Kangaroo Creek and White Sands Creek; 2. through the ridge forming the east abutment of the damsite; and 3. along the Cotter Fault.

Kangaroo Creek-White Sands Creek Divide.

The distance from the Kangaroo Creek branch of the reservoir to White Sands Creek, at an elevation 200 feet below proposed top water level, is only 2000 feet (Plate 2). Although the sediments are virtually impermeable, leakage could occur along any permeable structures such as faults or joints. For leakage to occur, the rock must be openly jointed or fractured to a depth of at least 400 feet below the top of the ridge. To check for possible leakage paths, in addition to detailed geological mapping of the ridge, seismic traverses were conducted along the Kangaroo Creek side of the divide. Several low velocity zones were located; these were exposed as far as possible by bulldozed trenches. The only major feature which was revealed is a shear zone which extends across the ridge and down to White Sands Creek (Plate 2). Where it is exposed close to proposed top water level in the Kangaroo Creek valley, the shear zone intersects siltstone, and although the rock is very closely jointed, it is quite tight and fresh, and is veined by quartz. The shear zone has been traced uphill in siltstone; it is considered impossible for extensive water losses to occur through it.

It is not considered that all possibility of leakage has been disproved, but any losses are likely to be very small; further investigation was therefore deemed unnecessary before construction of the dam.

Kangaroo Creek – Cotter River divide.

The configuration of Kangaroo Creek is such that the minimum horizontal distance from proposed top water level along Kangaroo Creek to the area just downstream of the damsite is only 1,000 feet. This possible leakage path was also tested by seismic traverses, which revealed a low velocity zone on top of the divide. The location of the proposed water table observation hole for the east abutment was therefore moved so that the possible leakage path could be tested by drilling and water pressure testing. Below 120 feet from the surface (i.e. below R.L. 3190 feet), the joints are generally clean and tight, and water losses during pressure testing were negligible. It is therefore unlikely that there will be appreciable leakage through this area.

Cotter Fault.

The possibility of leakage along the Cotter Fault was investigated by W. Oldershaw, and the results of his work are reported in a separate Record (Oldershaw, 1965); the following is a brief summary of the results.

From 600 to 2,000 feet upstream of the damsite, the sandstone, banded siltstone and quartz porphyry on the eastern side of the Cotter Fault are broken by several north-north-west trending faults which are bordered by zones of shattered rock, (Plate 3). The faults, together with the main Cotter Fault zone, crop out below top water level. Lenses of shattered sandstone occur along the Cotter Fault, and water pressure testing in drill holes D.D.6 and P. 2 indicated joint permeabilities of 2,000 feet per year in such rock. Seepage of drilling fluid from D.D.6 to the river bank along one of the north-north-west trending minor faults shows that ground-water could move freely along it, and possibly along other similar faults that terminate on the Cotter Fault.

If the shattered sandstone along the Cotter Fault is continuous, it could provide a passage for the movement of water past the left abutment of the dam. The geology of the Cotter Fault in this area is not sufficiently

accurately known to ascertain whether a continuous leakage path exists; therefore it is recommended that the dam grout curtain be extended westwards to beyond the Cotter Fault. Coring of some of the grout holes would be of assistance in providing more information about the structure and permeability of the fault zone, and may help to determine how far the grout curtain should be extended.

DAMSITE GEOLOGY.

LITHOLOGY.

The country rock at the damsite consists of folded beds of quartz sandstone, quartzite, quartz siltstone, laminated siltstone and shale, with a north-westerly strike and dips mostly steeper than 50°. The western boundary of this succession is the west-dipping Cotter Fault, which passes the site 1,000 feet west of the river; the strata mapped at the damsite have been downfaulted by the Cotter Fault and brought into contact with phyllite, with some sandstone interbeds, west of the fault. An outlier of Tidbinbilla Quartzite also occurs at the site; it forms a prominent bluff 180 feet above the river, on the east bank. The Tidbinbilla Quartzite dips regularly to the south-west at between 20° and 30°.

The lithology of the rocks at the damsite is described in detail in Best and Hill (1962). However, sluicing on the west bank has revealed a previously undescribed succession of well-bedded quartzite with many interbeds of quartzite that contain numerous irregular silty laminae. This quartzite succession underlies the coarse-grained quartzite (see Appendix 1 for grade scale), that forms the rockly rib on the west bank. At the surface, the quartzite is generally weathered brown, and where present, the silty laminae are dark grey. The succession was penetrated by drill holes D.D.2 and D.D.4, which showed fine to medium grained silicified sandstone with irregular silty interbeds. The grain size could not be distinguished in the surface exposures, indicating silicification due to weathering.

The beds of quartzite generally range in thickness from 4 to 15 inches, with a few beds up to 30 inches thick. The quartzite beds containing silty laminae are more thinly bedded; most of them range in thickness between one and six inches, but a few thicker beds (up to 21 inches) occur also. The silty laminae have a wavy appearance, but the dip and strike of

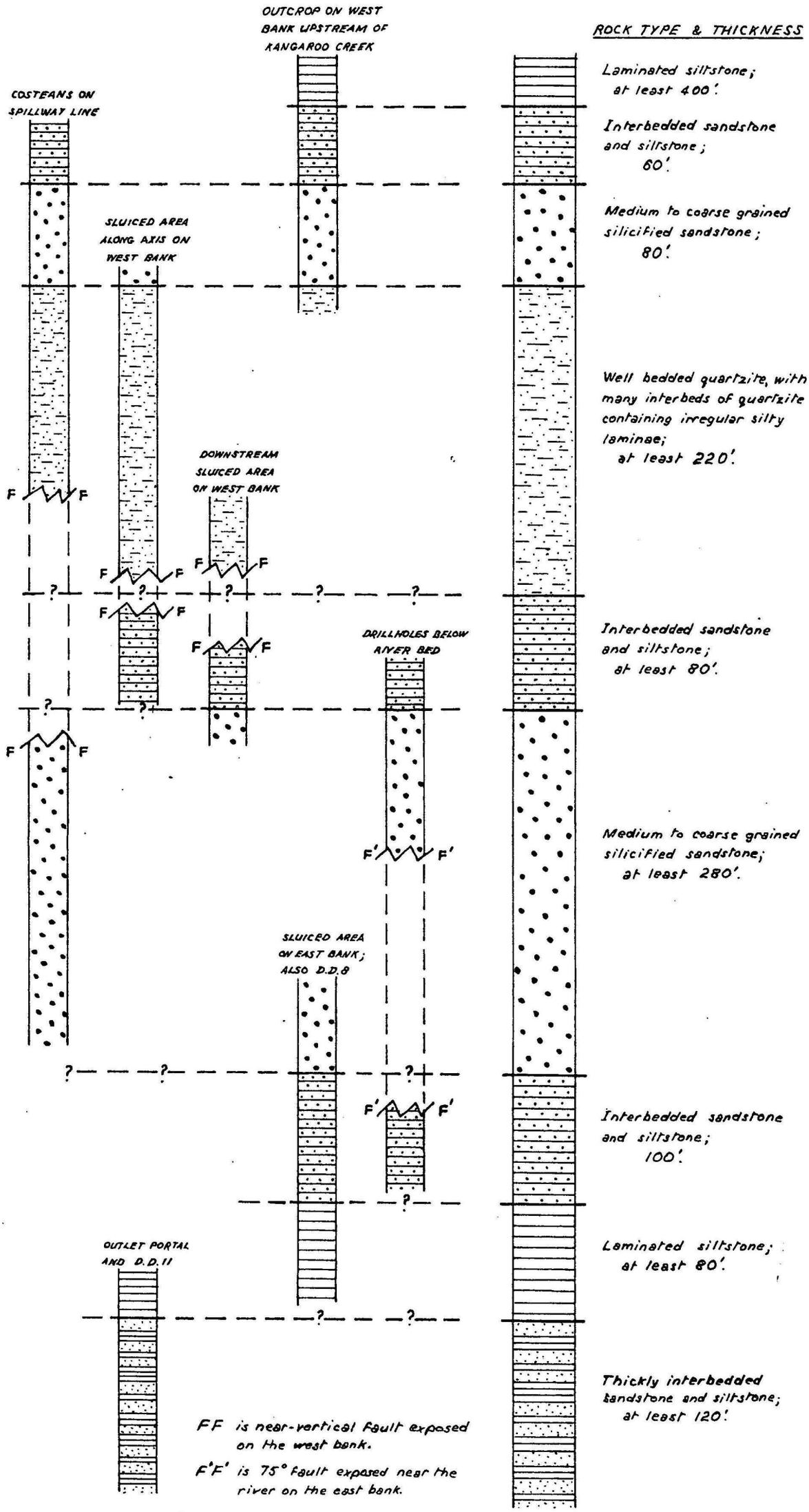


Fig. 3:- Generalised composite stratigraphic column.

Bureau of Mineral Resources, Geology & Geophysics, Oct. 1965. To accompany Record 1965/200 I 55/A16/273

bedding is easily distinguished. In the drill core, graded bedding is also evident.

STRATIGRAPHY.

The programme of diamond drilling and geological mapping during the feasibility and design investigations has provided much information on the stratigraphical succession of the country rocks at the damsite. Owing to widespread minor faulting, together with the lensing out of beds evident in many places, it has not proved possible to determine the succession in detail, but the major divisions have been distinguished.

The stratigraphical sequences mapped in several areas of the damsite are plotted in Fig. 3, and the most probable correlation has been made to produce a composite stratigraphic column. Minimum thicknesses only can be estimated for many of the rock units, because of large displacements on the major faults. The interpreted distribution of the stratigraphic units at the damsite is shown in Plate 20, and Plate 21 illustrates in section, the interpreted distribution along the proposed dam axis.

STRUCTURE

Folding.

The foundation rocks at the damsite are tightly folded, the main folds consisting of two anticlines and two synclines which crop out in the foundation area; all the fold axes were either located during, or inferred from the results of the preliminary investigation. The sluicing has revealed the presence of much minor folding on the limbs of the main folds, particularly on the west bank where four tight minor folds are evident in the quartzite beds which contain silty laminae (see Plate 4 and Figs. 5, 6 and 7).

On the west bank the main anticlinal axis has been traced across the foundation area from R.L. 3,000 feet to a point on the proposed spillway line at R.L. 3,100 feet (see Plate 4). The axis was encountered in drill hole D.D.2 at slope length 117 feet, confirming the conclusion from the preliminary investigation that the axial plane is inclined at about 75° to the north-east. Bedding plane measurements in the cores of the major and minor folds confirm that the fold axes plunge gently to the south-east. The inferred synclinal axis on the west bank was first located by drill hole D.D.1 at 83 feet (slope length), and later was exposed at the downslope end

of the sluiced area downstream of the axis. The uphill extension of the synclinal axis has not been exposed in any of the costeans along the spillway line, but it can be located approximately by the reversals of dip in the costean at R.L. 3030 feet (Plate 4).

During the detailed mapping of the sluiced areas on the west bank, 400 bedding plane measurements were taken. These were plotted as poles on an equal area stereogram net and the resultant plot was contoured to emphasise the distribution of the poles (see Fig. 4(a)). The stereogram shows that only one period of folding is present over the area mapped, the axis of folding plunging 21° in a direction of 147°M+; this agrees well with the strike direction of 141°M obtained from joint pattern stereograms in the report of the preliminary investigation.

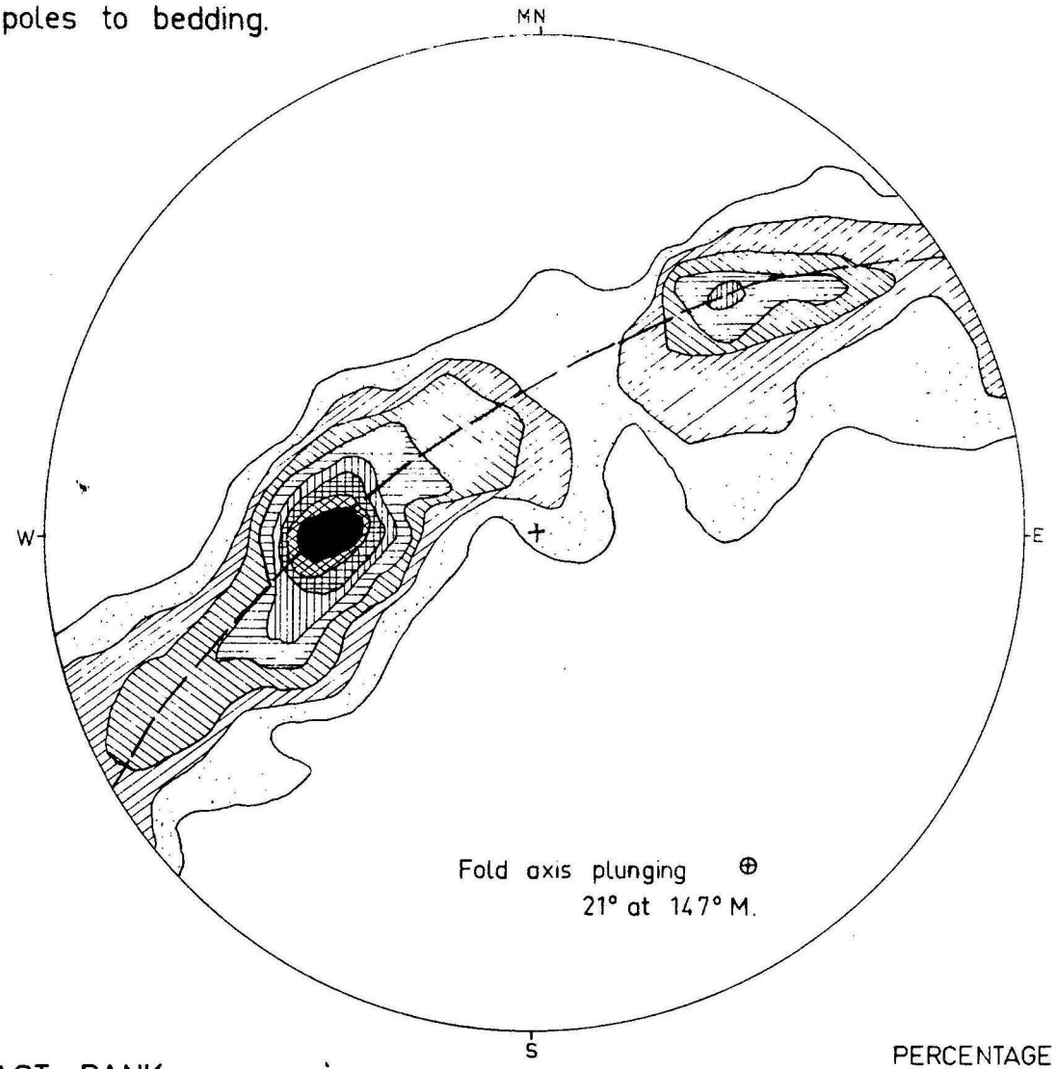
On the east bank, the anticline mapped during the preliminary investigation in an exploratory costean, has been extensively exposed by sluicing. The core of the fold consists dominantly of laminated siltstone which is cleaved parallel to the axial plane. The outcrop along the axial plane consists of a zone of sheared siltstone up to five feet wide; the sheared zone forms a notch in the bedrock surface, two feet deep. In contrast to this anticline, the syncline farther uphill has not been clearly exposed, and its position can only be inferred from bedding measurements in scattered outcrops. The outcrops are of very thickly bedded sandstone and quartzite, and very few bedding planes are evident.

A total of 165 measurements of bedding were made during the mapping of the sluiced areas on the east bank, and these have been plotted on a stereogram (see Fig. 4 (b)). The distribution is not as regular as on the west bank, but most of the bedding plane poles lie on a great circle representing fold axes plunging 20° in a direction 159°M; this compares with a plunge of 15° at 160°M obtained from the joint pattern stereograms during the preliminary investigation. The large concentration of poles which do not correspond to the main fold axes is derived from bedding measurements obtained exclusively from the sluiced area upstream of the dam axis and below R.L. 2950 feet. This area is bounded to the north-east by a major

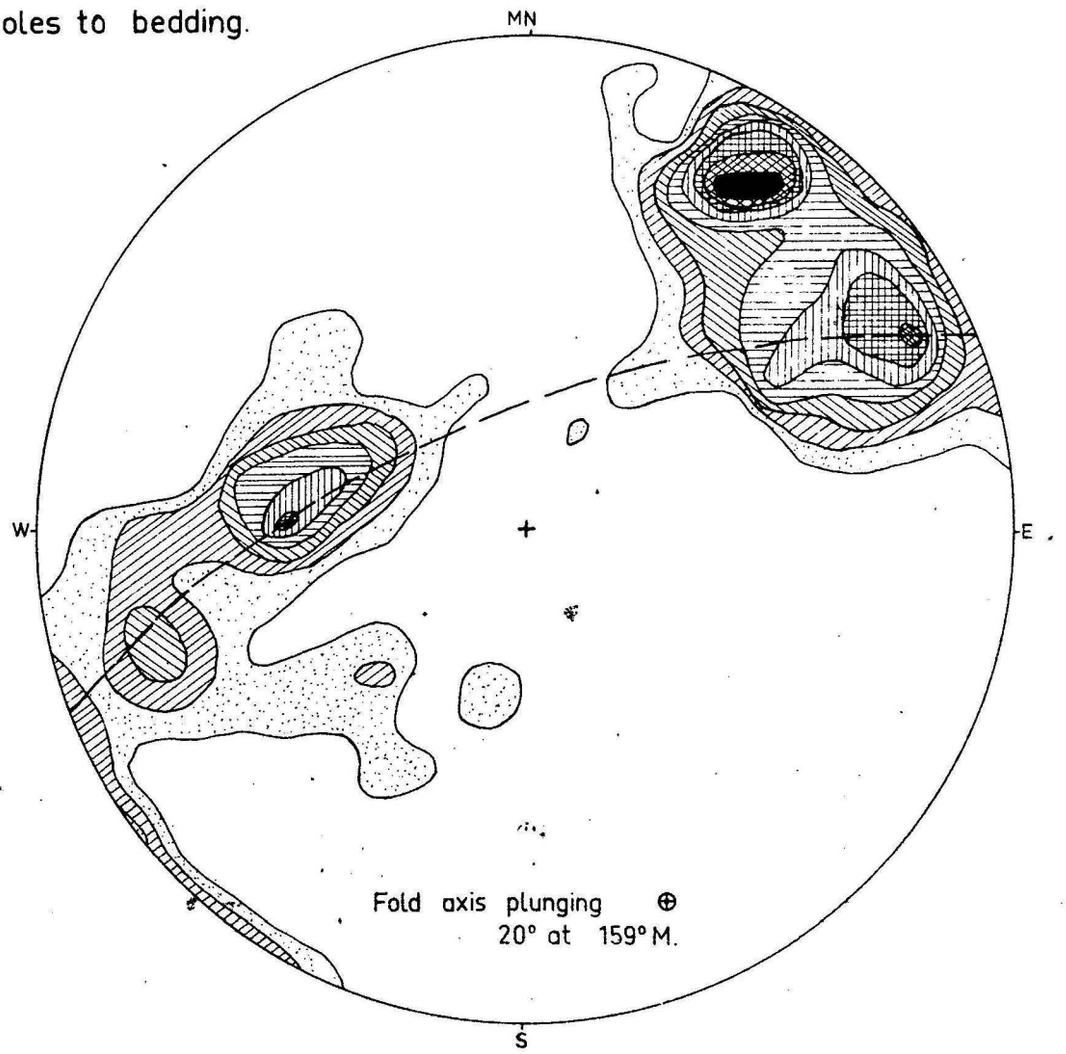
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FOOTNOTE. + All bearings and directions in this report are magnetic.

(a) WEST BANK.
400 poles to bedding.



(b) EAST BANK.
165 poles to bedding.



PERCENTAGE DISTRIBUTION

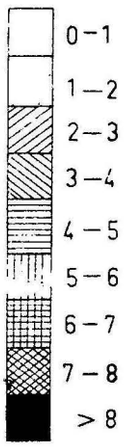


FIG.4:- CONTOUR MAPS OF BEDDING PLANE STEREOGRAMS FROM DAMSITE.
Poles of bedding planes are projected on to the lower hemisphere, using an equal area net.

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Fig. 5: Crest of one of the anticlines exposed in the axial sluiced area on the west bank. This is one of the tight minor folds present in the quartzite on the eastern limb of the main anticline; the location is 79685 S, 51955 W.



Fig. 6: Syncline exposed in the well-bedded quartzite on the west bank at R.L. 3025 feet. This tight fold was exposed during sluicing of the down-stream area, and the prominent quart-zite bed in the core of the fold is 14 inches thick.



Fig. 7: This broad anticline is one of the minor flexures near the main synclinal axis on the west bank. It is exposed towards the bottom of the downstream sluiced area, where the rock is thickly bedded siltstone. The painted numbers on the rock are 4 inches high.

fault, and movement along the fault plane has probably caused the 30° change in strike direction.

The minor folds exposed on the west bank are very tight, the crests and troughs being generally less than two feet wide. The quartzite beds are not significantly jointed or broken along the fold axes. Often individual quartzite beds can be clearly traced across the folds (see Figs. 5, 6 and 7); it is inferred that much of the folding occurred while the rocks were still plastic.

Faulting.

The foundation rock at the damsite has obviously been highly stressed, and numerous displacements of adjacent blocks of rock have been noted. In the quartzite and sandstone, fault movement has taken place along joints and bedding planes with the consequent development of innumerable striated and slickensided surfaces; this is particularly noticeable in the quartzite on the west bank. Where siltstone interbeds are present in the sandstone and quartzite, local stresses were relieved by shearing of the less competent silty interbeds, while the competent sandstones remained more-or-less intact.

The sluicing of the dam foundations has revealed the presence of two major faults on the east bank (Faults A and B, Plate 18), and one on the west bank, together with several minor faults which will need treatment during the preparation of foundations. The most important fault (Fault A), from the foundation treatment point-of-view, is a zone of crushed rock with much clay which crops out adjacent to the dam axis on the lower slopes of the east bank. Sluicing has exposed the fault over a distance of 100 feet between R.L. 2950 feet and 3015 feet; the thickness of the fault zone ranges between 6 and 48 inches (see Fig. 8). Three drill holes (D.D. 38, 39 and 40) were drilled upstream of the fault trace to determine the nature of the fault at depth and to establish its dip and strike more accurately than is possible from the exposure. The drilling indicated that, within 50 feet of the surface, brecciation, clay content and thickness of the fault zone are similar to those at the surface. The attitude of the fault was determined by plotting the surface mapping of the fault and the intercepts in drill holes on to a structure contour map (Plate 18); the plot indicates that the fault strikes

at between 115° and 145°, and dips 40° to the south-west.

Several small shear zones, many with clay, are present in both the foot-wall and hanging-wall of the fault. They generally widen out and have a greater clay content towards the main fault.

The main fault zone is also generally wider and more weathered at the intersections with these smaller shear zones than elsewhere. This effect is well shown at the intersection at the fault with a bed of sheared siltstone at co-ordinates 79841 S, 51530 W., (Plate 6). Here, the main fault zone, which is generally less than 12 inches thick, widens to a 48 inch thick zone of very broken rock with much clay. Drill hole D.D.39 intercepted the fault zone close to the same intersection (faults A and C in Plate 18), and over three feet of clay and shattered rock were recovered by the core barrel; this represents a true thickness of 30 inches for the fault zone.

Near the river, fault A (the 40° fault) terminates against a steeply dipping, north-trending fault (fault B in plate 18); it has not been located to the west of fault B. Uphill, fault A was intercepted by drill hole D.D.8, which revealed a three inch-thick fault zone, but its extension farther east is uncertain. In drill hole D.D.9, 5 inches of weathered, broken rock with quartz veining was intercepted at 75 feet; this may be fault A, particularly as it marks a boundary between fine and coarse grained sandstone. Also, a three-inch zone of very crushed and weathered bleached siltstone was located at 56 feet in D.D.10. Both of these zones correspond closely to the projection of fault A to the east. The true thicknesses of the zones, assuming that they are extensions of fault A, are 3½ inches and 2½ inches respectively. As the main rock type in this area is silicified sandstone, the fault zone is probably considerably thinner and less clayey than in the dominantly siltstone area downhill. It should be noted that there are other small broken zones in both D.D. 9 and D.D.10, and the correlation of the fault zones referred to above with fault A may not be correct - they are 120 feet and 200 feet respectively from the most easterly known point on fault A. Fault A may have been offset by the shear zone which crops out just downhill of D.D. 9.

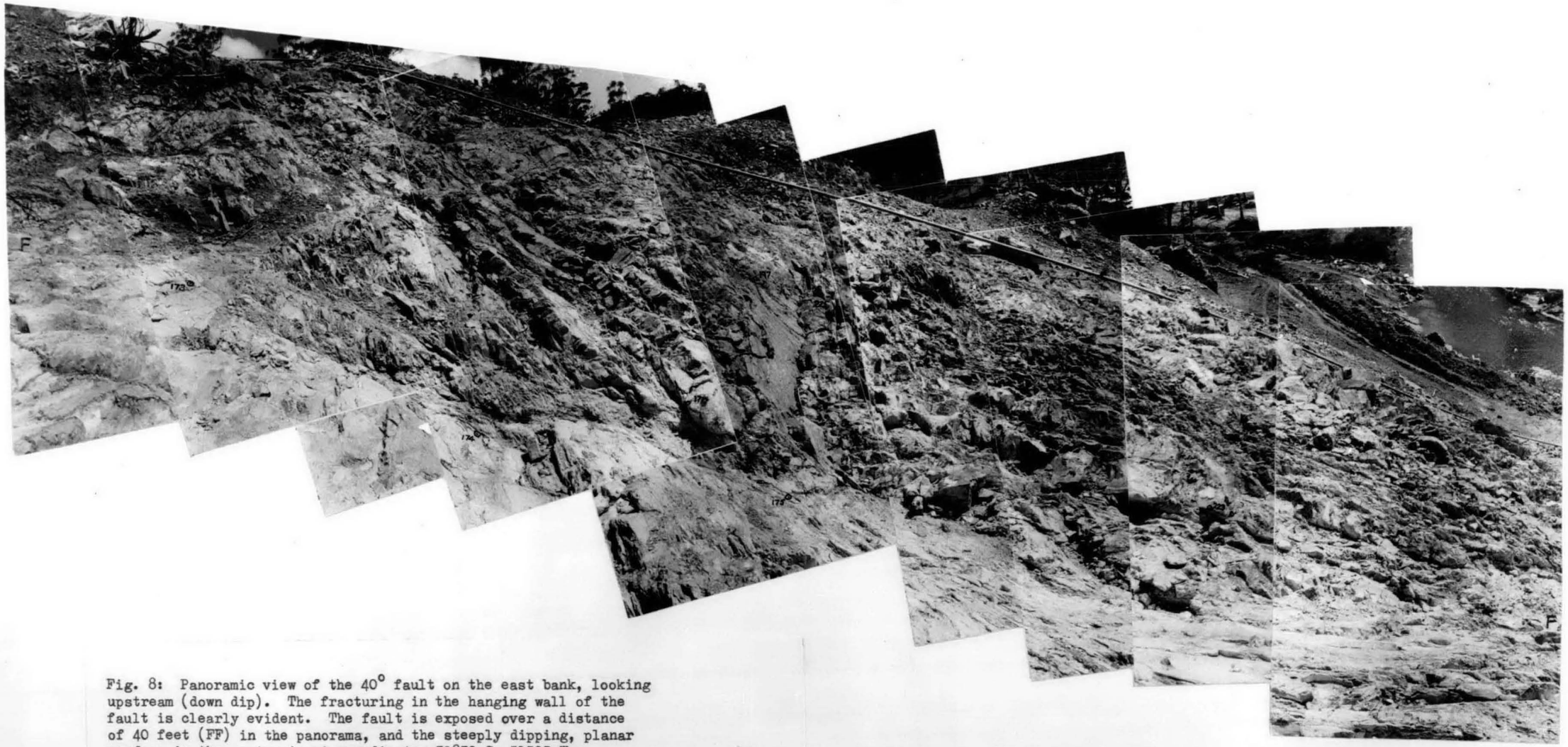


Fig. 8: Panoramic view of the 40° fault on the east bank, looking upstream (down dip). The fracturing in the hanging wall of the fault is clearly evident. The fault is exposed over a distance of 40 feet (FF) in the panorama, and the steeply dipping, planar surface in the centre is at coordinates 79870 S, 51505 W.

Fault B, of Plate 18, which crops out close to the river on the east bank, is marked by a zone of very cleaved, laminated siltstone with some decomposition to clay; it dips parallel to bedding at 70^{o} - 75^{o} to the west, with a strike of 170^{o}. The thickness of the cleaved siltstone in the exposure ranges from 10 feet to 4 feet; the thinning occurs towards the south. In the sluiced exposure, there is no single main zone of weathering or clay-development. However, in drill hole D.D.7 a very weathered zone one foot thick was located close to the bottom of a siltstone bed, and in D.D.3 it was intercepted below the river at 90 feet (see Plate 7); probably most of the fault movement took place along this zone. The amount and direction of movement is not known, as fault A has not been located on the western side of Fault B.

On the west bank only, one major fault with considerable displacement has been located, but there are a number of smaller, less persistent, fault zones up to 24 inches wide. The major fault was exposed in the sluiced area near the dam axis; it consists of a near-vertical zone of very crushed quartzite 24 inches thick. The strike is 180^{o} and, immediately downstream of the axial costean, the fault bifurcates. Two steeply west-dipping zones of crushed quartzite, each 9 to 12 inches thick, were mapped in the downstream sluiced area. Some quartz veinlets and clay are evident in the eastern branch of the fault.

The factual and interpretive geological cross sections (Plates 7 and 21 respectively), show that the displacement along this fault plane is considerable. The quartzite with silty laminae does not crop out to the east of the fault trace in any exposures at the damsite, and projection of bedding planes on the cross sections indicate that there is a vertical displacement of at least 250 feet, with downthrow to the west.

Possible faulting under the river is discussed under "Engineering Geology".

Jointing. In the sandstone and quartzite beds, jointing is invariably moderately to well developed (see Best and Hill, 1962, Plate 8 for joint stereograms). Most joints are straight or only slightly curved, and the more prominent joints persist for some distance at the surface, generally

at least 25 feet. Striations and slickensides are well developed on many of the joint faces, indicating considerable local adjustment. Iron staining of the joint surfaces is very common.

At the surface on the west bank, jointing is well developed in the quartzite containing irregular silty laminae. The main joint set is parallel to the bedding; these joints are seldom greater than 12 inches apart, and are commonly only 2 or 3 inches apart (see Figs. 10 and 11). Other sets of joints are less regularly developed and are seldom very persistent. Drill holes D.D. 2 and D.D. 4 indicate that closely-spaced, open jointing persists to at least 100 feet below the surface. In D.D.2, the joint spacing ranges between 2 inches and 16 inches, and in D.D. 4 the maximum joint spacing is 12 inches.

The thickly bedded sandstones adjacent to the river and high on the east bank are not as closely jointed as the west bank quartzite, except adjacent to major faulting. Surface and drillhole information indicate a joint spacing ranging in general between 9 inches and 3 feet.

Jointing in the laminated siltstone is mainly along bedding planes. The interbeds with sandstone are generally closely jointed (less than 5 inches spacing), due to relief of stresses by readjustment along the siltstone interbeds. In the succession of laminated siltstone in the core of the anticline on the east bank, however, the joint spacing ranges between 5 inches and 3 feet, except where cleavage is well developed.

No statistical analysis of joint directions, using stereograms, has been undertaken since the preliminary investigation.

WEATHERING.

There is no clearly-defined, uniform weathered zone at the damsite, as the degree of weathering depends upon the abundance of open jointing and broken zones. In the absence of close jointing, the sandstone and quartzite are fresh or only slightly weathered at the surface. Where they are cut by persistent open joints however, a weathered zone up to 12 inches wide, is developed adjacent to the joint faces. If the joint spacing is close enough, the entire rock is weathered to a considerable depth. Weathering along joints has been noted at depth in all drill holes at the

damsite; the deep weathering is probably due to the low water table at the site.

The laminated siltstone is also generally fresh, or almost so, at the surface, even in areas where it is cleaved. The jointing is much tighter than in the sandstone, and so weathering along joint planes is seldom extensively developed. Where the siltstone has been sheared, however, weathering is pronounced and commonly has resulted in the development of clay; clay is particularly common in thin interbeds of siltstone bounded by competent sandstone beds. Weathering of sheared siltstone generally extends well below ground surface, e.g., the sheared siltstone in fault zone B (of Plate 18), which was intersected by D.D. 3 at a vertical depth of 80 feet below ground surface, is very weathered, although nearby rock is fresh.

ENGINEERING GEOLOGY.

DAMSITE.

Removal of overburden.

Much of the soil and scree along the dam axis was removed before sluicing (see Figs. 1 and 2); the thickness of overburden in this area was generally less than 5 feet. Of the areas remaining to be cleaned down to bedrock prior to dam construction, a considerable thickness of overburden can be expected on the upstream slopes of the east bank, and on the downstream slopes of the west bank, near the river.

On the east bank, soil and scree is present up to fifteen feet deep in the gentle gully close to the upstream limit of the dam (co-ordinates 80150S, 51500W). The overburden probably increases in thickness and extends over a wider area towards the river.

On the western side of the river, the depth of overburden is generally greater than on the east bank, particularly on the river bank, where some thicknesses below original ground surface were more than 12 feet. Close to river level, the area of thick overburden is 80 feet wide at the dam axis, and widens considerably in a downstream direction. Much of the overburden has already been removed from the slopes of the west bank, but it has not been removed from the valley floor.

Another area of deep overburden on the west bank occurs at the upstream toe of the dam where vertical depths of up to 30 feet can be expected.

However, the area is not large, as it is limited northwards by a prominent sandstone outcrop.

The river flat between the Cotter River and Kangaroo Creek will have to be removed to expose foundations for the proposed coffer dam. Backhoe pits and a bulldozed trench were excavated to determine the thickness of alluvial gravels. Visual inspection was impossible, owing to flooding, but the machine operators reported solid rock at levels close to river bed level.

In all pits and trenches close to the river, the bedrock surface has been found very close to river bed level. In the areas of thick overburden near the river (see above), alluvium has been located in many pits. The alluvium is sometimes overlain by at least ten feet of slopewash material, and it is evident that the river has not always flowed in its present channel. It is therefore possible that an old buried river channel is present in the floor of the valley, which may be deeper than the present river bed level. In this event, the extra excavation and material required will not be great.

Foundations.

In this section, semi-quantitative descriptive terms for strength, hardness, bedding and grain size are used extensively; for definitions of these terms, see Appendix 1.

Laboratory tests to determine the strength, in pounds per square inch, of the rocks at the damsite have been carried out on five drill core samples. A further 78 samples have been tested to determine moduli of elasticity by dynamic methods. The results of these static and dynamic tests are given in Appendix 4. In addition, 44 drill core samples from the proposed quarry site have been tested to determine unconfined compressive strengths. (See Appendix 3). The rock types at the quarry site are the same as at the damsite, and the tests give an indication of the strength of similar foundation rocks at the damsite. It should be noted, however, that most of the samples tested were of weathered siltstone or interbedded siltstone and sandstone, hence the low strength values generally obtained.

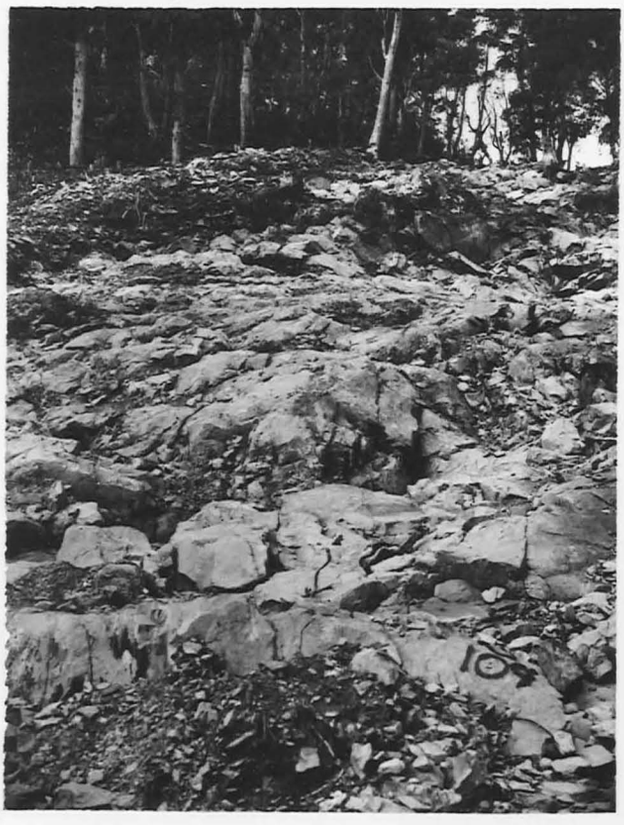


Fig. 9: Sluiced area on the upper slopes of the east bank, showing typical foundation conditions in interbedded sandstone and siltstone unaffected by major faulting. The strip of exposed bedrock is 20 feet wide, and the view is looking uphill from coordinates 79920 S, 51420 W.



Fig. 10: Part of the sluiced areas showing typical foundation conditions in the steeply-dipping quartzite beds of the west bank, close to top water level. The quartzite is exposed in the dam foundations to the south-west of the main anticlinal axis. The individual beds in the photograph range in thickness between 3 and 15 inches.

East Bank.

The foundations of the east bank are mainly of interbedded siltstone and silicified sandstone, grading to thickly bedded sandstone towards top water level (see Fig. 9). Cleaved siltstone is exposed extensively in the core of an anticline 100 feet above the river adjacent to the dam axis; the exposure widens to the north-north-west and forms the dominant rock towards the downstream toe of the dam.

Where the sandstone interbeds are exposed, they are generally unweathered, hard to moderately hard, and very strong to moderately strong, depending upon the degree of silicification. The thickly bedded sandstone above R.L. 3090 feet is generally unsilicified; consequently it is weathered in many places to a moderately soft, moderately weak rock. The sandstone intercepted by drill hole D.D.9 is not extensively weathered, however, indicating that the weathering is only a near-surface feature.

The sandstone beds on the east bank are not as closely jointed as those on the west bank. Core lengths of twelve inches to eighteen inches are quite common in drill holes D.D.7, D.D.9, and D.D.10. Further, the low degree of weathering adjacent to joints and the low water losses obtained during water pressure testing indicate that open jointing is generally not well-developed on the east bank.

The laminated siltstone is a well-compacted rock; abundant small-scale folding and faulting indicates that it has undergone considerable deformation. It is a soft to moderately soft rock, but is moderately strong due to compaction. Joints in the siltstone are generally tight and clean, as reflected in the low water losses and permeability values obtained during water pressure testing (see Appendices 5 and 6). Little weathering of the rock adjacent to joints is evident in drill core; even at the surface, the siltstone is generally fresh, except in and near fault and shear zones.

In the core of the anticline, the siltstone is closely cleaved at the surface. The extensive exposure in the sluiced area consists of fresh rock which has been partly indurated by silica; the numerous cleavage and joint planes dip steeply and are very tight. Consequently little foundation excavation will be necessary, except along fault and shear zones.

Faulting has profoundly affected the foundations on the east bank, particularly in the area adjacent to the dam axis below R.L.3040 feet. This area will form the foundations of the impermeable earth core, and careful excavation and treatment will be necessary to guard against settlement and cracking of the core. The major feature is the fault which dips obliquely upstream at 40° and crops out along the line of the dam axis. The fault zone itself consists of 6 to 48 inches of crushed rock with much clay, and the rock overlying the fault has been extensively broken and sheared, with the development of several minor crushed and clayey zones (see Fig. 8). The degree of fracturing and dislocation of the hanging-wall rock of the fault has been sufficient to obliterate the geological continuity of some of the individual beds for any distance along strike. In fact, there are several zones which consist of irregular broken blocks of sandstone with highly contorted siltstone present as squeezed out masses between the sandstone blocks. Uphill of R.L. 3040 feet, the fault zone becomes less prominent and the overlying sequence of interbedded sandstone and siltstone is relatively unaffected.

The downhill limit of the dislocated area of foundations in the hanging-wall of the 40° fault is the fault zone which dips steeply to the west-south-west. This fault follows a bed of laminated siltstone which is very cleaved and sheared; clay is not extensively developed, however, except for a narrow zone close to the eastern margin. (Fault A of Plate 18). To the west of this fault zone, the foundation rock consists of well-bedded quartzite, sandstone and siltstone, which is fresh or slightly weathered and unaffected by major faulting.

The 40° fault will require considerable treatment and excavation before placing of the core material. Excavation of the fault zone and of the overlying rock should continue to the point where round rock exists in the hanging-wall of the fault; the sides of the excavation will have to be battered back to a suitable slope. Excavation to a depth of 10 to 25 feet will probably be necessary. The fault zone in the bottom of the excavation should then be removed down dip for several feet and backfilled with concrete. The same treatment will be necessary along the steeply-dipping fault close to

the river, although the amount of excavation here will be small compared to that of the 40° fault.

The only other major fault zone located on the east bank during the sluicing will not require extensive treatment, as the rock has been silicified and recemented by quartz veins; this fault zone is close to top water level and dips steeply to the south-west.

The downhill extension of the fault bounding the northern margin of the Tidbinbilla Quartzite outlier was not located in the downstream portion of the sluiced area. Where the fault is exposed outside of the limits of the dam, indurated siltstone and shale are present, and clay does not occur extensively.

Apart from the two major fault zones containing clayey material, a number of minor zones of crushed rock, many with clay, have been located in the sluiced area, particularly in the rock overlying the 40° fault; the more prominent of these zones are noted, together with thicknesses, on the map of the sluiced area (Plate 6). Removal of clay and crushed rock will be necessary in these zones, particularly in the foundations for the impermeable core, followed by back filling with concrete if the clay persists at depth. Excavation, by sluicing or mining, of unsound rock should be carried to a depth at least equal to the width of the zone of unsound rock, or three feet, whichever is the greater.

Only a small proportion of the foundation area has been exposed by sluicing, and many other minor crushed zones and clay seams, and possibly even one or two major faults must be expected in the unexposed areas. These should all be treated, according to their extent and magnitude, as described above.

River Bed.

No bedrock exposures of the river bed and the river terrace on the west bank have been obtained to date. Drill holes P - 1, P -1B, D.D.1, and D.D.3, are the only sources of geological information in this area. The drill holes which penetrated below the river bed (P - 1, P - 1B and D.D.3) all revealed a sequence of thickly bedded silicified sandstone, with only a few thin interbeds of siltstone. Drill hole D.D.1, which penetrated into the west bank below the river terrace, passed through an interbedded sequence

of sandstone and subordinate siltstone. The foundations of the river bed in the vicinity of the dam axis therefore consist mainly of hard, strong, silicified sandstone.

Several broken zones, with associated high permeabilities, were located in drill holes P - 1 and P - 1B, and it was originally thought that a fault zone is present under the river. Drill hole D.D.3 which was planned to locate the downstream extension of this possible fault zone penetrated fresh, strong, relatively unjointed sandstone, and although joint permeabilities were of the same order as in P - 1 and P - 1B, there were no broken zones which could be correlated with those of the earlier drilling. Subsequent mapping of the Cotter Fault and of the cleared areas at the damsite has revealed a system of faults, trending north-north-west; the broken zones in P - 1 and P - 1B could be due to faulting in this direction. Faults already located have a wide range of attitudes, consequently the trace of the fault or broken zones at the surface cannot be predicted. However, the projection along strike of a major fault mapped in the tunnel inlet portal area, 500 feet to the south, passes under the river at the dam axis. It dips steeply east.

The extrapolated trace of the 75^{o} fault on the east bank crosses to the west bank of the river towards the downstream toe of the dam (see Plate 20); this has been confirmed by a seismic traverse which located a low velocity zone along the extrapolated fault line. The foundations in the river bed to the east of this fault will consist dominantly of laminated siltstone dipping steeply to the south-west, and with a cleavage dipping steeply north-east. The rock type forming the bedrock of the river terrace on the western side of the fault is not known. The sparse exposures along the spillway line indicate that the foundations of the downstream portion of the dam on the west bank of the river will be dominantly of thickly bedded silicified sandstone.

The expected foundations in the river bed towards the upstream toe of the dam can only be deduced by extrapolation of the geology on the river bank; this is shown in Plate 20. It can be seen that the prominent fault on the west bank crosses the river just upstream of the junction with Kangaroo Creek; this extrapolation coincides with a shear zone deduced from a seismic

traverse across the alluvial flat at the junction.

To the east of the fault, the foundation rock is folded interbedded siltstone and sandstone, and to the west the foundations consist of silicified sandstone and quartzite, which dip steeply south-west.

West Bank.

The drilling and sluicing on the western side of the river have confirmed the results of the preliminary investigation in that silicified sandstone and quartzite form the foundations over most of the west bank (see Figs. 10, 11 and 12). Interbedded siltstone and sandstone are present only on the lower slopes in the core of the syncline (see Plate 20). The sandstone is everywhere well-cemented, hard and strong, and silicification is evident to various degrees; in many places the sandstone grades to quartzite. The siltstone interbeds on the lower slopes are soft to moderately soft, but moderately strong as they are highly compacted; in places, as a result of silicification, they are as strong as the sandstone.

The anticline on the western side of the river was intercepted at depth by D.D.2, and the suspected syncline close to the river was confirmed by D.D.1. These holes show that there are no extensive broken zones in the core of the folds, although D.D.2 indicates some minor fracturing along the anticlinal axis. Jointing of the sandstone sequence in general is moderate, core lengths obtained during drilling generally being between 3 inches and twelve inches, with some lengths of 30 inches. Most of the joints are heavily stained, owing to weathering which commonly extends several inches into the adjacent rock; this, combined with the moderate to high water losses obtained during water pressure testing, indicates that the western foundations are openly jointed. Drilling has not, however, intersected any major zones of faulting or close jointing.

Only one major fault zone has been located on the west bank; it crops out in both sluiced areas at about R.L. 2995 feet. On the dam axis, the fault consists of a zone of crushed quartzite, two feet wide, with 20 feet of cleaved, laminated siltstone immediately to the east. In the downstream sluiced area, the fault appears to have bifurcated, and two zones of crushed rock up to one foot wide are exposed. Excavation will be necessary along this

fault to remove the crushed rock and any clay present to a suitable depth, particularly beneath the impermeable core where backfilling with concrete will be necessary. The adjacent cleaved siltstone is fresh, compact and moderately hard, and should not have to be removed below general foundation level.

Several other minor zones of broken rock have been located in the sluiced areas (see Plate 5), and many others are undoubtedly present over the remainder of the foundations. Where these zones occur beneath the impermeable core, all loose material and clay will have to be removed, and the slots so formed backfilled with concrete. The zones are rarely greater than one foot wide, and "dental" treatment only will be required in most cases.

In the areas on the eastern limb of the anticline, where the bedding is roughly parallel to the bedrock surface, extensive dip slopes of the well-bedded quartzite are present (see Figs. 11 and 12). Surface weathering has penetrated many of the joints and bedding planes, and there are many large, loose slabs of rock which will have to be removed; it is also possible that several of the thin beds of quartzite below bedrock surface will have to be removed to expose fresh rock with tight bedding planes. If the foundation surface after this treatment still consists of extensive areas of smooth dip slopes, surface blasting may be necessary to improve contact friction between the dam and its foundations.

Leakage.

During the feasibility investigation of 1964, all drill holes at the damsite were water pressure tested; the holes drilled in the abutments above top water level for groundwater level observation were also tested. Reliable results were obtained in most test sections; they are shown on the geological drill log sheets (Appendix 5). Effective test pressure calculations are included as Appendix 6, and the results presented graphically in Plate 26. Permeabilities, in feet per year, have also been calculated from the corrected results (Plates 25 and 17). Although the formula used for the permeability calculations assumes that the rock is isotropic and that water flow in joints is laminar, the permeabilities obtained form a good means of

Fig. 11
(below)

Crest of the major anticline on the west bank, as exposed in the sluiced area downstream of the dam axis. The foundation rock is well-bedded quartzite, and the slabby nature of the quartzite where the beds dip gently eastward is evident to the right (east) of the anticlinal crest. The quartzite bed forming a prominent dip slope in the upper centre of the photograph is 11 inches thick. The coordinates of the centre of the photograph are 79610 S, 52040 W.





Fig. 12
(above)

Panorama of part of the downstream sluiced area on the west bank, immediately downhill of Fig. 11, showing extensive dip slopes on the eastern limb of the main anticline. Exposures are typical of the foundations down to R.L. 3010 feet. Survey rod stations 35 and 394 are on top of a quartzite bed 11 inches thick, and the coordinates of the centre of the photograph are 79620 S, 52010 W.

comparing the relative openness of joints in different holes and in various sections of the same hole. The upper limit of tight rock has been interpreted from drill holes which penetrate into rock of negligible permeability (less than 250 feet per year), and from this, a lower limit of curtain grouting is proposed below (see also Plate 17).

West Bank.

The results from drillholes D.D.1, 2, 4 and 5 indicate that curtain grouting will be necessary to depths ranging from 120 feet close to the river to 200 feet high up on the abutment, i.e. 30 -60 feet into tight rock, depending on geological conditions. In D.D. 1 and D.D. 2, leakage was generally quite low, and grout "takes" (consumption) will therefore be small in this area. High permeabilities were obtained in D.D. 4 and D.D. 5, however, and large grout takes can be expected towards top water level. In view of the very high permeabilities obtained in D.D. 5, the curtain should extend westwards at least to this drill hole; it may be necessary to extend the curtain to the western side of the Cotter Fault zone.

River Bed.

The hole below the river (D.D.3), revealed highly permeable rock down to a vertical depth of 90 feet. Nearby holes (P - 1 and P - 1B) indicate that the open rock extends to a depth greater than 90 feet immediately to the west, whereas immediately to the east of the river the depth to tight rock is only 60 feet. This abrupt change in depth to tight rock is due to the steeply dipping fault on the east bank; to the east of the fault the rock is dominantly siltstone, which is not open-jointed, while the rock to the west of the fault is thickly bedded, open-jointed sandstone. Grouting to a depth of 90 to 120 feet, as shown in Plate 17, is recommended.

East Bank.

Over most of the east bank, the depth to tight rock ranges between 40 and 80 feet. The presence of much laminated siltstone, which is relatively tightly jointed, is probably the main reason for the tight rock at shallower depths than on the west bank; the proximity of the Cotter Fault zone is probably a contributory factor to the open jointing on the west bank. Towards top water level on the east bank, however, permeability values of

well over 2,000 feet per year were obtained down to 120 feet below the surface (D.D.10). The striking contrast to results from D.D.9 is due to the effect of faulting and major jointing in the nearby outcrop of Tidbinbilla Quartzite. A similar outcrop of well-jointed quartzite is present 120 feet upstream of the main Tidbinbilla Quartzite outcrop; consequently the grout curtain will need to be extended to the east of the dam to prevent leakage through this zone of open jointing. Drill hole D.D.12 indicates that the zone does not extend eastwards for more than 120 feet beyond the dam. The recommended depth of grouting on the east bank ranges from 90 to 170 feet, as shown in Plate 17.

The contrast between the relative openness of jointing on the two sides of the river is well illustrated by the groundwater levels recorded from April 1964 to May 1965 (see Appendix 2). In D.D. 5, which is located 800 feet to the west of the river, the groundwater level was only 20 feet above river level after a sustained dry period, and 50 feet after protracted rain. On the east bank, the main water table observation hole (D.D.11) is also sited at a horizontal distance of 800 feet from the river. The groundwater levels in this hole, however, ranged from 90 to 115 feet above river level. Water levels have also been recorded regularly in D.D.10, which is 400 feet to the east of the river; here, the recorded groundwater levels range from 100 to 125 feet above the river. It is therefore evident from the groundwater level observations that the west bank generally is much more permeable than the east bank.

Geophysical Results.

A geophysical survey was carried out at the damsite during February and March 1965, by a field party from the Geophysical Branch, Bureau of Mineral Resources. Twelve seismic refraction lines were traversed; seven at the damsite, four along the Kangaroo Creek arm of the proposed reservoir, and one along the proposed spillway line. In additon, the constant electrode spacing method of resistivity traversing was used along two of the seismic traverses at the damsite, and magnetic traverses were carried out along the seismic lines. The results of the geophysical survey are the subject of a separate Record (Polak and Kevi, in preparation), and only a summary of the results are given here.

Bedrock profiles.

The seismic velocities may be arranged in three groups, corresponding with the following three layers:

Top layer. This is interpreted as soil with a velocity of 1,000 to 1,800 feet per second (ft/sec.); thickness ranges generally from 2 to 5 feet.

2nd layer. This layer, with a velocity of about 4,000 to 5,000 ft/sec., is interpreted as rock with weathered joints.

3rd layer. This is interpreted as bedrock with seismic velocities of 7,000 to 19,000 ft/sec.

The velocities obtained in bedrock depend upon rock type and the degree of jointing. Thickly bedded sandstone and quartzite have velocities of 15,000 to 19,000 ft/sec., while the laminated siltstone on the east bank has a velocity of 11,000 ft/sec. Interbedded sandstone and siltstone transmit seismic waves at velocities of 10,000 to 13,000 ft/sec., depending on the content of higher velocity rocks.

Velocities in bedrock of less than 10,000 ft/sec. indicate fault or shear zones. Most of the low velocity zones recorded in bedrock during the survey can be correlated with faults mapped at the surface; they include the northerly extension of the 75° fault on the east bank, the extension to the south of the near-vertical fault on the west bank, the faulting in the Tidbinbilla Quartzite, and the Cotter Fault zone. Low bedrock velocities were also recorded in the area on the east bank where the 40° fault is close to the surface. Because the fault is gently dipping, it does not show up in the seismic profile as a definite zone; however, the low velocities are indicative of the close jointing and weathering of nearby rock.

Rock quality.

Longitudinal and transverse wave velocities were measured along 200-foot long sections of seismic traverses in four areas. These values were used to determine the dynamic properties of the rock, assuming an average specific gravity of 2.55 for the rock. The sections of seismic traverses tested were:- 1. from bed of Cotter River for 200 feet (slope length) up the west bank along line of D.D.1; 2. an extension of 1, for 200 feet up the east bank from the Cotter River; 3. a line perpendicular to the dam axis, crossing the axis between D.D.1 and the River; and 4. a 200-foot

line on the upper slopes of the east bank, upstream of the dam axis, and perpendicular to the regional strike of bedding. The calculated dynamic properties are tabulated below:

Area (described above)	Seismic Velocity ft/sec.	Poisson's ratio.	Modulus of elasticity x 10^6 (p.s.i.)		
			Young's	Rigidity	Bulk
1	12,500	0·37	3·0	1·1	4·0
2	11,000	0·30	3·1	1·2	2·6
3	11,000	0.36	2·5	0·9	3.0
4	7,000	0.30	1.2	0.5	1·0

Laboratory determinations of dynamic and static properties were carried out on 78 drill core specimens from the damsite; these results are given in Appendix 4. Comparison of field and laboratory determinations shows a large difference in the range of values for the moduli of elasticity. The discrepancies are attributed to the fact that in field tests, an average value for jointed rock is measured, while in the laboratory, only an unjointed sample of rock can be tested.

Seismicity.

Earth tremors have been recorded in the Canberra area, but there is no evidence to suggest that any have originated in the Cotter valley. Epicentres have been noted in the headwaters of the Snowy and Murrumbidgee Rivers, and also along the Murrumbidgee to the north of the Australian Capital Territory. There is no evidence to suggest that seismic disturbances have originated from the Cotter Fault. It is therefore concluded that no special aseismic design is needed in Corin Dam.

SPILLWAY.

The originally proposed spillway was sited on the west bank, and ran due north; it would have been 1,000 feet long. The overflow water would have entered the Cotter River 1,500 feet downstream of the damsite, thus avoiding erosion near the downstream toe of the dam. A seismic refraction traverse along the spillway line, in March 1964, indicated that bedrock was at a considerable depth along much of the line. A bulldozed trench failed to reveal bedrock within safe limits of excavation, so two diamond drillholes were drilled, one at each end of the trench (D.D.13 and D.D.15 in Plates 2 and 4). D.D.13 penetrated 73 feet of soil and scree before entering bedrock, and D.D.15 revealed 16½ feet of soil and scree overlying quartzite bedrock.

An attempt was then made to produce a bedrock profile map of the west bank downstream from the dam, using both a seismic timer and a 12-channel portable seismic refraction instrument. It was hoped thereby to locate the most suitable site for a spillway. Unfortunately, satisfactory results could not be obtained, and the seismic methods were not persisted with.

A close inspection of the west bank indicated a small ridge, trending north-east, immediately downstream of the dam foundation area, with several outcrops of quartzite. Bulldozed trenches were excavated to locate the bedrock surface, which was found to dip away very steeply on the north-western side of the ridge. The centre line of the spillway was planned so that the chute will be as close as possible to this sudden change in slope; this is necessary to ensure that the spillway discharges as far downstream from the toe of the dam as possible, thus minimizing the danger of erosion near the dam. The spillway chute will incorporate a ski-jump for energy dissipation, and two shallow drill holes (D.D.16 and D.D.17) were drilled to test the foundations of the ski-jump structure.

Model tests at high spillway discharges revealed that the side-channel spillway arrangement shown in Plate 4 was necessary to avoid scour of the upstream rockfill face.

The foundations have been exposed for much of the spillway length by bulldozed and hand-dug trenches. Extrapolation of nearby outcrops along strike, together with the core obtained from D.D.16 and D.D.17, provide additional information, and there are only two areas where the foundation rock type is not known; these are between R.L.'s 2960 and 2980 feet and between 3010 and 3025 feet (see Plate 4). Elsewhere the foundation rock is either thickly bedded silicified sandstone or well-bedded quartzite. Probably sandstone predominates in the two unknown areas. The predicted distribution of the two main rock types is shown in Plate 20.

The north-western extension of the main fault on the west bank (Plate 20), crosses the spillway line between R.L. 3040 feet and 3070 feet. The exact location and nature of the fault zone is not known, as the soil and scree have not been removed down to bedrock. If the fault is similar in nature and thickness to the exposures in the sluiced areas, only minor treatment will be necessary. The rock on the south-western side of

the fault is well-bedded quartzite with silty laminae, and to the north-east the foundation rock is thickly bedded, silicified, medium-grained sandstone.

Consolidation grouting below the spillway chute should not be necessary, except possibly below the ski-jump structure, providing the concrete structure is well-anchored to bedrock by anchor bars. This will facilitate the drainage of the foundation rock, which will be necessary to relieve uplift pressures.

Extensive excavation will be needed for the overflow channel near the spillway crest - the western wall is up to 60 feet high. Most of the channel will be excavated in thickly-bedded, open-jointed, silicified sandstone; some interbedded sandstone and siltstone will be encountered at the extreme upstream end of the excavation. A joint stereogram, using 200 joint measurements from the sandstone outcrop in the area of the spillway channel, was plotted during the preliminary investigation. Contouring of this stereogram (Best & Hill, 1962, Plate 8, stereogram 1) revealed five sets of joints with the following attitudes:

Strike (magnetic)	Dip
030°	vertical
072°	vertical
010°	70°W - vertical
070°	40° N.W.
170°	70° E.

Only one of the joint sets has an easterly component of dip, and that dip is steep (70°). Bedding strikes almost normal to the centre-line of the spillway and dips steeply to the south-west. It should therefore be possible for the channel to be excavated with a steep batter on the western wall (up to 0.4 : 1), without the danger of rockfalls due to an adversely-dipping set of joints. However, the joints in the walls of the excavation will be open, and the seismic traverse in this area indicated low velocity-bedrock. A programme of rock-bolting will therefore probably be necessary to prevent rockfalls during high discharges over the spillway crest.

It is proposed that the grout curtain be extended along the line of the spillway crest; consolidation grouting of the crest will not therefore be necessary. The concrete lining for the overflow-channel will be anchored to bedrock by a close pattern of anchor bars, and consolidation grouting

should not be necessary. An adequate drainage system must be installed in the foundation rock of the channel.

DIVERSION TUNNEL.

Inlet Portal.

It was originally proposed that the diversion tunnel would be excavated in the western abutment, the inlet portal being provisionally sited close to co-ordinates 80200S, 52400W. This area is completely covered by soil and scree, but adjacent outcrops indicate that silicified laminated siltstone would be exposed at the portal. Late in 1964, bulldozing was commenced in the area of the proposed inlet portal to expose bedrock.

The thickness of soil and scree was much greater than expected, and no bedrock could be exposed within the excavation limits of the bulldozers. Soon after this, the spillway location and layout was established and it became evident that, from design considerations, the diversion tunnel should be located on the east bank. The layout adopted is shown in Plate 4.

No outcrops were present at the inlet portal area, so bedrock was exposed by bulldozing and sluicing. The sluiced area was geologically mapped at 10 feet to 1 inch (see Plate 8), and two diamond drill holes were drilled to test the rock along the proposed tunnel line, near the inlet portal.

The sluicing exposed a succession of interbedded, silicified, fine-grained sandstone and laminated siltstone (see Plate 8). These beds are folded to form an anticline with an axis which trends north-north-west and appears to plunge in a northerly direction. Several minor faults displace strata in the crest of the fold, and the succession is abruptly terminated against a near-vertical fault zone east of the crest of the fold. The fault zone consists of very sheared siltstone, and quartz veining is evident along its western margin. To the east of the fault, a thick bed of laminated siltstone is exposed. The siltstone adjacent to the fault zone shows a marked cleavage that dips 70° east. Uphill, more interbedded siltstone and sandstone is exposed to the eastern limit of the sluiced area.

The information obtained by diamond drilling is shown in the

interpretive geological section along the line of the two drill holes (see Plate 22). The surface information is plotted on the section and the most likely correlation with the drill hole data is shown. From this, it can be seen that the main fault zone does not appear to have been intercepted by either D.D.29 or D.D.30; the fault must therefore be near-vertical, and the adjacent rock cannot be extensively broken close to tunnel level. The direction of movement along the fault is not known. In view of the anomalous plunge of the anticline compared with the folding at the damsite, the folding at the inlet portal is probably due to drag against the major fault zone. If this is the case, the western side of the fault must be the upthrown side, and must have moved to the north.

The two faults which crop out farther west and have the same trend as the main fault are clean breaks which have not affected the adjacent rock to a marked degree. The easterly fault shows a maximum displacement of four feet vertically near the thin cleaved siltstone bed at 80400S, 51670W, and grades into a flexure in a laminated siltstone bed at approximately 80360S, 51680W. The other fault has a displacement of at least several feet, as thickly bedded silicified sandstone abuts directly against interbedded sandstone and siltstone. The correlation of surface and drill hole data, shown in Plate 22, indicates a vertical displacement of 20 feet.

The portal face should be established at or near the crest of the anticline (as shown in Plate 22), so that slabs of rock dipping gently to the west are not present in the portal face. Excavation to the anticlinal crest would also remove any unsound rock associated with the most westerly of the faults described above. The first 30 feet of tunnel will be in gently-dipping interbedded siltstone and sandstone, and then the main fault zone will be encountered. The fault zone is not expected to provide difficult tunnelling conditions, as it is silicified at the surface and, presumably, also at tunnel level. Farther east, at least 50 feet of laminated siltstone will be penetrated, beyond which are thickly interbedded sandstone and siltstone. Water pressure testing in D.D.29 indicates that the laminated siltstone is tightly jointed at tunnel level, with negligible joint permeabilities.

Subsequent to the field investigations and the plotting of data, the

tunnel line has been re-aligned slightly; consequently D.D.29 and D.D.30 are not directly along the tunnel (see Plate 4). The variation is slight, however, and does not substantially alter the expected conditions described above. The new alignment is an improvement geologically, as the centre line of the tunnel is now more closely normal to the strikes of faulting and bedding.

Outlet portal.

The area of the tunnel outlet portal was cleared of vegetation by hand, and the area mapped by plane table tacheometry. The slopes of the portal area are too steep for bulldozing, so natural outcrops only were mapped. On the basis of the outcrop mapping, two drill holes were planned; D.D.26 was drilled to test the geological succession at tunnel level, and D.D.27 is a horizontal hole drilled along the line of the tunnel to determine the conditions at tunnel level and close to the proposed portal face.

The outlet portal area is sited in a sequence of laminated siltstone with silicified sandstone interbeds (see Plate 9). The rocks have been folded to form a tight anticline, with an axis plunging north-west at about 40°; to the north-east of the anticline there is a corresponding syncline. Cleavage is generally well-developed in the siltstone; it dips at 60° to 70° in an easterly to north-easterly direction. No prominent faults were located, but there has clearly been displacement along many of the bedding planes in siltstone.

Because of the abrupt changes in the strike of bedding, little surface information can be plotted on the interpretive section through the outlet portal (see Plate 23). The drill holes show that siltstone predominates over sandstone in the portal area, but silicified sandstone is more abundant at tunnel level to the south-east.

The moderate to high water losses during pressure testing of D.D.26 are due to the presence of jointed sandstone. The horizontal hole located a bed of hard, strong, silicified sandstone with few joints, in the predominantly siltstone sequence; it is recommended that the portal face be established in this sandstone. The siltstone underlying the sandstone bed is much less jointed than the overlying sequence of interbedded siltstone and sandstone.

Tunnel Line.

All available geological information along the proposed tunnel line has been plotted on a cross section (Plate 24), and some of the more reliable data have been extrapolated down to tunnel level. Apart from the drill holes at the portals, only two other holes were drilled down to tunnel level; one is located at the site of the proposed valve tower and shaft (D.D.31), and the other is located at the intersection of the tunnel line with the dam axis (D.D.8).

Between the points 100 feet along the tunnel from each portal, the rock cover above the tunnel roof is generally at least 80 feet, with a maximum of 120 feet. The only section where the cover is less than 80 feet is in the area of the gully 100 feet downstream from the site of the valve tower; here, the minimum thickness of rock cover is estimated to be 70 feet.

Between the inlet portal and the valve tower shaft, the tunnel will traverse interbedded siltstone and sandstone; some of the interbeds are up to 40 feet thick. Similar rock conditions are expected for some distance to the north of the valve tower shaft. The attitude of the beds will change as the tunnel crosses the synclinal axis. Farther north, the rock grades into the laminated siltstone penetrated by D.D.8, and the tunnel will be in this siltstone for at least 150 feet to the north of D.D.8. The transition from interbedded siltstone and sandstone to laminated siltstone cannot be located accurately; it is expected to be about half-way between D.D.31 and D.D.8.

At the point 150 feet north of D.D.8, it is expected that the tunnel will intercept the east-west trending vertical fault located during the preliminary investigation. The displacement along the fault is not known, and the rock outcrops above the tunnel line to the north of the fault indicate that the strike of bedding is roughly parallel to the tunnel line. It is therefore not possible to predict the rock types likely to be encountered in this downstream portion of the tunnel with any reliability. The prevalence of siltstone, with some interbedded sandstone, in the outlet portal area indicates that the lower parts of the stratigraphic succession crop out in this area. This is consistent with the regional structure at the damsite, as the south-easterly plunging folds would bring successively older strata to the surface in a downstream direction. It is therefore expected that the

downstream section of the tunnel line will be excavated mostly in laminated siltstone with some sandstone interbeds.

Breakage of the rock during tunnel excavation will be controlled by bedding and joint planes, and some overbreak can be expected. Drill holes D.D.8 and D.D.31 show that parting in the laminated siltstone is generally controlled by bedding. In D.D.8, however, the laminated siltstone is relatively unjointed. It can be seen from Plate 4 that the strike of bedding is roughly parallel to the tunnel line in several areas; it is likely that overbreak due to prominent bedding planes may persist for some distance along the tunnel in such areas.

It is expected that the tunnel will be excavated in tightly jointed rock for most of its length. Any open jointing present is in the sandstone interbeds only. Significant water losses during water pressure testing of D.D.8 and D.D.31 were confined to sandstone interbeds, and even those water losses were low to moderate. Large inflows of water into the tunnel are therefore not expected, except possibly along fault zones.

There are three known major faults which may be intersected by the tunnel. One of these is referred to above, and is expected to be encountered 150 feet north of the dam axis. This fault was tested by a drill hole during the preliminary investigation (P - 5), and was intersected in very openly jointed sandstone; during the water pressure testing of the fault zone, a metered loss of 2.85 gallons per minute per foot of test section was recorded with no back pressure developed by the pump. However, the drill hole intersected the fault at R.L. 3015 feet, which is 90 feet above the proposed tunnel floor. Interbedded laminated siltstone and sandstone was penetrated from R.L. 3,000 feet to 2,985 feet (the bottom of the hole), and it is possible that the fault may be in laminated siltstone at tunnel level. In view of the lack of positive information on the condition of the fault zone at tunnel level, it is recommended that provisions should be made for face support, and that the possibility of inflow of water should be borne in mind while penetrating this zone.

The extrapolated extensions of both of the major faults located in the sluiced area on the east bank intersect the tunnel line. The mapped traces of the faults at the surface are some distance from the tunnel line,

and the points of intersection cannot be predicted accurately. The 40° fault will probably be penetrated by the tunnel about 200 feet north of the valve tower shaft. Assuming a constant attitude, the 75° fault will probably be intersected by the tunnel about 100 feet north of the valve tower shaft. This figure may be subject to wide variation, however, as it is necessary to extrapolate the fault for 300 feet along strike from the nearest outcrop. Both the inclined faults strike obliquely to the tunnel line, particularly the 75° fault, the strike of which is at 30° to the tunnel line. The faults will therefore persist for several tens of feet along the tunnel line.

Other faults may be intersected by the tunnel, particularly in the area downstream of the major vertical fault tested by drillhole P - 5. One minor fault has been located at the surface in this area, and it is highly likely that other concealed faults are present.

CONSTRUCTION MATERIALS.

It is estimated that the dam will contain 1.77 million cubic yards of fill (as placed) comprising 1.32 million cubic yards of rockfill, 0.34 million cubic yards of earthfill in the core, and 0.11 million cubic yards of filter material. In addition, about 15,000 cubic yards of coarse concrete aggregate and 10,000 cubic yards of fine aggregate will be required for the appurtenant works (spillway, diversion tunnel, valve tower and access bridge).

ROCKFILL.

General.

A reconnaissance survey was carried out in 1962 with the object of locating large sources of first-grade aggregate and rockfill close to the damsite. Three prospective sources were found; a bed of quartzite near White Sands Creek, 0.6 mile north-east of the damsite; a bed of quartzite north of Kangaroo Creek, 0.6 mile east-south-east of the damsite; and a body of dacite porphyry, one mile south of the damsite, on the east bank of the Cotter River. Only the quartzite near White Sands Creek was mapped in any detail during the reconnaissance survey.

In April, 1964, the quartzite north of Kangaroo Creek and the dacite porphyry were mapped by compass, tape and Abney level traverses. Seismic traverses with a seismic interval timer were carried out over the dacite

porphyry to determine the depth of overburden and weathered rock, and a drill hole was planned to test the Kangaroo Creek quartzite. The results of all investigations of construction material sources, together with estimates of quantities, were included in an unpublished report sent to the Department of Works in July 1964 (Gardner, 1964).

In addition to the possible sources of aggregate and rockfill mentioned above, mapping of the Kangaroo Creek - White Sands Creek divide in April 1964 revealed a succession of silicified sandstone, with some siltstone interbeds, on the south-east facing slope of the spur forming the east abutment of the damsite; examination of the outcrops and exposures in road cuttings indicated that this material might be suitable for use as rockfill, a view supported by engineers of the Snowy Mountains Authority during an inspection in July, 1964. As this was the closest possible source of rockfill, it was selected for diamond drilling at the earliest opportunity during the design investigation. Drilling commenced on the 12th January, 1965, and the first hole revealed a succession consisting of over 90% of silicified sandstone. However, later drill holes revealed the presence of laminated siltstone scattered throughout the succession and forming up to 50% of the rock. The siltstone is soft and finely laminated, and it was considered that better quality rock could be found elsewhere. The sandstone beds are generally 10 feet or less thick so it would be impossible to select the suitable material economically; drilling of this quarry area was therefore stopped on 2nd February.

The Northern Kangaroo Creek quartzite body was the next source of rockfill to be tested by drilling and costeaning. A drill hole of the 1964 investigation (D.D.14) had indicated that the quartzite was free of silty interbeds, and mapping revealed another prominent quartzite outcrop 500 feet to the north-west. The intervening area is covered by soil and scree. A costean was therefore bulldozed between the two quartzite outcrops, but revealed overburden over 12 feet thick in places, with bedrock consisting of interbedded sandstone and laminated siltstone. The siltstone beds are too thick and numerous for the quarrying of suitable rockfill material. Nevertheless, the main quartzite was seen to continue uphill on the south

side of Kangaroo Creek as a prominent outcrop, and it was decided to continue investigations on both sides of the creek to determine the amount of rockfill material available.

The quartzite on the north side of Kangaroo Creek (referred to hereinafter as the North Kangaroo Creek quartzite), was penetrated by another drill hole (D.D.25), to determine the stratigraphic thickness of the bed. At the same time, costeaning to determine the western limit of the quartzite was in progress; the costean indicated that suitable rockfill material is confined to the outcrop area.

Mapping and costeaning of the South Kangaroo Creek quartzite proceeded simultaneously with the drilling of D.D.25. However, it became apparent that there was not sufficient rockfill material present in the two Kangaroo Creek quarry areas, and that quarrying would be expensive. It was therefore decided, on the 22nd February, to investigate the dacite porphyry in the Cotter Valley more closely by bulldozing costeans to determine the depth of weathered rock.

Within two days, it was obvious that the dacite porphyry was weathered to a considerable depth. Previous mapping by Gardner had revealed a faulted contact with quartzite to the east of the dacite porphyry, and it was decided to trace this quartzite to the north. A reconnaissance revealed the presence of a cliff of quartzite 140 feet high only a few hundred feet to the north of the dacite. The bedding of the quartzite in the cliff face dips gently to the east, and the west-facing cliff is bounded to the north and south by two prominent gullies about 700 feet apart; the area is thus topographically well suited to the development of a free-draining quarry. A prominent outcrop, 600 feet east of the cliff face, was found to consist of quartzite that dips steeply to the west, indicating a possible synclinal structure between the two quartzite bodies. In view of the very large possible volume of quartzite in the area, mapping and costeaning was undertaken immediately. By early March, the synclinal structure was confirmed. A drilling programme was designed, and initiated on 15th March, to define more precisely the structure, to establish the depth to, and thickness of, suitable rockfill material between the two outcrops of quartzite, to enable the volume of potential rockfill material to be estimated, and to obtain

specimens for laboratory testing.

Six drillholes, of total length 1284 feet, were completed by the end of June. As a result of the investigation, it was clear that an ample supply of good quality rockfill is present at the Cotter quarry site.

North Kangaroo Creek Quartzite.

Costeaning around the limits of the quartzite outcrop indicated that the bed has been offset an unknown amount by faulting along the northern margin of the outcrop. The two drillholes (D.D.14 and D.D.25) have delineated the upper and lower boundaries of the quartzite bed, and values of the true stratigraphic thickness have been calculated for various angles of dip (see Plate 11).

A quarry in the quartzite, with a vertical back face and a horizontal floor at R.L.3080 feet, would yield an estimated 525,000 cubic yards of solid quartzite. If the back face of the quarry consisted of benches 50 feet high and 40 feet wide, the yield would be reduced to 450,000 cubic yards. These estimates assume that the quartzite only is removed to form a slot with a floor at R.L. 3080 feet. In practice, it would obviously be necessary to batter back the side walls; this would mean the removal of a considerable quantity of cleaved siltstone which must not be incorporated to any great extent in the material for use as rockfill.

South Kangaroo Creek Quartzite.

The quartzite on the southern side of Kangaroo Creek occurs as two prominent outcrops. The area between the outcrops is 150 feet wide, and is covered by soil and scree (see Plate 12); bulldozed trenches in this area indicated that the quartzite is not continuous between the outcrops.

Geological mapping and one diamond drill hole (D.D.28) have delineated the upper and lower boundaries of the quartzite bed (see Plate 13). From this, an estimate of the quantity of quartzite available has been made, the two outcrops being considered as separate bodies. Assuming a quarry floor at R.L. 3100 for the quartzite near the creek, 125,000 cubic yards of solid rock are available if benches 50 feet high and 40 feet wide are left at the back face. The quartzite body to the south contains 165,000 cubic yards of solid rock, assuming a quarry floor at R.L.3260 feet. Both of these quartzite bodies are better-suited topographically to the development of

a quarry than the North Kangaroo Creek Quartzite.

Cotter Quarry.

The proposed source of rockfill for the dam is a succession of gently-dipping quartzite and silicified sandstone, with some silty interbeds, which crops out as a prominent cliff, a little under a mile upstream from the damsite, on the eastern side of the Cotter Valley.

Geological Succession. The lowest strata exposed at the quarry site are of well-bedded (2 inches to 2 feet), quartzite, with bands of irregular silty laminae; the sequence is very similar to the quartzite exposed on the upper part of the western foundations at the damsite. This quartzite succession is at least 100 feet thick, and is very hard and strong. Overlying this sequence is a stratum of thick-bedded, coarse-grained quartzite which is very hard and strong and has very few joints. The quartzite is 90 to 100 feet thick and forms the prominent upper face of the cliff (see Plate 15).

Between these two quartzite sequences is a bed of sedimentary breccia about two feet thick (see Plates 15 and 16). This bed was first noted in the cliff face, and was subsequently recorded in two of the drill holes. However, the bed was not intersected by drillhole D.D.34; possibly the breccia bed is lenticular. The breccia is cemented by quartz, and is as hard and strong as the adjacent quartzite.

Above the main quartzite bed, i.e., on top of the cliff face, there is a succession of thick beds of fine to medium grained silicified sandstone, grading in places to quartzite, with scattered interbeds of laminated siltstone; the succession is about 60 feet thick, and siltstone comprises about 25% of the rock. Overlying this succession is a sequence of laminated siltstone with a few sandstone interbeds; this sequence forms the uppermost part of the succession exposed at the quarry site, and reaches a maximum thickness of 70 feet.

Dacite porphyry forms the bedrock along the western margin of the quarry area. The dacite-quartzite contact lies roughly at the foot of the cliff (see Plate 14). Where exposed, the contact dips steeply to the east, and in several exposures it is obviously a faulted contact.

Folding. Broadly, the strata in the quarry site form a syncline with a north-south axis; the western limb dips gently (20^{o} - 25^{o}), to the east from the

cliff face, and the eastern limb dips steeply (60° to 70°) to the west (see Plates 15 and 16). Detailed mapping of the scattered outcrops near survey stations Q 42 and Q 43 has indicated at least one, and possibly two, small anticlines in the core of the fold. The plunges of the fold axes do not appear to be uniform, when traced in the field, but a contoured stereogram of all the bedding planes measured in the quarry area shows that the poles to bedding are well concentrated on a great circle representing a fold axis plunging at 10°, on bearing 177° M. (Fig.13).

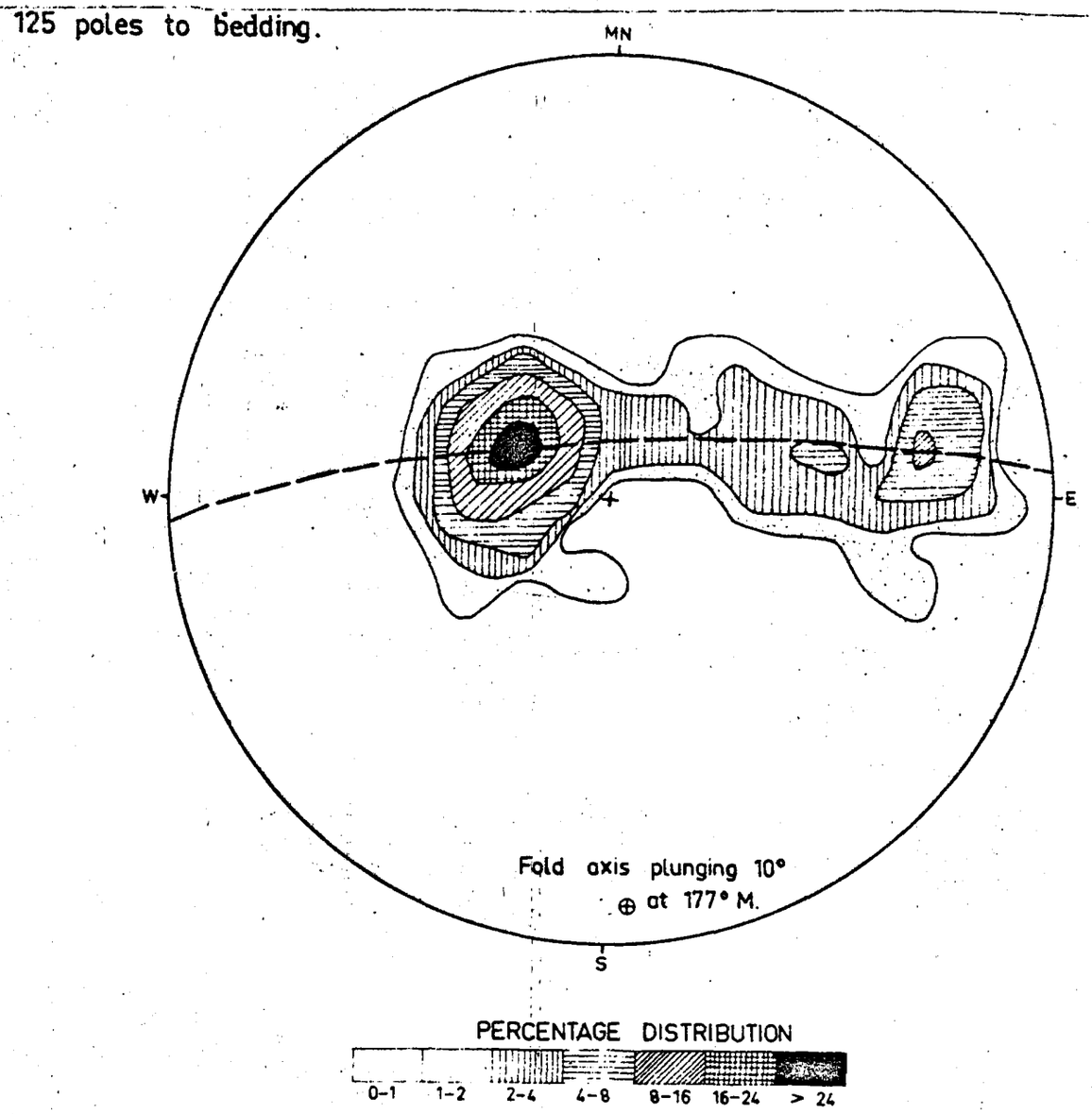


FIG.13: COTTER QUARRY — CONTOUR MAP OF BEDDING PLANE STEREOGRAM. Poles of bedding planes are projected on to the lower hemisphere, using an equal area net.

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The general structure is shown in the geological sections (Plates 15 and 16); these were constructed using strike directions measured in outcrops, and dips measured in outcrops and vertical drillholes.

Faulting One major fault, which displaces the breccia bed vertically by 15 feet, is present in the cliff face. Zones of broken rock with clayey gouge were also intersected in drill hole D.D.33. Faulting can therefore be expected elsewhere in the quarry area, but it is considered unlikely that there are any extensive zones of broken rock which would have to be selectively quarried and rejected as unsuitable for use as rockfill.

Mapping to the north of the quarry has not located the extension of the quartzite beds along the regional strike. The gully to the north of the quarry area possibly reflects a faulted zone, and consequently has been taken as the northern limit of the quarry area. Drill hole D.D. 34 is located just south of the gully, and it revealed quartzite and interbedded sandstone which is more closely jointed than most other drill core from the quarry area; there is also much quartz veining in the quartzite beds which tends to confirm the presence of nearby faulting. The rock is quite suitable for rockfill material, however.

Jointing No systematic measurement of joint dips and directions has been undertaken, but the drill core provides information on joint spacing at depth which may be useful in determining the grading of rock fragments during quarry operations. The range of core lengths obtained in the various strata is as follows.

In the laminated siltstone, core lengths were generally 5 to 6 inches long; in two holes, however, there were several broken zones up to one foot wide. The interbedded sandstone and siltstone generally occurred as 5 to 10 inch core lengths; some siltstone beds contained smaller fragments, and core lengths of sandstone up to 30 inches were obtained. Core lengths from the quartzite bed above the sedimentary breccia range between 5 to 60 inches, most being between 12 and 24 inches. The quartzite below the sedimentary breccia is more broken than the upper quartzite owing to the presence of silty interbeds. Core lengths range from 3 to 24 inches; most are in the range between 8 and 12 inches.

Because the drill holes seldom intersect the joints perpendicularly, the fragments of rock, assuming splitting along all joints, will be smaller than indicated by the core lengths set out above. This tendency will be partially offset by the fact that some of the breaks bounding the core lengths are due to drilling.

Suitability of material for rockfill. Of all the rock in the quarry area, doubts as to suitability as rockfill are held only for the laminated siltstone in the core of the syncline. It was originally thought that there may be a weathered zone close to the surface which would have to be rejected, and that even laminated siltstone below this zone may be useable. Compression testing of drill core specimens was carried out by the Department of Works (see Appendix 3), and the results indicate that there is no well-defined boundary between suitable and unsuitable rock in the laminated siltstone. The interbedded sandstone and siltstone will be suitable for rockfill, as will the underlying quartzite beds which form the bulk of the proposed quarry. However, final acceptance of the rockfill material will rest with the Engineer during construction.

The range of core lengths obtained from the strata which will be quarried for rockfill indicates that there should be no difficulty in meeting the size requirements. The rock should also break to fragments of a suitable shape.

The quartzite is a very hard and strong rock, and will therefore be expensive to drill. It will also be abrasive to quarrying, transportation, and placing equipment.

Quantities of rockfill. None of the six holes drilled to test the quarry revealed any zones or beds which would not be suitable for use as rockfull other than the laminated siltstone previously referred to; the block of rock tested by these holes can therefore be considered as proven rockfill material. The area is bounded to the west by the dacite-quartzite contact, to the north by the gully referred to earlier, to the east by a line from Q 68 to Q 56, and to the south by a line from Q 56 to Q 46. Assuming a quarry floor with an

elevation of 3150 feet, and assuming that benches 50 feet high by 40 feet wide are left along the back (eastern) face of the quarry, the total volume of rock in place in this area is 1,650,000 cubic yards. The volume of laminated siltstone on top of the spur is approximately 130,000 cubic yards, so, assuming that none of the siltstone is suitable, at least 1,5 million cubic yards of solid rock are available for rockfill. The eastern and southern limits are determined only by the location of drill holes D.D.33 and D.D. 42, and suitable material would certainly be available outside of these limits; further, the quarry floor could be considerably lower than 3150 feet. It is therefore considered that there is ample material suitable for use as rockfill available in the Cotter quarry area.

CONCRETE AGGREGATE.

The quartzite from the Cotter quarry should also be suitable for use as concrete aggregate. Appendix 3 shows that the quartzite ranges in compressive strength from 11,000 to 23,500 pounds per square inch. Pyrite is present in the quartzite, but not in large amounts; it is not expected to prove an impediment to the use of the quartzite as concrete aggregate, but quarrying may reveal some quartzite that should be rejected. An analysis of the percentage and distribution of pyrite in drill core samples will shortly be undertaken. Reactivity tests have not yet been conducted on samples of the quartzite.

Fine aggregate (maximum particle size of 3/16 inch) is required for use in grouting and pneumatically applied mortar, as well as in concrete. The alluvial flats in the Cotter River contain adequate supplies of suitable sized sand, though a high proportion of flaky phyllite fragments are present. It is likely that the contractor will either import fine aggregate from the Murrumbidgee near Point Hut Crossing, or crush quartzite from the quarry area to the correct size and grade.

The quartzite to be used as a source of aggregate is very hard and strong, and will be highly abrasive to the quarrying equipment and crushing plant. It will break to fragments of suitable shape during crushing.

IMPERMEABLE CORE MATERIAL.

An extensive programme of sampling the overburden in the Cotter Valley for 3 miles upstream of the dam was undertaken by the Department of Works

between November 1964 and March 1965. Several sources of suitable material were located, and an adequate volume of core material was proved by back-hoe pits and auger holes. The bulk of the core material will be derived from slope-wash material on the west bank of the Cotter River, supplemented by some decomposed dacite porphyry. The largest source of core material for the dam is located on the west side of theCotter Valley directly opposite the proposed quarry for rockfill. Details of the mechanical properties and resources of the soil to be used as core material are given in an unpublished report by the Commonwealth Department of Works Central Testing Laboratory.

FILTER MATERIAL.

All of the larger alluvial flats in the Cotter Valley have been tested by the Department of Works for a distance of 7 miles upstream of the damsite, and 8 flats have been selected as sources of material suitable for use in the filter zones of the dam embankment. The largest of these flats, extending over an area of 110,000 square yards, and with a volume of 140,000 cubic yards, is slightly less than a mile upstream of the dam, i.e., between the rockfill quarry to the east and the borrow area for core material to the west. The other 7 flats are all much smaller deposits; they range in area between 20,000 and 36,000 square yards, and all are upstream of the main borrow area.

CONCLUSIONS.

1. The rocks at the damsite are moderately to steeply dipping quartzite, silicified sandstone, and laminated siltstone, with sandstone predominating over siltstone. Except in some fault and shear zones (see 16-19 below), the rock is amply strong to support the proposed dam structure with very little excavation of bedrock.

2. The rocks are tightly folded, with many minor folds on the limbs of the main anticlines and synclines. At the damsite, the folds plunge at 20^{o} in a south-easterly direction.

3. The major structural feature in the area of the damsite is the Cotter Fault, which passes the site 1,000 feet to the west of the river.

4. Faulting, associated with the Cotter Fault, has affected the foundations of the damsite.

5. Jointing is prominent in the damsite foundations, and is appar-

ently genetically related to the compressive forces which caused the folding. Some jointing on the west bank is due to the proximity of the Cotter Fault.

6. The weathered zone is generally less than 20 feet thick, except near faults and in very openly jointed rocks.

7. Open jointing with associated weathering is prominent in the sandstone and quartzite, whereas joints in the siltstone are generally fresh, tight and clean, except close to the surface.

8. The soil and scree cover at the damsite is generally less than five feet thick. Greater thicknesses occur in the gully upstream of the dam axis on the east bank (at least 15 feet in places), and on the western bank of the river close to river level (up to 12 feet.). On the west bank at the upstream toe of the dam, overburden may be up to 30 feet thick over a small area.

9. The eastern foundations consist of interbedded siltstone and sandstone, grading to thickly bedded sandstone towards the top of the sequence. An extensive exposure of cleaved siltstone is present in the core of an anticline 100 feet above the river adjacent to the dam axis; the exposure widens to the north-north-west and forms the main foundation rock towards the downstream toe of the dam.

10. The western foundations consist mainly of silicified sandstone and quartzite. Some interbedded siltstone and sandstone is present on the lower slopes, near the dam axis, in the core of a syncline.

11. The silicified sandstone is a hard, strong, well cemented rock, and in places grades to very hard and very strong quartzite (for static and dynamic strengths of representative samples, see Appendix 4).

12. The thickly bedded and laminated siltstone is soft, but moderately strong as it is well compacted. It does not fret or slake on exposure to air, and a protective coating will not be needed on the foundations before the fill is placed. Silicification has been noted in some of the thicker beds, and also in the laminated siltstone close to the Cotter Fault zone; in these areas, the siltstone is hard and strong.

13. The differences in strength and elasticity of the sandstone and siltstone are not sufficiently great to produce unacceptable differences in foundation behaviour when loaded by the proposed dam structure.

14. The folding on the east bank has imparted cleavage to the laminated siltstone in the crest of the anticline, but weathering has not penetrated very deeply. The angle of cleavage is high (65 to 75 degrees), and dips into the hillside; little foundation excavation will be necessary, except along fault and shear zones.

15. The anticlinal fold on the west bank has resulted in a narrow zone of open jointing at depth with moderate leakage. The syncline, however, does not appear to have affected foundation conditions; this is probably because siltstone and fine-grained sandstone interbeds are the dominant rock types.

16. Three major faults have been located at the damsite. Two of the faults dip steeply to the west-south-west; one crops out on the east bank near the river, and the other trends obliquely across the western foundations. The third fault, which dips at 40^{o} to the south-west, crops out almost along the line of the dam axis on the downhill slopes of the east bank.

17. The zones of broken rock associated with the two steeply dipping faults are narrow, and excavation before placement of earth and rockfill should not be expensive. The 40^{o} fault will require considerable treatment, however, due to the extensive development of clay and the broken rock in the hanging-wall of the fault.

18. A fault or fault zone, trending north-north-west, is probably present in the bed of the river near the dam axis. It is also quite likely that one or more faults are present in those parts of the foundations which have not been cleaned down to bedrock.

19. A number of minor zones of crushed rock, many with clay, have been located in the sluiced areas, particularly in the rock overlying the 40^{o} fault on the east bank. Most of these zones will need to be cleaned out, and some will require backfilling with concrete.

20. Many loose slabs of rock are present on the extensive dip slopes of the west bank. These loose slabs, and possibly some of the thin quartzite beds below, will have to be removed to expose fresh rock with tight bedding planes. Treatment will need to be more rigorous for the foundations of the impervious core than elsewhere.

21. Apart from fault zones and dip slopes, little foundation excavation should be necessary below the present bedrock surface.

22. Area grouting of the foundation rock below the earth core will be necessary. High grout consumption is expected in the openly jointed sandstone and quartzite; extensive surface plugging will be necessary. The attitudes and locations of the grout holes should be planned to intersect the greatest number of open joints and bedding planes.

23. Water pressure testing of drill holes indicates that curtain grouting on the west bank will be necessary to depths ranging from 140 feet close to the river to 200 feet high on the abutment. Grout takes will be low towards the river, but high takes can be expected towards top water level.

24. On the east bank, curtain grouting will generally be necessary to depths ranging from 90 to 120 feet. Close to top water level, the grout curtain will need to be extended to a depth of 170 feet.

25. High leakage zones close to top water level have been located on both abutments; consequently the grout curtain will need to be extended beyond the limits of the dam on both sides of the river. On the east bank, the curtain need only be extended for 100 feet to the east of the dam axis. On the west bank, the curtain will need to be extended for at least 250 feet to the west of the dam axis, and possibly even to the west side of the Cotter Fault zone (500 feet west of the dam axis).

26. Apart from the Cotter Fault, no potential leakage paths from the reservoir area have been located during the investigation.

27. No special aseismic design is needed for the dam.

28. The foundations for the spillway chute consist dominantly of thickly bedded, silicified sandstone and well-bedded quartzite. The main fault located in the western foundations crosses the spillway line, but is not expected to require major treatment.

29. The excavation for the overflow channel near the spillway crest will mostly be in thickly bedded silicified sandstone and well-bedded quartzite. Analysis of joint pattern stereograms indicates that a steep batter is possible on the western wall of the excavation without the danger of

excessive overbreak or rockfalls due to an adversely-dipping set of joints. Some rock-bolting will probably be necessary.

30. No serious difficulties are envisaged in establishing tunnel portals in either the inlet or outlet portal areas. Both portals will be established in a sequence of interbedded siltstone and sandstone.

31. It is expected that the tunnel will be excavated mainly in laminated siltstone with numerous interbeds of silicified sandstone.

32. Breakage of the rock during tunnel excavation will be controlled by bedding and joint planes, and some overbreak can be expected. Rock bolts will be required for roof support.

33. Tightly jointed rock should be encountered in the tunnel for most of its length; large inflows of water into the tunnel are not expected, except possibly, where fault zones are intersected.

34. At least three major faults are likely to be intersected by the tunnel. Steel sets should be readily available for support, if required, when these faults are encountered.

35. Concrete lining of the tunnel will be necessary at the portals, at the junction with the valve tower shaft, and in any areas where steel sets are used for support. Much of the remainder of the tunnel will require treatment with pneumatically applied mortar, and where thick clay seams occur, the mortar will need steel mesh reinforcement. With such a short tunnel, it may be more economical to fully line the tunnel with concrete.

36. The proposed source of rockfill for the dam is a sequence of quartzite and silicified sandstone, with some silty interbeds, which crops out as a prominent cliff, slightly less than one mile upstream of the damsite, on the eastern side of the Cotter Valley.

37. The quarry site is topographically well-suited to the development of a free-draining quarry.

38. An adequate supply of rockfill material is readily available at the quarry site; at least 1.5 million cubic yards of solid rock have been proved by diamond drilling.

39. Ample material suitable for use as concrete aggregate should be available from the rockfill quarry. The sandstone and quartzite are strong and are expected to break to a good shape, to be non-reactive with

cement, and to have a low pyrite content. They will be highly to moderately abrasive to crushing plant. Breaking and reactivity tests have not been carried out on the quarry material.

40. An adequate volume of material suitable for use in the impermeable core of the dam has been proven in the Cotter Valley upstream of the dam. The bulk of the core material will be derived from slope-wash material on the west bank of the Cotter River, supplemented by some decomposed dacite porphyry.

41. Several large alluvial flats in the Cotter Valley contain sufficient suitably-sized material for use in the filter zones of the dam, and as fine aggregate. Some, at least, of these deposits probably contain a significant proportion of flaky phyllite particles, which may render the material unsuitable. Filter material and fine aggregate may alternatively be imported from the Murrumbidgee near Point Hut Crossing, or be obtained by crushing sandstone from the rockfill quarry.

RECOMMENDATIONS

1. The river terrace on the west bank of the river at the damsite should be cleaned down and inspected as soon as possible after construction of the coffer dam. The northern extension of the 75° fault on the east bank traverses this area, and the presence of other fault zones is strongly suspected.

2. The foundation treatment below the impermeable core should consist of the removal of all loose rock and compressible material, together with "dental" treatment of any near-vertical rock faces, followed by consolidation grouting to a depth of at least 25 feet.

3. All fault zones beneath the core should be excavated to remove broken rock and clay to a depth at least equal to the width of the fault (or to a minimum of three feet), and the excavation back-filled with concrete. In the case of the larger fault zones, the sides of the excavation may require battering back to a suitable gradient before back-filling with concrete.

4. Excavation along the 40° fault should continue until sound rock is present in the hanging wall. The fault in the bottom of the resulting excavation should then be treated as in 3 above, and the sides of the

excavation be battered back to a gradient of 2.1. After suitable concreting of the fault zone (and of the sides of the excavation if necessary), the excavation may be backfilled with core material.

5. Where major faults are exposed in the foundations for rockfill, they should be covered with filter material before the placing of rockfill.

6. In the areas of the west bank where extensive dip slopes are present, removal of loose slabs will be necessary. If the foundation surface, after this treatment, consists of extensive smooth dip slopes, surface notching may be necessary to improve contact friction between the dam and its foundations.

7. Grout holes for area grouting should be planned to intersect the greatest number of joints and bedding planes. Attitudes will vary across the site according to geological structure, and it is suggested that a statistical analysis of joint and bedding planes for the various structural areas of the site be undertaken; this will enable the most efficient area grouting programme to be planned. The average spacing of grout holes would probably need to be fifteen feet or less.

8. The grout curtain should extend at least 30 feet into tight rock, i.e., rock with a joint permeability, calculated from water pressure tests, of less than 250 feet per year. The depth of the grout curtain should range from 100 to 200 feet vertically below the surface (see Plate 17 for detail). Stage grouting will be necessary, and the spacing of grout holes will need to be ten feet or less for an adequate seal.

9. The grout curtain will need to be extended into the wings of both abutments. The curtain extension will not be great on the east bank (about 100 feet), but on the west bank, the advisability of extending the grout curtain to the west side of the Cotter Fault must be carefully considered. Should it be decided not to grout the Cotter Fault zone, regular observations should be made along the possible leakage paths during filling of the reservoir, and grouting should be carried out immediately if excessive leakage is observed.

10. The water level observation holes (one on each abutment), should be maintained, and levels read regularly during and after construction of the dam.

11. If the upper strata at the quarry site (containing siltstone interbeds) are used in the dam, they should be either used in areas where the presence of siltstone in significant amounts is not critical, or be mixed with the thickly bedded quartzite to lower the percentage content of siltstone to an acceptable amount.

12. The quartzite from the Cotter quarry should be tested to confirm its suitability for use as concrete aggregate.

13. The material in the alluvial flats of the Cotter River upstream of the dam should be tested to determine its suitability as a source of filter material and fine aggregate.

ACKNOWLEDGEMENTS.

The geological investigation was carried out at all times in close co-operation with officers of the Commonwealth Department of Works, Canberra. In particular, they were responsible for the installation and operation of the sluicing equipment which proved to be an invaluable aid to the detailed mapping at the damsite. The ready availability of a Department of Works' bulldozer was also of great assistance, particularly during the investigation of the prospective quarry sites. In addition, the Department provided labourers for pitting, trenching and, on occasions, as rod-men during the plane table mapping.

The compressive strength tests on drill core from the quarry site were carried out in the Commonwealth Department of Works Materials Testing Laboratory, Canberra.

The co-operation of the Department of Interior surveyors in providing control survey stations, as and where required, for the geological mapping, was much appreciated.

In the course of the investigations, the site was visited on several occasions by various officers of the Snowy Mountains Hydro-Electric Authority; on one occasion, they were accompanied by Mr. J.B. Cooke, an American consultant engineer for the Authority. Their appraisals of the site were valuable, and are taken into account in this report.

The programme of diamond drilling and water pressure testing was carried out by a team of drillers from the Snowy Mountains Hydro-Electric Authority. Apart from their usual ready co-operation during such investigations, particular thanks are due to them for their practical assistance in modifying water pressure testing techniques to cope with the abnormally high leakages obtained. They were also responsible for the design and construction of the apparatus used for calibrating the mechanical and hydraulic packers.

The assistance given by all these people is gratefully acknowledged.

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APPENDIX I.

DEFINITIONS OF SEMI-QUANTITATIVE DESCRIPTIVE TERMS.

The following semi-quantitative descriptive terms have been used as much as possible in this report:

Grade Scale.

Very coarse grained	-	1 mm. to 2 mm in diameter.
Coarse grained	-	½ mm. to 1 mm in diameter.
Medium grained	-	¼ mm. to ½ mm in diameter.
Fine grained	-	⅛ mm. to ¼ mm in diameter.
Very fine grained	-	$\frac{1}{16}$ mm to ⅛ mm in diameter.

Bedding.

Laminated	-	less than 10 mm. thick
Thinly bedded	-	10 mm. to 100 mm. thick.
Thickly bedded	-	More than 100 mm. thick.

Hardness.

Hard to very hard	-	impossible to scratch with knife blade.
Moderately hard	-	shallow scratches with knife blade.
Soft	-	deep scratches with knife blade.

Percussive strength.

Strong to very strong	-	cannot be broken after repeated blows with a hammer.
Moderately strong	-	rock breaks after 3 or 4 heavy blows with a hammer.
Weak	-	rock breaks after one blow (includes brittle, fissile, friable, plastic and flaky rocks).

APPENDIX 2.

WATER LEVEL OBSERVATIONS IN DRILL HOLES.

Date	D.D.5 800' west of river		D.D.10 400' east of river		D.D.11 800' east of river	
	R.L. of water table (feet)	Height above river	R.L. of water table (feet)	Height above river	R.L. of water table (feet)	Height above river
28/4/64	2969	49	3034	114	-	-
22/5/64	2950	30	3031	111	-	-
3/6/64	2946	26	3029	109	3020	100
11/6/64	2946	26	3028	108	3015	95
4/8/64	2960	40	3039	119	-	-
3/9/64	2961	41	-	-	3026	106
24/9/64	2961	41	-	-	3023	103
13/10/64	2975	55	3049	129	3035	115
21/10/64	-	-	3043	123	3033	113
28/10/64	2960	40	3037	117	3018	98
10/11/64	2961	41	3044	124	3015	95
20/11/64	2953	33	3035	115	3029	109
3/12/64	2947	27	3034	114	3026	106
12/1/65	2944	24	3037	117	3020	100
22/1/65	2943	23	3029	109	3016	96
28/1/65	2943	23	3029	109	3017	97
5/2/65	2943	23	3028	108	3016	96
11/2/65	2943	23	3028	108	3016	96
18/2/65	2943	23	3028	108	3015	95
24/2/65	2943	23	3028	108	3015	95
4/3/65	2943	23	3028	108	-	-
17/3/65	2943	23	3025	105	3015	95
25/3/65	2943	23	3024	104	3014	94
31/3/65	2943	23	3023	103	3015	95
7/4/65	2943	23	3024	104	3014	94
14/4/65	2943	23	3024	104	3024	94
19/5/65	2942	22	3023	103	3011	91

APPENDIX 3

RESULTS OF WET AND DRY COMPRESSIVE STRENGTH TESTING OF DRILL CORE SAMPLES FROM COTTER QUARRY.

Samples taken from diamond drill cores of the six drill holes in the quarry were tested by the Commonwealth Department of Works Materials Testing Laboratory, Canberra. Unconfined compression tests were carried out on these specimens, the procedure used being as follows:

The samples were first sawn to a length of core; diameter ratio of 2:1, and then sorted into similar pairs according to rock-type and degree of weathering. One sample from each pair was soaked in water for 24 hours, both ends capped with sulphur, and then tested in the compression machine; the other sample was similarly capped and tested without soaking or wetting.

The results are set out by drill hole number and depth of sample in the following table. The testing in pairs indicated that the wet strength is normally lower than the dry strength for similar specimens; other than this, no general distribution pattern of strength was shown up by the compression testing. The sorting into pairs is not indicated in the following table.

COMPRESSION TEST RESULTS OF DIAMOND DRILL CORE, SAMPLES FROM COTTER QUARRY

SAMPLE NO.	DRILL HOLE	DEPTH FT.	WET OR DRY	DESCRIPTION	COMPRESSIVE STRENGTH p.s.i.	REMARKS
6536041	D.D.32	6	W	Weathered Laminated siltstone	985	Failed along irreg.incipient joint.
42	"	9	W	" "	1,680	Columnar and angular fractures.
31	"	32	W	Fresh thinly interbedded sandstone & siltstone	4,070	Fracture through existing fault.
30	"	32	D	Slightly weathered laminated siltstone	5,720	Column and angular total collapse.
43	"	38	W	" " " "	3,870	Incipient joint failure with some angular fracture.
29	"	40	W	Fresh to slightly weathered siltstone	2,890	Columnar failure
44	"	41	W	Laminated siltstone	1,910	Angular fracture
28	"	43	D	"	6,040	Broke along weathered joint
45	"	45	W	Interbedded sandstone and siltstone	3,460	Angular fracture through fault
46	"	54	D	Interbedded sandstone and siltstone	8,450	Columnar and angular fracture
6536047	D.D.33	18	D	Laminated siltstone	4,250	Columnar and angular fracture through fault
48	"	20	W	"	3,680	" " " with fault
49	"	21	D	"	1,910	" " " "
50A	"	23	W	"	3,620	Angular fract. and col. fracture through fault.
50B	"	23	D	"	3,650	" " "
51	"	31	D	"	1,780	Columnar fracture
52A	"	34	W	"	1,460	Whole fracture collapsed.
52B	"	34	D	"	5,180	Angular fracture
53	"	40	W	Interbedded sandstone and siltstone	1,590	Columnar and angular fracture
54	"	48	W	" "	1,620	Failed along joints and weathered bedding planes.
55	"	52	W	" "	2,130	Angular and columnar failure through fault
6536025	D.D.34	18	D	Fresh thinly interbedded sandstone & siltstone	4,320	Column fracture
26	"	19	D	Almost fresh " " "	8,800	"
27A	"	26	W	Weathered, thinly interbedded " "	2,100	Column fractures
27B	"	26	D	" " " "	5,460	Angular fractures along existing faults
56	"	36	D	Interbedded sandstone and siltstone	4,640	Angular fracture through fault
57A	"	38	W	" " "	3,080	Column fracture
57B	"	38	D	" " "	3,370	Angular fracture through fault
58	"	44	D	" " "	1,970	Failed along incipient joint
6536059A	D.D.35	16	W	Laminated siltstone	2,950	Irregular fracture through fault
59B	"	16	D	"	6,450	" "
60	"	25	D	"	7,600	Failed along incipient joint, then col. fracture.
22	"	26	W	Almost fresh interbedded sandstone & siltstone	2,030	Suspect fracture along existing joint
21	"	32	W	Slightly weathered sandstone with laminae	635	Broke along two limonite stained joints
32A	"	96	W	Fresh quartzite	18,400	Column fracture
32B	"	96	D	"	16,100	"
33A	"	168	W	Fresh quartzite with silty laminae	10,850	Column fracture along incipient joint
33B	"	168	D	" "	12,700	" no apparent fault
6536061	D.D.41	11	D	Laminated siltstone	2,830	Angular fracture
23A	"	15	W	Weathered laminated siltstone	4,130	Col. and angular fract. through heavy flaws.
23B	"	15	D	" "	2,540	Irregular fractures through existing flaws.
24A	"	30	W	" "	3,210	Col. and angular fracts. through exist. faults.
24B	"	30	D	" "	2,700	Ang. fracture through existing faults.
20A	"	38	W	Slightly weathered laminated siltstone	6,660	Columnar fractures
20B	"	38	W	" interbedded sandstone and siltstone	7,810	"
62	"	39	D	" " "	4,130	Angular fracture.
34A	"	100	W	Fresh quartzite	19,400	Columnar fracture.
34B	"	100	D	"	23,500	"
6536018	D.D.42	37	D	Slightly weathered sandstone with laminae	1,250	Angular and col. fractures along existing faults.
19	"	48	D	" interbedded siltstone and sandstone	6,350	Column fracture.

APPENDIX 4.

DYNAMIC AND STATIC PROPERTIES OF DRILL CORE SAMPLES FROM THE DAMSITE.

Dynamic determination.

Dynamic properties of the rocks were determined on 78 samples of core obtained from drill holes at the damsite. The determinations were carried out in the B.M.R. Laboratory at Footscray, using standard techniques. Dynamic tests were also carried out on 17 core samples which had been saturated with water for forty-eight hours under partial vacuum. The results of dynamic testing on wet and dry samples are given in the following tables.

TABLE 1

Laboratory determination of dynamic properties of core samples - specimens tested wet.

(Geological description of samples given in following table).

Sample No.	Longitudinal Velocity ft/sec.	Poisson's ratio	Modulus x 10^6 lb/sq.in.			Logarithmic decrement.
			Young's	Bulk	Rigidity	
408	16,900	0.32	7.1	6.8	2.7	0.16
411	17,800	0.10	11.0	4.6	5.0	0.13
420	15,900	0.37	4.6	5.9	1.7	0.33
431	17,900	0.18	10.0	5.3	4.3	0.08
432	17,100	0.15	9.7	4.6	4.2	0.17
243	13,800	0.41	2.9	5.4	1.0	0.54
239	17,100	0.22	9.1	5.4	3.6	0.09
235	12,200	0.39	2.4	3.9	0.9	0.46
231	11,250	0.41	1.7	3.4	0.6	0.36
232	13,400	0.36	3.6	4.4	1.4	0.36
226	13,500	0.38	3.2	4.7	1.2	0.35
271	8,800	0.41	1.1	2.1	0.4	0.24
276	11,900	0.39	2.3	3.7	0.9	0.24
277	12,400	0.41	2.3	4.3	0.9	0.23
281	11,200	0.39	2.1	3.4	0.8	0.31
284	11,900	0.29	5.7	4.7	2.2	0.08
261	13,000	0.40	3.1	5.2	1.2	0.23

Appendix 4. (cont)

An examination of the values obtained for the specimens which were tested both wet and dry shows the following trends:

(a) Seismic velocities in wet rock show a tendency to be higher than in dry rock.

(b) Poisson's ratio of wet rock is generally higher than of dry rock.

(c) Young's modulus for wet rock is generally equal to that obtained for dry rock. Decrease in value of Young's modulus is shown by wet siltstone.

(d) Bulk modulus is higher on wet samples than dry samples.

(e) Modulus of rigidity on wet samples is lower than on dry samples.

(f) Logarithmic decrement of wet rock is higher than of dry rock.

Static determination.

Static tests were carried out on five drill core samples at the Commonwealth Department of Works Laboratory, Melbourne, using Phillips wire strain gauges. Stress-strain diagrams were plotted from the load and deformation measurements for each specimen tested. The tests were carried out to destruction of the rock sample, and the ultimate strength was calculated from maximum load.

The numerical results of the tests are given in Table 3, and a comparison of the static and dynamic results is given in Table 4. For locations and geological description of samples tested, refer to Table 2.

TABLE 3.

Laboratory determination of static properties of core samples- specimens tested dry.

Drill Hole No.	Sample No.	Lab. No.	Ultimate strength (p.s.i.)	Poisson's Ratio	Young's Modulus
2	412	1371	16,750	0.39	7.7×10^6
3	417	1376	13,780	0.12	9.5×10^6
3	419	1378	30,300	0,21	10.5×10^6
4	422	1381	25,040	0.16	10.5×10^6
4	429	1388	12,770	0.16	5.5×10^6

TABLE 2 : Laboratory determination of dynamic properties of core samples - specimens tested dry
(core diameter 0.17 feet)

Drill Hole No.	Depth	Field No.	Description (from hand specimen)	Length ft.	Specific Gravity	Longitudinal velocity ft/sec	Poisson's Ratio	Modulus x 10^6 lb/sq in. Young's	Bulk	Rigidity	Logarithmic decrement	Porosity
1	35' 0" - 35' 3"	241	Almost fresh quartzite.	0.148	2.57	14,000						4.5
1	67' 8" - 68' 3"	244	Fresh medium grained quartz sandstone.	0.550	2.62	16,100					0.06	1
1	87' 0" - 87' 6"	246	Slightly weathered interbedded fine grained sandstone and siltstone.	0.240	2.49	12,000						6.5
1	95' 0" - 95' 5"	245	Fresh interbedded fine grained silicified sandstone and siltstone.	0.358	2.57	9,480						6.5
1	138' 3" -138'10"	243	Fresh interbedded blue-grey fine grained sandstone and siltstone.	0.496	2.67	11,800	0.395	2.39	3.82	0.88	0.111	2
1	168' 1" -168' 6"	240	Fresh slumped quartz siltstone and fine grained quartz sandstone.	0.187	2.69	9,600						3
1	192' 2" -192' 8"	239	Fresh fine grained blue-grey silicified quartz sandstone.	0.486	2.68	17,300					0.094	0.5
1	217'10" -218' 2"	238	Fresh dark blue-grey siltstone.	0.146	2.74	14,600						1
1	223' 0" -223' 4"	242	Fresh blue-grey siltstone.	0.156	2.63	6,800						
2	33' 6" - 34' 0"	410	Slightly weathered fine grained quartz sandstone with numerous thin silty interbeds.	0.412	2.59	15,300	0.37	4.6	5.9	1.7	0.070	
2	41'-3" - 41'11"	412	Fresh fine grained silicified quartz sandstone.	0.492	2.60	15,000	0.10	7.7	3.2	3.5	0.052	
2	74' 1" - 74'11"	411	Fresh fine grained silicified quartz sandstone.	0.700	2.65	17,300	0.24	9.1	5.8	3.7	0.053	
2	96' 9" - 97' 4"	413	Slightly weathered fine grained silicified quartz sandstone with numerous thin irregular silty interbeds.	0.505	2.63	13,400	0.42	2.6	5.4	6.9	0.183	
2	112' 7" -113' 3"	408	Fresh fine grained silicified quartz sandstone with a few silty interbeds.	0.613	2.63	16,600	0.36	5.9	7.0	2.2	0.072	
2	138' 7" -139' 0"	414	Slightly weathered fine grained silicified quartz sandstone with quartz veins.	0.371	2.60	15,500						
2	156' 0" - 156'7"	409	Fresh fine grained silicified quartz sandstone with irregular silty interbeds.	0.470	2.61	15,800	0.24	7.4	4.7	3.0	0.13	
3	23'10" - 24' 5"	427	Slightly weathered medium grained silicified quartz sandstone.	0.408	2.62	17,600						
3	43' 4" - 44' 0"	417	Fresh medium grained silicified quartz sandstone.	0.468	2.63	16,700	0.10	9.6	4.0	4.4	0.089	
3	66'10" - 67' 3"	418	Interbedded fresh blue grey fine grained silicified quartz sandstone and siltstone.	0.119	2.66	12,300						
3	86' 7" - 87' 5"	420	Fresh to slightly weathered blue grey silicified quartz sandstone with siltstone interbeds.	0.685	2.34	15,000	0.34	4.6	4.8	1.7	0.205	
3	102'11" -103' 6"	419	Fresh fine grained silicified quartz sandstone.	0.428	2.63	16,700	0.10	9.6	4.0	4.4	0.082	
3	127' 3" -127'10"	415	Fresh blue massive siltstone with quartz veins.	0.444	2.57	13,100	0.15	5.6	2.7	2.4	0.304	
3	146' 9" -147' 4"	428	Fresh dark blue to grey fine grained silicified quartz sandstone with quartz veins.	0.500	2.68	17,700	0.20	10.0	5.7	4.2	0.114	
3	151' 4" -151' 9"	426	Fresh dark blue fine grained silicified quartz sandstone.	0.365	2.59	16,700						
3	173'11" -174' 7"	424	Fresh dark blue fine grained silicified quartz sandstone with silty interbeds.	0.494	2.63	15,800						
3	180' 8" -181' 1"	425	As for 424 but with numerous quartz veins . Probably recemented breccia. Pyrite present.	0.305	2.66	15,900						
3	197' 4" -197'11"	416	Fresh dark blue fine grained silicified quartz sandstone with quartz veins.	0.414	2.62	18,300	0.20	10.6	5.9	4.3	0.066	

TABLE 2: Laboratory determination of dynamic properties of core samples - Specimens tested dry.
(core diameter 0.17 feet)

TABLE 2. (cont.)

Drill Hole No.	Depth	Field No.	Description (from hand specimen)	Length ft.	Specific Gravity	Longitudinal velocity ft/sec.	Poisson's Ratio	Modulus x10^6 lb/sq. Young's	Bulk	Rigidity	Logarithmic decrement	Porosity
4	13' 9" - 14' 0"	234	Slightly weathered silicified fine grained quartz sandstone.	0.196	2.44	10,900						8
4	32' 6" - 33' 1"	430	Slightly weathered fine grained silicified quartz sandstone.	0.452	2.55	15,500	0.32	5.8	5.4	2.2	0.098	
4	57' 4" - 57' 8"	233	Slightly weathered interbedded fine grained silicified quartz sandstone and siltstone.	0.211	2.46	7,200						13
4	67'10" - 68' 5"	429	Slightly weathered fine grained silicified quartz sandstone.	0.408	2.51	14,000						
4	92' 3" - 92' 9"	423	Slightly weathered fine grained silicified quartz sandstones with numerous thin siltstone interbeds.	0.354	2.55	14,500						
4	106' 8" -107' 2"	422	Slightly weathered fine grained silicified quartz sandstone.	0.483		16,800	0.31	8.5	7.5	3.2	0.085	
4	127' 3" -128' 0"	421	Slightly weathered fine grained silicified quartz sandstone.	0.520	2.57	15,900	0.13	8.4	3.8	3.7	0.032	
4	141' 5" -142' 3"	432	Slightly weathered fine grained silicified quartz sandstone.	0.742	2.60	16,400	0.16	8.9	4.4	3.8	0.066	
4	168' 0" -168'10"	431	Slightly weathered fine grained silicified quartz sandstone.	0.667	2.62	17,200	0.115	10.0	4.3	4.5	0.074	
6	18' 4" - 18' 9"	253	Pale brown siltstone.	0.210	2.63	11,200						
6	32' 9" - 33' 2"	254	Buff siltstone with fine quartz veins.	0.372	2.61	13,000						
6	108'10" -109' 4"	260	Slightly weathered fine grained brown sandstone.	0.385	2.59	12,500						
6	126' 6" -127'1"	261	Slightly weathered fine grained sandstone with pyrites.	0.472	2.64	11,300	0.39	2.21	3.53	0.82	0.075	
6	156' 6" -156'11"	255	Fresh dark grey siltstone with quartz vein.	0.380	2.66	17,100						
6	179' 1" -179' 7"	256	Fresh dark grey siltstone with pyrites.	0.342	2.76	18,300						
6	191' 5" -191'11"	257	Fresh dark grey siltstone.	0.293	2.67	17,500						
6	217' 0" -217' 6"	258	Fresh dark grey sheared siltstone.	0.296	2.68	17,400						
6	249' 0" -249' 7"	259	Fresh dark grey brecciated siltstone.	0.370	2.72	15,100						
7	78' 6" - 79' 1"	274	Fresh dark grey siltstone.	0.460	2.84	13,300						
7	115' 9" -116' 4"	275	Fresh dark grey laminated siltstone.	0.290	2.72	11,300						
7	131' 4" -131' 8"	273	Fresh dark brown non laminated siltstone.	0.296	2.60	14,100						
8	17' 0" - 18' 1"	250	Moderately weathered fine grained quartz sandstone.	0.384	2.23	10,300						15
8	23' 8" - 24' 3"	249	Moderately to very weathered medium grained quartz sandstone.	0.430	2.12	7,620						
8	31' 4" - 31'10"	248	Moderately weathered fine grained quartz sandstone.	0.493	2.38	13,900					0.027	
8	57'10" - 58' 5"	247	Moderately to very weathered thinly bedded to laminated, interbedded siltstone and shale.	0.563	2.36	12,100	0.395	2.25	3.6	0.83	0.128	13
8	70' 8" - 71' 1"	229	Fresh blue-grey silicified quartz siltstone, thinly bedded to laminated, with well developed cleavage.	0.285	2.60	13,900						7
8	100' 0" -100' 6"	228	Fresh blue-grey silicified quartz siltstone, thinly bedded to laminated, well developed cleavage.	0.404	2.63	13,800						4.5
8	126' 8" -127' 4"	227	" " "	0.590	2.60	14,700	0.175	6.89	3.65	2.89	0.058	4.5
8	152' 0" -152' 7"	226	" " "	0.512	2.55	14,500	0.115	6.89	2.99	3.10	0.091	6.5

TABLE 2. (cont.)

Drill Hole	Depth	Field No.	Description (from hand specimen)	Length ft.	Specific Gravity	Longitudinal velocity ft/sec.	Poisson's Ratio	Modulus x10^6 lb/sq in. Young's	Bulk	Rigidity	Logarithmic decrement	Porosity
9	12' 1" - 12' 8"	262	Mod. weathered pale brown fine sandstone.	0.406	2.50	13,300						
9	34' 3" - 34'11"	271	Mod. weathered brown coloured siltstone.	0.568	2.28	8,100	0.116	1.67	1.09	0.67	0.056	
9	43' 4" - 43'10"	270	Mod. fresh pale grey non-laminated siltstone.	0.267	2.44	8,900						
9	65' 1" - 65' 6"	269	Fresh brown coloured medium grained sandstone.	0.331	2.57	14,200						
9	90' 7" - 91' 1"	268	Fresh grey coloured medium grained, silicified sandstone.	0.440	2.60	16,400						
9	125' 3" -125' 6"	266	Fresh grey coloured quartzite.	0.325	2.65	16,700						
9	193' 6" -194' 0"	263	Fresh dark grey, fine grained sandstone.	0.390	2.62	14,000						
10	34' 5" - 35' 0"	236	Fresh medium to coarse grained sandstone.	0.516	2.51	11,600					0.125	5
10	56' 7" - 57' 3"	235	Slightly weathered finegrained silicified quartz sandstone.	0.623	2.37	10,500	0.36	2.06	2.47	0.77	0.102	11
10	78' 4" - 78'10"	230	Moderately weathered impure coarse grained quartz sandstone.	0.488	2.52	14,000					0.044	4
10	103' 4" -103' 9"	231	Moderately weathered coarse grained quartz sandstone.	0.417	2.33	9,630	0.19	2.61	1.44	1.08	0.325	10
10	126' 1" -126' 8"	232	Fresh blue-grey silicified fine grained quartz sandstone.	0.513	2.59	12,700	0.17	5.10	2.70	2.14	0.189	3.5
10	159' 8" -160' 1"	237	Slightly weathered fine grained silicified quartz sandstone.	0.389	2.40	9,330						9.5
12	12' 1" - 12'11"	276	Mod. weathered coarse grained sandstone.	0.563	2.51	10,200	0.23	2.95	1.86	1.18	0.042	
12	22' 6" - 23' 0"	283	Mod. weathered pale brown medium grained sandstone.	0.263	2.26	7,220						
12	57' 5" - 58' 0"	282	Weathered fine grained sandstone.	0.375	2.28	8,340						
12	63' 5" - 63'11"	279	Weathered fine grained sandstone.	0.438	2.30	10,000						
12	82' 4" - 83' 0"	284	Mod. weathered brown medium grained sandstone.	0.539	2.55	14,500	0.25	5.83	3.98	2.31	0.023	
12	100' 3" -100' 9"	280	Slightly weathered buff coloured laminated siltstone.	0.362	2.42	9,400						
12	126' 5" -126'11"	278	Mod. fresh buff coloured fine grained sandstone.	0.436	2.42	12,600	0.17	4.68	2.48	1.96	0.032	
12	152' 2" -152' 8"	277	Fresh dark grey laminated siltstone.	0.437	2.56	13,200	0.24	5.02	3.26	2.01	0.045	
12	167' 1" -167' 9"	281	Fresh buff coloured laminated siltstone.	0.562	2.51	11,700	0.20	4.09	2.31	1.68	0.086	

Appendix 4. (cont)

TABLE 4.

Comparison of static and dynamic properties determined from laboratory tests.

Drill Hole No.	Sample No.	Lab. No.	Poisson's ratio Static	Poisson's ratio Dynamic	Young's Modulus Static	Young's Modulus Dynamic.
2	412	1371	0.39	0.10	7.7	7.7
3	417	1376	0.12	0.10	9.5	9.6
3	419	1378	0.21	0.10	10.5	9.6
4	422	1381	0.16	0.31	10.5	8.5
4	429	1388	0.16		5.5	

Table 4 indicates that the values of Young's Modulus found in static tests tend to be equal or higher than those found in dynamic tests.

Static measurements of wet samples were not carried out, but it is expected that the results would bear the same relation to those obtained with dry samples as is shown for dynamic measurements in Table 1.

Values of dynamic and static properties were determined using the standard procedure and equipment, and the results are within the $\pm$ 5 per centum error accepted by the American Society for Testing Materials.

APPENDIX 5.

GEOLOGICAL LOGS OF DIAMOND DRILL HOLES.

Explanatory Notes.

1. All angles of bedding and joint planes are measured relative to a plane normal to the core axis.
2. Fracture log is the number of fractures per foot of core. Zones of core loss are blacked in.
3. Pressures shown in water pressure test results column are gauge pressures.
4. Blacked-in strips on right of drill logs indicate water pressure test sections graphically.
5. The reference for the graphic log is given on sheet 1 of D.D.1.
6. The photographic reference numbers refer to the B.M.R. system of indexing black and white negatives and colour slides.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: Upper Cotter Damsite E. HOLE NO: D.D.1 R.L: 2927'

LOCATION: 79767' S, 51693' W. ANGLE FROM HORIZONTAL: 30° DIRECTION: 282°M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	DEPTH & SIZE OF CORE	STRUCTURES (JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES)
Alluvium	Mostly silt and fine grained sand with occasional boulders of weathered quartz sandstone.	NX casing. 10'0"	
	Fine to coarse grained sand with boulders of fresh to weathered quartz sandstone.	NMLC 19'0"	
Slightly weathered coarse grained sandstone.	Hard, strong, grey-brown, mottled rock. Many small blebs of pyrite.	21'4"	Joints are irregular and stained brown.
Very weathered siltstone.	Soft, weak, buff coloured rock. Bedding at 80° to core – much slumping evident. Boundary very soft and talcy.	22'4" 24'6" 28'5"	Closely jointed rock with minor shearing. Some joints black. Irregular black stained joints with some slickensides. Open 90° joint at 26'4".
Fragments of weathered fine grained sandstone and siltstone.	¼" to 2" fragments of sandstone with brown silty material. Occasional siltstone fragments.	31'7"	Irregular brown stained joints. Some quartz veining.
Fresh, medium grained silicified quartz sandstone, weathered for 1" adjacent to joints.	Hard, strong rock – 2" to 15" core lengths. Bedding at 85°–90°.	35'7"	Irregular quartz veining.
Slightly to moderately weathered siltstone.	Green-grey to buff, soft, weak siltstone. Mostly thinly bedded with a few laminated interbeds 2 mm. thick. Slumping and small scale faulting evident. Bedding at 85°.	37'2" 40'9" 41'7"	Broken zone – fragments less than 1" long with some silt. Bedding plane joints slickensided. Black iron oxide up to 2 mm. thick on joints. Sheared zone.
Slightly weathered, medium grained, silicified quartz sandstone.	Hard, strong rock – 1" fragments to 3" core lengths.	43'6"	Quartz veining up to 10 mm. wide. Open joint at 42'0".
Slightly to moderately weathered siltstone.	Grey green to buff, moderately soft, moderately strong rock. 24" core lengths to 1" fragments. Bedding at 65°. Sedimentary slumping and faulting evident. Bedding at 70° to 80°. Thin sandstone interbeds from 50'10".	51'5"	Black and brown stained joints. 55° joint. Joints dominantly parallel and perpendicular to bedding (20° to 70°).
Brown weathered, medium grained quartz sandstone.	Impure sandstone with occasional shale fragments up to 10mm. long. From 54'0" irregular interbeds and lenses of siltstone occur. Much slumping and contemporaneous deformation is evident. Bedding at 70°.	64'6"	Brown and black stained joints, mostly irregular. A few planar, black stained, slickensided joints are present parallel to bedding. Occasional quartz stringers from 61'0" to 66'0".
Almost fresh, medium to coarse grained, silicified quartz sandstone.	Hard, strong, massive rock, occurring as 10" to 2" core lengths, mode 9". From 68'0" to 72'6", drillhole follows gradational bedding plane between coarse grained sandstone and siltstone. Zone of graded bedding (medium grained sandstone to siltstone). True thickness 6". Dipping at 80°.	75'8" 79'0"	Prominent black stained bedding plane joint strongly slickensided. [slickensides dip at 70° in plane of joint].
Weathered siltstone.	Massive siltstone.	80'10" 81'10"	Quartz infilled joint at 65°.
Slightly weathered fine grained sandstone & siltst.	Graded bedding. Bedding planes wavy, dips ranging from 75° to 55°.	83'6"	Folding indicated by change in dip.
Weathered, medium grained qtz. sandstone.	Contains a few small shale fragments.	84'10"	Quartz infilled joints at 55°.
Fresh to weathered siltstone.	Blue-grey to green-grey, moderately hard and strong rock. Pyrite crystals scattered throughout. Several bedding planes at 10° to 15°.	88'6"	
Fresh to slightly weathered, medium grained, silicified quartz sandstone.	Hard, strong rock with numerous small fragments of included shale.	93'0"	Prominent brown stained joint at 80°– adjacent rock weathered for ½" to 2". Quartz infilled joint at 70°.
Almost fresh to weathered siltstone and fine grained sandstone.	Thickly bedded to laminated interbeds of fine grained sandstone and siltstone. Maximum thickness of interbed is 2". Bedding ranges from 15° to 25°.		

WATER LEVEL: 11' 11/3/64

WATER PRESSURE TEST — Gallons per minute per foot loss (1:0 – 2:0)

PACKER TYPE:- NX mechanical unless otherwise stated.

SUPPLY LINE:- N rod for first test section, EX. casing thereafter.

VERTICAL SCALE:- 50 p.s.i. = 1" ; 100 p.s.i. = 1"

N.B.:- Figures given are gauge pressures.

TEST SECTION

12, 18, 25, 18, 14

BX hydraulic packer used.

10, 20, 30, 40, 30, 20, 10

BX hydraulic packer used.

10, 20, 30, 40, 50, 40, 30, 20, 10

SEE NEXT SHEET

DRILL NO: 6 – A – 18
TYPE: BOYLES BBS-2
DRILLER: PARCELL & TOMIC
COMMENCED: 14-1-64
COMPLETED: 11-2-64

REFERENCE.

Quartz sandstone, quartzite.
- Coarse grained
- Medium grained
- Fine grained
- Brecciated.

Quartz siltstone.
- Massive
- Laminated.
- Interbedded siltstone and sandstone.

Phyllite

Alluvium

Fracture log:- No. of fractures per foot of core: zones of core loss are blacked in.

N.B.:- Angles of bedding and joint planes are measured relative to the normal of the core axis

Sheet 1 of 9

LOGGED: E. J. Best.

VERTICAL SCALE: 10 Feet : 1 inch

PHOTO. REFERENCES:- Core box photos:- M 327/10-14 (Monochrome) E 1-5 (Colour) Core barrel photos:- E 11-34 (Colour)

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: Upper Cotter Damsite E. HOLE NO: D.D.1. R.L: 2927'

LOCATION: 79767'S, 51693'W. ANGLE FROM HORIZONTAL: 30° DIRECTION: 282°M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	DEPTH & SIZE OF CORE	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES
		NMLC 0	
		101' 0"	
Slightly weathered fine grained silicified sandstone	Hard, strong, massive rock. Bedding at 35°	103' 6"	Slickensided joint parallel to beds.
Fresh siltstone. Weathered from 106' 9".	Blue-grey rock — some light laminations. 4½" medium grained sandstone interbed. Bedding at 40°.	105' 3" / 107' 3"	Irregular, clean, unweathered slickensided joints.
Slightly to moderately weathered, medium to coarse grained silicified quartz sandstone.	Bedding at 30°. Hard, strong rock containing small shale fragments and blebs of pyrite. 3" siltstone interbed. Bedding at 10°.	110' 0" / 114' 6"	Moderately broken zone with much brown staining on joints. ½" shear zone at 70° at 108' 3". Irregular quartz veining from 110' 10" to 111' 8".
Weathered, interbedded siltstone and sandstone.	Hard, strong, thinly bedded rock. Bedding at 10°	116' 8"	Crushed rock at boundary.
Fresh medium to coarse grained, silicified quartz sandstone. Rock is weathered for up to 1" adjacent to major joints.	Very hard and strong massive rock containing irregular shale fragments. 4" siltstone interbed. Silty interbed at 20° at 121' 9". 2" silty interbed at 125' 10".	118' 10" / 127' 10"	Slickensided quartz vein 1" thick parallel to bedding. 65° joint. Slickensided, quartz lined joint at 70°. Siltstone very crushed & weathered.
Fresh to weathered interbedded siltstone and fine grained sst.	Hard, strong, blue-grey to brown rock. Bedding at 10° - 15°.	131' 6"	Jointing dominantly parallel to bedding. Crushed rock at boundary.
Fresh, medium to coarse grained silicified quartz sandstone. Brown weathered for 1" adjacent to major joints.	Very hard and strong, massive rock with scattered shale fragments up to ½" long. Occasional pyrite crystals present. Interbedded siltstone and fine grained sandstone — mostly fresh rock. Bedding at 15°. Bedding at 25°.	137' 6" / 139' 2" / 143' 8"	Irregular quartz infilled joints up to 1" wide. Boundary crushed and weathered. 1" crushed zone with adjacent weathering for 1".
Interbedded siltstone and silicified quartz sandstone.	Mostly fresh rock. Bedding at 20°.	147' 1"	
Fresh to slightly weathered, medium grained silicified quartz sandstone.	Very hard and strong rock, grading in places to quartzite. Occasional graded bedding at 20°.	152' 0"	
Slightly to moderately weathered, medium to coarse grained silicified quartz sandstone.	Hard, strong rock. Fresh, silicified quartz siltstone, weathered for 2" at lower contact. Bedding at 20°. Fresh to weathered siltstone. Bedding at 15°.	156' 0" / 157' 6" / 159' 9" / 161' 0" / 162' 8" / 167' 0"	Crushed, clay material at bedding contact. Broken zone with yellow and grey clay.
Fresh, light to dark grey siltstone. 6" weathered zone at upper contact.	Shows evidence of slumping prior to compaction — bedding irregular. Pyrite is scattered throughout and occurs as smears on slickensided joint planes.	170' 0" / 172' 6"	Siltstone has been sheared and partly re-cemented by quartz. 6" broken zone. 3 small shear zone, each 2" wide.
Fresh, blue grey, fine grained, silicified quartz sandstone with silty matrix. Slight weathering in broken zone. Rock becomes dominantly siltstone between 195' and 200'.	Hard, strong, massive rock. Bedding at 45°. 3" band of sheared siltstone.	176' 6" / 185' 3" / 187' 0" / 199' 6"	Irregular quartz stringers scattered throughout. Irregular weathered joint at 70° - 90°. Moderately broken zone with associated quartz veining. One major open joint at 50°, ½" wide, partly infilled with quartz. From 190' most joints are tight and clean, often showing slickensides. A few brown stained joints occur but there is no weathering of adjacent rock. Rock is sheared at 65° to core, no associated weathering.

WATER LEVEL

WATER PRESSURE TEST — Gallons per minute per foot loss (1·0, 2·0)

20 40 60 75 BX hydraulic packer used. 50 40 20 20 40 60 80 100 BX hydraulic packer used. 80 60 40 20 25 50 75 100 BX hydraulic packer used. 125 100 75 Packer split. 50 25 50 75 100 25 50 75 100 125 25 50 75 100 125

1·0 2·0

DRILL NO: 6 - A - 18
TYPE: BOYLES BBS 2
DRILLED: PARCELL & TOMIC
COMMENCED: 14 - 1 - 64
COMPLETED: 11 - 2 - 64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 327/14 to 18 (Monochrome)
E 5 to E 9 (Colour)
Core barrel:- E 34 to E 57 (Colour)

DRILLERS NOTES:- 0 - 19' Full water return
19' - 131' Partial water return
131' - 176' No water return
176' - 200' Partial water return

Sheet 2 of 3

LOGGED: E. J. Best.

VERTICAL SCALE: 10 feet : 1 inch

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E — HOLE NO D.D.1. — R L 2927'

LOCATION 79767'S, 51693'W. — ANGLE FROM HORIZONTAL 30° — DIRECTION 282°M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	LIFT & CORE RECOVERY %	CASING	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss 1·0 2·0
Fresh, blue-grey siltstone.	Soft, moderately strong, thickly bedded rock. Numerous minute pyrite crystals occur scattered throughout with occasional clusters.		NMLC				Although rock is not very broken from 200' to 206' it has been sheared at 55°-65° and many incipient clean, tight joints are present.		150 125 100 75 50 25 50 75 100 125 150 125 100 75 50
			205'3"				Strongly sheared zone 8" wide. Fragments having flaky feel.		
	10" zone of darker blue-grey, softer siltstone.		211'0"						
	From 209' to 214' very irregular, thin layers of darker siltstone occur		211'10"				Sinuous bedding planes indicate much deformation.		
			215'6"				From 215'6" to end of hole siltstone has been sheared - long pieces of core break along flaky shear planes when struck with hammer. Very broken and sheared rock from 216'8" to 217'2". Joints at 222'8" and 223'4" contain clay produced by extreme shearing.		
Slightly weathered siltstone with a few fresh patches.	As above. Regular bedding planes at 45°.		228'7"				Brown stained joints.		
Fresh siltstone.			233'0"				Very broken zone (6") with clay.		
	END OF HOLE 233'10"								

DRILL NO 6-A-18

TYPE BOYLES BBS-2

DRILLER PARCELL & TOMIC

COMMENCED 14-1-64

COMPLETED 11-2-64

PHOTOGRAPHIC REFERENCE:-

Core box:- M 327/18 and 19 (Monochrome)
E 9 and 10 (Colour)

Core barrel:- E 57 to 64 (Colour)

DRILLERS NOTES:- 200' - 233'10" Partial water return.

Sheet 3 of 3.

LOGGED E. J. Best.

VERTICAL SCALE 10 Feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E. HOLE NO D.D.2 R.L. 3020'

LOCATION 79663' S, 51896' W ANGLE FROM HORIZONTAL 40° DIRECTION 282°M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & CORE RECOVERY %	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss 1:0 2:0
Red-brown soil and scree.			NX casing. 3' 0"					
Weathered, medium grained silicified quartz sandstone with intermixed red-brown silt and sand.			10' 6"					
Weathered, medium grained silicified quartz sandstone, grading in places to quartzite. A few almost fresh patches of rock are present. From 21', silicified quartz sandstone is generally fresh or almost so. Weathering is more pronounced adjacent to silty interbeds and major joints.	Very hard and strong rock with scattered zones of very thin (less than ½ mm.) interbeds of siltstone. Scattered cubes and clusters of pyrite. Silty interbeds at 5° from 13'0" to 14'0" showing slumping.		NMLC 15' 6" 16' 9"			Staining on joints is mostly brown, though sometimes black. Quartz stringers are scattered throughout; some infill joints, others are irregular. Broken zone recemented by quartz		
	Silty interbeds at 15°.		20'			Quartz vein ½" wide showing striations.		
	Silty interbeds at 15°-30°					Irregular open joint lined with quartz at 90°.		
	Silty interbeds at 30°.		30'			Quartz vein 1" wide.		
	From 33'0" to 35'4" irregular interbeds and lenses of siltstone occur showing slumping. Silty interbeds at 20°.							
	Sinuous siltstone laminae at 30°-50°.		40'			Irregular quartz veins up to ¾" wide occur between 39'6" and 43'0".		
	Silty interbeds at 25°.							
	From 45'4" to 48'6" many very irregular laminae of siltstone occur. Bedding is at 45°-70° to core and much slumping is evident.		50'					
	Scattered irregular silty interbeds at 60°-80° from 51'0" to 58'6".		55' 9"			Pink coloured clay is present on 2 joint planes.		
			58' 6"			Several major joints at 80° with crushed and clayey material on joint faces; quartz veining and striations are also present.		
	Irregular silty interbeds showing small scale folding.					Irregular quartz veining also showing small scale folding.		
	Silty interbeds at 25°-30°.		70'					
	Silty interbeds at 20°.							
	Bedding at 10° Bedding at 15°.		80'					
	Silty interbeds at 20°.							
	Silty interbeds at 20°.							
			89' 2"			Quartz veins ¾" wide parallel to bedding.		
						Prominent joint with striations.		
						Irregular quartz veining.		
			97' 0"					
	Interbedded siltstone and fine grained quartz sandstone at 25°.		98' 6" 99' 8"			Very broken zone with fragments of vein quartz		

PACKER TYPE:- NX mechanical unless otherwise stated.
SUPPLY LINE:- N rod for sections to 41', EX casing thereafter.
VERTICAL SCALE:-
——— 50 p.s.i. = 1"
- - - - 100 p.s.i. = 1"
N.B:- Figures given are gauge pressures.

TEST SECTION

BX hydraulic packer used.

DRILL NO 6-A-16
TYPE BOYLES BBS-2
DRILLER Kasi & Driwalski
COMMENCED 10-1-64
COMPLETED 10-2-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 327/ 5 to 9 (Monochrome)
E 65 to 69 (Colour)
Core barrel:- E 73 to 92 (Colour)

DRILLERS NOTES:- 0-23' Full water return
23'-100' Partial water return

Sheet 1 of 2
LOGGED E. J. Best.

VERTICAL SCALE 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E. HOLE NO D.D.2 R.L. 3020'

LOCATION 79663'S, 51896'W ANGLE FROM HORIZONTAL 40° DIRECTION 282°M

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	DEPTH & SIZE OF CORE	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES
Silicified medium grained quartz sandstone, grading to quartzite. Rock is fresh except adjacent to silty interbeds and major joints.	As on previous sheet. Silty interbeds at 15°.	NMLC	Open joint at 75°.
	Silty interbeds at 10°.		
	Interbedded quartzite and quartz siltstone showing sedimentary structures. Bedding at 5°	113'0"	Striated joints parallel to bedding.
Rock is mostly slightly weathered from 115' downward		114'6"	
	Silty interbeds at 15°.	116'3"	
	Silty interbeds showing change in dip from 20° to 60° in opposite direction	117'9"	
	From 117'9" to 136'6", silty interbeds occur scattered irregularly throughout rock. Bedding is at 65°-85°.		
		126'7"	Major broken zone recemented by quartz: crushed rock at upper contact. Lost drilling water.
		127'3"	Striated quartz vein ½" wide. Open joint with ¼" of black stained clayey material.
	Bedding at 85°.	132'6"	
		133'6"	Broken zone associated with striated bedding plane joint. Some clay is present.
	In this zone the drill has travelled along one bedding plane which is striated and contains quartz veining. Adjacent rock is weathered. Silty interbeds occur adjacent to main bedding plane joint.	136'6"	Rock is moderately to very broken with much brown staining on joints. Small amounts of clay are present on the major joint.
		144'0"	
	Silty interbeds at 60°.	145'6"	Broken zone recemented by quartz and later broken again
	Silty interbeds at 50°.		
	Silty interbeds at 45°.		Crushed quartz and clay on joint at 149'3".
		152'8"	
	8" of moderately weathered fine grained sandstone and siltstone.		
	Bedding not evident as silty interbeds are irregular.		Clay lined joint at 55°.
	END OF HOLE 161'1".		

WATER LEVEL: 111' 5/3/64; 125' 11/3/64; 132' 12/3/64

WATER PRESSURE TEST — Gallons per minute per foot loss: 1:0 2:0

DRILL NO 6-A-16

TYPE BOYLES BBS-2

DRILLER Kasi & Driwalski

COMMENCED 10-1-64

COMPLETED 10-2-64

PHOTOGRAPHIC REFERENCE:-

Core box:- M 327/1 to 5 (Monochrome)
E 69 to 72 (Colour)

Core barrel:- E 92 to 102 (Colour)

DRILLERS NOTES:- 100'-126' Partial water return.
126'-161' No water return.

Sheet 2 of 2

LOGGED E.J. Best

VERTICAL SCALE 10 Feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: Upper Cotter Damsite "E" — HOLE NO: D.D.3 — R.L: 2927'

LOCATION: 79,763' S; 51,686' W. — ANGLE FROM HORIZONTAL: 60° — DIRECTION: 068° M.

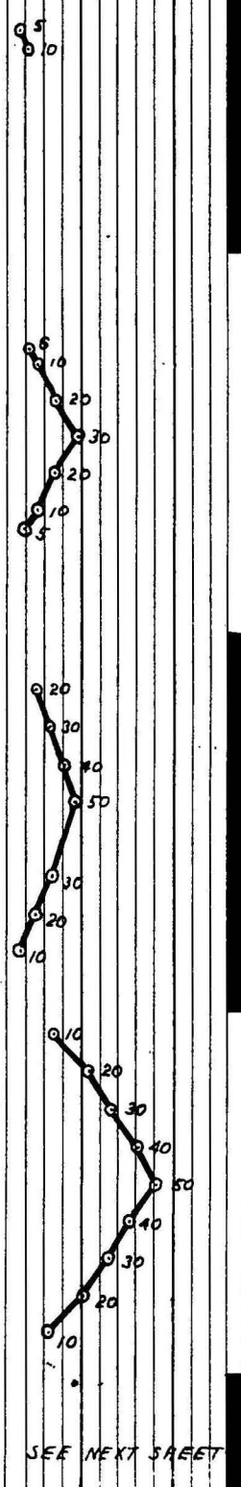
ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	DEPTH & SIZE OF CORE	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES
Boulders of quartz sandstone with river sand and gravel.		NX casing 8'9"	
Slightly to moderately weathered medium grained silicified quartz sandstone	Hard, strong rock containing irregular shale fragments up to 2" long. Occasional cubes and clusters of pyrite scattered throughout. Bedding at 45°	NMLC 14'4"	Joint surfaces are rough and stained brown by limonite deposits - a few black stained joints occur. No dominant joint direction apparent.
	4" interbed of weathered siltstone.		
	Shale fragments are absent from 15'0" down.		Occasional thin quartz stringers occur throughout the hole.
	Patches of fresh rock occur between 17'6" and 25'0".	25'0"	
Fresh medium grained silicified quartz sandstone with slight weathering for up to 2" adjacent to major joints.	Hard, strong blue-grey massive rock occuring as 20" to 2" core lengths, mode 6". No shale fragments evident. Pyrite cubes are scattered throughout. Spherical clusters of pyrite occur from 25' to 28' and are absent from 28' down.	38'0"	
		34'0"	Broken zone containing very weathered sandstone and siltstone decomposed to clay.
		37'6"	
		38'0"	Moderately broken weathered sst.
		40'6"	
		41'3"	Moderately broken & weathered zone.
	Shale fragments present from 47'0" to 50'3".		
	Weathered siltstone - 4" interbed at 45°	50'8"	
	Fine grained silicified quartz sandstone. Bedding at 40°	51'10"	2 sets of mutually perpendicular joints evident; both at 45° to core.
	½" siltstone interbed at 53'3" - bedding at 35°	64'3"	
Thinly bedded to laminated interbeds of f.gr. silic. qtz. sst. and siltstone. Slight to moderate weathering.	Moderately soft (siltstone) to hard (sandstone) rock containing clusters of pyrite crystals. Bedding at 40°-50°	68'0"	A little clay is present on joints which occur in siltstone.
Fresh medium to coarse grained silicified quartz sandstone.	Hard strong massive rock. Spherical clusters of pyrite present. Fine grained interbeds at 73'3" - bedding at 45°	75'0"	
Interbedded f.gr. silic. qtz. sandstone and siltstone. Fresh with some weathering on joints.	Much banding due to slight variations in composition of rock. Pyrite present as cubes and clusters. Bedding at 40°-50°	79'9"	Joint infilled by quartz & pyrite. Some deformation of banding with associated qtz. veining at 78'-78.5
Fresh medium to coarse grained silicified quartz sandstone.	Hard, strong massive rock with occasional spherical clusters of pyrite up to 10 m.m. across.	84'6"	Fresh, clean bedding joint at 45°
Fresh to weathered interbedded fine grained silicified quartz sandstone and siltstone.	Banding due to variations in composition. Irregular patches of fresh rock occur in weathered zones. Bedding at 40°-50°	89'4"	Joints are still mostly rough and iron-stained with associated weathering.
		90'6"	Broken zone with some clay.
		94'0"	Several slickensided joints occur between 90' and 94'
Fresh m. to c.gr. silic. qtz. sst. and qtzt. with occasional interbeds of slightly weathered f.gr. qtz. sst. and sltst.	Fine grained interbed at 50°		
	Silty interbed at 45°	97'10"	Many joints are smooth and planar, particularly bedding plane joints.
	Silty interbeds at 45°	98'6"	

WATER LEVEL: 6½' 11/3/64

WATER PRESSURE TEST — Gallons per minute per foot loss (1:0 — 2:0)

PACKER:- NX mechanical.
SUPPLY LINE:- EX casing.
VERTICAL SCALE:-
50 p.s.i. = 1"
100 p.s.i. = 1"
N.B.:- Figures given are gauge pressures.

TEST SECTION.



SEE NEXT SHEET

DRILL NO: 6-A-18
TYPE: Boyles. B.B.S. 2.
DRILLER: L. Tomic & M. Porcell.
COMMENCED: 12-2-64.
COMPLETED: 24-2-64.

PHOTOGRAPHIC REFERENCE:-
Core box:- M 328 / 0 to 11 (Monochrome)
E 103 to 108 (Colour)
Core barrel:- E 114 to 132 (Colour)

DRILLERS NOTES:- 0-32' Full W.R. 68'-79' Partial W.R.
32'-52' Partial W.R. 79'-89' No W.R.
52'-68' No W.R. 89'-100' Partial W.R.

LOGGED: E.J. Best.

VERTICAL SCALE: 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite "E" HOLE NO D.D.3. R.L. 2927'

LOCATION 79,763'S. ; 51,686'W. ANGLE FROM HORIZONTAL 60° DIRECTION 068°M

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	CORE RECOVERY %	CASING	STRUCTURES (JOINTS VEINS SEAMS FAULTS CRUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss 1:0 2:0
Fresh to slightly weathered medium to coarse grained silicified quartz sandstone grading to fresh quartzite at 105'	"Silty interbeds at 45° Graded bedding at 40° Numerous scattered silty bands at 40°-45°. Graded bedding at 45° Graded bedding at 45°		NMLC 114'6" 121'3"				Most joints are iron-stained. Slickensided joint. Slickensided joints. Quartz vein with cavity 1" long containing terminated quartz crystals.		20 40 60 80 60 40 20 25 50
Fresh blue-grey siltstone grading in places to fine grained sandstone.	Soft, moderately strong rock which shows evidence of shearing throughout, though 2" to 6" core lengths are common. Small localised crushed zones occur. Pyrite is commonly associated with quartz veining.		122'11" 128'3"				Very crushed zone with plastic clay from 122'9" to 122'11". Shearing is at 50°-60° to core. 3" crushed zone consisting dominantly of vein quartz.		75 90 75 50
Fresh medium grained silicified quartz sandstone	Blue-grey rock which is mottled due to white quartz grains. Hard, strong rock which has been brecciated and recemented by qtz. Siltstone band at 50° from 133'3" to 133'8".		134'3" 137'6"				Several prominant iron stained joints occur. All joints show strong slickensides. Open weathered joint at 129'8". Several small cavities in quartz veins from 130'3" to 132'3" Pyrite is common on shear planes which are at 60° to core.		25 10
Fresh blue-grey sheared siltstone.	Soft, moderately strong rock. 7" core lengths to 1" fragments.		138'9"				Shear zone.		25
Blue-grey, fresh fine grained silicified quartz sandstone	Hard, strong massive rock. 12" to 2" core lengths.		147'5" 148'3" 149'0"				Irregular quartz stringers scattered throughout. Siltstone interbeds which are very strongly sheared. 1" band of sheared rock decomposed to clayey silt at 149'9"		50 75 100 75 50
From 155' there are gradations from fine grained sandstone to siltstone	Rock is dominantly siltstone. Bedding at 45° Pyrite more abundant than in fine grained sandstone.		155'6" 159'3"				Dominant joint direction is parallel to bedding from 150' downwards. Shearing is evident in siltstone bands – parallel to bedding.		25 50 75 100
	Graded bedding at 35°. Graded bedding at 35° Graded bedding showing minor deformation of rock.		164'6" 168'9"				2" shear zone - all fragments less than 5m.m. in length.		120 100 75
Fresh blue-grey siltstone.	Soft, moderately strong rock with some zones showing laminated bedding at 40° to 55°.		171'3" 172'8" 178'11"				No quartz stringers, shearing between two adjacent joints at 170'6". Laminated siltstone with several shear zones containing silt to coarse sand sized fragments.		50 25 50 90
	Highly contorted beds shown up by quartz veining with pyrite.		181'3"				Sheared siltstone from 181'0" to 182'0" 1" wide shear zone at 183'0" parallel to bedding at 55° Small shear zone at 186'6".		120 150 120
Fresh blue-grey fine grained silic. quartz sandstone.	Hard, strong massive rock. Bedding not evident.		187'10" 188'11" 195'0"				Siltstone is broken and partly recemented by quartz. Irregular quartz stringers scattered throughout. Joints are smooth and often slickensided.		90 60
	END OF HOLE 195'0"								1:0 2:0

DRILL NO 6-A-18

TYPE Boyles BBS 2

DRILLER L. Tomic & M. Parcell

COMMENCED 12-2-64.

COMPLETED 24-2-64.

PHOTOGRAPHIC REFERENCE:-

Core box:- M 328/5 to 12 (Monochrome)
E 108 to 113 (Colour)

Core barrel:- E 132 to 148 (Colour)

DRILLERS NOTES:- 100'-113' Partial water return.
113'-195' No water return

Sheet 2 of 2

LOGGED E.J. Best

VERTICAL SCALE 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite "E" HOLE NO D.D. 4 R L 3127'

LOCATION 79653' S; 52146' W. ANGLE FROM HORIZONTAL 45° DIRECTION 047° M

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	% CORE RECOVERED	FEATURE	STRUCTURES (JOINTS VEINS SEAMS FAULTS CRUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss 1·0 2·0
Very weathered fine to medium grained silicified quartz sandstone Rock is buff-brown coloured.	Massive sandstone is hard and strong, though very soft and weak clay occurs frequently in broken zones.		NX casing				Quartz stringers scattered throughout.		PACKER TYPE:- NX mechanical. SUPPLY LINE:- EX casing. VERTICAL SCALE:- 50 p.s.i. = 1" N.B.:- Figures given are gauge pressures.
			NMLC						
	Very soft and weak yellow-brown clayey silt with sst. fragments.		6'9"						
			8'7"						
	Weathered remnants of pyrite clusters evident.		11'6"				Broken zone with clay 5" wide.		
	Scattered reddish coloured patches present resulting from weathering of pyrite cubes.		14'5"				½" of clay on 20° joint at 13'0"		
			16'3"				Broken zone with a little clay		
			17'6"						
	Laminar silty interbeds and graded bedding occur scattered throughout.		20'0"				Very broken zone with clay.		
			23'8"				Very broken zone – 2" to ¼" fragments with a little sandy and clayey material.		
	Silty zone from 27'0" to 27'6" Bedding at 55°		27'6"						
	Silty interbeds at 30°.						One set of joints parallel to bedding and another set perpendicular to bedding.		
	Silty interbeds at 25°		35'8"				3" broken zone		
Slight to moderate weathering from 36' downwards.	Graded bedding at 25°.						From 37' staining on joints is predominantly black.		
	Bands of very weathered and broken siltstone at 40'6" and between 42'9" and 43'6". Bedding at 30°								
	Bedding at 55°		49'3"				4" broken zone parallel to bedding.		
	Graded bedding at 55°								
	Silty interbeds at 55° Graded bedding at 60°								
	Graded bedding at 55°								
	Silty interbeds at 50°		62'4"				4" broken zone.		
	Graded bedding and silty interbeds at 50°		67'7"				1" broken zone-weathered siltstone		
			70'0"				4" broken zone with a little silt		
			72'0"				½" clay zone.		
	Graded bedding at 45°								
	Silty interbeds at 45° Silty interbeds at 35°								
	Graded bedding at 30°		79'8"				2" clay zone		
	Graded bedding at 25°						Joints are not as heavily stained as above. Joints are dominantly parallel to bedding		
	Graded bedding and numerous silty interbeds at 30°								
	Strongly weathered zone with numerous silty interbeds at 30°		97'0" 98'0"				8" moderately broken zone with black stained joints.		

TEST SECTION

SEE NEXT SHEET

DRILL RD 6-A-16
TYPE Boyles BBS-2

DRILLER M. Driwalski
COMMENCED 17-2-64
COMPLETED 2-3-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 329/284 and M 328/15, 16 & 18. (B.R.M.) E 149 to 153 (Colour)
Core barrel:- E 159 to 179 (Colour)

DRILLERS REMARKS:- 0-10', Full water return; 10'-31', Partial water return; 31'-100' No water return.

Sheet 1 of 2
LOGGED E.J. Best.

VERTICAL SCALE 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite "E" HOLE NO D.D.4 R L 3127'

LOCATION 79653'S; 52146'W. ANGLE FROM HORIZONTAL 45° DIRECTION 047°M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	% CORE RECOVERED	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss (1.0 2.0)
Slightly to moderately weathered fine to medium grained silicified quartz sandstone	Very weathered zone with many silty interbeds at 20°		NMLC 102'0"			Joints are heavily stained with black and brown iron oxides.	HOLE DRY	10 20 30 20 10
	Very weathered zone with many silty interbeds at 15°		105'8" 106'5"			1" crushed zone of siltstone at 106'4"		
	Silty interbeds at 15°							
	Silty interbeds and graded bedding at 15°					3/4" crushed zone-mostly silty material - at 112'10"		
			114'4" 115'6" 116'6" 117'0"			Very broken zone extensively weathered to brown silt, clay, and sand sized particles.		10 20 30 40 30 20 10
	Graded bedding at 45°							
	Silty interbeds at 25°		121'3"					
	4" thick siltstone interbed. Graded bedding at 20° Silty interbeds at 10°							
	4" of laminated siltstone at 5°		129'0"					
	Silty interbeds at 0°							
	Silty interbeds at 5°		139'6"					10 25 40 50 40 25
Slightly to moderately weathered, coarse grained, silicified quartz sandstone.	Hard, strong, massive rock 5" to 12" core lengths. Sandstone contains a few scattered shale fragments and pyrite crystals. Bedding at 20°		145'3"			Crushed silty interbed at 145'3"		
Slightly weathered, fine to medium grained, silicified quartz sandstone	Zones containing silty interbeds occur throughout: such zones where siltstone predominates are commonly broken.		147'3"			Crushed siltstone with some vein quartz.		
	Silty interbeds at 20°					Crushed silty interbed at 150'6" Prominent jointing at 90° from 147'6" to 159'0"		
	Silty interbeds at 20°		157'8" 158'10"			Broken zone with silty material		10 20 40 50
			160'6" 161'10"			6" broken zone with silt.		
	1" silt interbed at 162'2" crushed and very weathered.					Moderately broken zone with prominent jointing at 90° Very broken rock from 163'4" to 163'9"		
			166'5" 169'3" 170'0"			Broken zone partly recemented by quartz-very weathered.		
	Silty interbeds at 20°							
	Silty interbeds at 20°					Dominant joint planes are at 20° (parallel to bedding) 60° (same strike as bedding but dip in opposite direction), and 80°-90°.		
	Silty interbeds at 25°							
	1" interbed of blue gray massive siltstone at 179'0"							
	Silty interbeds at 25°					Quartz veins and stringers are present from 182' downwards.		10 30 20 10
	Silty interbeds at 30°							
	Silty interbeds at 30°							
	Silty interbeds at 25°					1" of crushed silty material at 196'3"		

END OF HOLE 200'0"

DRILL NO 6-A-16

TYPE Boyles BBS 2

DRILLER M. Driwaski.

COMMENCED 17-2-64.

COMPLETED 2-3-64.

PHOTOGRAPHIC REFERENCE:-

Core box:- M 328/13, 14, 17 & 19 and M 329/3 (B.B.W.) E 154 to 158 (Colour)

Core barrel:- E 179 to 200 (Colour).

DRILLERS NOTES:- 100'-200' No water return.

Sheet 2 of 2

LOGGED E.J. Best.

VERTICAL SCALE 10 feet : 1 inch.

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

PROJECT UPPER COTTER DAM SITE 'E' HOLE NO D.D.5 R.L. 3215 feet

LOCATION 79555' S. 52363' W. ANGLE FROM HORIZONTAL 90° DIRECTION -

ROCK TYPE AND DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (NX 0 6 12 18+)	LIFT & CORE RECOVERY %	CASING	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss (1·0 2·0)
Soil and scree	Excavated and concreted before drilling commenced		casing 2' 0"						
Moderately weathered, silicified, fine-grained sandstone to siltstone.	Moderately hard and strong rock. Siltstone has bleached appearance except adjacent to major joints where it is stained brown. Sandstone is brown coloured generally.		NMLC 11' 2"				Joints are stained brown. Dominant joint system dips at 20°. Another system occurs at 70° (parallel to bedding). Quarts stringers occur throughout. 5" zone of crushed, bleached siltstone.		
	Intervals of medium to coarse grained sandstone at 70° from 20'.		19' 0" 20' 0" 22' 0"				Crushed silty interbed 1" thick at 80° to core. Thin crushed silty interbed.		
Slightly to moderately weathered, coarse grained, impure, silicified quarts sandstone. Rock is irregularly weathered.	Clayey material in matrix of sandstone imparts mottled appearance to rock. Hard strong, massive rock - 1" to 12" core lengths, mode 7" Bedding at 70°.		37' 0"				Two joint systems at 20° and 70°. Joints are stained brown and occasionally black. Sheared silty interbed 1" thick at 70°. Quarts infilled joints occur between 31'0" and 35'0" - one prominent joint at 90°. Veins are up to ½" wide.		0.5
Slightly weathered medium grained silicified quarts sandstone grading almost to quartzite.	Hard strong massive rock - 3" to 8" core lengths, mode 7".		43' 6"				Prominent jointing at 20° and 70° - most joints stained black. Several close joints at 60°		10 20 25 15 5
Fresh, to moderately weathered, inter-bedded siltstone and silicified quarts sandstone.	Siltstone is weathered, sandstone mostly fresh. Graded bedding at 70° to 80°.		47' 6"				Black stained joints, often with thin film of silty material on surfaces. 6" of crushed siltstone.		
Fresh, medium to coarse grained silicified quarts sandstone. Brown weathering adjacent to major joints.	Very hard and strong, massive rock 6" to 28" core lengths. Sandstone contains occasional shale fragments and some pyrite crystals are present. 1½" interbed of laminated siltstone at 65°.		63'10"				Widely spaced, brown stained joints at 20° and 70°.		20 30 40 30 20 10
Weathered siltstone	Soft weak rock.		64'10"				Very broken with much silt.		
Moderately weathered fine grained, silicified quarts sandstone. A few almost fresh patches.	Brown, strong, hard, massive rock. Numerous very weathered silty interbeds present at 75°.		70' 4"				Black stained joints.		
Fresh to moderately weathered silicified siltstone.	Hard, strong, massive rock. Contains scattered medium sized quarts grains in varying proportions - in places siltstone grades to silty sandstone. Siltstone weathers to orange - red colour - it is green-grey where fresh. Bedding at 70°.		80' 6"				Black stained joints, many of which have rough surfaces. 1" band of crushed siltstone at 80'1"		15
Slightly to moderately weathered, medium to coarse-grained, impure, silicified quarts sandstone. A few small patches of fresh rock.	Hard, strong, massive rock with numerous small shale fragments. Interbedded weathered fine grained quarts sandstone and siltstone. Bedding at 60°.		85'11" 87' 2" 95' 0" 96' 0" 97'11"				Siltstone is sheared. Clay lined joint at 90' Broken zone with some silt.		14
Slightly to moderately, weathered interbedded fine-grained quarts sandstone and laminated siltstone.	Moderately hard and strong rock. Bedding at 55°.						Joints dominantly parallel to bedding. Some are striated.		0 1·0 2·0

PACKER TYPE:- NX mechanical
SUPPLY LINE:- EX casing.
VERTICAL SCALE:- 50 p.s.i. = 1"
Figures given are gauge pressures.
TEST SECTION

DRILL NO. 6/A/18
TYPE BOYLES BBS - 2
DRILLER Parcell & Tomic
COMMENCED 29-2-64
COMPLETED 12-3-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 329/11, 13, 14, 17, 18, 19 (Monochrome)
E 201 to 208 (Colour)
Core barrel:- E 216 to 294 (Colour)

DRILLERS NOTES:- 0 - 74' Full water return.
74' - 100' No water return.

Sheet 1 of 3
LOGGED E.J.Best and J.K.Hill
VERTICAL SCALE 10 feet : 1 inch.

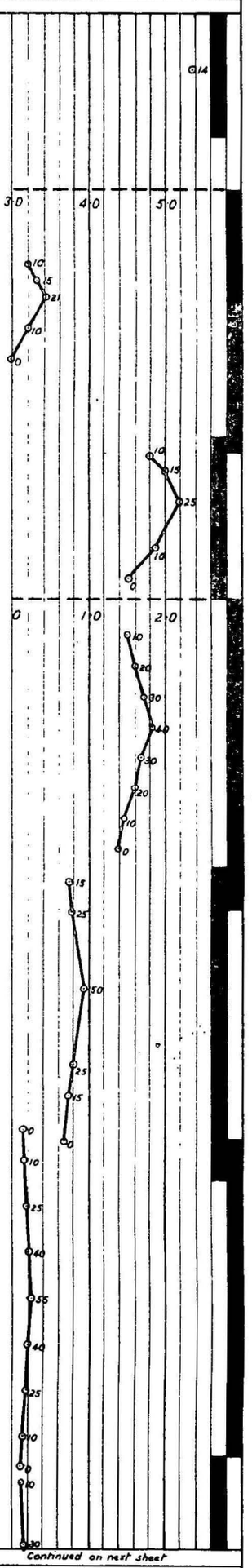
BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS
GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E — HOLE NO D.D.5. — RL 3215'

LOCATION 79555' S, 52363' W — ANGLE FROM HORIZONTAL 90° — DIRECTION —

ROCK TYPE AND DEGREE OF WEATHERING	DESCRIPTION	DEPTH & SIZE OF CORE	LIFT & CORE RECOVERY %	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES
	As above	NMLC 102'3"	100'3" 101'7"	
Fresh to moderately weathered medium to coarse grained silicified impure quarts sandstone.	Hard strong uniform rock		106'8" 108'0"	Two dominant joint direction, at 15° and 70°. Joints stained black and brown, mottled appearance. No evidence of movement on joints.
	Silty interbed at 65° at 110'	110'0"		
Fresh fine to medium grained silicified quarts sandstone. Weathered for up to 2" adjacent to joints. Grades in places to quartzite.	Very hard strong rock. Contains occasional shale inclusions up to 1" long. Numerous small clusters of pyrite crystals, weathered out in weathered rock leaving small cavities (1-2 mm.)		113'1"	Two dominant joint directions at 20° and 70°. Joints stained black and brown. No evidence of movement on joints.
	Silty interbeds at 65° at 121'		118'3"	
			123'4"	
			128'6"	
Rock slightly weathered from 128'6" to 141'3"			130'4"	Rock closely jointed from 128'6" to 141'3"
			135'4"	
	2" thick bed of siltstone at 70°	139'0"	138'0"	
		141'3"		Very closely jointed rock; jointing parallel to bedding. Silt filled joint at 141'0".
			143'2"	
			148'4"	
	Thin silty interbeds at 65° at 151'. 2" interbed of siltstone at 60°.	152'6"	153'5"	
	2" interbed of siltstone at 70°	156'3"	158'6"	
	Interbedded siltstone and fine grained sandstone at 65°.	161'0" 162'8"	163'8"	
		167'3"		
		170'0"	168'7"	Broken zone with some silty material.
Fresh to slightly weathered interbedded siltstone and fine grained sandstone.	Hard strong rock. Bedding at 45°.		172'3"	
			176'0"	
		179'0"	179'2"	
Fresh quartzite, brown weathered adjacent to major joints.	Very hard strong rock; silty interbeds 180'9" - 181'3".	182'3"		
Fresh to slightly weathered interbedded siltstone and fine grained quarts sandstone.	Hard strong rock. Bedding at 35°.	185'6"	184'4"	Irregular quarts veins from 182'6" to 183'0".
Fresh quartzite, slightly weathered adjacent to joints.			188'11"	
	Siltstone interbeds	191'0" 193'0"		
	Thin siltstone interbeds at 45°		194'0"	
	Siltstone interbeds at 50°		199'2"	

WATER LEVEL — WATER PRESSURE TEST — Gallons per minute per foot loss



Continued on next sheet

DRILL NO 6-A-18
TYPE BOYLES BBS-2
DRILLER PARCELL & TOMIC
COMMENCED 29-2-64
COMPLETED 12-3-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 329/8 to 10, 13, 15, 16 (Monochrome)
E 206 to 211 (Colour)
Core barrel:- E 234 to 256 (Colour)

DRILLERS NOTES:- 100' - 200' No water return.

Sheet 2 of 3
LOGGED E.J. Best & J.K. Hill
VERTICAL SCALE 10 feet : 1 inch

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

PROJECT Upper Cotter Damsite E. HOLE NO D.D.5 RL 3215'

LOCATION 79555' S, 52363' W. ANGLE FROM HORIZONTAL 90° DIRECTION —

ROCK TYPE AND DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	LIFT & CORE RECOVERY %	CASING	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss (1·0 2·0)
As above			NMLC						
			203'0"						
	Fresh to weathered interbedded siltstone and quartzite; bedding at 50°.				204'4"		All joints coated and stained with brown and black material.		54
			206'6"						
	Graded bedding at 45°, right way up.				209'7"				30
									10
							Several joints are slickensided and striated. Some joints with 2-3 mm clay and silty material.		0
			216'0"		214'9"				15
Interbedded fine grained fresh to slightly weathered quartz sandstone and fresh to moderately weathered laminated siltstone.	Sandstone is hard and strong; siltstone moderately hard and strong. Bedding 45° at 218'. Sandstone constitutes about 80% of core.				219'10"		½" fault breccia at 219'0" 2" clay at 220'8"		40
					220'11"		Offset laminations in places. Preferential faulting has occurred in siltstone sections.		60
	A few clusters of pyrite crystals occur scattered throughout.								
	Bedding 40° at 222'				220'6"				40
	Bedding 40° at 226'								
	Bedding 40° at 232'				231'3"				20
	Bedding 45° at 236'				235'1"				10
			236'9"						0
			237'5"				8" fault breccia - granulated rock with silty clay matrix		5
					240'4"				21
	Bedding 50° at 242'						2-3 mm clay on a few joints, others clean but with black and brown stains.		36
	Bedding 70° at 246'				244'10"		Only a few slickensided joints below 232'		51
	Bedding 80° at 248'								34
	Bedding 55° at 252'				249'11"				
	Bedding 55° at 254'								16
	Bedding 50° at 256'		254'8"		255'1"		2" of broken siltstone with some vein quartz		5
From 262', rock is fresh except for brown weathering ¼" thick adjacent to joint faces.	Bedding 65° at 262'				260'3"		Occasional quartz veins up to ½" thick occur on bedding planes.		15
	Bedding 75° at 267'				265'5"				30
	Bedding 65° at 271'				270'6"				32
								272' 29/9/64	30
	Bedding 70° at 275'				275'6"				15
	Bedding 85° at 277'						Weathered, bedding plane joint at 277' with vein quartz and a little silt.		
			280'1"		280'1"				
	END OF HOLE						280'1"		

DRILL NO 6-A-18
TYPE BOYLES BBS-2
DRILLER PARCELL & TONIC
COMMENCED 29-2-64
COMPLETED 12-3-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 329/ 5, 6, 7, 9, 12 (Monochrome).
E 211 to 215 (Colour)
Core barrel:- E 256 to 272 (Colour)
DRILLERS NOTES:- 200'- 280' No water return.

Sheet 3 of 3
LOGGED E.J. Best & J.K. Hill
VERTICAL SCALE 10 feet : 1 inch

M(PF) 7

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: Upper Cotter Damsite E. HOLE NO: D.D.6. R.L: 3112'

LOCATION: 80452'S, 52959'W. ANGLE FROM HORIZONTAL: 70° DIRECTION: 083°M

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & CORE RECOVERY %	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot lost
				0 6 12 18+	25 50 75 100			
Slightly weathered impure, fine grained sandstone with interbeds of weathered phyllite.	Sandstone is moderately hard and strong, grey green in colour. Although it occurs as 5" core lengths to 1" fragments, it has been sheared – this is shown by incipient shear planes seen on irregular fractures. Thin interbeds consisting dominantly of white quartz grains occur. Phyllite is a soft, weak rock which is also grey-green. It breaks easily into innumerable platy fragments which have smooth, talcy feeling surfaces. It occurs as interbeds up to 6" thick in the sandstone. Sandstone comprises 80% of the sequence. Bedding 40° at 17' Bedding 45° at 21'.		NX casing. NMLC 20' 25'3"			Prominent jointing and shearing parallel to bedding. Joints are stained black and brown. Both regular and irregular quartz stringers occur in the sandstone – not the phyllite.		DRILLERS NOTES Lost drilling water at 10'. Regained water at 11' Lost water at 13'. 50% water return from 15'6". Lost water at 22'.
Slightly to moderately weathered, thinly interbedded silicified sandstone and siltstone.	Moderately hard to hard rock. 3" core lengths to 1" fragments. From 30' rock is generally very broken – 4" core lengths to minute fragments. Mostly less than 1" fragments.		30' 40' 44'0" 50' 58'6"			Shearing is evident, accompanied by varying degrees of quartz veining parallel to bedding and shearing. From 30', the rock is very broken and the larger core fragments show evidence of deformation and brecciation with later infilling by quartz. Shear planes are not as obvious as in previous core. Fragments are heavily stained black and brown. 8" zone of prominent shear planes with striations.		Hole could not be water pressure tested above 100' as casing had to be put down immediately behind core barrel to prevent caving.
Fresh quartzite.	Hard, strong rock. 2" core lengths to ½" fragments.		60'0"			Moderately broken – brown stained joints.		
Fresh siltstone. Silicified siltstone.	Dark blue-grey rock which is moderately hard but weak due to extensive shearing. Pyrite is present as clusters and smears on joint planes. From 65'3" to 70'0" core barrel could not recover rock. ¼" to silt sized fragments of sheared siltstone were recovered by flushing the hole. Core recovered from 70'0" to 72'0" is hard and strong (silicified) From 72'0" to 78'4" no core could be picked up by core barrel. ¼" to silt sized fragments of siltstone were recovered by flushing the hole.		70' 80'4"					
Almost fresh brecciated quartzite which is re-cemented by silica.	3" only of hard strong rock recovered in core barrel. Grey to buff coloured silty sand recovered by flushing. Dark brown sand recovered from 82'5 to 86'5" and 88'3" to 90'0" by flushing. 2' of core recovered by barrel is brecciated rock which has been recemented and silicified and then broken again. From 93'4" to 97'4", quartzite fragments were recovered by core barrel. Flushing of hole brought up brown silty sand. Brown stained quartzite fragments up to 3" long recovered from 97'4"		90'			Core is moderately broken – 3" core lengths to ½" fragments. Joints are stained black and brown. Very broken rock recovered by core barrel – 2" fragments to sand sized particles.		

DRILL NO: 6-A-16
TYPE: BOYLES BBS-2
DRILLER: M. Driwalski
COMMENCED: 12-3-64
COMPLETED: 8-4-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 333/11 to 16 (Monochrome)
E 273 to 278 (Colour)
Core barrel:- E 286 to 309 (Colour)

Sheet 1 of 3
LOGGED: E.J. Best.
VERTICAL SCALE: 10 Feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E — HOLE NO D.D.6 — R L 3112'

LOCATION 80452'S, 52959'W — ANGLE FROM HORIZONTAL 70° — DIRECTION 083°M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & CORE RECOVERY %	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL
Almost fresh brecciated quartzite, recemented by quartz.	Very hard and strong rock 10" to 3" core lengths, mode 5".		NMLC 103' 0"			2" of broken rock at 100'10", 101' 2", and 101'10" Broken zone — mostly less than 1" fragments. 3" of clay at top of zone. Much staining.	
Almost fresh, silicified fine grained sandstone and siltstone, grading to quartzite in a few places.	Hard and strong rock which has been strongly deformed and fractured prior to silicification		106' 6" 110' 0"			Many quartz veins and stringers scattered throughout. Most joints are stained orange-brown and black.	
	Same rock as above, but closer jointing is evident — 3" core lengths to ½" fragments with some clayey zones.		115' 3" 116' 6" 117' 4" 120' 10" 121' 3" 122' 0"			3" Very broken rock with much clay 10" Very broken zone with clay.	
	Hard and strong, deformed and fractured rock with later silicification. 8" to 1" core lengths, mode 2"-4"		134' 6"			At 126'10" there is an inclusion of fresh, strongly deformed rock 2" long with much pyrite. 4" moderately broken and weathered zone.	126' 6/1/64
	Mostly yellow-brown silt and clay with fragments of weathered siltstone and quartzite.		138' 6" 141' 10"				
Fresh, fine grained quartz sandstone and siltstone with some silicification.	Hard and strong, medium-grey rock. 18" to 1" core lengths, mode 5". Occasional darker lenses or interbeds occur in places — these are at 60° and probably indicate bedding. Scattered crystals of pyrite occur throughout. At 151' lenses of darker material indicate gentle folding.		153' 2" 154' 2"			Most joints have a very thin brown coating. Several major joints at 70° to 90° occur. Occasional quartz veins and stringers are present. Moderately broken zone.	
	Dark coloured lenses oriented at 70°-90°.					Prominent near vertical joint with orange and dark brown staining. Several unstained joints occur showing slickensides and striations, usually along quartz veins	
	Rock has a very variable composition consisting of medium blue grey and dark blue grey rock occurring as bands, lenses, laminae and irregular blebs. Much contortion is evident particularly in the siltstone (darker coloured rock). Rock is hard and strong, occurring as 12" to 1" core lengths. Pyrite occurs throughout.		174' 6"			Rock has been strongly deformed and fractured with subsequent infilling of all joints and cracks by quartz. The rock has been broken by later joints which are often smooth and slickensided. — these occur at 60°-80° to core. Only a few major joints are brown stained.	
	Hard, strong medium grey rock with numerous very thin dark grey laminae and lenses of siltstone scattered throughout. These laminae indicate much minor warping and folding of the beds but they generally occur at 60° to 70° to core. 18" to 2" core lengths, mode 4"-6".		184' 3"			Only a few brown stained joints occur below 190'. Silty laminae show much small scale faulting. Slickensided joints occur scattered throughout, often with "smears" of pyrite on the joint faces. Only a few quartz veins or stringer are present.	

WATER PRESSURE TEST — Gallons per minute per foot loss (10, 20)

PACKER:- NX mechanical
SUPPLY LINE:- EX casing.
VERTICAL SCALE:-
50 p.s.i. = 1"
N.B:- Figures given are gauge pressures

TEST SECTION

5, 10, 20, 30

5, 10, 20, 30, 20, 10, 5

0·01 g.p.m. per foot at 100 p.s.i.

10 20

DRILL NO 6-A-16
TYPE BOYLES BBS-2
DRILLER M. Driwalski.
COMMENCED 12-3-64
COMPLETED 8-4-64

PHOTOGRAPHIC REFERENCE.
Core box:- M 333/16 to 18, M 336/12, 13, 16. (B&W)
E 278 to 283 (Colour)
Core barrel:- E 309 to 334 (Colour)

DRILLERS NOTES:- 100'-118' Partial water return.
118' 200 No water return.

Sheet 2 of 3
LOGGED E. J. Best.
VERTICAL SCALE 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E — HOLE NO D.D.6 — R.L 3112'

LOCATION 80452' S, 52959' W. — ANGLE FROM HORIZONTAL 70° — DIRECTION 083°M

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	% CORE RECOVERED	CASING	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss
Fresh. Fine grained quartz sandstone and siltstone with some silicification	As on previous sheet from 184' 3". Silty laminae at 60°-80°.		NMLC				As on previous sheet from 184' 3".		
			210'				Major slickensided joint at 80°-90°. Brown staining at 206'. Several joints and incipient joints at 70° - a little brown staining.		
			213' 6"				Numerous irregular quartz infilled joints at 70°-90°. Several sinuous, open, brown stained joints of similar attitude are present. Pyrite is abundant in vein quartz.		0·01 g.p.m. per foot at 100 p.s.i.
			218' 0"				Several sinuous quartz veins occur indicating tight folding. From 220' joints are clean and tight. Only a few quartz stringers are present.		
			220'						
	From 230' to 244', the dip of the silty laminae ranges between 45° and 80°, indicating gentle folding or warping of beds.		230'				Between 230' and 240' several major joints at 70°-90° occur; they are stained brown, though the staining is very thin		
Rock is slightly weathered from 235' to 238' - adjacent to major joint at 70°-90°			240'						
			244' 3"				Zone of jointing at 50°-80°. Some brown staining. Fresh, plastic clayey silt from 244' 6" to 244' 10"		
			246' 9"				From 245', brecciation and tight folding is evident with subsequent infilling by quartz.		
	END OF HOLE 250' 1"								

DRILL NO 6-A-16

TYPE BOYLES BBS-2

DRILLER M. Driwalski.

COMMENCED 12-3-64

COMPLETED 8-4-64

PHOTOGRAPHIC REFERENCE.

Core box :- M 336/ 14 to 16 (Monochrome)
E 283 to 285 (Colour)

Core barrel :- E 334 to E 343 (Colour)

DRILLERS NOTES :- 200' - 250' No water return.

Sheet 3 of 3

LOGGED E. J. Best.

VERTICAL SCALE 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E. HOLE NO D.D.7. R.L. 2937'

LOCATION 79878' S, 51621' W ANGLE FROM HORIZONTAL 30° DIRECTION 057°M

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LOST & CORE RECOVERED %	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL
Fresh silicified fine grained quartz sandstone grading to quartzite.	Very hard and strong blue-grey rock. 15" to 2" core lengths, mode 5".		NX casing			Joints are stained yellow-brown. Several slickensided and striated joints occur scattered throughout. A few quartz stringers are present	
Zones of slight weathering occur from 8' – usually associated with silty interbeds.	From 8', zones up to 12" wide containing numerous thin, irregular silty interbeds occur. Bedding at 0° Bedding at 10°.		NMLC 10' 20'				14½' 22/5/64
	Hard, strong rock consisting of highly contorted irregular lenses of siltstone, fine and medium grained sandstone. Light to dark grey colour.		23'0"				
Fresh, silicified medium grained sandstone to siltstone.			25'8"			Much deformation and small scale faulting.	
Slightly to moderately weathered laminated siltstone.	Soft, moderately strong to weak rock – 4" core lengths to ¼" fragments, mode 2" core lengths.		30'9"			Thin coating of yellow-brown silt on many joints. Black staining on a few joints. ½" zone of pale grey clay at 30'9"	
Siltstone is mostly thickly bedded from 30' to 35'	Bedding at 25°.		34'10" 35'10" 37'0"			Very broken and weathered zone	
Fresh, fine grained silicified quartz sandstone.	Hard, strong, thickly bedded, medium blue-grey rock. 40" to 2" core lengths, mode 10". Rock has mottled appearance due to scattered white quartz grains.		40'			Joints are stained brown. A few quartz veins up to ¾" wide occur. Dominant direction of jointing and quartz veining is at 65°, and is normal to bedding planes.	
Slight weathering is evident between 52'8 and 53'8", 54'9" and 55'9", and 58'3" and 59'8".	Silty interbeds at 35°. Scattered silty interbeds at 35° occur between 54'6" and 57'0".		50' 59'8"				
Fresh to slightly weathered, thinly bedded to laminated siltstone.	Soft, moderately strong rock. 6" to 1" core lengths, mode 3".		62'3"			Joints are stained brown.	
	Fresh fine grained silicified sst.		63'3"				
	Bedding at 25°-35°.		67'10"				
	Fresh fine grained silicified quartz sandstone – hard and strong.		70'6"			Joints are stained brown. Quartz stringers present.	
	Bedding at 30°.		72'0"				
	Fresh, hard, strong, massive bedded silicified fine grained quartz sandstone.		74'9"			Joints are stained brown. Quartz veining adjacent to upper boundary.	
Fresh rock only, from 75'.	Bedding very irregular with much deformation and small scale faulting.		75'7"			2" shear zone at 75'7" Many slickensided joints with smears of pyrite. Most are not stained.	
	Fresh fine grained sandstone.		80'4" 81'9"				
Fresh, fine grained, silicified quartz sandstone, blue-grey in colour.	Hard, strong thickly bedded rock.		83'3"			Major joints stained brown. Most joints are clean. Dominant joint direction is at 45° (parallel to bedding).	
	Fresh, moderately soft, moderately strong laminated siltstone.		85'4"				
	10" to 2" core lengths, mode 4".		89'6"				
	Slightly weathered, laminated siltstone. Bedding at 45°.						
Slight weathering from 91'0" to 94'6".	Silty interbeds occur between 93'0" and 94'4".		93'0" 94'0" 97'0"			Much quartz veining evident. Broken zone with vein quartz. Scattered quartz stringers.	
Fresh laminated siltstone	See next sheet.					See next sheet.	

WATER PRESSURE TEST

Gallons per minute per foot loss

1·0 2·0

PACKER TYPE:- NX mechanical.

SUPPLY LINE:- EX casing.

VERTICAL SCALE:- 50 p.s.i. = 1"

NB:- Figures given are gauge pressures.

TEST SECTION

5 10 15 10 5

5 10 15 10 5

5 15 25 35 25 15 5

5 20 35 55 35 20 5

1·0 2·0

DRILL NO 6-A-17

TYPE Boyles BBS-2

DRILLER Parcell & Driwalski

COMMENCED 3-5-64

COMPLETED 15-5-64

PHOTOGRAPHIC REFERENCE:-

Core box:- M 343/1, 2, 3, 8 89 (Monochrome)
E 344 to 348 (Colour)

Core barrel:- E 351 to 370 (Colour)

DRILLERS NOTES:- 0 – 31' Full water return
31' – 50' Partial water return
50' – 100' No water return.

Sheet 1 of 2

LOGGED E. J. Best.

VERTICAL SCALE 10 Feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E. HOLE NO D.D.7. R.L. 2937'

LOCATION 79878' S, 51621' W ANGLE FROM HORIZONTAL 30° DIRECTION 057°M

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	CORE LOST & CORE RECOVERED %	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss (1.0 2.0)
Fresh laminated siltstone, silicified in places.	Soft to hard, moderately strong to strong, blue-grey rock. 6" to 1" core lengths, mode 2"-3". Laminations show lensing and slumping of beds but not minor faulting. Bedding at 20°-30°.		NMLC			Several brown stained joints down to 105'. From 105' joints are fresh and clean; they invariably are slickensided indicating that the rock has been highly stressed. Smears of pyrite are often present on slickensided joints which are all parallel to bedding. Rock always breaks along bedding planes when struck with hammer.		5
			110'					25
								50
								75
			120'					100
Slight to moderate weathering from 123' to 125'.			124'4"			2" crushed zone with silt and clay.		
Slight weathering from 126'6" to 130'0".						Brown stained joints in weathered rock.		75
			131'0"					50
Fresh, medium blue-grey, fine grained silicified quartz sandstone with dark grey siltstone interbeds.	Hard, strong rock with soft, moderately strong thin bands of siltstone. 14" to 1" core lengths, mode 2"-4".					Major joints are stained brown; others are clean. Open joint ⅛" wide partly infilled by quartz at 133'6".		
Slightly weathered from 137'0" to 139'0".			137'0"					25
			139'0"			Moderately broken zone - 2" core to silt. Associated weathering		
			141'4"					
	END OF HOLE					141' 4"		

DRILL RIG 6-A-17

TYPE Boyles BBS-2

DRILLED Parcell & Drivalski

COMMENCED 3-5-64

COMPLETED 15-5-64

PHOTOGRAPHIC REFERENCE:-

Core box:- M 343/8, 10 & 11 (Monochrome)
E 348 to 350 (Colour)

Core barrel:- E 370 to 377 (Colour)

DRILLERS NOTES:- 100'-14 % - water return.

Sheet 2 of 2

LOGGED E. J. Best.

VERTICAL SCALE 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E — HOLE NO D.D.8 — R.L 3050'

LOCATION 79894' S, 51444' W. — ANGLE FROM HORIZONTAL 90° — DIRECTION —

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	LIFT & CORE RECOVERY %	CASING	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss (10, 20)
Slightly to moderately weathered massive siltstone with some fine grained sandstone.	Moderately soft, moderately weak, yellow-brown, thickly bedded siltstone. 15" to 1" core lengths, mode 6".		NX casing				Joints are invariably stained black, the staining being up to 1 mm. thick on some joints. Dominant joint direction is at 45° to core. Most joints are planar.		PACKER TYPE:- NX mechanical. SUPPLY LINE:- EX casing. VERTICAL SCALE:- 50 p.s.i : 1" ; 100 p.s.i. : 1". NB:- Figures given are gauge pressures.
	No trace of bedding.		NMLC				Quartz vein 1" wide at 8'9".		
			24' 0"						5, 10
	Some rock as above though more broken — 4" core lengths to 1" fragments, mode 2" core lengths. Still no trace of bedding.		26' 3"				3" of crushed siltstone with much yellow-brown clay. Quartz vein ¼" wide at 70°. Small quartz vein at 70°.		
			32' 4"						
Fresh to slightly weathered, laminated siltstone.	Soft, moderately strong grey-green rock which weathers to brown colour. 30" to 3" core lengths, mode 8"–14". Rock is irregularly weathered along incipient joint planes and minor zones of faulting and deformation. Bedding at 45°–50°.						Deformation and displacement of bedding is clearly evident though the rock is not broken along fault and joint planes.		
			37' 0"				Small scale faulting and folding is still evident, though not as extensively as in the zone from 32'4" to 37'0". Joints are stained black and/or brown.		5, 10, 15, 20, 15, 10, 5
	Bedding at 55°.								
	Bedding at 60°.								
	Bedding at 60°.						1" zone of crushed, very weathered siltstone at 53'0". Prominent near vertical joint at 55' to 57'.		
	Bedding at 50°.								
	Bedding at 35°.		59' 0"						5, 10, 20, 30, 20, 10, 5
	Soft, weak, moderately weathered siltstone — weathering obscures bedding.		61' 0"						
			62' 0"						
Fresh, laminated siltstone.	Soft, moderately strong blue-grey rock. 30" to 3" core lengths, no mode. Bedding at 45°.						Joints are fresh and clean, dominantly parallel to bedding. Several tight, incipient joints are present at 70°–90° which displace laminae slightly.		
	Bedding at 35°.								
	Bedding at 35°.						Breaking the core along some incipient joints reveals striations and slickensides.		
			72' 6"						
	Yellow-brown, slightly weathered, laminated siltstone. Bedding at 40°.		76' 0"						
	Bedding at 45°.								5, 20, 30, 45, 20
							Several prominent, near-vertical, tight joints.		
	Bedding at 45°.								
Slight weathering adjacent to a few major joints.	Bedding at 50°						Brown staining on a few joints: others are fresh and clean. Major fresh joint at 80°.		
	Bedding at 50°.						Irregular fractures and some joints reveal cleavage or shear planes at 70°–90° to core: these planes are very closely spaced, though core is still strong and coherent.		
	Bedding at 45°.								

SEE NEXT SHEET

TEST SECTION

DRILL RIG 6-A-17

TYPE BOYLES BBS-2

DRILLER M. Parcell.

COMMENCED 16-4-64

COMPLETED 29-4-64

PHOTOGRAPHIC REFERENCE:-

Core box:- M 338/38 to 46 (Monochrome)
E 378 to 382 (Colour)

Core barrel:- E 385 to 400 (Colour)

DRILLERS NOTES:- 0–11' Full water return.
11'–100' No water return.

Sheet 1 of 2

LOGGED E.J. Best.

VERTICAL SCALE 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E — HOLE NO D.D.8 — R.L. 3050'

LOCATION 79894'S. 51444'W — ANGLE FROM HORIZONTAL 90° — DIRECTION —

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	% CORE RECOVERED	FAULTS	STRUCTURES (JOINTS VEINS SEAMS FAULTS CRUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss (10 20)
Fresh laminated siltstone, with slight weathering adjacent to a few major joints.	Soft, moderately strong, blue-grey rock. 30" to 2" core lengths, mode 6" to 10". Bedding at 50°.		NMLC				Most joints are tight and clean, the dominant direction being parallel to bedding. A few open joints with brown staining occur.		0 20 40 55
			110'				Major joint at 80° with adjacent weathering.	109' 30/4/64	40 20
	Bedding at 45°.							113' 22/5/64	5
			120'						5 25 45 65
	Bedding at 40°.								45 25 5
			130'						5
	Bedding at 50°.								30 50 85
			140'						60 30 5
	12" to 1" core lengths, mode 3" to 6", from 145' down. Wavy bedding planes at 45°. Bedding at 30°. Bedding at 30°.		150'						
	Bedding planes are very irregular.		157'7"				Several joints at 80°. Much folding and deformation of bedding planes.		
	END OF HOLE 157'7"								

DRILL RIG 6-A-17
TYPE BOYLES BBS-2

DRILLER M. Parcell.
COMMENCED 16-4-64
COMPLETED 29-4-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 338/84 to 88 (Monochrome)
E 382 to 384 (Colour)
Core barrel:- E 401 to 409 (Colour).

DRILLERS NOTES:- 100' - 157' No water return.

Sheet 2 of 2
LOGGED E. J. Best

VERTICAL SCALE 10 feet : 1 inch

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E. HOLE NO D.D.9. R.L. 3129'

LOCATION 79953'S, 51312'W. ANGLE FROM HORIZONTAL 65° DIRECTION 277°M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	LIFT & CORE RECOVERY (% 0 50 100)	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss (1·0 2·0)
Slightly weathered fine grained, silicified quartz sandstone.	Brown, hard, strong, thickly bedded rock — 30" to 4" core lengths, mode 6" to 10'0" and 16" from 10'6". From 3'0" to 4'6", silty laminae are present at 70° and show current bedding.		NX casing			Black stained joints are common, often with quartz infilling. Brown staining is present on less prominent joints. Massive quartz veining from 4'6" to 5'0".		PACKER TYPE:- NX mechanical. SUPPLY LINE:- EX casing. VERTICAL SCALE:- 50 p.s.i. = 1". NB:- Figures given are gauge pressures.
			NMLC 9'0"			Broken zone consisting dominantly of vein quartz.		
			10'0"					
Rock is fresh from 16'0" to 20'6".								
	Bedding at 65°.		25'2"					
Moderately weathered fine grained quartz sandstone grading to siltstone in places.	Soft, moderately strong, yellow brown thickly bedded rock 12" to 2" core lengths.		26'9"			Joints are stained black.		
			27'6"			Strong jointing and quartz veining at 60° with associated silicification.		
						Incipient black stained joint at 90° partly infilled with quartz.		
	Bedding at 60°.		34'0"			Prominent black stained joint at 70° at 32'6".		
			35'6"			Broken zone. Quartz vein 2" wide at top.		
Slightly weathered from 36'6".			39'0"					
			40'0"			Broken zone.		
Fresh, fine grained, silicified quartz sandstone.	Hard, strong, massive bedded rock. 30" to 4" core lengths.					Slight brown staining on joints.		
Slight weathering from 47'0" to 49'0".	Bedding at 45°.		47'6"			Broken zone with silty material.		
			50'4"					
Slightly weathered to fresh fine grained silicified quartz sandstone. Weathering is associated with major joints.	Hard, strong, medium blue-grey rock, buff where weathered. Many minor variations in composition of rock causing distinct banding. Bedding 40°-50°.					Thin layer of black staining on joints. Most joints are parallel to bedding. Fresh striated joint at 52'3".		
	30" to 4" core lengths, mode 12".					Quartz vein ¼" wide at 60°.		
	Very little banding is evident from 65'.							
			74'10"			Moderately broken and weathered zone with quartz veining.		
			75'3"					
Fresh to slightly weathered coarse grained quartz sandstone.	Hard, strong, thickly bedded rock. 12" core lengths.		77'9"			Slight brown staining on joints.		
Slightly weathered fine grained quartz sandstone	Hard, strong, rock. Bedding at 40°.		79'6"					
Almost fresh to fresh, medium grained, silicified quartz sandstone.	Hard, strong, thickly bedded rock. 12" to 1" core lengths, mode 5". Occasional thin silty interbeds at 45°. Some scattered clusters of pyrite crystals.					Most joints are stained black or brown. Major joint at 80° with black, brown and red lining up to 2mm. thick. Striated, fresh joint at 40°.		
			94'6"					
Slightly weathered, silicified fine grained sandstone and siltstone.	Moderately hard, moderately strong rock. 10" to 2" core lengths. Bedding at 50°. Pyrite present on some bedding planes.					Black and brown staining on joints.		

TEST SECTION

DRILL NO 6-A-18
TYPE BOYLES BBS-2
DRILLER PARCELL & TOMIC
COMMENCED 2-4-64
COMPLETED 9-4-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 336/2 to 6 (Monochrome)
E 410 to 414 (Colour)
Core barrel:- E 420 to 434 (Colour)
DRILLERS NOTES:- 0'-34' Full water return.
34'-86' Partial water return.
86'-100' No water return.

Sheet 1 of 2
LOGGED E.J. Best.
VERTICAL SCALE 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E. HOLE NO O.D.9. R.L. 3129'

LOCATION 79953' S, 51312' W. ANGLE FROM HORIZONTAL 65° DIRECTION 277° M

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	DEPTH & SIZE OF CORE	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES
Slightly weathered fine grained silicified quartz sandstone.	Hard, strong, thickly bedded rock 10" to 1' core lengths, mode 4". Some silty interbeds at 40°.	NMLC	Most joints are stained black, some are brown. Several quartz veins occur between 100' and 102'.
	Silty interbeds.	110'3" 111'3"	Broken zone with some silt
Slightly weathered, medium to coarse grained, silicified quartz sandstone, grading in places to quartzite.	Very hard and strong, thickly bedded rock. 14" to 3" core lengths, mode 10". Sandstone contains many small shale fragments, and small blebs of pyrite are also common. A few silty interbeds at 45°.	120'	Joints are stained black and brown. Numerous quartz veins and stringers are present, some containing much pyrite.
			Fractured quartz vein 1½" wide at 50°.
Rock is fresh from 124'2".	Silty interbed at 45°.		Prominent brown stained joint at 80°.
		130'	From 128', numerous fresh, striated and slickensided joints are evident.
		133'3"	
Fresh, fine grained silicified quartz sandstone with zones of interbedded siltstone.	Sandstone is hard and strong, occurring as 12" to 1' core lengths, mode 4". Siltstone is moderately hard and strong and when thickly bedded occurs as 5" to 2" core lengths. Often the siltstone occurs as laminae interbedded with sandstone. Pyrite occurs as blebs and infilling of joints.	134'2"	4" of crushed siltstone. Most joints are stained brown; a few are striated and slickensided.
	Medium grained sandstone with distinctive white quartz grains.	143'6" 145'3"	
	Moderately soft, blue-grey siltstone. Boundaries are very irregular.	146'3" 148'0"	Much quartz veining and incipient shearing at 50°. Some folding evident.
	Silty interbed at 50°.	155'0"	
	Fresh, dark blue-grey, thickly bedded, moderately hard siltstone.	158'0"	Very prominent joint at 85° with very soft, slickensided surfaces.
From 158'0" to 163'3" slight weathering adjacent to major joints is evident.	Silty interbed at 45°.		
Fresh blue-grey siltstone, with a little interbedded fine grained sandstone.	Moderately hard and strong rock which is laminated in some places and thickly bedded in others. 12" to 2" core lengths. Pyrite occurs scattered throughout. Bedding at 45°.	164'6"	Joints are fresh and clean. Quartz vein ½" wide at 80° — adjacent rock is weathered. Deformation evident 167' to 169'. Slickensided joints evident.
		173'10"	
Slightly weathered fine grained silicified quartz sandstone.	Hard, strong, thickly bedded rock. 36" to 2" core lengths, mode 10".		Joints are mostly stained black and brown. A few quartz stringers occur. Slickensided and striated joints.
		184'0"	
	Fresh to weathered, moderately soft, strong siltstone.	186'0"	Laminations show evidence of deformation in siltstone.
Fresh sandstone from 189'6".	Fresh, thickly bedded siltstone.	190'0" 191'2"	
		194'0"	
Fresh siltstone.	Moderately hard, strong, thickly bedded siltstone. No traces of bedding planes. 12" to 2" core lengths, mode 4".		Most joints are fresh and clean. A few have brown staining.

HOLE DRY

WATER PRESSURE TEST — Gallons per minute per foot loss (1·0, 2·0)

6, 10, 20, 30, 20, 10, 6, 5, 8, 5, 15, 25, 35, 25, 15, 5, 5, 15, 30, 40, 30, 15, 5, 5, 20, 35, 45, 35, 20, 5, 15, 20, 35, 50, 35, 20, 5

DRILL NO 6-A-18
TYPE BOYLES BBS-2
DRILLER PARCELL & TOMIC
COMMENCED 2-4-64
COMPLETED 9-4-64

END OF HOLE 201'0"

PHOTOGRAPHIC REFERENCE:-
Core box:- M 336/7 to 11 (Monochrome)
E 415 to 419 (Colour)
Core barrel:- E 434 to 446 (Colour)

DRILLERS NOTES:- 100'-201' No water return.

Sheet 2 of 2
LOGGED E. J. Best.

VERTICAL SCALE 10 Feet : 1 inch.

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

PROJECT UPPER COTTER DAMSITE 'E' HOLE NO D.D.10 R.L. 3131 feet

LOCATION 7994.9'S 5130.9' W ANGLE FROM HORIZONTAL 45° DIRECTION 063° M

ROCK TYPE AND DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & CORE RECOVERY %	CASING	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss 1·0 2·0
				0 6 12 18+					
Slightly weathered, fine grained, silicified quarts sandstone - pale grey in colour.	Hard strong thickly bedded rock with irregular thin lenses siltstone.		NX casing 5' 0"				Joints are mostly planar and regular with black and/or brown staining.		PACKER TYPE:- NX mechanical SUPPLY LINE:- EX casing VERTICAL SCALE:- 50 p.s.i. = 1" 100 p.s.i. = 1" Figures given are gauge pressures
	Very weathered, soft, weak, siltstone		NMLC 6' 6"				Broken and partly decomposed to silt		
From 8'6" , rock is brown coloured due to weathering	Bedding at 20°						From 9'0" to 13'0", a few quarts veins and stringers occur, the adjacent rock being weathered black for up to 5 mm.		
	Very weathered siltstone band 4" thick		14' 2" 15' 9"						
Almost fresh fine-grained silicified qts. sst. and siltstone.	Rock is banded due to variations in composition. Hard, strong, rock blue-grey in colour. Bedding 20°.		19' 0"				Two joints only present, being parallel to bedding - these are tight and clean.		
Slightly weathered, fine grained, silicified quarts sandstone.	Hard, strong, thickly bedded, buff coloured rock 15" to 2" core lengths, mode 5".		27' 8"				Joints stained black and brown. Most joints are parallel to bedding. A few irregular joints are present which show weathering of adjacent rock for up to 5 mm. - one of these joints contains a little quarts.		
	Irregular lens of coarse grained sst.						Several quarts infilled joints at 31'		
From 35' there are several gradations to medium grained sandstone.			41' 0"				Quarts vein at 70°		
Slightly weathered, medium grained, silicified quarts sandstone.	Hard, strong, thickly bedded rock. 20" to 2" core lengths mode 6".		48' 4"				Jointing is more irregular than in overlying rock. Quarts veins and stringers are present from 43'.		
Slightly to moderately weathered, silicified siltstone, grading in places to fine grained sandstone.	Fresh, fine grained, silicified sst.		49' 6" 51' 2"				Rock has been strongly brecciated and re-cemented by quarts.		
	Strong, moderately hard to hard rock. Numerous thin, dark interbeds are present throughout. 12" to ½" core lengths, mode 2". Bedding at 15°.		56' 0"				Striated and slickensided joint at 51'2". Prominent quarts vein up to 1" wide at 85° ± 3" of very crushed and bleached siltstone decomposed to silt.		
	Bedding at 0 - 10° Small scale faulting along re-cemented joint plane.		61' 9"				Moderately broken and weathered zone. Most joints are parallel to bedding.		
	Bedding at 10 - 20°		65' 0" 66' 0"						
Fresh to slightly weathered, medium grained, silicified quarts sandstone, grading in places to quartzite.	Hard, strong rock containing scattered crystals of pyrite. Bedding at 15°. 8" to 1" core lengths, mode 5".		76' 6"				Widely spaced joints which are rough and stained black and/or brown. Quarts veins and stringers scattered throughout.		
Fresh to moderately weathered, coarse grained sandstone	Hard, strong rock containing numerous small shale fragments. Fine grained sandstone from 76'10" to 77' 4".		79' 8"				Bedding plane joints predominate. Some are stained black.		
Fresh to slightly weathered, fine grained silicified sandstone, grading to quartzite in places	Hard, strong, massive bedded rock, A few thin silty interbeds are present. Bedding at 15° 10" to 1" core lengths, mode 3"		86' 4"				Most joints are parallel to bedding and stained black		
Fresh to slightly weathered, coarse grained silicified quarts sandstone - grades in places to medium grained.	Very hard and strong, massive bedded rock. 24" to ½" core lengths. Abrupt change in grain size from coarse to medium at 91'. Boundary is at 35°						The few joints which are present are stained black and brown Prominent joint at 85° with thin coating of pale yellow clay.		SEE NEXT SHEET

TEST SECTION

0 1·0 2·0

DRILL NO 6 - A - 18
TYPE Boyles BBS 2
DRILLER Parnell & Tomio
COMMENCED 19 - 3 - 64
COMPLETED 23 - 3 - 64

PHOTOGRAPHIC REFERENCE.
Core box:- M 333/3 to 6 and 9 (Monochrome)
E 447 to 451 (Colour)
Core barrel:- E 455 to 463 (Colour)

DRILLERS NOTES:- 0 - 9½' Full W.R. 21' - 30' No W.R.
9½' - 14' No W.R. 30' - 35' Full W.R.
14' - 21' Full W.R. 35' - 100 No W.R.

Sheet 1 of 2
LOGGED R. J. Best
VERTICAL SCALE 10 feet = 1 inch

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

PROJECT UPPER COTTER DAMSITE "E" HOLE NO D.D.10 R.L. 3131'

LOCATION 7994.9' S., 5130.9' W ANGLE FROM HORIZONTAL 45° DIRECTION 063° M

ROCK TYPE AND DEGREE OF WEATHERING	DESCRIPTION	DEPTH & SIZE OF CORE	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES
Slightly to moderately weathered coarse grained silicified quarts sandstone.	Hard, strong rock - mostly 2" to 4" core lengths	NMLC	4" broken zone -much black staining
		104' 0"	Open joint at 102'2" with black staining and silty material.
	Moderately weathered siltstone	105' 0"	Evidence of shearing -some joints are striated.
		106' 8"	
Fresh to slightly weathered brecciated quartzite, re-cemented by quarts,	Very hard and strong rock, 4" to 1" core lengths.		Rock is open jointed with prominent black staining. 15° joints are common, others being irregular.
	Fresh 2½" core lengths from 111' to 113'.		Pyrite present in vein quarts
		115' 0"	
Slightly to moderately weathered fine grained silicified quarts sandstone.	Hard, strong, massive bedded rock. 12" to 4" core lengths.		2 small broken zones in silty material at 116'5" and 116'10"
		118' 0"	
		118' 8"	Broken zone with silty material and quarts veining.
		119' 8"	
Fresh, fine grained, silicified quarts sandstone.	Hard, strong, massive bedded blue grey rock. 12" to 6" core lengths to 123' 12" to 1" core lengths from 123' mode 3"		Most joints have small amount of brown staining.
		132' 0"	
	Slightly weathered, medium grained silicified quarts sandstone - boundaries are gradational.	135' 0"	Major black stained joint at 90° present between 129'6" and 133'0" Adjacent rock weathered for up to 2"
			Major brown stained joint at 85° present between 135'6" and 139'0" Adjacent rock is weathered for 2"
Rock is slightly weathered from 140'6" to 145'6"			A few quarts stringers are present from 139' downwards.
		145'6"	
Fresh, interbedded fine grained silicified quarts sandstone and siltstone.	Hard, strong, blue-grey rock 12" to 1" core lengths, mode 4" to 6". From 145'6" to 147'6", small scale folding is evident.		Joints are clean; many of them are slickensided.
	Bedding at 15° - 20°.		Bedding plane joints along siltstone interbeds, predominate.
	Slightly weathered fine grained silicified quarts sandstone.	158' 9"	A few quarts filled joints occur below 158', always in fine grained sandstone.
		160' 9"	
		165' 0"	
	END OF HOLE		165' 0"

WATER LEVEL: DRY HOLE

WATER PRESSURE TEST — Gallons per minute per foot loss

DRILL NO 6 - A - 18
TYPE Boyles B.B.S. 2
DRILLER Parsell & Tomic
COMMENCED 19. 3. 64
COMPLETED 23. 3. 64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 333/2, 3, 7 & 8 (Monochrome).
E 451 to 454 (Colour)
Core barrel:- E 464 to 466 (Colour)
DRILLERS NOTES:- 100'-165' No water return.

Sheet 2 of 2
LOGGED E.J. BEST
VERTICAL SCALE 10 feet : 1 inch

M(PF) 7

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: Upper Cotter Damsite "E" — HOLE NO: DDII — R.L: 3303'

LOCATION: 79877'S 50796'W. — ANGLE FROM HORIZONTAL: 90° — DIRECTION: –

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	DEPTH & SIZE OF CORE	STRUCTURES (JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES)
		NX casing	
Slightly to moderately weathered siltstone	Yellow brown colour, soft. Bedding inclined at 30°	NMLC	Black staining and very soft weathered seams at 11'7" to 12'8" & 18'4". Crush zone 20'4"–20'11", broken ½" pieces, white clay. Quartz vein 2" wide at 22'. Dominant jointing direction at 50°. Black staining on joints. Broken zone ¼" pieces 26'3"–26'8", also thin quartz vein.
		20'1"	
Moderately weathered medium grained sandstone.	Pale brown colour, fairly strong and hard. Core broken 3"–15", mode 5". Quartz grains average size 0·5–1·0m.m, well rounded, silty matrix. Sandstone intersected by some quartz veins, ⅛" in width. No bedding features.		
		38'7"	
Weathered brecciated fine grained sandstone	Angular pieces of fine grained sandstone, cemented by a ferruginous silt. Rock is soft and easily crushed. Core is broken to 2" pieces.		Very weathered zone. Sandstone broken to ¼" pieces, crumble easily.
		45'3"	1" pieces of vein quartz. Also some brecciated sandstone.
Weathered siltstone	Pale brown colour, altered along joint planes to a soft pink "pug". Broken to 3" pieces.		Some pieces of vein quartz.
		52'0"	Some shearing, material weathered to a soft powder.
Weathered to slightly weathered siltstone	Brown to dark blue colour, current bedding at 55°. Strong and hard; core broken 3"–20" mode 7."		Joints every 6" of core at 50°, slickensided, with black staining, some clay. Essentially non-jointed.
		71'8"	
Slightly weathered medium grained sandstone.	Pale brown colour, strong and hard. Core broken to 9" pieces. Quartz grains well rounded; matrix of silt.	74'2"	Slickensided joint at 80° with black staining.
Slightly weathered siltstone	Pale brown colour, strong and hard. Core broken to 6" pieces.		Current bedding at 35° also slump structures seen.
		82'3"	
Moderately fresh medium grained sandstone.	Pale brown colour, medium grain size, strong and hard. Core broken to 4"–18" pieces, mode 8."		Joint at 80°, coated with black mineral. Joint at 85°, iron staining and coated with black mineral.
		100'	

WATER LEVEL

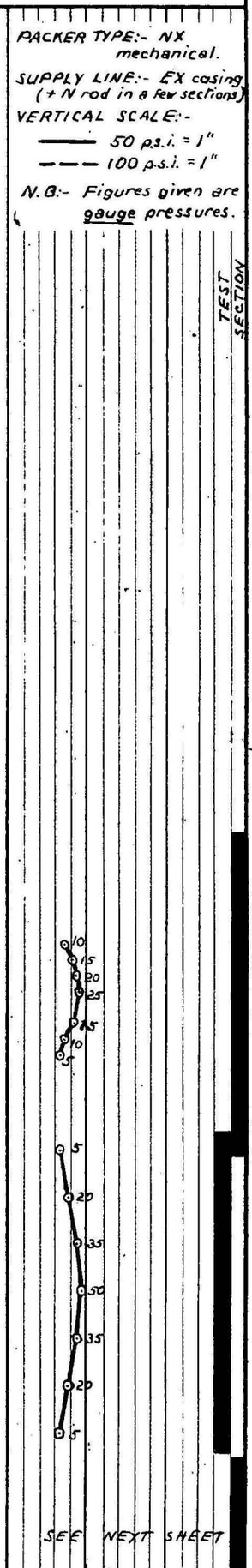
WATER PRESSURE TEST — Gallons per minute per foot loss (1·0, 2·0)

PACKER TYPE:- NX mechanical.

SUPPLY LINE:- EX casing (+ N rod in a few sections)

VERTICAL SCALE:-
- 50 p.s.i. = 1"
- 100 p.s.i. = 1"

N.B:- Figures given are gauge pressures.



DRILL NO: 6-A-18
TYPE: Boyles B.B.S.2.
DRILLER: L. Tomic & Wolf.
COMMENCED: 17-4-64.
COMPLETED: 3-5-64.

PHOTOGRAPHIC REFERENCE:-
Core box:- M 338/24 to 32 (Monochrome)
E 467 to 472 (Colour)
Core barrel:- E 486 to 503 (Colour)

DRILLERS NOTES:- 0–17' Full water return.
17'–100' No water return.

Sheet 1 of 5

LOGGED: D.F. Maggs.

VERTICAL SCALE: 1 inch: 10 feet

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite "E" HOLE NO D.D.11 R.L. 3303'

LOCATION 79877'S, 50796'W. ANGLE FROM HORIZONTAL 90° DIRECTION —

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	Graphic Log	DEPTH & SIZE OF CORE	Fracture Log	STRUCTURES (JOINTS, VEIN, SEAMS, FAULTS, CORE BREAKS)	WATER PRESSURE TEST Gallons per minute per foot loss 1·0 2·0
			100'			
Weathered to slightly weathered sandstone.	Pale brown to grey colour; graded bedding texture present. Fine grained laminated sandstone grades into medium grained sandstone at 105' and then into coarse grained sandstone at 107'. Sandstone fairly strong & hard.		NMLC 111'4"		Core broken 8"-16" mode 10". Joint at 80°, iron stained.	5 20 10 5
Slightly weathered sandstone.	Pale brown colour, very fine grained. Current bedding inclined at 30°.		125'9"		Core intersected by quartz veins at 55°, broken and iron stained. Core broken 5"-12" pieces, mode 6". A few joints inclined at 30° and recemented by secondary silica. Core broken 5"-8" mode 6".	
Weathered sandstone breccia.	Angular pieces of medium grained sandstone ½"-2" across, in a matrix of sugary quartz. May be a zone of faulting; evidence not conclusive.		132'0"		Joint, inclined at 75°, ¼" thick crust of sugary quartz & rock flour, some iron staining.	
Moderately weathered to slightly weathered sandstone.	Pale brown to brown colour. Sandstone has graded bedding texture and the grain size varies from medium grained size (0·5mm) at the top of the bed, to coarse grained size (3·0 m.m) near the bottom. The sandstone is fairly hard and strong; the core breaks to 10 inch sticks in the medium grained sandstone and 3 inch pieces in the coarse grained sandstone.		158'8"		Large open fracture parallel to the drill hole thick crust of iron oxides, and black staining. Irregular fracture inclined at 80°. Weathering along fracture, also coating of black mineral. Joint inclined at 60°, with thick coating of white clay. Core broken 2"-6" pieces. A few tight joints.	5 15 28 22 15 5
Fresh laminated siltstone.	Pale grey colour, laminated but no dominent cleavage direction. Fairly soft - can easily scratch the core with a knife. Core breaks to sticks 1"-18" in length, mode 5. Laminations inclined at 55 degrees. Core broken to 2" pieces from 170'-172'6". Very soft claystone in this interval.		200'		Some thin sandy interbeds. Siltstone is not easily cleaved parallel to the bedding, and does not contain many joints. Slickensided joint with rock flour, inclined at 55°.	

SEE NEXT SHEET

DRILL RIG 6-A-18

TYPE Boyles BBS2

DRILLER Wolf & L. Tomic

COMMENCED 17-4-64.

COMPLETED 3-5-64.

PHOTOGRAPHIC REFERENCE:-

Core box:- M 338/14 to 22 (Monochrome)
E 472 to 476 (Colour)

Core barrel:- E 503 to 521 (Colour)

DRILLERS NOTES:- 100'-200' No water return

Sheet 2 of 5

LOGGED D.F. Maggs.

VERTICAL SCALE 1 inch : 10 feet.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter River Damsite "E" — DD11 — 3303'

LOCATION 79877' S, 50796' W. — ANGLE FROM HORIZONTAL 90° — DIRECTION —

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	Graphic Log	Fracture Log	%	Zoning	REMARKS	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss 10 20
Fresh laminated siltstone.	Bedding inclined at 35°		200 NMLC.			Slickensided joint, inclined at 85°		5 15 25 32 25 15 5 — 180' EX casing + 20' N rod.
			210'			Irregular fracture, coated with brown iron oxides.		
						Joints at about 12" spacing parallel to the bedding.		
			220'					5 15 25 33 25 15 5 — 180' EX casing + 40' N rod.
	Pale blue colour; laminated. Slump structures and micro-faulting are very common. Core broken 4"—18", mode 7".		230'			Fracture zone 234' 5" to 234' 11". Brown iron staining.		
						Joint inclined 35° and with thick iron oxide coating.		
			240'			Core broken to 3/4" pieces.		
	Bedding inclined at 35°					Core broken to ½" pieces, and iron stained from 243'–243' 6". Iron oxide staining.		6 25 28 25 20 10 6 — 180' EX casing + 60' N rod.
			250'					
			257'			Joints generally parallel to the bedding every 6".		
Fresh fine grained sandstone	Pale blue colour, slightly silicified; strong and hard. Few joints.		260'					
			262'3"					
Fresh siltstone	Pale blue colour, laminated.		265'4"					
Fresh medium grained sandstone.	Pale blue colour; silicified. A strong hard rock. Core broken to 12" sticks. Quartz veins to ¼" thick, lengthwise along core.		268'9"			Small crush zone, width 5". Thin white coating on sheared surfaces.		5 25 28 25 20 10 5
Fresh laminated siltstone	Pale blue colour, laminations inclined at 20°. Slump bedding features and micro-faulting present. Siltstone fairly strong and hard. Core broken 4"—16", mode 7".		270'			Small crush zone. 1"		
						Siltstone can be cleaved parallel to the bedding, generally every 8". Thin white coating on cleavage face.		
			280'					
Fresh medium grained sandstone.	Pale blue colour, silicified, strong and hard. Core broken to 8" sticks. Quartz veins at 6" intervals inclined at 60° and generally ⅛" thick.		280'6"			Small crush zone, 5" of siltstone weathered to blue "pug".	283' 3/6/64	5 10 20 28 20 10 5
			290'			Shear zone, width 12". Some pyrite cubes on slickensided surfaces.		
			300'					

DRILL NO 6-A-18

TYPE Boyles BBS2

DRILLER L. Tomic & Wolf

COMMENCED 17·4·64

COMPLETED 3·5·64

PHOTOGRAPHIC REFERENCE

Core box:- M 338/6 to 14 (Monochrome)
E 476 to 480 (Colour)

Core barrel:- E 521 to 539 (Colour)

DRILLERS NOTES:- 200'-300' No water return.

Sheet 3 of 5

LOGGED D.F. Maggs.

VERTICAL SCALE 1 inch : 10 feet.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: Upper Cotter River Damsite "E" — HOLE NO.: DD 11 — R.L.: 3303'

LOCATION: 79877'S, 50796'W. — ANGLE FROM HORIZONTAL: 90° — DIRECTION: -

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	DEPTH & SIZE OF CORE	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES
		300 NMLC	
Fresh fine grained sandstone.	Pale blue colour, massive, silicified; strong and hard. Core broken to 12 in. sticks. Some fine grains of pyrite present.	308'3"	Irregular fractures coated with white clay.
Fresh. siltstone	Pale blue colour, laminated. Core broken 1"–5" pieces	310'	
		313'	Irregular fracture coated with white clay.
Fresh fine grained sandstone.	Pale blue colour, massive strong and hard, slightly silic-ified. Core broken to 12" sticks.	318'3"	
		320'	
Fresh laminated siltstone with some intercalations of fine grained sandstone.	Pale blue colour, laminated, but no cleavage parallel to the bedding. Core broken to sticks 3"–12" pieces, mode 6." Sedimentary features such as, slump bedding and micro-faulting present. Bedding is inclined at 35°.	330'	Shear zone 4" wide siltstone shattered to 1/8" pieces. Core broken to 1/2" pieces clay coating. Joint inclined at 60°. Core broken to 1" pieces and coated with white film.
		340'	Irregular fracture, coated with thin white clay. Joint inclined at 90° with white thin clay coating.
		350'	Some joint parallel to the bedding, generally every 12". Joints tight; no clay or iron oxide staining.
		357'8"	
Fresh fine grained sandstone	Pale blue colour; massive, slightly silicified; strong and hard. Core broken 2"–16" pieces, mode 9." Bedding is inclined at 50°.	360'	
		370'	Slickensided joint plane inclined at 50° and coated with rock flour
		374'6"	Joint inclined at 50° thin white coating.
Fresh siltstone with some thin intercalations of fine grained sandstone	Pale blue colour, slightly laminated. No cleavage parallel to bedding. Slumped bedding and micro-faulting present. Siltstone is fairly hard. Core is broken into sticks 3"–16," mode 8." Siltstone is brittle and broken to angular shards along joint planes.	380'	Joint inclined at 65° with rock flour.
		390'	Shear zone 16" across. Core broken to 3/4" pieces and coated with rock flour. Joint inclined at 75° with thin coating of white clay.
		400'	

WATER PRESSURE TEST (Gallons per minute per foot loss; 1.0, 2.0)

10 50 75 100 75 50 25 10 — 6 20 43 30 19 6 — 2 — 0 — 25 50 100 50 25

6—A—18

Boyles BBS2

L. Tomic & Wolf

17·4·1964

3·5·1964

PHOTOGRAPHIC REFERENCE:-

Core box:- M 338/4 & 6 and M 346/14 to 16. E 480 to 484. (Colour)

Core barrel:- E 539 to 558 (Colour)

DRILLERS NOTES:- No water return from 300'-400'.

Sheet 4 of 5

LOGGED: D.E. Maggs

VERTICAL SCALE: 1 inch : 10 feet

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter River Damsite "E" HOLE NO DD 11 R L 3303'

LOCATION 79877'S, 50796'W ANGLE FROM HORIZONTAL 90° DIRECTION —

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	CORE RECOVERY %	CASING	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss 1.0 2.0
			400	0 6 12 18+					
Fresh Siltstone	Pale blue, laminated sedimentary features such as slump bedding and micro-faulting are present. Core broken to 1"-8" pieces, mode 4".		NMLC				Joint inclined at 70° striated and thin white coating.		
			409'0"						
Fresh fine grained Sandstone.	Pale blue colour, massive silicified, strong and hard. Core broken to 12" pieces.		410'						
			413'3"						
Fresh Siltstone	Pale blue colour, laminated and strong. Core broken to 36" sticks. Some thin irregular quarts veins.						Joint inclined at 60°. Bedding inclined at 50° Irregular fractures slickensided and coated with rock flour.		
			420'						
	Completed hole at 420'6"								

DRILL RIG 6-A-18

TYPE Bayles BBS 2

DRILLER L. Tomic & Wolf

COMMENCED 17·4·1964

COMPLETED 3·5·1964

PHOTOGRAPHIC REFERENCE:-

Core box:- M 346/15 & M 343/7 (Monochrome) E 484 & 485 (Colour)

Core barrel:- E 558 to 561 (Colour)

DRILLERS NOTES:- 400 - 420' No water return.

Sheet 5 of 5

LOGGED D. F. Maggs

VERTICAL SCALE 1 inch : 10 feet

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: Upper Cotter Damsite E. HOLE NO: D.D.12 R.L: 3211'

LOCATION: 79999'S; 51134'W. ANGLE FROM HORIZONTAL: 50° DIRECTION: 097°M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & CORE RECOVERY % (0 6 12 18+)	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Gallons per minute per foot loss (1.0 2.0)
Soil and scree	Scattered boulders of weathered quartz sandstone.		NX casing 5'0"					
Slightly to moderately weathered coarse grained quartz sandstone.	Moderately hard to hard, moderately strong to strong, massive bedded rock. 12" core lengths to 2" fragments, mode 6" core lengths.		NMLC 18'6"			Joints are stained yellow-brown. Scattered quartz veins present. Some joints are striated.		
Slightly to moderately weathered fine grained quartz sandstone.	Moderately hard and strong thickly bedded rock with some silty interbeds. 15" to 1" core lengths, mode 3"-6". Bedding at 10°-15°. Thin siltstone interbeds. Silty interbeds at 20°. Irregular silty interbeds.		20'3" 21'0" 24'0" 28'10" 31'7" 32'3" 35'0"			Yellow brown silty material on joint. Soft, weak, sheared siltstone. Crushed, weathered zone.		
	Weathered laminated siltstone. Bedding at 15°. 6" of siltstone at contact							
Slightly to moderately weathered, medium grained silicified quartz sandstone.	Hard, strong massive bedded rock. Weathered laminated siltstone. Bedding at 20°. 10" to 2" core lengths, mode 3"-4". Silty interbeds at 10°		36'8" 37'8" 42'0"			Joints are stained black and brown. 1" zone of crushed silty material. 3" broken zone		
	Weathered laminated siltstone. Bedding at 10°. Silty interbeds at 15°		48'10" 50'3" 54'3" 55'0" 58'0" 60'2" 63'0"			6" of crushed siltstone at upper contact with sandstone. Crushed zone consisting of sand and silt sized particles. Moderately broken zone — 4" core to ½" fragments.		
Slightly to moderately weathered massive silicified siltstone with some laminations	Soft, moderately strong rock. 6" core lengths to 1" fragments, mode 3" core. Bedding at 10°.		69'0"			Joints stained black and brown. 3" Crushed zone with vein quartz.		
Slightly weathered fine grained silicified quartz sandstone, grading to quartzite. A few patches of fresh rock between 83'0" and 90'0".	Hard, strong, thickly bedded rock. 15" to 3" core lengths, mode 5". Silty interbeds at 20°. Pyrite crystals are evident in fresh rock		91'6"			Joints are stained black & brown. A few quartz veins and stringers are present, mostly at 60°-70° to core.		
Slightly weathered laminated siltstone.	Soft, moderately strong rock. 8" to 1" core lengths, mode 2"-3". Bedding very irregular. Bedding at 25°-30°.					Joints stained black and brown. Rock is strongly contorted — laminations are very wavy and irregular. 4" crushed and weathered zone		

PACKER TYPE:- NX mechanical.
SUPPLY LINE:- EX casing.
VERTICAL SCALE:-
50 p.s.i. = 1"
100 p.s.i. = 1"
N.B. Figures given are gauge pressures.

TEST SECTION

SEE NEXT SHEET

DRILL NO: 6-A-18
TYPE: Boyles BBS-2
DRILLER: Tomic & Driwalski.
COMMENCED: 11-5-64
COMPLETED: 16-5-64

PHOTOGRAPHIC REFERENCE.
Core box:- M 343/13 15 17 19 & 20 (Monochrome)
E 562 to 566 (Colour)
Core barrel:- E 571 to 589 (Colour)

DRILLERS NOTES:- 0 - 35½' Full water return.
35½' - 100' No water return

Sheet 1 of 2
LOGGED: E.J. Best.

VERTICAL SCALE: 10 Feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: Upper Cotter Damsite E — HOLE NO: D.D.12 — R.L: 3211'

LOCATION: 79999' S ; 51134' W — ANGLE FROM HORIZONTAL: 50° — DIRECTION: 097°M

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	DEPTH & SIZE OF CORE	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES
Slightly weathered laminated siltstone.	Soft, moderately strong rock. 18" to 2" core lengths, mode 4"-6". Bedding at 20°-25°.	NMLC	Joints are stained black and brown. Thin veneer of silt on major joints.
	Bedding at 40°.		
	Bedding is irregular due to slumping or folding.		
	Weathered fine grained sandstone.	108' 10"	
	Bedding at 55°.	110' 0"	3" of decomposed siltstone at 110'6".
	Bedding at 45°.		several thin quartz veins at 45°-60° (normal to bedding).
Light grey fresh siltstone from 113'6" to 114' 9".			
	Almost fresh, hard, strong, silicified fine grained quartz sandstone.	116' 3" 118' 0"	Quartz veins in sandstone.
	Bedding at 50°-55°.	121' 6"	
Slightly to moderately weathered fine grained silicified quartz sandstone.	Moderately hard to hard, strong thickly bedded rock. 8" to 1" core lengths, mode 2"-3". Lenses of siltstone present down to 124' 0". Scattered cubes of pyrite in almost fresh rock.		Joints are stained black & brown. A few thin quartz stringers are present throughout. Slickensiding evident on one or two major joints only.
	Moderately weathered, soft, weak laminated siltstone.	129' 6" 131' 6"	
	Bedding irregular in siltstone.		
		139' 0" 140' 0"	Broken, weathered sandstone.
Fresh to slightly weathered, fine grained silicified quartz sandstone.	Hard strong rock, thickly bedded. 20" to 4' core lengths. 1" silty interbed at 35° at 141' 9".	145' 8"	Joints are stained black & brown.
Slightly to moderately weathered laminated siltstone.	Soft, weak rock. Bedding at 30°. 5" to 10" core lengths.	147' 2"	Very broken and decomposed rock. 3" fragment to silt. Brown stained joints.
Fresh to slightly weathered laminated siltstone.	Soft, moderately strong rock. Grey when fresh, buff when weathered. 18" to 2" core lengths, no mode. Bedding at 45°. Patches of irregular and wavy bedding planes occur throughout. Minute pyrite crystals occur scattered throughout.		Brown stained joints in weathered rock; clean, fresh joints in fresh rock.
	Bedding at 40°.		
	Bedding at 10°-15°.		
Moderate weathering from 168'0" to 169'9".	Bedding at 50°.	170' 6"	
	Buff, fine grained sandstone.	171' 6"	
	Bedding at 60°.	172' 6"	Quartz stringers occur in sandstone only.
	Slightly weathered, hard, strong fine grained quartz sandstone.	174' 10"	
	END OF HOLE		175' 8"

WATER LEVEL: DRY.

WATER PRESSURE TEST — Gallons per minute per foot loss

Depth	Loss
108' 10"	5
110' 0"	20
	40
	60
	40
	20
	10
	5
116' 3"	7
118' 0"	25
	50
	70
	50
	25
121' 6"	7
129' 6"	5
131' 6"	25
	50
	68
139' 0"	50
140' 0"	25
	5
145' 8"	5
147' 2"	25
	50
	71
	100
	71
170' 6"	50
171' 6"	25
172' 6"	5
174' 10"	

DRILL NO: 6-A-18
TYPE: Boyles BBS-2
DRILLER: Tomic & Driwalski
COMMENCED: 11-5-64
COMPLETED: 16-5-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 343/12, 14, 16 & 19 (Monochrome)
E 567 to 570 (Colour)
Core barrel:- E 588 to 603 (Colour).

DRILLERS NOTES:- 100'-155' No water return.
155'-159' Partial water return.
159'-176' No water return.

Sheet 2 of 2
LOGGED: E. J. Best.

VERTICAL SCALE: 10 Feet : 1inch

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E — HOLE NO D.D.13. — R.L. 3045'

LOCATION 79180' S, 52181'W — ANGLE FROM HORIZONTAL 90° — DIRECTION -

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	LIFT & CORE RECOVERY %	CASING	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	DRILLERS' REMARKS
Soil and scree	Red-brown silty sand soil with occasional boulders of weathered fine grained silicified quartz sandstone.		NX casing						
	Fine grained sandstone boulder.		11' 2"						Soil and sand washed away.
			12' 0"						
	Scattered fragments of fine & medium grained silicified quartz sandstone, and vein quartz. 50% rock, 50% soil.		34' 6"						Hole caving.
			40' 0"						Cemented hole to 41' and redrilled.
	Boulders of Fine grained silicified quartz sandstone		41' 9"						
			42' 6"						
			43' 3"						
			44' 0"						
			45' 6"						
			46' 10"						
	Boulders and fragments of fine grained silicified quartz sandstone.		50' 0"						
			52' 10"						
	Medium grained sandstone boulder.		55' 9"						
			57' 3"						
	Fine grained sandstone boulder		63' 0"						
			64' 0"						
	Fine grained sandstone boulder.		66' 3"						
			67' 0"						
	Fine grained sandstone boulder		71' 4"						
			72' 0"						
Fresh to slightly weathered, fine grained silicified quartz sandstone, grading to quartzite in places.	Hard, strong, thickly bedded rock with occasional banding and silty interbeds. 8" to 1" core lengths, no mode. Bedding at 55°.		73' 0" NMLC				Joints are stained black & brown. A few quartz stringers are present.		Full water return to bottom of hole.
	Silty interbeds at 60°.		90' 3"				6" Very broken silty interbed.		
	Silty interbeds at 65°		93' 6"				Broken zone - 2" fragments to silt sized particles		
Moderate weathering from 96'9" to 98'0"	Bedding at 65°		95' 2"						

DRILL NO 6-A-17

TYPE Boyles BBS-2

DRILLER M. Parcell.

COMMENCED 18-5-64

COMPLETED 29-5-64

PHOTOGRAPHIC REFERENCE:-

Core box:- M 346/6 to 12 (Monochrome)
E 604 to 610 (Colour)

No core barrel photographs taken.

Sheet 1 of 2

LOGGED E. J. Best.

VERTICAL SCALE 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E. HOLE NO D.D.13 R.L. 3045'

LOCATION 79180' S, 52181' W ANGLE FROM HORIZONTAL 90° DIRECTION —

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	LIFT & CORE RECOVERY %	CASING	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	DRILLERS' REMARKS
Fresh to slightly weathered fine grained silicified quartz sandstone.	As on previous sheet.		NMLC				Joints are stained black and brown.		Full water return.
	Silty interbeds at 65°.							DRY HOLE.	
			110'				Prominent weathered quartz-infilled joint at 85°.		
	Irregular silty interbeds.		114' 7"						
	END OF HOLE						114' 7"		

DRILL RIG 6-A-17

TYPE Boyles BBS-2

DRILLER M. Parcell.

COMMENCED 18-5-64

COMPLETED 29-5-64

PHOTOGRAPHIC REFERENCE:-

Core box:- M 346/6 (Monochrome)
E 610 (Colour)

No core barrel photographs taken.

Sheet 2 of 2

LOGGED E.J. Best.

VERTICAL SCALE 10 feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: Upper Cotter Damsite E. HOLE NO: D.D.14. R.L: 3202'

LOCATION: 81430'S, 48372'W. ANGLE FROM HORIZONTAL: 30° DIRECTION: 280°M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & CORE RECOVERY %	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	DRILLERS' REMARKS.
Slightly weathered fine grained silicified quartz sandstone.	Hard, strong, thickly bedded rock 8" to 1' core lengths, no mode.		NX casing NMLC			Joints are stained black and/or brown. Quartz vein ½" wide.		
	Weathered massive siltstone.		12'6" 13'10"					50% water return.
	From 17'6" to 22'0" irregular silty interbeds are present. Many of these are wavy due to slumping or folding. Bedding at 45°-60°.		20'					20% water return. Lost drilling water at 24'
			26'0" 27'0"			Moderately broken and weathered zone — 2" to 1" fragments. Heavy black staining on joints.		100% water return.
			30'					
	Bedding at 55°. Fresh to weathered, soft, weak laminated siltstone.		34'0" 35'9"			6" of very broken and weathered rock		
Fresh fine grained silicified quartz sandstone — slightly weathered adjacent to major joints.	Hard, strong, thickly bedded rock. 14" to 3" core lengths, mode 4"-6".		40'			Joints are stained brown. A few quartz stringers are present.		
			44'3"					
Slightly weathered silicified laminated siltstone.	Hard strong rock due to silicification 12" to 4" core lengths.		50'6"			Joints are stained brown and black.		70% water return from 50' to bottom of hole.
Fresh, fine grained silicified quartz sandstone grading to quartzite.	Hard, strong, thickly bedded pale grey rock. 12" to 3" core lengths, mode 5"-8". Minute pyrite crystals occur scattered throughout.		60'			Most joints are clean and tight. Major joints are stained brown. Quartz veining with pyrite present from 58'9" to 60'0". Much pyrite between 63'0" & 64'0".		
			65'3"					
Slightly to moderately weathered laminated siltstone.	Soft, moderately strong to weak rock. 8" core lengths to 1" fragments. Bedding at 55°.		69'0"			Joints are stained black & brown.		
			71'6"			Moderately broken zone — 2" core to ½" fragments. Very broken from 72'0".		
Fresh fine grained silicified quartz sandstone, grading to quartzite.	Hard, strong, thickly bedded rock. 10" to 1' core lengths, mode 3"-4"		80'			Most joints are fresh and clean. Quartz veins and stringers occur scattered throughout.		
Slight weathering from 82'9" to 90'3".			90'			Joints are stained black and brown in weathered zone.		
	Silty interbed at 55°.							
Slight weathering from 97'4" to 100'0".						Several quartz veins up to ¼" wide present.		

DRILL RIG: 6-A-18
TYPE: Boyles BBS-2
DRILLER: Tomic & Drinovski
COMMENCED: 21-5-64
COMPLETED: 30-5-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 344 10 to 15 & M 346/2 (B.&W.)
E 611 to 616 (Colour)
No core barrel photographs taken.

Sheet 1 of 3
LOGGED: E.J. Best.

VERTICAL SCALE: 10 Feet : 1 inch.

BUREAU OF MINERAL RESOURCES GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E. HOLE NO D.D.14 R.L. 3202'

LOCATION 81430' S, 48372' W ANGLE FROM HORIZONTAL 30° DIRECTION 280° M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	% CORE RECOVERED	CORE LOSS	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	DRILLERS' REMARKS.
Fresh fine grained silicified quartz sandstone, grading to quartzite. Slight weathering adjacent to major joints.	Hard, strong, thickly bedded rock, medium blue-grey in colour. 9" to 1" core lengths, mode 3"-4". Pyrite occurs scattered throughout rock — is concentrated in some joints and quartz veins. 24" to 2" core lengths, no mode.		NMLC 110' 120' 130' 140' 150' 160' 170' 180' 190'	0 6 12 18+			Major joints are stained brown; others are clean and fresh. Quartz veins and stringers occur throughout. Occasionally joints show striations and slickensides. From 115' most joints are stained brown but adjacent rock is not weathered.		
Slight weathering From 149' 0" to 149' 6"									Very hard drilling.
Slight weathering from 160' 9" to 161' 3"									
Slight weathering from 172' 2" to 172' 8"									

DRILL NO 6-A-18

TYPE Boyles BBS-2

DRILLER Tomic & Driwolski.

COMMENCED 21-5-64

COMPLETED 30-5-64

PHOTOGRAPHIC REFERENCE:-

Core box:- M 346/1,82 and M 344/18 to 21.
E 616 to 621 (Colour)

No core barrel photographs taken.

Sheet 2 of 3

LOGGED E.J. Best.

VERTICAL SCALE 10 feet : 1 inch

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E. HOLE NO D.D.14. R.L 3202'

LOCATION 81430'S, 48372'W ANGLE FROM HORIZONTAL 30° DIRECTION 280°M.

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG (0 6 12 18+)	% CORE RECOVERY	CASING	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	DRILLERS' REMARKS.
As on previous sheet	As on previous sheet.		NMLC				As on previous sheet.		
			209'2"				6" Broken zone: 2" to ½" fragments		
Slight weathering from 207'0" to 208'3".	Bedding at 50°.		210'6"						
Fresh, medium grained, silicified quartz sandstone.	Hard, strong rock. 12" to 3" core lengths. Bedding at 60°.		214'0"				Joints are stained brown.		
Fresh fine grained silicified quartz sandstone, grading to quartzite.	Hard, strong, thickly bedded rock. 10" to 2" core lengths, mode 4"-5". Slight variations in composition are evident as banding at 50°-60°.		220'				Most joints are stained brown. Only a few quartz stringers occur.		
			230'						
	18" to 3" core lengths, mode 12".		240'						
			250'						
			252'11"					DRY HOLE.	
	END OF HOLE						252' 11"		

DRILL NO 6-A-18

TYPE Boyles BBS-2

DRILLER Tomic & Driwalski

COMMENCED 21-5-64

COMPLETED 30-5-64

PHOTOGRAPHIC REFERENCE.

Core box:- M 344/16 to 18 (Monochrome)
E 621 to 623 (Colour).

No core barrel photographs taken.

Sheet 3 of 3

LOGGED E. J. Best.

VERTICAL SCALE 10 Feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT Upper Cotter Damsite E. HOLE NO D.D.15 R.L. 3127'

LOCATION 79385' S, 52229' W ANGLE FROM HORIZONTAL 90° DIRECTION —

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	L.P.I. & ORE RECOVERED	STRUCTURES JOINTS VEINS SEAMS FAULTS CRUSHED ZONES	WATER LEVEL	DRILLERS' REMARKS.
Soil and scree	Orange-brown silty sand soil with scattered fragments and boulders of fine grained silicified quartz sandstone.		NX casing					Soil and sand washed away.
	Fine grained, weathered, silicified quartz sandstone boulder.		8' 9"					
			10' 3"					
			16' 6"					
Slightly to moderately weathered, fine grained silicified quartz sandstone.	Hard, moderately strong thickly bedded rock with several zones containing irregular silty interbeds 6" core lengths to 1" fragments, mostly less than 3" fragments.		NMLC			Joint faces are often covered by thin film of hard white material. Some brown staining present also.		Full water return,
	Silty interbeds at 45°.							
	Silty interbeds at 45°.							
			31' 3"					
			32' 0"			Crushed zone - 1½" to silt sized fragments.		
			34' 3"			1" crushed zone.		
	Silty interbeds at 40°.							
			39' 6"					
Slightly weathered medium grained silicified quartz sandstone.	Hard, strong, thickly bedded rock 6" to 1½" core lengths, made 5"		43' 6"			Joints are stained black & brown Some quartz veining evident.	DRY HOLE	
	END OF HOLE					43' 6"		

DRILL NO 6-A-17
TYPE Boyles BBS-2
DRILLER M. Parcell
COMMENCED 1-6-64.
COMPLETED 2-6-64

PHOTOGRAPHIC REFERENCE:-
Core box:- M 346/3 to 5 (Monochrome)
E 624 to 626 (Colour)
No core barrel photographs taken.

Sheet 1 of 1
LOGGED E. J. Best.

VERTICAL SCALE 10 Feet : 1 inch.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE.

LOCATION: Proposed ski-jump structure on spillway line.

ANGLE FROM HORIZONTAL: 90° DIRECTION: -

COORDINATES: 79229S 51792W R.L. 2985'

HOLE NO. D.D.16.

SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF. NO. CORE BOX	PHOTO REF. NO. CORE BARREL
Fill material.			1' 0"								
Fresh to slightly weathered, fine to medium grained silicified sandstone grading to quartzite in places.	Hard, strong rock. 15" to 2" core lengths.						Joints stained brown and sometimes black.			ISS/16/E627	
	Scattered siltstone fragments oriented at 30° (bedding)		7' 0" 8' 0"								
Moderately weathered from 8'8" to 9'4".	Silty laminae at 30° from 9'6" to 10' 6".										
	Silty laminae at 40° from 16'8" to 18' 4"		20'							ISS/16/E628	
	Silty laminae at 45°-55° from 25'3" to 27'0".						Crushed silty interbeds.				
	Silty interbeds at 25°-30° from 32'0" to 32'9".		30'				Crushed and decomposed silty interbeds.			M409/4	
	Silty interbeds at 30°-40° from 36'6" to 37'7".						1" crushed silty interbed at 35'9"				
	Lenticular silty interbeds at 10°-25° from 40'0" to 40'7".		40'				1" crushed silty interbed at 38'0"	HOLE DRY.		ISS/16/E629	
	Graded bedding at 25°.		44'2"								
	END OF HOLE						44' 2"				

PHOTOS TAKEN

NO

DRILL TYPE: Boyles BBS 2

FEED: Hydraulic

CORE BARREL TYPE: NMLC triple, split inner tube.

DRILLER: J. Wood

COMMENCED: 9-1-65.

COMPLETED: 11-1-66.

LOGGED BY: E.J. Best.

VERTICAL SCALE: 10 feet : 1 inch

NOTES

FRACTURE LOG Number of fractures per foot of core. Zones of core loss are blacked in.

BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

0'0" - 20'0" Full water return

20'0" - 44'2" Half water return

WATER PRESSURE TESTS

PACKER TYPE -

SUPPLY LINE -

VERTICAL SCALE

Figures given are gauge pressures

Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE 5.M.R. 35mm film (Negative Register with frame numbers. e.g. M409/4)

COLOUR S.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE.

LOCATION: Proposed ski-jump structure on spillway line

ANGLE FROM HORIZONTAL: 90° DIRECTION: -

COORDINATES: 79286 S 51852 W R.L. 3011'

HOLE NO: D.D.17.

SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION (LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC)	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES (JOINTS, VEINS, SEAMS FAULTS, CRUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST (Loss in gallons per minute per foot)	PHOTO REF. NO. CORE BOX	PHOTO REF. NO. CORE BARREL
Fill material			NX casing 7' 0"								
Slightly weathered, medium grained, silicified sandstone	Hard strong rock. Irregular siltstone fragments present.		6' 0"				Quartz veins and stringers scattered throughout; also occasional blebs of pyrite.				
Slightly weath. fine grained silic. sstone	Silty interbeds from 7'0".		NMLC 7' 9"				Silty interbeds crushed.				
Slightly weathered fine to medium grained silicified sandstone.	Bedding at 25°-30°. Hard strong rock. Many small siltstone fragments scattered throughout giving mottled appearance. 27" to 3" core lengths.						A few partially open joints lined with terminated quartz crystals are present.	HOLE DRY.		M409/5	M377/7
	3" interbed of moderately weathered siltstone		20' 4"							M377/7	M377/6
			31' 3"							M377/6	M377/5
	END OF HOLE						31' 3"			M377/5	M377/4
										M377/4	M377/3
										M377/3	ISS/16/E634
										ISS/16/E634	

DRILL TYPE: Boyles BBS 2

FEED: Hydraulic.

CORE BARREL TYPE: NMLC triple, split inner tube.

DRILLER: J. Wood.

COMMENCED: 19-1-65

COMPLETED: 20-1-65

LOGGED BY: E. J. Best

VERTICAL SCALE: 10 feet: 1 inch

NOTES

FRACTURE LOG Number of fractures per foot of core Zones of core loss are blocked in

BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

Lost water at 11'2", regained water at 20'11". Full water return thereafter to 31'3"

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

All gures given are gauge pressures
Test sections are indicated graphically by blocked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35 mm film number together with frame number. (e.g. 377/7)

COLOUR B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed quarry on spur forming eastern abutment of dam.

ANGLE FROM HORIZONTAL: 90° DIRECTION: —

COORDINATES: 80223S 50567W RL 3110'

HOLE NO: D.D.18.

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION (LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC)	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES (JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST (Loss in gallons per minute per foot)	CORE BOX	PHOTO REF NO (CORE SHARED)
Fine to medium grained silicified sandstone, slightly to moc	Hard, strong blue-grey rock with mottled appearance when weathered.		NMLC				Joints are mostly planar and are stained black and brown. Pyrite occurs disseminated throughout rock. Occasional concentrations occur as clusters of crystals or as joint infilling.				
	A few silty laminae at 40°		6' 8"								
			7' 6"								
	Bedding at 45°.										
			19' 2"								
Fresh to slightly weathered medium grained silicified sandstone.	Hard, strong rock. 12" to 3" core lengths.		24' 0"								
			25' 8"				4" crushed silty interbed				
Slightly weathered fine grained silicified sandstone	Hard strong rock, 24" to 3" core lengths.		31' 3"								
Mostly silicified siltstone with some fine grained sandstone interbeds. Slightly weathered.	Moderately hard to hard, strong rock. 8" to 2" core lengths						½" interbed of strongly sheared siltstone at 33'0". Also 2" of very sheared rock at 33'8".				
	Bedding at 35°.		39' 0"								
			39' 6"				Crushed zone - ½" frags. to silt				
Fresh rock from 41'0" to 42'4".	Bedding at 25° to 35°.										
			44' 7"								
Fresh quartzite	Very hard and strong rock 12" to 5" core lengths		48' 6"								
Slightly weath. siltst.	Mod. soft, mod. weak rock.		49' 8"				Siltstone sheared adjacent to boundary with quartzite.				
Slightly weathered fine grained silicified sandstone with numerous silty laminae.	Hard, strong rock 14" to 3" core lengths Bedding at 35° Mostly soft siltstone from 53'3"		54' 6"								
Fresh to slightly weathered medium to coarse grained silicified sandstone Entirely fresh rock from 59'0"	Hard, strong rock 10" to 3" core lengths. Bedding at 35°.										
	14" to 5" core lengths. Very hard and strong rock.		60'								
	22" to 10" core lengths.										
			70'								
	Fine grained silicified sandstone with silty laminae at 25°-35°.		72' 9"								
			74' 3"								
	Slightly weathered fine grained silicified sandstone with silty laminae at 15°-30°.		78' 5½"								
			79' 8½"								
			86' 0"					85'	27/1/65.		
Fine grained silicified sandstone with occasional silty laminae. Slightly weathered to 90'0", fresh thereafter.	Very hard, strong rock. Blue grey when fresh, grey-brown when weathered. 21" to 5" core lengths. Bedding at 20°-30°.		87' 7"				5" of crushed, moderately weathered rock between 2 major joints at 50°.				
			96' 10"					92'	7/4/65		
Fresh, fine to medium grained silicified sandstone.	Very hard, strong rock, blue grey in colour. 24" to 3" core lengths.										

DRILL TYPE: Boyles BBS 2

FEED: Hydraulic

CORE BARREL TYPE: NMLC triple, split inner tube.

DRILLED: M. Parcell

COMMENCED: 12-1-65

COMPLETED: 20-1-65

LOGGED BY: E. J. Oest

VERTICAL SCALE: 10 feet : 1 inch

NOTES

FRACTURE LOG - Number of fractures per foot of core shown. Where core loss are blocked in.

BEDDING AND JOINT PLANES - Angles are measured relative to the plane normal to the core axis.

DRILLERS NOTES

0'0" - 7'0" Full water return

7'0" - 46'2" Partial water return

46'2" - 61'5" Very little water return

61'5" - 100'0" No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures

Test sections are indicated graphically by blocked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35m.m. film number together with frame number. (e.g. M372/27)

COLOUR: B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE.

LOCATION Proposed quarry on spur forming eastern abutment of dam.

ANGLE FROM HORIZONTAL 90° DIRECTION —

COORDINATES 80123 S 50567 W R.L. 3110'

HOLE NO. D.D.18.

SHEET 2 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF. NO CORE BOX	PHOTO REF. NO CORE BARREL
Fine to medium grained silicified sandstone. Fresh rock with some slightly weathered patches between 100' and 106'.	Very hard, strong, blue-grey rock. " 14" to 4" core lengths with a 36" stick from 110' to 113'.		NMLC 110' 117'6"							M372/28 M372/29 M372/30 M372/31 M372/32 M372/33	
Poorly sorted fine to coarse grained silicified sandstone	Very hard, strong rock. Bottom 2' very poorly sorted rock with numerous rounded siltstone fragments. Basal rock.		123'10"				Quartz veins present from 122'. 4" broken zone at rock type boundary. (123'8" – 124'0").			M373/11	
Fresh to slightly weath. silic. silty sandstone	Hard strong rock		126'0"								
Fresh siltstone.	Soft, blue grey rock.		127'0"								
	END OF HOLE						127' 0"				

DRILL TYPE Boyles BBS 2

FEED Hydraulic

CORE BARREL TYPE NMLC triple split inner tube

DRILLER M. Parcell.

COMMENCED 12-1-65

COMPLETED 20-1-65

LOGGED BY E.J. Best

VERTICAL SCALE 10 feet = 1 inch

NOTES

FRACTURE LOG Number of fractures per foot of core. Zones of core loss are blacked in.

BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis.

DRILLERS NOTES

100'0" - 127'0" No water return

WATER PRESSURE TESTS

PACKER TYPE —

SUPPLY LINE —

VERTICAL SCALE —

Figures given are gauge pressures. Test sections are indicated green cells by blocked in strata.

PHOTOGRAPH REFERENCE SYSTEM

Black and white B.M.R. 35mm film number together with frame number. (e.g. M373/10)

Colour B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE.

LOCATION: Proposed quarry on spur forming eastern abutment of dam.

ANGLE FROM HORIZONTAL: 90° DIRECTION: -

COORDINATES: 80334 S 50751 W R.L. 3137'

HOLE NO: D.D.19.

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION (incl. fracture, colour, strength, hardness etc.)	GRAPHIC	CASING & SIZE OF CORE	CORE LOSS	% CORE RECOVERY	CASING	WATER LEVEL	WATER LOSS OR TEST (Zones of loss or take, pressure, etc.)	DRILL RATE & REMARKS
Soil and scree			NX casing 2' 8"						
Slightly weathered, fine grained, silicified sandstone.	Hard, strong buff coloured rock. 15" to 3" core lengths with a few scattered broken zones. Graded bedding at 20°.		NMLC 10' 20' 25' 4"						
Sandstone is almost fresh, colour ranging from light brown to grey-green.	Almost fresh grey green, laminated siltstone. Moderately hard and strong rock. 15" to 2" core lengths. Bedding at 10°-20°.		30' 2"						
	Almost fresh laminated siltstone. Moderately hard and strong rock. 12" to 3" core lengths. Bedding at 10°-25°.		31' 10" 39' 6"						
	Thinly interbedded fine grained sandstone and siltstone. Slightly to moderately weathered		39' 8" 42' 6"						
	Almost fresh laminated siltstone		43' 7" 45' 0"						
	2" silty interbed at 46'3". Bedding at 15°.		48' 8"						
	Fresh laminated siltstone. 6" to 1" core lengths. Bedding at 0°-10°		52' 4"						
	6" of slightly weath. siltstone		58' 6"						
6" of fresh rock from 62'6".	Graded bedding at 15°. Silty interbeds at 25°-30°. 2" siltstone band at 66' 1".		68' 8"						
	6" to 3" interbeds of fine grained sandstone and siltstone. Bedding at 30°-40°.		72' 3"						
	Fresh laminated siltstone. 10"-3" core lengths		74' 8" 75' 6"						
	Thinly interbedded fresh sandstone and siltstone. Hard and strong. Bedding at 50°		78' 4" 79' 7"						
	Thinly interbedded, fresh sandstone and siltstone.		81' 6"						
	3" interbed of siltstone at 83'. Bedding at 50°.		86' 1"						
	Thinly interbedded siltstone and sandstone. Bedding at 60°.		88' 5" 91' 5"						
Fresh to slightly weathered interbedded fine grained sandstone and siltstone.	Interbeds range in thickness from laminae to 12" - mostly less than 1". Moderately hard to hard, moderately strong to strong rock. 12" to 2" core lengths.								

Joints are stained black and brown. Dominant joint directions are parallel to bedding and at 80°-90°. Other irregular joints common.

A few quartz stringers occur scattered throughout.

Laminations show much slumping and contortion of bedding. Soft broken zone from 29'0" to 29' 7".

Slumping evident in siltstone.

Some siltstone interbeds crushed to less than ½" fragments.

6" of crushed, weathered siltstone at upper boundary. Slumping evident in siltstone.

M377/1 M377/2 M377/3 M377/4 M377/5 M377/6 M377/7 M377/8 M377/9 M377/10 M377/11 M377/12 M377/13 M377/14 M377/15 M377/16 M377/17 M377/18 M377/19 M377/20 M377/21 M377/22 M377/23 M377/24 M377/25 M377/26 M377/27 M377/28

M313/1 M313/2 M313/3 M313/4 M313/5 M313/6 M313/7 M313/8 M313/9 M313/10 M313/11 M313/12 M313/13 M313/14 M313/15 M313/16 M313/17 M313/18 M313/19 M313/20 M313/21 M313/22 M313/23 M313/24

155/16/E641 155/16/E642 155/16/E643 155/16/E644 155/16/E645

DRILL TYPE: Boyles BBS 2

FEED: Hydraulic

CORE BARREL TYPE: NMLC triple split inner tube.

DRILLER: Wood & McDonald

COMMENCED: 22-1-65

COMPLETED: 25-1-65

LOGGED BY: E.J. Best.

VERTICAL SCALE: 10 feet : 1 inch.

NOTE:

DRILLER'S NOTES

Lost water at 3'

35'9" - 100'0" No water return

WATER PRESSURE TEST:

PHOTOGRAPH REFERENCE SYSTEM: B.M.R. 35mm film number together with frame number. (e.g. M373/25) B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed quarry on spur forming eastern abutment of dam.

ANGLE FROM HORIZONTAL: 90° DIRECTION: -

COORDINATES: 80334 S 50751 W R.L. 3137'

HOLE NO. D.D.19.

SHEET 2 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF NO. CORE BOX	PHOTO REF NO. CORE BARREL
Interbedded sandstone and siltstone (continued)	See previous sheet.		NMLC 103'0" 104'0"				Joints stained black & brown. Crushed zone - ½" fragments to silt.			TSS/16/E644	M3471/1
Almost fresh, fine grained silicified sandstone.	Hard, strong, brown-grey rock. 20° to 2" core lengths.										M3471/33
Fresh, blue grey rock from 109'0" to 110'10".	Silty interbeds at 55°.		110'				From 112'0" to 115'6", irregular quartz veins up to ½" wide occur. Dip approx. 90°.			TSS/16/E645	M3373/25 M3471/34
Patches of medium grained silicified sandstone occur between 117' and 127'.			120'				Quartz veins and stringers present from 116' to 124'. Some are parallel to bedding others are irregular.	118'	1½/2/55		M3471/35
	Thinly interbedded sandstone and siltstone.		127'0" 128'7" 129'6"				Crushed siltstone interbeds.				M3471/36
Fresh laminated siltstone.	Soft, moderately strong dark blue grey rock. 18" to 3" core lengths. Bedding at 45°-50°. Bedding at 50°.						Much minor scale faulting and folding is evident, probably due to slumping.				M3374/2
			144'6"								M3374/3
Fresh fine grained silicified sandstone. Hard strong rock. 15" to 2" core lengths.	7" of fresh laminated siltstone. Silty interbeds at 55°.		145'7" 149'6"				Quartz veins at 45°-55° from 147'. Partially open quartz vein 1" wide at 149'3".			TSS/16/E646	M3374/4
	Fresh laminated siltstone.		150'4"								M3374/5
	END OF HOLE						150'4"			M3373/28	M3374/6

DRILL TYPE: Boyles BBS 2

FEED: Hydraulic.

CORE BARREL TYPE: NMLC triple, split inner tube.

DRILLER: Wood & McDonald

COMMENCED: 22-1-65

COMPLETED: 25-1-65

LOGGED BY: E.J. Best

VERTICAL SCALE: 10 Feet : 1 inch.

NOTES

FRACTURE LOG Number of fractures per foot of core Zones of core loss are blacked in

BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

100'0" - 150'4" No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures
Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm. film number together with frame number (e.g. M373/28)

COLOUR B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed quarry on spur forming eastern abutment of dam.

ANGLE FROM HORIZONTAL: 45° DIRECTION: 050° M.

COORDINATES: 80065S 50384W R.L. 3109'

HOLE NO: D.D.20.

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	DIAMETER (in)	CORE RECOVERY %	CASING	STRUCTURES JOINTS, VEINS SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF CORE BOX / CORE BARREL NO
Soil and scree.			NX casing 4' 0"							
Slightly weathered laminated siltstone	Moderately soft, moderately strong, grey-green rock. 6" core lengths to 2" fragments. Bedding very irregular - 45° to 70°.		NMLC 9' 11"				Minor scale folding and faulting very common. Joints stained black and brown.			ISS/16/E647
	Slightly weathered fine grained, silicified, hard, strong. sandstone.		11' 9"							M373/12 M376/3
	Almost fresh fine grained silicified sandstone. 12" to 4" core lengths.		14' 9" 17' 7"							M373/13 M376/4
	Slightly weathered fine grained silicified sandstone. Hard, strong		19' 7" 21' 8" 22' 4"							ISS/16/E648 M376/5
Slightly to moderately weathered laminated siltstone.	Soft, weak, brown to grey rock. 2" fragments to silty material.		25' 9"				Moderately to very broken rock.			M376/6
Slightly weathered laminated siltstone.	Soft, moderately strong rock 9" to 2" core lengths. Bedding at 30°.		32' 0"				Dominant joint system is parallel to bedding. 2 small crushed zones at 29'4" and 29'8".			M376/7
Fresh, thickly bedded to laminated siltstone. Mostly laminated. Slightly weathered from 37'3" to 39'3". Slightly weathered from 40'6" to 52'1".	Soft, moderately strong rock; blue-grey colour, green-grey when slightly weathered. 9" to 2" core lengths. Bedding at 15° - 20°.		42' 1" 42' 9"				2" crushed zone at 38'9". Moderately broken zone - 2" to ½" fragments.			M373/13 M376/8 ISS/16/E649 M376/9
	Bedding at 20°.									M376/10
	A few thin interbeds of fine grained sandstone occur from 52'0".									M376/11
Slightly weathered from 58'3" to	Bedding at 30°. Bedding at 45° - 60°. Bedding at 50° - 60°						Some slumping evident. Much slumping from 61'0" to 61'9".			M373/14 M376/12
	27" stick of core.									M376/13 ISS/16/E650
Slightly weathered from 69'3" to 73'9".	Bedding at 35°.									M376/14 M376/15
			78' 0"				Much quartz veining and small scale faulting from 78'9" to 80'3". Slumping and small scale folding and faulting is well developed in siltstone from 78'0" downwards.			M373/15 M376/16 ISS/16/E651
	Little regular bedding evident.		88' 0" 88' 9"				Sheared siltstone with many polished shear planes at 60°. Quartz veining with associated pyrite scattered throughout.			M376/17 M376/18
								Probe would not go down hole		M373/16 M376/19

DRILL TYPE: Boyles BBS 2

FEED: Hydraulic

CORE BARREL TYPE: NMLC triple, split inner tube

DRILLER: Parcell & McDonald

COMMENCED: 23-1-65

COMPLETED: 26-1-65

LOGGED BY: E.J. Best.

VERTICAL SCALE: 10 Feet : 1 inch.

NOTES

FRACTURE LOG Number of fractures per foot of core. Zones of core loss are blacked in

BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

0'0" - 13'5" Lost water

13'5" - 100'0" No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures. Test sections are indicated graphically by blacked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M373/16)

COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed quarry on spur forming eastern abutment of dam

ANGLE FROM HORIZONTAL: 45° DIRECTION: 050° M

COORDINATES: 8005b S 5038 4W R.L. 3109'

HOLE NO: D.D.20.

SHEET 2 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION (LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC)	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE	% CORE RECOVERY	CASING	STRUCTURES (JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST (Loss in gallons per minute per foot)	PHOTO REF CORE BOX	PHOTO REF CORE BARREL NO
Fresh laminated siltstone with a few thin interbeds of sandstone and siltstone.	Moderately soft, moderately strong, light to dark blue-grey rock. 12" to 3" core lengths. No regular bedding.		NMLC 110' 116'0"				Much minor scale folding and faulting due to slumping. Most joints are clean - a few are stained brown.			I55/1b/E652 M373/20 M376/21 M376/22 M376/23 M373/17 M376/25 M376/26 M376/27 M373/18 M376/28 M376/24 M376/30 M376/31 M373/19	
Fresh fine grained silicified sandstone.	Hard, strong, blue-grey rock. 15" to 3" core lengths. A few silty interbeds at 15° to 25°. Fresh laminated siltstone at 20°		121'1" 122'5" 123'0"				Most joints are clean - a few are stained brown. Irregular quartz veins and stringers are present.				
Fresh laminated siltstone with a few thin interbeds of sandstone and siltstone.	Moderately soft, moderately strong rock 20" to 1" core lengths Bedding at 25°. Bedding at 35°. Fresh, hard, strong sandstone Fresh, hard, strong sandstone		125'8" 136'8" 138'0" 139'4" 140'8" 141'4"				Joints are clean. A few scattered quartz veins and stringers are present. 4" shear zone with much silty material. Much slumping evident. Small 1" shear zone at 133'0".				
Fresh Fine grained silicified sandstone with some interbeds of siltstone.	Hard, strong, blue-grey rock 20" to 2" core lengths. Fresh, moderately soft, moderately strong laminated siltst. Silty laminae at 40°. Fresh, laminated siltstone. 6" to 1" core lengths. Bedding at 45°. Silty interbeds at 45° - 55°.		146'6" 148'8" 153'1" 155'6" 160'2"								
	END OF HOLE						160' 2"				

DRILL TYPE: Boyles B.B.S 2.

FEED: Hydraulic

CORE BARREL TYPE: NMLC triple split inner tube. Purcell & McDonald.

RUN: 23-1-65. 26-1-65. E.T. Test. 15 feet 7 inch.

FRACTURE LOG: Number of fractures per foot of core. Zones of core loss are blacked in.

BEDDING AND JOINT PLANES: Angles are measured relative to the plane normal to the core axis.

DRILLER'S NOTES

155'0" - 160'2" No water return

WATER PRESSURE TESTS

PACKER TYPE:

SUPPLY LINE:

VERTICAL SCALE:

Figures given are gauge pressures. Test sections are indicated graphically by blacked in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35mm film number together with frame number. (e.g. M373/19)

B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed quarry on spur forming eastern abutment of dam.

ANGLE FROM HORIZONTAL: 90° DIRECTION: –

COORDINATES: 80477 S 50843 W R.L. 3139'

HOLE NO: D.D.21.

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION (Hardness, Colour, Strength, Hardness, etc.)	CASING	DEPTH & SIZE OF CORE	FRACTURE INDEX	CORE RECOVERY %	CORE LOSS	STRUCTURES (JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF NO CORE BOX / CORE BARREL
Fresh to slightly weathered fine grained silicified sandstone. Grades to medium grained in places. From 9'3" to 9'9" rock is very weathered to orange-brown soft sandstone.	Hard, strong, buff to blue-grey rock. 12" to 2" core lengths, mode 8".		NX casing NMLC 10' 16'3"				Joints are mostly planar and are stained black and brown.			I55/16/E655 M373/3 M374/7 M374/8 M374/9
Slightly weathered laminated siltstone.	Moderately soft, moderately strong, grey-green rock 12" core lengths to 2" fragments, mode 2" core lengths. 20'6" Hard, strong, fine grained sandstone 28'6" Regular bedding – no slumping. Bedding at 40°-50° throughout siltstone sequence. 6" interbed of fine gr. sandstone 28'10" 8" interbed of fine gr. sandstone 32'3" 10" interbed of fine gr. sandstone 33'8" 35'10"						4" crushed zone with silt adjacent to boundary. Silt-lined joint at 25'10".			I55/16/E656 M374/10 M374/11 M374/12 M374/13
Slightly weathered fine grained silicified sandstone	Moderately hard to hard, strong, buff coloured rock. 18" to 3" core lengths, mode 8" 39'0" Moderately hard and strong, silicified laminated to thinly bedded siltstone. 42'7" Bedding at 45° 48'11" Laminated siltstone – bedding 45° 50'0" 57'8" 4" siltstone interbed. 60'4"						A few irregular quartz stringers present in sandstone. 4" crushed zone – ½" fragments to silt.			I55/16/E657 M374/14 M374/17 M373/4 M374/18 M374/19
Fresh to slightly weathered laminated siltstone. Interbeds up to 2" thick of massive siltstone and sandstone are scattered throughout. Fresh rock from 88'3".	Moderately hard, moderately strong rock. 12" to 3" core lengths 63'3" 66'1" Fine grained silicified sandst. 65'7" 66'4" Bedding at 45°. 69'5" Fine grained silicified sandstone 70'5" 74'7" Fine grained silicified sandstone grading to medium grained at base. 76'2" Bedding at 50°-55°. 79'2" Fine to medium grained sandstone Siltstone from 80'8" to 81'0" 81'5" 86'6" Sandstone grading from fine grained at top to medium grained at base. Moderately weathered from 87'5" to 87'9" 88'1" Bedding at 50°.									I55/16/E658 M374/20 M374/21 M373/5 M374/22 M374/24 M374/25 M373/6 M374/26 M374/27

DRILL TYPE: Boyles 885 2

FEED: Hydraulic

CORE BARREL TYPE: NMLC triple, split inner tube.

LOGGED BY: Wood & Mc.Donald.

COMMENCED: 25-1-65

COMPLETED: 2-2-65

DRAWN BY: E.J. Best

SCALE: 10 Feet : 1 inch.

FRACTURE LOG: Number of fractures per foot of core. Losses in core less are blocked in.

BEDDING AND JOINT PLANES: Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

Lost water at 4'

16'5" - 100'5" No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures.
Test sections are indicated graphically by blocked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35mm film. number together with frame number. (e.g. M373/6)

COLOUR: B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed quarry on spur forming eastern abutment of dam.

ANGLE FROM HORIZONTAL: 90° DIRECTION: -

COORDINATES: 80477 S 50843 W R.L. 3139'

HOLE NO. D.D.21.

SHEET 2 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE %	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX PHOTO NO.	CORE BARREL PHOTO NO.
Siltstone as from previous page			NMLC 102'6"								
Slightly weathered to fresh fine grained silicified sandstone, becoming med. grained after 123'	Hard, strong buff coloured and pale blue-grey rock. Max core length 18", mode 6", several 1" fragments.		110'				Small 2mm thick quartz veins scattered throughout section from 102'6" - 130'5" Joints throughout stained either dark blue black or yellow brown.	117'	5/2/65	I55/16/E660 M374/30 M374/31 M373/17 M374/32 I65/16/E661 M374/33	
			120'								
			130'5"				4" crushed zone in silty interbed. Dark blue-brown stained joints.	128'	17/3/65		
Mostly fresh laminated siltstone	Fine grained, hard, fresh, pale blue grey sandstone		131'9" 132'9"							M373/18 ND PHOTOS	
	Moderately hard and strong pale blue grey rock, buff coloured at top of bed down to 134'. Max core length 18" mode 6"						Bedding about 45° here Minor slumping in siltstone at 134'8", 136'6" and 140'3"			I55/16/E662 M374/34 M374/35	
			151' 1"							M375/9 M374/36	
	END OF HOLE						151' 1"				

DRILL TYPE: Boyles BBS 2

FEED: Hydraulic

CORE BARREL TYPE: NMLC triple split inner tube.

DRILLER: Wood & Mc.Donald.

COMMENCED: 25-1-65

COMPLETED: 2-2-65

LOGGED BY: G.A.M. Henderson

VERTICAL SCALE: 10 feet : 1 inch

NOTES

FRACTURE LOG: Number of fractures per foot of core. Zones of core loss are blocked in.

BEDDING AND JOINT PLANES: Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

100'0" - 151'1" No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures. Test sections are indicated graphically by blocked in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35mm film number together with frame number. (e.g. M378/8)

COLOUR: B.M.R. colour slide index system.

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed quarry on spur forming eastern abutment of dam

ANGLE FROM HORIZONTAL 90° DIRECTION —

COORDINATES 80300S 50440W (approx) R.L. 3030 (approx)

HOLE NO D.D.22

SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF NO CORE BOX	PHOTO REF NO CORE BARREL
Soil and scree			NX casing 8'0"							NO PHOTOS	
	END OF HOLE (Hole abandoned)						8' 0"				

DRILL TYPE Boyles BBS2

FEED Hydraulic

CORE BARREL TYPE NMLC triple split inner tube

DRILLER M. PARCELL

COMMENCED 2-2-65

COMPLETED 2-2-65

LOGGED BY G.A.M. HENDERSON

VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG :- Number of fractures per foot of core Zones of core loss are blocked in

BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures
Test sections are indicated graphically by blocked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE

COLOUR

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed quarry on spur forming eastern abutment of dam.

ANGLE FROM HORIZONTAL: 90° DIRECTION: –

COORDINATES: 80263 S 50940 W R.L. 3239'

HOLE NO. D.D. 23

SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX	PHOTO REF NO CORE BARREL
Soil and scree											
Moderately weathered sandstone	Buff coloured, hard, strong, medium grained rock becoming coarser towards base. Max. core length 1'0" mode 4"		NX Casing 4'1" NMLC 7'6"				1" Broken zone of mustard yellow fragments				
Moderately weathered sandstone	Buff coloured, hard, strong, fine grained rock: medium grained between 10'0" and 10'6" Max. core length 10", mode 4"		18'10" 20'0" 21'4" 23'4"				Joint surfaces black Broken zones of soft weathered rock 1" and smaller fragments				
Slightly to moderately weathered silicified sandstone	Pale buff coloured, medium grained, hard strong rock. Max. core length 1'10", mode 9"		32'7"				Joint surfaces black				
Fresh quartzite: except where slightly weathered from 38'9" to 39'0"	Pale blue-grey coloured, hard, strong mainly medium grained rock. Max. core length 3'6", mode 1'0"		48'0"								
Slightly to mod. weathered silicified sandstone	Medium grained buff coloured, hard mostly strong rock. Core lengths from 1'6" – 1", mode 6"		50'5" 50'6" 57'9" 58'2"				Broken zone, 1" and smaller fragments. Broken zone where rock weaker. Broken zone in soft silty interbed, 1" and smaller fragments				
Slightly weathered silicified. sandstone	Fine grained buff coloured rock, strong and moderately hard. Core lengths from 1'6" – 2"		61'4" 62'8"				2 4" broken zones with small fragments 3" broken zone with small fragments	HOLE DRY			
	Medium grained sandstone		70'0"								
	Buff coloured siltstone		72'0"								
	Medium grained sandstone		73'4"								
	Buff coloured siltstone		74'7"				Several small quartz veins				
	END OF HOLE		75'1"				75' 1"				

PHOTOS NO

M390/6 M378/16 M378/15 M378/14 M378/13 M390/12 M378/12 M390/7 M378/11 ISS/16/E446 M390/8 ISS/16/E444 M390/7 M378/2 ISS/16/E443

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER Wood & McDonald
COMMENCED 4-2-65
COMPLETED 5-2-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

0'0"-15'9" Water return
15'9"-75'1" No water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blocked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M370/6)
COLOUR B.M.R. colour slide index system.

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed area for stilling basin

ANGLE FROM HORIZONTAL 90° DIRECTION

COORDINATES 79039 S 51629 W R.L. 2925'

HOLE NO D.D.24

SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF. NO CORE BOX	PHOTO REF. NO CORE BOARD
Soil and scree			NX Casing					5'	5/2/65		
Unrelated fragments of moderately weathered sandstone	Fine grained buff coloured, pink and dark grey rock: hard and moderately strong		9'0"								
Sandstone slightly to mod. weathered down to about 25', mostly fresh below this, sl. weathered from 51'6" – 59'3"	Fine grained, buff coloured down to 25' and pale blue grey below. Hard and mod. strong. Core lengths range from 1'4" to 3" mode about 5"		10'4" N.M.L.C. 13'3"				Joints coated black or yellow brown.				
							Broken zone with many small fragments and some larger ones up to 3" in length.				
			20'6" 23'6" 24'6"				Broken zone with many small fragments.				
			30'4" 30'10"				Broken zone with 1" fragments and many smaller ones.				
	Slightly laminated siltstone strong and mod. hard		36'0" 37'7"				36'11"				
			38'5" 39'8"				Broken zones with ½" fragments and smaller				
			42'3" 43'5"				½" fragments				
			45'8"								
	Siltstone interbed		47'2" 47'9"				Broken zones ½" and less fragments and smaller				
							Vertical 1" quartz vein from 56' – 59'3" small fragments				
			55'6" 56'0"								
			59'3"				Small fragments in quartz vein.				
Sandy siltstone, nearly fresh	Pale blue grey and mottled, very extensively slumped, strong and mod. hard rock.		70'11"								
	END OF HOLE						70' 11"				

DRILL TYPE Boyles BBS2

FEED Hydraulic

CORE BARREL TYPE NMLC triple split inner tube

DRILLER M. PARCELL

COMMENCED 3-2-65

COMPLETED 5-2-65

LOGGED BY G.A.M. HENDERSON

VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in.

BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

0'0" - 44'1" Full water return

Lost water at 45'

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures. Test sections are indicated graphically, by blocked in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35 mm film number together with frame number. (e.g. M188/9)

COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed quarry - North Kangaroo Creek.

ANGLE FROM HORIZONTAL 30° DIRECTION 100° M

COORDINATES 814225 4867 3W R.L. 3129'

HOLE NO. DD25

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC.	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX NO.	PHOTO CORE BOX NO.
Mod. weathered fine grained sandstone	Pale blue grey and buff coloured mod. hard and strong rock. Core lengths 5" - 1", mode 4"		NX 1'3" NMLC 3'4"				1'0" 2'0" Broken zones with black and yellow brown coated fragments ranging from 1" to very small.				
Mod. weathered siltstone	Buff coloured, mod. hard, mod. strong to weak rock. Core lengths 7" - 1", mode 3"		5'4" 5'10"				4'0" 5'0" 7'4" 8'4" 9'2" 11'1" 13'0"				
	Fine grained sandstone		7'11"								
Slightly weathered sandstone	Buff coloured to pale blue grey fine grained, mod. hard and strong rock. Core lengths 1'5" - 1", mode 7"		11'9"								
	Soft weak siltstone		13'0"								
	Buff coloured siltstone		14'8" 15'6"								
	Buff coloured siltstone		18'0" 18'4"				17'1" 18'1" 2 1" broken zones in siltstone interbeds				
	Buff coloured siltstone		24'2" 25'1"				25'0" 25'10" 28'10" Broken zones of 3", 2" and 2" in siltstone interbeds				
Laminated siltstone, mostly only slightly weathered except in the broken zones from 41'0"-45'0" and 48'8"-49'0" where mod. to very weathered	Buff coloured to pale blue grey mod. soft fairly weak rock. Core lengths from 7" - 1", mode 3"		29'10" 40'				30'10" 32'0" Moderately broken zone 33'10" Broken zones of 2" and 8" 35'10" 36'11" 37'2" Broken zones of 5", 6", 1'3", 2" and 4'0". 38'6" Fragments coated black and range from 2" to very small in size. 40'6" 45'0" Bedding at 70° 49'10" 50'0" Broken zone 1" and smaller fragments				
Fresh sandstone silicified	Pale blue grey medium grained hard strong rock. Core lengths from 2'0" - 1" mode 10". Contains pyrite		52'6" 53'0"				Quartz veins up to ¼" thick scattered throughout sandstone below 52'0".				
Fresh silicified sandstone	Pale blue grey, fine and medium grained hard and mostly strong rock. Core lengths 1'8" - 2", mode 6". Contains pyrite		63'11"				63'11" 64'3" Broken zone, ¼" and smaller fragments				
	Fresh weak siltstone		64'5" 70'				70'5" 71'0" Broken zone, 1" - ¼" fragments				
			80'				Much quartz between 83'8" and 86'0"				
	Moderately weathered siltstone		86'0" 86'5" 90'				86'0" 89'5" Broken zone, 1" and smaller fragments coated black and yellow brown.				

Probe would not go down hole.

M388/32 M388/31 I55/16/E674 M378/27 M378/26 M378/24 M338/30 M378/23 M378/21 I65/16/E672 M378/20 M378/19 M378/18 I55/16/E671 M378/17

NO PHOTOS

M375/19 M375/18

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER J. Wood
COMMENCED 8-2-65
COMPLETED 17-2-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG:- Number of fractures per foot of core. Zones of core loss are blacked in.

BEDDING AND JOINT PLANES:- Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

0'0" - 9'1" Water return

9'1" - 100'0" No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures
Test sections are indicated graphically by blacked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number: (e.g. M388/32)

COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed quarry - North Kangaroo Creek.

ANGLE FROM HORIZONTAL 30° DIRECTION 100° M

COORDINATES 81422 S 48673 W R.L. 3129'

HOLE NO. D.D.25

SHEET 2 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot
Silicified sandstone as above	Pyrite scattered throughout sandstone in small quantities.		NMLC 110' 120' 130' 140' 150' 160'7"	0 5 10 15 20	0 20 40 60 80 100		102'6" 104'3" Section of weaker rock with 2" core lengths to ¼" fragments, fresh rock 112'8" 113'5" Broken zone, 1" and smaller fragments coated black and yellow brown 139'1" 3" broken zone, 1" and smaller fragments 150'0" 5" broken zone, a few 1" fragments and many very small ones		
END OF HOLE							160' 7"		

CORE BOX: TSS/16/E675 M375/20 M375/21 M388/33 M375/21 TSS/16/E676 M375/23 M375/24 M375/25 M388/34 M375/26 TSS/16/E677 M375/27 M375/28 M375/29 M388/35 M375/30 TSS/16/E678 M375/31

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER J. Wood
COMMENCED 8-2-65
COMPLETED 17-2-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG.- Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES:- Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

100'0" - 160'7" No water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures. Test sections are indicated graphically by blacked-in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M388/36)
COLOUR B.M.R. colour slide index system.

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Outlet portal of diversion tunnel.

ANGLE FROM HORIZONTAL: 80° DIRECTION: 126°M

COORDINATES: 79300 S 51380 W R.L. 2991'

HOLE NO: DD26

SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION (THICKNESS, COLOUR, STRENGTH, HARDNESS, ETC.)	GRAPHIC LOG	DEPTH & SIZE OF CORE	HARDNESS	% CORE RECOVERY	CASING	STRUCTURES (JOINTS, VEINS, SEAMS, FAULTS, RUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST (Loss in gallons per minute per foot)
Laminated siltstone, slightly weathered to almost fresh.	Buff coloured to pale blue grey fairly soft moderately strong rock. Max. core length 14", mode-5". Bedding horizontal		NX Casing 3'0" N.M.L.C. 15'0"				3'0" 4'0" Small fragments between 3" core lengths 5'0" 5'2" 1" of small earthy pieces		
Laminated siltstone, slightly to moderately weathered	Buff coloured fairly soft and weak rock. Max. core length 12", mode 6"		30'				15'2" ½" to very small fragments 17'1" 18'0" 2 3" broken zones with 19'9" ½" and smaller fragments 21'8" 22'10" 1" and smaller fragments 23'10" 24'0" 2 3" zones of 1" to very small fragments 24'11" 25'11" 5" zone of very small fragments 29'4" Zone of almost continuous broken rock 1" - ½" fragments and some very small 32'5" between 30'0" and 31'8" 32'8" 3" core lengths to very 32'11" small fragments 40'8" 40'7" 1" to very small fragments		
Sl. weathered to nearly fresh sandstone	Fine grained moderately hard and strong rock		45'0" 48'0"				48'0" 3 4" core lengths and 1" - ½" fragments in between 51'0" 51'6" 52'11" 4" core lengths to ½" fragments 53'8" 1" zone, ½" - ¼" fragments		
Slightly to mod. weathered laminated siltstone	Moderately soft and fairly weak rock		50'8"						
	Fine grained slightly weathered sandstone		53'0" 55'10"						
Fresh to mod. weathered siltstone	Soft and fairly weak rock								
	Fine grained slightly weathered sandstone		57'7" 58'2" 60'0"				57'8" 58'4" 3" core lengths to very small fragments		
Fresh to slightly weathered sandstone, fine grained, blue grey.	Hard and fairly strong rock		61'11"				62'0"		
	2 5" beds of laminated siltstone		63'5" 66'5"				63'8" 4" to very small fragments 67'0"		
	Fresh to slightly weathered siltstone		68'10"				68'10" 1" to ¼" fragments, not weathered 70'0" 70'3" 2" to very small fragments	72'	14/4/65
	Bedding 10°						72'6" 6" split core length to very 73'2" small fragments		
	Fresh siltstone		77'1" 77'5"				73'1" 74'9" 1" to very small fragments		
	Slightly weathered siltstone		79'6" 80'0" 82'7"				Small 1cm quartz veins scattered throughout sandstone		
	Slightly to very weathered siltstone		85'0" 88'9"				83'6" 83'8" 4" split core lengths to ½" fragments		
	Almost fresh siltstone		94'8" 96'8"				91'9" 93'0" 1" to ¼" fragments		
	Siltstone, almost fresh med. hard and strong		97'2" 100'2"						

END OF HOLE 100' 2"

WATER PRESSURE TEST: 0, 1·0, 2·0, 3·0

CORE PHOTOS: I55/16/E679, M388/7, I55/16/E680, PHOTOS, M388/6, M379/5, I55/16/E681, M379/6, M379/7, I55/16/E682, M379/8, M379/9, M388/5, M379/10, I55/16/E683, M379/11, M379/12, M388/4, NO PHOTO, M379/13, I55/16/E684, M379/14, M379/15, M388/3, M379/16, M379/17, M379/18, M379/19

DRILL TYPE: Boyles BBS2

FEED: Hydraulic

CORE BARREL TYPE: NMLC triple split inner tube

DRILLER: PARCELL & McDONALD

COMMENCED: 16-2-65

COMPLETED: 21-2-65

LOGGED BY: G.A.M. HENDERSON

VERTICAL SCALE: 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blocked in.

BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

Lost water at 7'6"

12'2" - 100'2" No water return

WATER PRESSURE TESTS

PACKER TYPE: NX hydraulic

SUPPLY LINE: NX rod

VERTICAL SCALE: 100 p.s.i. : 1"

Figures given are gauge pressures.

Test sections are indicated graphically by blocked-in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35mm film number together with frame number. (e.g. M388/4)

COLOUR: B.M.R. colour slide index system: all numbers should be prefixed by I55/16/

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Outlet portal of diversion tunnel.

ANGLE FROM HORIZONTAL: 0° DIRECTION: 126° M

COORDINATES: 79178 S 51493 W R.L. 2920'

HOLE NO. D.D.27

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC.	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX
Sandstone, slightly weathered	Pale blue grey, fine grained hard strong rock. Max core length 15", mode 8"		NX 6'0"							
Sandstone, slightly to moderately weathered	Pale blue grey to pale buff coloured, fine to medium grained, hard, strong rock. Max. core length 10", mode 5"		8'0" NMLC 10'0"							
Sandstone, moderately weathered	Pale buff coloured, medium to coarse grained, hard, strong rock. Fine grained sandstone		13'7" 16'3" 16'0"							
Sandstone, moderately weathered	Buff coloured, fine grained moderately strong and hard rock. Max. core length 14", mode 4" Medium to coarse grained sandstone		19'0" 21'1"				16'5" 17'9" 4" split core lengths to ½" fragments; 21'1" 22'0" 4" core length between 1" to very small fragments; 24'0" 25'5" 3" zone of 1" to ½" pieces; 27'5" 29'6" 29'8" 30'0" 30'5" Broken zones of 4", 2", 12", and 8" with 2" to very small fragments			
	Sandy siltstone		28'6" 29'8"							
	Siltstone interbed		32'5" 32'9"				33'2" Broken zones of 9", 5" and 4"; 1" to small earthy fragments			
	Bedding at 20° Fairly soft siltstone		35'7" 35'11"				35'6" 36'1" Broken zones of 2", 2", 2" and 4"; ½" to ¼" fragments			
	Moderately hard siltstone		38'1" 40'0" 41'10"				40'0" 1" to ½" fragments, 4" zone; 42'2" 44'0" 3" core lengths to very small fragments			
Siltstone, laminated, slightly to moderately weathered	Buff coloured to pale blue-grey moderately soft and weak rock. Maximum core length, 7", mode 4" Fine grained sandstone		44'0" 44'6"				45'0" 2" to very small fragments; 48'6" 49'0" 1" to ½" fragments; 51'5" 51'8" 52'10" ¼" to very small fragments; 55'0" 2" to very small fragments			
	Bedding at 45°		56'1"				57'2" 57'7" 3' 2" zones of 1" to very small fragments			
Sandstone, slightly weathered	Buff coloured to pale blue grey, fine grained, mod. hard, strong rock. Maximum core length 11", mode 6"		63'10"				63'10"			
Siltstone, laminated, slightly to moderately weathered	Buff coloured to pale blue-grey, moderately soft, weak rock. Maximum core length 6", mode 3" Bedding at 40°						65'0" 66'0" 67'11" Broken zones of 14", 5" and 5" with 1" to very small fragments; 69'2" 69'6" 2" to ½" fragments; 70'6" 71'0" 2" to very small fragments; 71'6" 76'0" 2"-3" core lengths with ½" to very small fragments at each joint; 76'6" 77'0" 3" core lengths to ½" fragments, many quartz veins			
	Buff coloured, fine grained sandstone		75'7" 78'0"							
	Fine grained sandstone		80'0" 80'11" 82'0"				80'0" 81'3" 2 2" zones with ½" to very small fragments			
Siltstone, laminated, fresh.	Pale blue-grey, moderately soft, weak rock. Maximum core length 4", mode 2" Bedding at 25°		89'2"				82'2" 86'5" 3"-1" core lengths with broken zones of ½" fragments at most joints; 88'6" 89'2" 1" core lengths to very small fragments			
Sandstone, fresh.	Pale blue-grey, fine to medium grained, hard, strong rock. Maximum core length 48", mode 12"									

M390/16 M391/4 M391/8 M391/7 M391/6 M391/5 M391/4 M391/3 M390/17 M391/2 M390/15 M391/1 M390/14 M390/13 M379/22 M379/28 M379/26 M379/27 M379/25 M379/24 M379/23 M379/21 M379/20 M379/32 M379/33 M379/34 M379/35 M379/36 M379/37 M379/38 M379/39 M379/40 M379/41 M379/42 M379/43 M379/44 M379/45 M379/46 M379/47 M379/48 M379/49 M379/50 M379/51 M379/52 M379/53 M379/54 M379/55 M379/56 M379/57 M379/58 M379/59 M379/60 M379/61 M379/62 M379/63 M379/64 M379/65 M379/66 M379/67 M379/68 M379/69 M379/70 M379/71 M379/72 M379/73 M379/74 M379/75 M379/76 M379/77 M379/78 M379/79 M379/80 M379/81 M379/82 M379/83 M379/84 M379/85 M379/86 M379/87 M379/88 M379/89 M379/90 M379/91 M379/92 M379/93 M379/94 M379/95 M379/96 M379/97 M379/98 M379/99 M379/100 M379/101 M379/102 M379/103 M379/104 M379/105 M379/106 M379/107 M379/108 M379/109 M379/110 M379/111 M379/112 M379/113 M379/114 M379/115 M379/116 M379/117 M379/118 M379/119 M379/120 M379/121 M379/122 M379/123 M379/124 M379/125 M379/126 M379/127 M379/128 M379/129 M379/130 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DRILL TYPE: Boyles BBS2
FEED: Hydraulic
CORE BARREL TYPE: NMLC triple split inner tube
DRILLER: PARCELL & McDONALD
COMMENCED: 23-2-65
COMPLETED: 6-3-65
LOGGED BY: G.A.M. HENDERSON
VERTICAL SCALE: 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in.

BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

0'0"-16'10" Water return

16'10"-21'10" 60% water return

Hole caved at 17'0", 33'0", 54'0", 70'0"

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures. Test sections are indicated graphically by brackets in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M390/16)

COLOUR B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Outlet portal of diversion tunnel

ANGLE FROM HORIZONTAL: 0° DIRECTION: 126 M

COORDINATES: 79178 S 51493 W R.L. 2920'

HOLE NO. D.D.27

SHEET 2 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION (LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC)	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES (JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST (Loss in gallons per minute per foot)
Sandstone, as above			102'11"						
Siltstone, fresh to slightly weathered, laminated	Buff coloured to pale blue-grey moderately soft, weak rock. Maximum core length 10", mode 6"		105'0"						
	Moderately hard and strong sandy siltstone		107'9"				108'1" 2" core length to very small fragments 105'1"		
							111'9" Several 3"-1" core lengths with 1" to ¼" fragments 118'8" 114'8"		
	Moderately hard and strong sandy siltstone		115'0"						
			117'0"						
	Bedding at 65°						124'6" 2" to ¼" fragments 125'0"		
							127'0" 2 3" core lengths with 1" 128'8" to very small weathered fragments		
			130'						
			144'6"						
	Moderately hard and strong fine grained sandstone		145'6"				147'3" 1" to ¼" fragments 146'6"		
							149'0" 1" to very small fragments 148'6"		
Sandstone, fresh to slightly weathered.	Buff coloured to pale blue-grey, fine grained, hard moderately strong rock. Maximum core length 15", mode 6".		160' 0"				Many quartz veins in sandstone 158'0" 2" to ¼" fragments 159'5"		
	END OF HOLE						160' 0"		

CORE BOX: M390/18 M391/11 M391/12 M391/14 M391/15 M391/16 M391/17 M391/18 M391/19 M391/20 M391/21 M391/22 M391/24

DRILL TYPE: Boyles BBS2
FEED: Hydraulic
CORE BARREL TYPE: N.M.L.C. triple split inner tube
DRILLER: PARCELL & McDONALD
COMMENCED: 23-2-65
COMPLETED: 6-3-65
LOGGED BY: G.A.M. HENDERSON
VERTICAL SCALE: 10' : 1"

NOTES

FRACTURE LOG :- Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

Hole caved in at 115'0"-120'0", 125'0"-127'0", 135'0", 140'0"

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35mm film number together with frame number. (e.g. M390/22)
COLOUR: B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed quarry - South Kangaroo Creek

ANGLE FROM HORIZONTAL: 30° DIRECTION: 082° M

COORDINATES: 81995S 48469W R.L. 3160'

HOLE NO. D.D28

SHEET 1 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot
Sandstone rubble, slightly to moderately weathered	Buff coloured, pinkish and pale blue-grey, hard rock. Medium grained.		NX 7'9"						
Sandstone, slightly weathered to nearly fresh	Pale blue-grey, hard strong rock. Max. core length 15", mode 6" Medium grained.		9'0" NMLC 13'8"				13'8" 1" to very small weathered fragments		
Sandstone, laminated, slightly weathered	Buff coloured to pale grey fine grained, hard but fairly weak rock. Max. core length 6", mode 2"		20'0"				14'0" 16'2" 3" core lengths to ¼" fragments 20'0"		
Sandstone, fresh to slightly weathered:	Pale blue-grey, medium grained, hard and mostly strong rock. Max. core length 24", mode 9"		30'				26'4" 28'8" 2" core lengths to very small fragments 32'6" 33'1" 3" core length to very small fragments		
	Slightly weathered fine grained sandstone		39'5" 40'8"						
Mainly fresh below 42'			50'				51'9" 51'11" Broken zone at quartz vein. 1" to very small fragments.		
	Fresh fine grained sandstone		57'2" 60'6"				Slickensiding on many joints throughout sequence		
	Fresh fine grained sandstone		65'0" 68'0"						
							72'1" 72'3" 1" to ¼" fragments 76'9" 76'11" 1" to ¼" fragments		
			80'8"						
Sandstone, fresh	Pale blue-grey, fine to medium grained, hard strong rock.		90'				89'9" 90'0" Crush zone with slickensides 1" to very small pieces 99'0" 99'14" Slickensided fragments, ¼" core length to small pieces	Probe would not go down hole	

COMPRESSIVE STRENGTH: ISS/16/E694 M390/2 M390/3 M390/4 M390/5 ISS/16/E695 M390/6 M390/7 M390/8 M390/9 ISS/16/E696 M390/10 M390/11 M390/12 ISS/16/E697 M390/13 M390/14 M390/15 M390/16 M390/17 ISS/16/E698 M390/18 M390/19 M390/20

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER WOOD & McDONALD
COMMENCED 21-2-65
COMPLETED 4-3-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in

BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

0'0"-14'0" Water return

14'0"-100'0" No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures
Test sections are indicated graphically by blacked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M390/10)

COLOUR B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed quarry – South Kangaroo Creek

ANGLE FROM HORIZONTAL: 30° DIRECTION: 082° M

COORDINATES: 81995 S 48469 W R.L. 3160'

HOLE NO. D.D 28

SHEET 2 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF. CORE DRY	PHOTO REF. CORE WET
Sandstone as above, fresh	Pale blue grey, fine to medium grained hard, strong rock. Max. core length 34", mode 9"		NMLC		0 20 60 100						
			110'				112'4" / 112'6" 1" to very small fresh fragments				
							117'3" / 117'7" 2" to very small fresh fragments				
			120'				122' ¼" quartz vein				
			130'				Pyrite on some fracture surfaces				
			140'								
			150'				152'0" / 152'6" 2 ± zones of ± to very small fragments				
Soft, weak, fresh siltstone			160' 161'4" / 161'10"				161'4" / 161'10" 1½" to very small fresh fragments				
Hard, slightly laminated sandy siltstone			171'9" / 172'10"								
Laminated siltstone			188'4" / 188'10"								
Moderately hard sandy siltstone with a few laminations			193'2" / 198'6"								

ISS/16/E699 M390/26 ISS/16/E700 M390/27 ISS/16/E701 M390/12 ISS/16/E702 M390/28 ISS/16/E703 M390/29 M398/1 NO PHOTOS NO PHOTOS

M380/22 M380/23 M380/24 M380/25 M380/27 M380/28 M380/29 M380/30 M380/31 M380/33 M380/34 M380/35 M380/36 M380/37

DRILL TYPE Boyles BB52

FEED Hydraulic

CORE BARREL TYPE NMLC triple split inner tube

DRILLER Wood & McDonald

COMMENCED 21-2-65

COMPLETED 4-3-65

LOGGED BY G.A.M. HENDERSON

VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG Number of fractures per foot of core Zones of core loss are blacked in

BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

100'0" - 200'0" No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures
Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M390/29)

COLOUR B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed quarry - South Kangaroo Creek

ANGLE FROM HORIZONTAL 30° DIRECTION 082° M

COORDINATES 81995 S 48469 W R.L. 3160'

HOLE NO. DD28

SHEET 3 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC.	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX	PHOTO REF. CORE BOX	PHOTO REF. CORE BARREL
Sandstone as above			208'3"				200'0" 8" Quartz vein					
	Fresh, hard, moderately strong sandy siltstone		218'11"									
			219'2"									
Siltstone, fresh, laminated in places.	Pale blue-grey, moderately hard and strong rock. Maximum core length 10", mode 4". Bedding at 45°		232'10"									
	Hard fine grained sandstone		233'0" 233'10"									
	END OF HOLE						235'10"					

M155/16/E704 M328/12 M328/13 M328/14 M390/20 M328/15 M328/16 M155/16/E705 M328/17 M390/21 M328/18

DRILL TYPE Boyles BBS2

FEED Hydraulic

CORE BARREL TYPE NMLC triple split inner tube

DRILLER WODD & McDONALD

COMMENCED 21-2-65

COMPLETED 4-3-65

LOGGED BY G.A.M. HENDERSON

SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blocked in.

BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

200'0" - 235'10" No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures

Test sections are indicated graphically by blocked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M390/21)

COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Inlet portal of diversion tunnel.

ANGLE FROM HORIZONTAL: 55° DIRECTION: 210° M

COORDINATES: 80319 S, 51606 W. R.L. 3000'

HOLE NO. D.D.29

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC.	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX	PHOTO NO. CORE BARREL
Soil and scree			5'0"						0 1·0 2·0 3·0	155/16/E706	M409/6
Sandstone, mod. to very weathered.	Buff coloured, fine grained mod. hard, mod. weak rock. Very weathered soft siltstone		7'3" 7'6" 9'2" 10'2"				7'2" 8 6"-2" core lengths interspersed with 2" to very small fragments				
Sandstone, slightly to mod. weathered.	Buff coloured to pale blue grey, mod. hard and strong rock. Max. core length 8", mode 6". Slightly weathered siltstone		15'0" 22'1" 23'11"				18'2" 17'3" 2" to ¼" fragments 17'8" 19'2" ¼" to ¼" fragments 20'3" ¼" to very small pieces 21'10"			155/16/E707	M390/37
Siltstone, laminated, slightly weathered.	Buff coloured to pale blue grey, mod. soft and weak rock. Max. core length 8", mode 2". Bedding at 40°		29'9"				3" split core lengths to ¼" fragments 28'0" 29'2" 2" to ¼" fragments 29'8"			155/16/E708	M390/36
Sandstone, slightly weathered	Buff coloured to pale blue grey, fine grained, mod. hard and strong rock. Max. core length 12", mode 6". Laminated siltstone Laminated siltstone		44'5" 46'8" 47'8" 49'1" 50'2"				32'10" 5" to 3" core lengths with 34'2" 1" to ¼" fragments 36'1" 2" to ¼" fragments 36'11" 38'4" 39'2" 2" to very small fragments 41'9" ¼" to ¼" fragments 42'0" 45'4" 1" to ¼" fragments in 47'6" 3 1" zones 47'8" ¼" to small earthy pieces 49'9" 3 3" core lengths with 2" to very small fragments			155/16/E709	M390/36
Siltstone, laminated, fresh to slightly weathered.	Buff coloured to pale blue grey, mod. soft and weak rock. Max. core length 11", mode 4". Bedding at 20° Fresh below 65'. Slightly stronger below 73'		60'0" 70'0" 80'0"				52'2" 2" core lengths to very small fragments 53'2" 1" to ¼" fragments 56'1" 2" to very small fragments 56'11" Several 4"-2" split core lengths with 1" to ¼" fragments. Very broken between 55'2" and 57'2" 59'0" 62'1" 4" to 1" core lengths with 64'1" 1" to ¼" fragments 65'3" 1" to ¼" fragments 66'6" 2" to ¼" fragments 67'1" 1" to very small fragments 68'1" 3" core length with 2" to ¼" fragments. 69' 25/3/65 72'2" 72'11" 3" to very small fragments 77'0" 77'8" 2" to ¼" fragments 83'0" 84'4" 85'6" 1" to very small fragments 3" to 1" pieces with small fragments on joints		0 5 25 50 75 100 125 150	155/16/E710	M390/35
	Fine grained sandstone		91'5" 92'6"				90'11" 2" to ¼" fragments 91'2" 99'6" 3"-¼" fragments		0 5 25 50 75 100	155/16/E711	M390/34 M390/12 M390/13

DRILL TYPE: Boyles BB52
FEED: Hydraulic
CORE BARREL TYPE: NMLC triple split inner tube
DRILLER: McDONALD & LUCAS
COMMENCED: 21-3-65
COMPLETED: 24-3-65
LOGGED BY: G.A.M. HENDERSON
VERTICAL SCALE: 10' : 1"

NOTES

FRACTURE LOG:- Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

0'0" - 15'0" Water return
15'0" - 100'0" No water return

WATER PRESSURE TESTS

PACKER TYPE: NX mechanical
SUPPLY LINE: NX rod
VERTICAL SCALE: 100 p.s.i. : 1"
Figures given are gauge pressures
Test sections are indicated graphically by blacked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35mm film number together with frame number (e.g. M390/34)
COLOUR: B.M.R. colour slide index system

PHOTOS ND

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Inlet portal of diversion tunnel.

ANGLE FROM HORIZONTAL 55° DIRECTION 210° M

COORDINATES 80319 S, 51606 W R.L. 3000'

NO. D.D. 29

SHEET 2 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX NO.	PHOTO CORE BOX NO.
Siltstone, as above.									1.00 1.25 1.50 1.75 2.00	M310/33	M389/14 M389/15 M389/16
	Fine grained sandstone		105'9" 107'0" 110'0"								
	END OF HOLE						110' 0"				

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER McDONALD & LUCAS
COMMENCED 21-3-65
COMPLETED 24-3-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG Number of fractures per foot of core Zones of core loss are blacked in
BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

100'0"- 110'0" No water return

WATER PRESSURE TESTS

PACKER TYPE NX mechanical
SUPPLY LINE NX rod
VERTICAL SCALE 100 p.s.i. : 1"
Figures given are gauge pressures
Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M389/18)
COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Inlet portal of diversion tunnel.

ANGLE FROM HORIZONTAL 30° DIRECTION 030°M

COORDINATES 80433 S, 51710 W R.L. 2950

HOLE NO. DD30

SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC.	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot
Sandstone, moderately weathered	Buff coloured, medium grained, hard, moderately strong rock. Max. core length 10", mode 5".		NX 3'0" NMLC 5'11"						
	Laminated siltstone		6'2" 8'0"						
	Fine grained sandstone		9'6"				16'9" 5" split core length to ½" fragments 17'3"		
Siltstone, mod. weathered	Laminated, buff coloured, mod. soft and weak rock.		19'9"						
			21'9"				21'5" 1½" core length to very small fragments 21'9"		
Sandstone, slightly weathered to almost fresh	Buff coloured to pale blue grey fine grained, moderately hard and strong rock. Max. core length 9", mode 5"		27'1"				27'4" 1" to very small earthy fragments 27'6"		
Sandstone, slightly weathered	Buff coloured to pale blue grey medium grained, hard and moderately strong rock.		31'0"				31'0"		
Siltstone, laminated, moderately weathered	Buff coloured, soft, weak rock. Maximum core length 5", mode 2"		37'2"				4" core lengths to very small fragments. Very broken between 33'6" and 35'0" 35'0" 36'8" 37'0" 1" to ½" fragments		
Sandstone, mod. weathered.	Buff coloured, medium grained, mod. hard and strong.		40'0"						
Sandstone, slightly weathered	Buff coloured to pale blue grey fine grained, mod. hard and strong rock.		44'7"					45' 17/3/65	
Siltstone, irregular laminations, slightly weathered	Pale blue grey, mod. soft and weak rock. Max. core length 7", mode 4"		59'4"				44'10" 3" core length with 2" to very small fragments 48'2" 52'5" 2" core lengths to ½" fragments 55'1" 57'1" 2 ½" zones of 2" to ½" fragments 58'8"		
Silty sandstone, slightly weathered.	Pale blue grey, very fine grained, mod. hard and strong rock. Max. core length 9", mode 5"		67'8"				61'3" 1" core lengths to ½" fragments 61'8" 64'0" 2" to ½" fragments 66'5" 67'3" ½" zones of ½"-¼" fragments 67'10"		
	Laminated siltstone		69'8"				1" to ½" fragments, 4" zone 69'5" 9" zone, 2" core lengths to ½" fragments		
Siltstone, laminated, fresh.	Pale blue grey, moderately soft and weak rock. Max. core length 14", mode 5".		71'6"				71'11" 2" core lengths to ½" fragments 73'10"		
			88'0"				83'1" 2" to ½" fragments 83'6" 88'1" 3" split core length with 1" to ½" fragments 88'0"		
	END OF HOLE						88' 0"		

WATER PRESSURE TEST: 0 — 1·0 — 2·0 — 3·0

5 — 29 — 50 — 75 — 92 — 75 — 50 — 25 — 5

CORE BOX PHOTO REF: ISS/16/E714 M392/19; ISS/16/E713 M392/20 M392/21 M392/22 M392/23 M392/24 M392/25; ISS/16/E714 M392/26 M392/27 M392/28; ISS/16/E715 M392/1 M392/2 M392/3 M392/4; ISS/16/E716 M392/5 M392/6 M392/7 M392/8; NO PHOTO

DRILL TYPE Boyles BB52
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER M. PARCELL & LUCAS
COMMENCED 8-3-65
COMPLETED 18-3-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

0'0" - 39'11" Water return
39'11" - 47'9" Half water return

WATER PRESSURE TESTS

PACKER TYPE NX mechanical
SUPPLY LINE NX rod
VERTICAL SCALE 100 psi : 1"
Figures given are gauge pressures
Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M392/2)
COLOUR B.M.R. colour slide index system

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Valve tower shaft

ANGLE FROM HORIZONTAL 90° DIRECTION -

COORDINATES 80238 S, 51527 W R.L. 3023'

HOLE NO. D.D.31

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF NO CORE BOX	PHOTO REF NO CORE BARREL
				0 6 18	0 20 60 100				0 1·0 2·0 3·0		
No core			6'0"								
Sandstone, moderately to very weathered	Buff coloured, fine grained mod. hard, mod. weak to mod. strong rock. Max. core length 14", mode 6".		NMLC				7'8" 2", 4" and 2" zones of 1" to ¼" fragments		Vertical Scale 100 p.s.i. : 1"		
	Mod. weathered laminated siltstone Bedding at 90°		10'0"				13'5" 3" split core length to very small earthy pieces				
			14'4"				15'0"				
	Mod. weathered laminated siltstone Bedding at 40°		18'6"				19'0" 2" to very small earthy fragments.				
			23'0"				23'0" 2 2" zones of 1" to very small earthy fragments				
	Mod. weathered laminated siltstone		26'0"				26'2" 2" core lengths to very small fragments				
			28'3"				28'3"				
	Very fine grained silty sandstone, moderately soft		31'2"				32'9" 2" to ¼" fragments				
			34'8"				33'11" 35'0" 3" core lengths to 1" pieces				
	Soft siltstone		38'0"				35'6" ¼" to ½" fragments				
			38'7"				37'7" 4" split core lengths to very small fragments				
							40'8" 1" to very small fragments				
							41'0"				
							42'4" ½" to very small pieces				
							43'1"				
	Very fine grained silty sandstone, moderately hard		45'5"				45'6" 1" to very small fragments				
			48'9"				46'5" 47'10" 2" to very small earthy fragments				
			50'4"								
Sandstone, mostly fresh.	Pale blue grey hard, strong, fine grained rock. Max. core length 12", mode 8"										
	Moderately soft laminated siltstone		64'6"								
			66'6"								
			67'2"								
Siltstone, fresh to slightly weathered, irregular laminations. Contains several thin beds of fine grained sandstone up to 4" in thickness	Buff coloured to pale blue grey, moderately soft and weak rock. Max. core length 7", mode 4".		67'9"				69'7" Small fragments on joints 71'6" spaced at 1" - 3"				
							73'4" 74'7" 1" to very small fragments				
							75'3" 74'3" 4" split core length to ½" fragments				
			79'4"				78'3" 78'10" 3" split core length to very small fragments	80'	7/4/65		
Sandstone, fresh to slightly weathered.	Buff coloured to pale blue grey, hard, moderately strong rock. Max. core length 7", mode 5"		84'8"				84'8" 85'1" 2" to very small fresh fragments				
Siltstone, laminated, fresh	Blue grey, mod. soft, mod strong rock. Max. core length 20", mode 8". Bedding at 75°		89'6"								
	Fresh fine grained hard, strong sandstone		93'0"								
			96'3"								
	Fine grained sandstone		97'7"								

Vertical Scale 200 p.s.i. : 1"

ISS/16/E717 M390/5 No PHOTOS
ISS/16/E718 M407/13 M390/19 M390/22 M397/1 M397/2 M397/3 M397/4
ISS/16/E719 M407/12 M397/5 M397/7 M397/8 M397/9 M397/10 M397/11 M397/12
ISS/16/E720 M397/14 M397/15 M397/16 M397/17

DRILL TYPE Boyles BB52
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER PARCELL & LUCAS
COMMENCED 30-3-65
COMPLETED 2-4-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in.

BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

0'0" - 96'1" Water return

96'1" - 100'0" Half water return

WATER PRESSURE TESTS

PACKER TYPE NX mechanical

SUPPLY LINE NX rod

VERTICAL SCALE See above

Figures given are gauge pressures. Test sections are indicated graphically by blacked-in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M407/11)

COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Valve Tower shaft.

ANGLE FROM HORIZONTAL 90° DIRECTION –

COORDINATES 80238 S, 51527 W R.L 3023'

HOLE NO D.D. 31

SHEET 2 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX	PHOTO REF. NO. CORE BARREL
Siltstone, as above	Bedding at 80°		102'6"				100'0" 6" split core length with 101'6" ½" to very small fragments		0 1·0 2·0 3·0	M407/10	M339/18
Sandstone, slightly weathered to fresh.	Buff coloured to pale blue grey, hard, strong rock. Max. core length 15", mode 7"		105'10" 106'8"				105'8" 5 3" to 5" core lengths 107'0" with 1" to very small pieces			M407/11	M339/24
	Laminated siltstone						110'0" 1" to ½" fragments 110'3"			M407/12	M339/25
			113'0"							M407/13	M339/26
	Laminated siltstone Bedding at 60°		114'5" 114'6" 115'1"				114'2" 1" to very small fragments 115'1"			M407/14	M339/27
							119'4" 1" to ½" fragments 119'6"			M407/15	M339/28
	Siltstone Bedding at 70°		129'0" 130'0"				129'0" 4" split core length to 130'0" very small fragments				
	END OF HOLE						130' 0"				

DRILL TYPE Boyles BBS 2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER PARCELL & LUCAS
COMMENCED 30-3-65
COMPLETED 2-4-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG Number of fractures per foot of core Zones of core loss are blacked in
BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

100'0" - 110'0" Half water return
110'0" - 130'0" No water return

WATER PRESSURE TESTS

PACKER TYPE NX mechanical
SUPPLY LINE NX rod
VERTICAL SCALE 200 p.s.i. : 1"
figures given are gauge pressures
test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M427/1)
COLOUR B.M.R. colour slide index system.

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BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed Quarry, on east side of Cotter 0.8 M upstream from dam axis

ANGLE FROM HORIZONTAL 90° DIRECTION

COORDINATES 849616 52170 W R.L. 3331'

HOLE NO. D.D.32

SHEET 1 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX & PHOTO REF.	CORE BOX & PHOTO REF.
Siltstone, rubble slightly to mod. weathered	Buff coloured. 5 core lengths up to 4",		NX 5' 0"								
Siltstone, laminated, mod. weathered to almost fresh	Buff coloured to pale blue grey, moderately soft and weak rock. Max. core length 10", mode 6"		NMLC 12'7"				4'10" Broken zones @ 5", 5" and 9". 2" to very small pieces; 9'5"; 11'1" 1" to very small fragments; 11'5"; 12'10" 2, 6" broken zones, 2" core lengths to small earthy fragments; 14'2"			M407/8	T55/16/E722 M391/25 M391/26
	Sandstone, mod. weathered, fine grained, buff coloured to pinkish.		12'7" 13'10" 15'7" 16'2" 17'8" 18'8"				17'5" 2" core lengths to ¼" fragments 19'0"; 21'5" 2" split core length to ¼" fragments 21'9"			M407/7	T55/16/E723 M391/27 M391/28 M391/29
Sandstone, slightly to mod. weathered	Very pale blue grey to buff coloured, fine grained, hard, moderately strong rock.		22'5" 27'4"				27'2" ¼" to small earthy fragments 27'6"			M407/7	M391/31
Siltstone, laminated, fresh to slightly weathered	Buff coloured to pale blue grey, moderately hard and strong rock. Max. core length 16", mode 6" Bedding at 30°		35'6" 36'7" 39'0" 40'0" 40'11"				38'5" 1" to ¼" fragments 38'7"; 40'11" 1" to ¼" fragments 41'1"			M407/7	M391/32
Sandstone, laminated, slightly to mod. weathered	Buff coloured to pale blue grey, very fine grained, mod. hard and strong rock. Not laminated below 45'0"		46'6"				45'11" ½" to ¼" fragments 46'2"			M407/6	T55/16/E724
Siltstone, laminated with many thin fine grained sandstone bands, slightly to moderately weathered	Buff coloured to pale blue grey mod. soft and weak rock. Fine grained sandstone		48'0" 48'9" 50'0"				49'9" ½" to very small fragments 49'11"			M407/6	T55/16/E725
	Sandstone, buff coloured medium grained		52'3" 55'4"				55'1" 1" to very small earthy fragments 55'4"			M407/5	T55/16/E726
	Sandstone, buff to pale blue grey, medium grained		57'11" 59'3"				59'0" Very small earthy fragments 59'2"			M407/5	
	Sandstone, pale blue grey, medium grained		62'1" 64'3"				61'9" 4" to 1" core lengths with ¼" fragments at most joints 64'6"			M407/5	
	Sandstone, almost fresh medium to fine grained		65'4"				64'5"			M407/5	
	Bedding at 40°?		68'8"				4" core length with ¼" to very small fragments at most joints 65'8"			M407/5	
Sandstone, fresh to slightly weathered.	Pale blue grey, medium to coarse grained, hard strong rock. Max. core length 21", mode 9" Bedding at 55°									M407/4	
	Siltstone, laminated, fine grained sandstone bands.		81'2" 83'8"				82'8" 4, ½" broken zones with ¼" to very small fragments 82'11"				
	Siltstone, laminated, fine grained sandstone bands.		85'3" 87'5"				85'11" ½" to very small fragments 86'2"; 88'2" ¼" to very small fragments 88'4"				
	Sandstone, laminated fine grained, siltstone bands		97'2" 100'0"				99'6" ½" zone, small earthy fragments				

PHOTOS NO

DRILL TYPE Boyles BBS2

FEED Hydraulic

CORE BARREL TYPE NMLC triple split inner tube

DRILLER WOOD & McDONALD

COMMENCED 15-3-65

COMPLETED 5-4-65

LOGGED BY G.A.M. HENDERSON

VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in.

BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis.

DRILLERS NOTES

0'-47' Water return.

47'-269' No water return.

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures. Test sections are indicated graphically by blacked in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M407/4)

COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed Quarry, on East side of Cotter 0.8 M upstream from dam axis

ANGLE FROM HORIZONTAL 90° DIRECTION

COORDINATES 84961 S 52170 W R.L. 3331'

HOLE NO D.D32

SHEET 2 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF. NO CORE BOX	PHOTO REF. NO CORE BARREL
Sandstone, as above	Sandstone, laminated fine grained, siltstone bands		101'5" 102'7" 104'0"								
Siltstone, laminated mostly fresh	Fine grained sandstone. Pale blue grey, moderately hard and strong rock. Max. core length 12", mode 5".		110'0" 114'6"				109'2" ½" broken zones on joints 113'4" small earthy fragments				
Sandstone, mostly fresh, silicified	Pale blue grey, medium to coarse grained, hard strong rock. Max. core length 25", mode 12"		119'5"				119'9" Small earthy fragments 119'11"				
	Sandstone, fine grained, slightly to moderately weathered		121'3" 123'3" 126'1"				124'2" 5" split core length with 125'0" 2" to ½" fragments				
			122'11"				130'7" 1" core length to very 130'11" small earthy fragments	132'	19/5/65		
Sandstone, silicified, slightly weathered.	Buff coloured to pale blue grey, medium grained, hard, strong rock. Max. core length 15", mode 7". 4 1" siltstone bands		140'4"								
Sandstone, fresh with many thin siltstone bands	Pale blue grey, fine grained, med. hard and strong rock. Max. core length 12", mode 5"		144'8"				144'1" 1" to ½" weathered 144'3" fragments				
Sandstone, silicified, mostly fresh.	Pale blue grey, coarse grained, hard, strong rock. Max. core length 3'2", mode 12".										
	Odd irregularly shaped blebs of siltstone up to ½" in size, scattered throughout sandstone below 155' 0".										
	Bedding at 20°		167'4"								
	Siltstone bands and laminae in fine to medium grained sandstone		169'0" 171'2" 171'8"								
	Siltstone bands		181'5"				182'6" 1" to very small fresh 182'8" fragments				
	Interbedded siltstone and fine grained sandstone		182'9" 185'4"								
	Siltstone band		193'9" 194'7"				194'1" 1" to ½" fragments 194'4"				
	Medium grained sandstone		196'6"								

ISS/16/E727 M407/3 ISS/16/E728 M407/2 ISS/16/E729 M407/1 ISS/16/E730 M395/29 ISS/16/E731 M395/28 PHOTOS NO

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER WOOD & McDONALD
COMMENCED 16-3-65
COMPLETED 5-4-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG.- Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES'- Angles are measured relative to a plane normal to the core axis

DRILLERS NOTES

0'-47' Water return.
47'-269' No water return.

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures. Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M395/28)
COLOUR B.M.R. colour slide index system

2

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed Quarry, on East side of Cotter 0·8 M upstream from dam axis

ANGLE FROM HORIZONTAL: 90° DIRECTION:

COORDINATES: 84961S 52170W R.L. 3331'

HOLE NO: D.D.32

SHEET 3 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot
Sandstone, as above									
	Mod. strong siltstone band		213'10"						
			215'6"				Pyrite on joint surface		
	Siltstone with 2 3" fine sandstone beds		232'5"						
			235'1"						
	Bedding at 30° Soft siltstone		242'9"						
Breccia, fresh	Medium sandstone with many siltstone pieces upto 1", hard, strong		245'3"						
Sandstone with many siltstone bands and laminae	Pale blue grey fine to medium grained, moderately hard and strong rock. Max. core length 18", mode 9" Rock becomes stronger towards base.						Pyrite on joint surface		
			269'2"						
	END OF HOLE						269' 2"		

CORE BOX PHOTOS: M395/24 M392/10 | I55/16/E735 M392/9 | M392/8 M395/26 M392/7 | I55/16/E734 M395/25 NO PHOTOS | I55/16/E733 M390/3 M395/27 NO PHOTOS | I55/16/E732

CORE BOX BARCODES:

DRILL TYPE Boyles BBS1
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER Wood & McDonald
COMMENCED 15-3-65
COMPLETED 5-4-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG Number of fractures per foot of core. Zones of core loss are blocked in.

BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis

DRILLERS NOTES

0'-47" Water return.

47'-269' No water return.

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures
Test sections are indicated graphically by blocked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M395/24)

COLOUR B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed Quarry, on east side of Cotter 0·8 M upstream from dam axis.

ANGLE FROM HORIZONTAL 45° DIRECTION 090°

COORDINATES 84963 S 52014 W R.L. 3374'

HOLE NO **D.D.33**

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE REF. BOX	PHOTO NO. CORE BARREL
Siltstone rubble, laminated mod. weathered	Buff coloured, soft weak rock. Max core length 3". 4 core lengths, rest fragments		NX 5'0"				Most joint surfaces coated black from 4' to 86'				
Siltstone, laminated, slightly to mod. weathered	Buff coloured to pale blue-grey, soft mod. weak to mod. strong rock. Max core length 12", mode 6".		NMLC 7'7"				5'0" 3" core lengths to ½" fragments				
	Sandstone, medium grained, hard, mod. strong		10'4"				5'11" 8'8" 7'0" 2" core length with 1" to very small earthy fragments				
			15'3"				10'4" 11'2" 2" to very small earthy fragments				
	Sandstone, fine grained, mod. hard weak rock		17'2"				12'9" 13'6" 2" to ½" fragments				
							16'0" 5" core length at 18'0", with 2" to very small earthy fragments 19'6"				
	Bedding at 30°						22'0" 22'6" 2" to ½" fragments				
	Sandstone, fine grained, hard, mod. strong rock		25'6" 27'0"				24'0" 25'6" 2" to very small fragments				
	Sandstone, fine grained		30'0" 30'6"				28'6" 29'0" 30'0" 2" to ½" fragments 30'4" 3" to ½" fragments				
	Bedding at 35°		37'0"				36'10" 1" zone of ½" to very small fragments				
	Sandstone, slightly weathered, very weathered last 6", medium grained hard, strong rock.		44'7"								
	Bedding at 40° Sandstone, fine grained		44'8" 45'1"				45'0" 45'7" 2" to ½" fragments				
			48'8"				47'6" 2" zone of 1" to ½" fragments				
	Sandstone, slightly to mod. weathered, pink and buff coloured, fine grained rock.		49'9" 51'1" 52'1"				50'4" 50'11" 2" to ½" fragments				
	Bedding at 50°		53'5" 54'6" 55'1"								
Sandstone with silty bands and laminae, slightly to mod. weathered	Buff coloured to pale blue grey, very fine grained, mod. hard, mod. weak rock. Max. core length 6", mode 4"										
	Sandstone, medium grained hard, mod. strong rock.		62'8"				65'7" 66'6" 2 3" zones of 2" to ½" fragments				
	Bedding at 50°						66'8" 3" zone of 2" to very small fragments				
	Sandstone, medium grained hard rock		68'7" 71'5"								
	Sandstone, medium grained hard rock		72'3" 75'0"								
	Bedding at 25°		77'0"				77'0" 78'0" 3" to very small fresh siltstone fragments				
Siltstone, fresh and slightly weathered	Buff coloured and pale blue grey moderately hard and strong rock. Max. core length 12", mode 7".										
	Sandstone, fresh, silicified, medium grained		88'0" 90'10"								
	Bedding at 45°		92'6"				Pyrite on joint surface				
Sandstone, fresh, silicified	Pale blue grey, medium grained, hard, strong rock. Max. core length 18", mode 10"		100'0"								

Probe stopped by caving near top

CORE REF. BOX	PHOTO NO. CORE BARREL
	I55/16/E724
	I55/16/E725
	I55/16/E737
	M396/15
	M396/14
	M396/13
	M396/12
	M396/11
	I55/16/E738
	M392/16
	M392/15
	M392/14
	M392/13
	M392/12
	M392/11
	I55/16/E738
	M392/18
	M392/17
	M392/16
	M392/15
	M392/14
	M392/13
	M392/12
	M392/11
	I55/16/E739
	M392/21
	M392/20
	M392/19
	M392/18
	M392/17
	M392/16
	M392/15
	M392/14
	M392/13
	M392/12
	M392/11
	I55/16/E740
	M395/18
	M392/27
	M392/26
	M392/25
	M392/24
	M392/23
	M392/22
	M392/21
	M392/20
	M395/19
	M392/31

NO PHOTOS

No Pyrite

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER PARCELL & McDONALD
COMMENCED 7-4-65
COMP'D 15-4-65
LOGGED G.A.M. HENDERSON
SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

0'0" - 50'6" Water return
50'6" - 100'0" No water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M395/19)
COLOUR B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed Quarry, on east side of Cotter 0.8M upstream from dam axis

ANGLE FROM HORIZONTAL: 45° DIRECTION: 090°

COORDINATES: 849635 5201LW R.L. 3374'

FILE NO. D.D.33

SHEET 2 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot
Siltstone, fresh, silicified.	Pale blue grey, hard, mod. strong rock.		103'4"						
Sandstone, fresh to slightly weathered. silicified	Pale blue grey coarse grained, hard, mod. strong to strong rock. Max core length 18", mode 8"								
	Siltstone, laminated		122'10" 123'8"				122'7" 1" zone of ½" to very small weathered fragments		
	Bedding at 15°		132'3"						
Sandstone, fresh, silicified	Pale blue grey, medium grained, hard, mod. weak rock. Max. core length 12", mode 5". Matrix appears to be partly dissolved away in places. 1" to 4" beds of siltstone at 122'7", 133'5", 125'9", 131'5" and 136'9".						Disseminated pyrite present in this section		
	Siltstone, dark grey soft, weak rock		143'3" 144'8"				144'8" 145'8" Very broken zone especially from 145'0" to 143'4"		
	Siltstone, massive		156'8" 157'0"						
Sandstone, fresh, silicified. First 8" contains siltstone fragments	Pale blue grey, medium grained, hard, strong rock. Max. core length 25", mode 10".								
	Siltstone, massive		174'0" 174'8"						
	Bedding at 0°		183'4"						
Sandstone with siltstone laminae	Very fine grained.		185'0"						
	END OF HOLE						185'0"		

CORE PHOTOS: M392/22, M392/35, M392/34, M392/25, M392/27, M395/10, M395/21, M392/38, M396/2, M396/3, M396/4, M395/22, M395/23 — I55/16/E741, I55/16/E742, I55/16/E743, I55/16/E744 — NO PHOTOS

DRILL TYPE: Boyles BB52
FEED: Hydraulic
CORE BARREL TYPE: NMLC Triple split inner tube
DRILLER: PARCELL & McDONALD
COMMENCED: 7-4-65
COMPLETED: 15-4-65
LOGGED BY: G.A.M. HENDERSON
VERTICAL SCALE: 10' : 1"

NOTES

FRACTURE LOG Number of fractures per foot of core. Zones of core loss are blacked in

BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

100'0" - 185'0" No water return

WATER PRESSURE TESTS

PACKER TYPE:
SUPPLY LINE:
VERTICAL SCALE:
Figures given are gauge pressures
Test sections are indicated graphically by blacked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35mm film number together with frame number (e.g. M395/23)
COLOUR: B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed Quarry, on east side of Cotter 0·8 M upstream from dam axis.

ANGLE FROM HORIZONTAL 90° DIRECTION

COORDINATES 84673 S 52059 W R.L. 3281'

HOLE NO D.D.34

SHEET 1 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss or gallons per minute per foot	CORE BOX PHOTO REF.	CORE NO. PHOTO REF.
Soil and mod. weathered fine grained sandstone scree	Max. size of pieces 4"		6'4"								
Sandstone, mod. weathered	Buff coloured, fine grained hard, mod. strong rock. Max. core length 24", mode 6".		13'0"				13'0" 1" to very small earthy fragments 13'4"			M395/20	I65/16/E745
Siltstone, slightly to mod. weathered with an 18" section of fresh rock from 17'0" to 18'6". Rock sandy in places, and with occasional laminations.	Mottled, buff coloured to pale blue grey, mod. soft, mod weak to mod. strong rock. Max. core length 24", mode 5"									M395/20	I65/16/E746
	Sandstone, med. grained		20'8" 21'1"								
	Bedding at 30°		30'				25'0" 2 3" zones of 1" to very small fragments 25'10" 27'0" 27'11" 3" to very small earthy fragments 29'1" 2 3" zones of 1" to ¼" fragments. 32'4" 32'9" 2" to very small fragments			M395/21	I65/16/E747
			40'				38'0" 39'0" 2" to ¼" fragments 40'6" 40'7" 2" to very small fragments	41'	19/5/65	M396/1	M396/5
Mainly fresh below 47'	Sandstone, very weathd medium grained		45'6" 46'1"				44'9" 45'3" 1" to very small fragments			M396/7	I65/16/E747
	Bedding at 40°		52'0"							M396/8	
	Sandstone, fresh to slightly weathered, medium grained		53'5"							M396/9	
Sandstone with silty laminae, fresh.	Pale blue grey fine grained hard, strong rock. Max. core length 16", mode 9"		57'1" 63'0"							M396/10	I65/16/E748
Sandstone, fresh, silicified	Pale blue grey, medium grained, hard, strong rock. Max. core length 16", mode 10"		69'6"							M396/22	I65/16/E749
	Siltstone, laminated Bedding at 30°		71'0" 74'1"				Pyrite common in siltstone bed.				
Laminated siltstone grading to fine grained sandstone	Pale blue grey, mod. hard, strong rock. Max. core length 20", mode 12".		78'1"								
Massive siltstone grading to thinly interbedded fine grained sandstone and siltstone	Pale blue grey, hard, strong rock. Max. core length 12", mode 8".		84'5"				77'11" 79'2" 3" split core lengths to ½" fragments.			M396/23	I65/11/E749
Sandstone, fresh, silicified.	Pale blue grey fine to medium grained hard, strong rock. Max. core length 10", mode 8".		87'8" 89'6" 90'6" 91'3"				Pyrite present in rock			M396/24	I65/11/E750
	Interbedded siltstone and fine grained sandstone										
	Siltstone, laminated		94'2" 94'8" 97'6"								
Sandstone fine to med. grained	Many thin siltstone interbeds and laminae, hard, strong rock									M396/12	

NO PHOTOS

NO PHOTOS

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER WOOD & LUCAS
COMMENCED 29-4-65
COMPLETED 10-5-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

0'0" - 100'0" Water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M395/34)
COLOUR B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed Quarry, on east side of Cotter 0.8M upstream from dam axis

ANGLE FROM HORIZONTAL: 90° DIRECTION:

COORDINATES: 84673 S 52059 W R.L. 3281'

HOLE NO. D.D.34

SHEET 2 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot

Sandstone — as above

Sandstone, fresh, silicified. Contains small pieces of siltstone in places — Pale blue grey, coarse grained, hard, strong rock. Max. core length 26", mode 12"

102'2"

1" thick quartz vein

Siltstone, soft — 118'2"

118'6"

Siltstone, soft. — 120'0"

120'6"

Bedding at 40°

128'6"

Siltstone, soft — 128'9"

130'6"

131'6"

Siltstone, soft to moderately hard — 132'0"

135'6"

Bedding at 10°

Siltstone, soft — 144'1"

145'6"

Bedding at 50°

166'0"

Siltstone, interbeds soft weak rock — 167'6"

168'0"

168'9"

170'9"

178'6" 1" zone of white clay

179'2"

2" to very small fresh fragments

179'9"

Siltstone, mod. hard — 180'8"

Sandstone fresh silicified — Pale blue grey, medium grained, hard, mod. strong rock. Max. core length 17" mode 6"

181'11"

182'6"

Siltstone, mod. hard

1" siltstone beds at 182'0", 182'7"

Bedding at 40°

Siltstone soft — 194'10"

195'11"

197'8"

Interbedded, fine and med. grained sandstone — 199'6"

I55/16/E750 M395/25 I55/16/E751 M396/13 M396/14 M395/36 M396/16 I55/16/E752 M396/17 M396/18 M396/19 M395/37 M396/20 I55/16/E753 M396/21 I55/16/E754 M396/22 M396/23 M395/28 M396/24 M396/25 I55/16/E754 M396/26 M396/27 M395/13 M396/30

PHOTOS NO

CORE BOX PHOTO NO. CORE BARREL

DRILL TYPE: Boyles BBS2

FEED: Hydraulic

CORE BARREL TYPE: NMLC triple split inner tube

DRILLER: Wood & Lucas

COMMENCED: 29-4-65

COMPLETED: 10-5-65

LOGGED BY: G.A.M. Henderson

VERTICAL SCALE: 10': 1"

NOTES

FRACTURE LOG:- Number of fractures per foot of core. Zones of core loss are blacked in.

BEDDING AND JOINT PLANES:- Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

100'0"- 200'0" Water return.

WATER PRESSURE TESTS

PACKER TYPE:

SUPPLY LINE:

VERTICAL SCALE:

Figures given are gauge pressures. Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35mm film number together with frame number (e.g. M395/13)

COLOUR: B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed Quarry, on east side of Cotter 0.8 M upstream from dam axis

ANGLE FROM HORIZONTAL 90° DIRECTION

COORDINATES 84673 S 52059 W R.L. 3281'

HOLE NO. D.D.34

SHEET 3 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX	PHOTO NO. CORE BARREL
Sandstone, fresh, silicified	Pale blue grey, interbedded medium and fine grained hard, mod. strong rock. Max. core length 12", mode 7" Medium grained rock predominates. Fine grained material mostly as thin bands. Bedding at 55°		210' 220' 230' 240' 255' 7"		0 20 40 60 80 100		¼" quartz veins common				
	END OF HOLE.										

M394/21 I55/16/E765 M396/32 M396/33 M396/34 M345/12 M396/35 I52/16/E756 M396/36 M345/11 I66/16/E757 M398/14 NO PHOTOS

DRILL TYPE Boyles BB52
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER Wood & Lucas
COMMENCED 29-4-65
COMPLETED 10-5-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG :- Number of fractures per foot of core Zones of core loss are blacked in
BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

200'0" - 255'7" Water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blacked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M395/14)
COLOUR B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed Quarry, on east side of Cotter 0·8M upstream from dam axis

ANGLE FROM HORIZONTAL: 90° DIRECTION: –

COORDINATES: 84760S 52267W R.L. 3275'

HOLE NO. D.D.35

SHEET 1 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX	PHOTO REF NO CORE BOX SAMPLE
No recovery			NX 4'0"								
Siltstone, mod. weathered massive	Buff coloured to pinkish, mod. soft, weak rock. Max. core length 7", mode 3"		5'0" NMLC 8'9"				7'11" 8'10" 2" to ¼" fragments				I55/16/E768
Sandstone, mod. weathered	Buff coloured to pinkish, mod. hard, weak rock. Max. core length 6", mode 3" Medium grained						10'0" 4" to 2" core length with 1" to ¼" fragments 12'6"				M395/10
Siltstone massive slightly weathered	Buff coloured, mod. soft, mod. strong rock		15'6" 17'10"								
Sandstone, fresh to slightly weathered	Buff coloured to pale blue grey, hard, mod. strong rock. Fine to medium grained. Max. core length 24", mode 8"		23'4"				23'4" 2" to ¼" pieces with earthy material 23'9"				I55/16/E759
Siltstone, massive, slightly weathered	Buff coloured to pale blue grey, mod. soft, mod. strong rock. Max. core length 8" mode 5"		29'4"								M395/9
rock fresh below 35'	Sandstone, fine grained, mod. hard and strong rock		32'11"								
	Bedding at 20°										
	Sandstone, medium grained		37'0" 38'7" 40'9"								I55/16/E760
Sandstone, fresh, silicified	Pale blue grey, medium grained, hard, strong rock. Max. core length 24", mode 10"		45'0"								
	Siltstone massive		45'8" 47'2" 47'6"				Pyrite on joint				
	Sandstone, fine grained with many siltstone bands		50'0" 54'0"								M395/6
Sandstone, fresh, silicified	Pale blue grey, coarse grained, hard, strong rock. Max. core length 48", mode 10"										I55/16/E761
	Siltstone, massive		66'0" 66'7"								
	A few siltstone fragments in rock at 69'										
	2 1" siltstone beds		69'6" 70'10"								
	Bedding at 15°										
	Siltstone, massive		72'1" 72'4"								M395/8
											I55/16/E762
	Siltstone, massive		85'6" 86'10"								
	Interbedded siltstone and med. grained sandstone		87'2" 88'8"								
	Bedding at 25°										
											M395/5
	Siltstone, massive		96'7" 97'6"								

NO PHOTOS TAKEN

DRILL TYPE: Boyles BBS2
FEED: Hydraulic
CORE BARREL TYPE: NMLC triple split inner tube
DRILLER: LUCAS & McDONALD
COMMENCED: 12-5-65
COMPLETED: 18-5-65
LOGGED BY: G.A.M HENDERSON
VERTICAL SCALE: 10' : 1"

NOTES

FRACTURE LOG Number of fractures per foot of core Zones of core loss are blocked in
BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

0'0"- 100'0" Water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blocked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M395/5)
COLOUR B.M.R. colour slide index system.

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed Quarry, on east side of Cotter 0·8 M upstream from dam axis

ANGLE FROM HORIZONTAL 90° DIRECTION -

COORDINATES 847605 5226 7W R.L. 3275'

HOLE NO D.D.35

SHEET 2 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION (LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC)	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES (JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST (Loss in gallons per minute per foot)	PHOTO REF. NO. CORE BOX	PHOTO REF. NO. CORE BURNT
Sandstone as above			110'							I55/16/E763	M395/4
	Bedding at 40°										
	Sandstone, medium grained, mod. hard		121'9" 122'5"								
	1" Siltstone band		126'0"							I55/16/E764	M395/4
			137'0"								
	Siltstone, massive		138'5"							I55/16/E765	M395/4
			150'0"								
Breccia, fresh	Mod. hard, strong rock.		152'0"								
Sandstone with many silty bands and laminae fresh, silicified	Pale blue grey, mod. soft to hard, mod strong to strong fine grained rock. Max. core length 16" mode 10"										
	Bedding at 40°										
			165'6"								
	Sandstone, fine to medium grained		168'0"							I55/16/E766	M395/3
			179'6"								
	Sandstone, medium grained, hard, strong rock		186'9"								
	Bedding at 35°										

NO PHOTOS TAKEN

DRILL TYPE Boyles BBS 2

FEED Hydraulic

CORE BARREL TYPE NMLC triple split inner tube

DRILLER LUCAS & McDONALD

COMMENCED 12-5-65

COMPLETED 18-5-65

LOGGED BY G.A.M. HENDERSON

VERTICAL SCALE 10': 1"

NOTES

FRACTURE LOG Number of fractures per foot of core Zones of core loss are blacked in

BEDDING AND JOINT PLANES – Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

100'0" - 191'8" Half water return

191'8" - 200'0" No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures
Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M395/3)

COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed Quarry, on east side of Cotter 0·8 M upstream from dam axis

ANGLE FROM HORIZONTAL 90° DIRECTION

COORDINATES 847605 522677W R.L. 3275'

HOLE NO. D.D.35

SHEET 3 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF NO. CORE BOX	PHOTO REF NO. CORE BARREL
Sandstone, fresh, silicified	Pale blue grey, med. grained, hard strong rock. Max. core length 15", mode 9" 1" to 3" siltstone bands at 200'8", 202'0", 206'9", 207'11", 209'0" and 211'4" Bedding at 45°		213'2"							M409/7	TAKEN
Sandstone, fresh, silicified with many siltstone bands and laminae	Pale blue grey, fine grained, hard, strong rock. Max. core length 10", mode 7"		218'2"								NO PHOTOS
	END OF HOLE						218'3"				

DRILL TYPE Boyles BBS 2
FEED Hydraulic
CORE BARREL TYPE N.M.L.C. triple split inner tube
DRILLER Lucas & McDonald
COMMENCED 12-5-66
COMPLETED 18-5-66
LOGGED BY G.A.M. Henderson
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

200'0" - 218'3" No water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M409/7)
COLOUR B.M.R. colour slide index system

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION West Bank, upstream limit of dam wall

ANGLE FROM HORIZONTAL 90° DIRECTION -

COORDINATES 801515 52196W R.L. 2965'

HOLE NO. D.D.36

SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss n gallons per minute per foot	PHOTO REF NO. CORE BOX	PHOTO REF NO. CORE BARREL
Soil and scree			NX casing 29'0"							NO PHOTOS TAKEN	
Sandstone and granite	3"-2" cores of sandstone and granite, and rounded pebbles		NMLC 34'0"								
Siltstone, laminated. sl. weathered	5"-2" core lengths with many smaller angular fragments. Bedding 60°-70°		39'9"								
	END OF HOLE						39' 9"				

DRILL TYPE Boyles BBS2

FEED Hydraulic

CORE BARREL TYPE N.M.L.C. triple split inner tube

DRILLER PARCELL & WOOD

COMMENCED 5-4-65

COMPLETED 6-4-65

LOGGED BY C.A.M. HENDERSON

VERTICAL SCALE 10': 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core Zones of core loss are blacked in

BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

No water return

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures
Test sections are indicated graphically by blocked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE

COLOUR

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION West Bank', upstream limit of dam wall

ANGLE FROM HORIZONTAL 90° DIRECTION -

COORDINATES 800695 52212W R.L. 2987'

HOLE NO. D.D.37

SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF. NO. CORE BOX	PHOTO REF. NO. CORE SHAPED
Soil and scree			NX casing								
	Sandstone boulder.		NMLC								
			NX casing								
			NX casing 50'0"								
Sandstone	Water worn pebbles of fine grained sandstone		NMLC 55'0"								
Siltstone, laminated, slightly to very weathered	Soft, weak, very broken rock, bedding at 60°-70°.		63'0"								
	END OF HOLE						63'0"				

NO PHOTOS TAKEN

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER J. WOOD
COMMENCED 7-4-65
COMPLETED 11-4-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10': 1"

NOTES

FRACTURE LOG :- Number of fractures per foot of core Zones of core loss are blocked in
BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

No water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blocked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE
COLOUR

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE
LOCATION: East Abutment
ANGLE FROM HORIZONTAL: 90° DIRECTION:
COORDINATES: 79900S 51537W R.L. 2993'

HOLE NO. D.D.38
SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC.	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX	PHOTO REF. CORE BARREL
Siltstone, rubble laminated	6" 4" and 1" core lengths with smaller fragments		NX 5'0"							I55/16/E768 M397/22	
Sandstone, slightly weathered	Buff coloured to pale blue grey, fine grained, hard, mod. strong rock. Max. core length 19", mode 6".		NMLC 10'0"							M407/15	PHOTOS
	Siltstone, laminated, mod. weathered, weak rock		11'9"				11'0" 1" to ½" fragments				
	Bedding at 70°		14'0"				13'9" 15'6" 3" core lengths to ½" pieces				
Sandstone, slightly to mod. weathered	Buff coloured, fine to medium grained, hard, mod. strong rock. Max. core length 14" mode 6"									I55/16/E769 M397/23	NO
	Bedding at 70°		28'1"				28'1"			M397/24	
	Siltstone, laminated, soft, weak rock		31'11"				5" to 3" core lengths with 1" to very small earthy pieces 30'0"			M407/17	
	Siltstone, massive, soft rock		35'0"								
			40'8"							I55/16/E770	PHOTOS
Sandstone, fresh to slightly weathered.	Buff coloured to pale blue grey, hard, mod strong, fine grained rock. Max. core length 10", mode 5" 1" siltstone beds at 42'5" and 47'5"						47'0" 2" to ½" slickensided fragments 47'7" 48'0" 50'0" 1" to very small earthy fragments	Hole dry		M407/16	NO
	Siltstone, soft, weak		44'4" 50'0"								
	Bedding at 50°		52'6"								
	END OF HOLE						52'6"				

DRILL TYPE: Boyles BB52
FEED: Hydraulic
CORE BARREL TYPE: NMLC triple split inner tube
DRILLER: Wood & McDonald
COMMENCED: 28-4-65
COMPLETED: 29-4-65
LOGGED BY: G.A.M. HENDERSON
VERTICAL SCALE: 10' : 1"

NOTES

FRACTURE LOG :- Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

4'0" - 52'6" No water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blacked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35mm film number together with frame number (e.g. M407/16)
COLOUR: B.M.R. colour slide index system

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GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE
LOCATION: East Abutment
ANGLE FROM HORIZONTAL: 90° DIRECTION:
COORDINATES: 79926 S 51617 W R.L. 3010'

HOLE NO. D.D.39
SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC.	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF. CORE TRAY NO.	PHOTO REF. CORE BARREL NO.
Siltstone rubble fresh to mod. weathered	Mostly 2" - ½" fragments with 2 4" split core lengths		NX 3'10"							I55/16/E771	M397/23
Siltstone, slightly to very weathered laminated	Buff coloured, soft weak rock. Max. core length 7", mode 4". Bedding at 75°		8'0" NMLC 7'11"				5'0" Most joints very broken with ½" to very small black coated & earthy fragments 7'6"				
Sandstone slightly to mod. weathered	Buff coloured to pale blue grey, fine grained, mod. hard, mod. strong rock. Max. core length 17", mode 7"						11'4" 2" to very small black coated fragments 12'9"			M407/21	M397/24
			17'11"				17'11" 2" to very small black coated fragments 18'7"			I55/16/E772	
	Siltstone, laminated Bedding at 65°		19'0"								
	Siltstone, laminated 2 6" beds		22'9" 24'0"				22'9" 2 4" zones of 2" to ½" fragments 24'0"				
			26'0"				25'6" 3" to very small earthy fragments 27'8"			M407/20	
	Siltstone laminated, mod. to very weathered soft, weak rock Bedding at 75°		29'9"				29'0" Small black coated fragments in joints 30'7" 31'2"			I55/16/E773	
			33'8"				33'0"				
Siltstone, laminated, mod. weathered	Buff coloured, soft, weak rock. Max. core length 7", mode 3". Bedding at 60°		42'2"				2" to ½" fragments with much black and buff coloured earthy material 37'6" 42'0"				
Sandstone, slightly weathered	Buff coloured, fine grained, mod. hard and strong rock. Max. core length 19", mode 8" ½ 1" silty bands at 42'11", 43'10", and 46'10" and 61'8"						43'0" 3" to ½" fragments				
							51'3" Mostly yellow brown clay with a few larger pieces 54'5"			M407/19	
	Bedding at 50°									I55/16/E774	
	Siltstone, laminated, mod. weathered		63'7" 65'7"				65'6" ½" zone of ½" to very small fragments				
rock fresh below 65'7"	Siltstone, laminated fresh		67'0"								
								72'	19/5/65	M407/18	
			74'6"								
	END OF HOLE						74' 6"				

NO PHOTOS

DRILL TYPE: Boyles BBS2
FEED: Hydraulic
CORE BARREL TYPE: NMLC triple split inner tube
DRILLER: M. PARCELL
COMMENCED: 4-5-65
COMPLETED: 6-5-65
LOGGED BY: G.A.M. HENDERSON
VERTICAL SCALE: 10' : 1"

NOTES

FRACTURE LOG:- Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES:- Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

37'0" - 74'6" No water return

WATER PRESSURE TESTS

PACKER TYPE:
SUPPLY LINE:
VERTICAL SCALE:
Figures given are gauge pressures
Test sections are indicated graphically by blacked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE: B.M.R. 35mm film number, together with frame number. (e.g. M407/18)
COLOUR: B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE
LOCATION: East Abutment
ANGLE FROM HORIZONTAL: 90° DIRECTION:
COORDINATES: 79900 S 51487 W R.L. 3020'

HOLE NO. D.D.40
SHEET 1 OF 1

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF NO. CORE BOX	PHOTO REF NO. CORE BARREL
Sandstone rubble, mod. weathered	Several split core lengths up to 6" down to ¼" pieces		NX 5'3"								
Sandstone, mod. weathered silty	Buff coloured, very fine grained, mod. soft, mod strong rock. Max. core length 28", mode 12". Last 5" siltstone		NMLC 10'1"				6'8" 1" to ¼" fragments in 2" zone			I55/16/E775	
Sandstone, mod. weathered	Buff coloured, fine grained, mod. hard, mod. weak rock. Max. core length 9", mode 4" 2" siltstone band at 12'0" Bedding at 50°		17'10"				12'0" ¼" to very small fragments on ¼" joint; 15'0" 8 core lengths up to 4' with 1" to very small fragments. Especially broken between 15'9" & 16'2", 17'0" & 18'3", and 20'0" & 21'8"			M407/23	TAKEN
Siltstone, laminated, slightly to very weathered	Buff coloured to pale blue grey, soft, mod. weak rock. Max. core length 12", mode 6"						21'8"; 25'0" 5 3" core lengths with 2" to ¼" fragments; 27'8"			I65/16/E776	PHOTOS
Siltstone, laminated, fresh	Pale blue grey, soft, strong rock. Max. core length 25", mode 12" Bedding at 40°		27'10" 40'4"					HOLE DRY		M407/22	NO
	END OF HOLE						40'-4"				

DRILL TYPE Boyles BBS 2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER M. PARSELL
COMMENCED 11-5-65
COMPLETED 12-5-65
LOGGED BY G.A.M HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot at core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

0'0"-40'4" No water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures.
Test sections are indicated graphically, by blacked in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M407/22)
COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed Quarry, on east side of Cotter 0.8M upstream from dam axis

ANGLE FROM HORIZONTAL: 90° DIRECTION: -

COORDINATES: 85084S 51300W R.L. 3291'

D.D. 41

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION (LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC)	GRAPHIC LOG	DEPTH & SIZE OF CORE	HARDNESS LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES (JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES)	WATER LEVEL	WATER PRESSURE TEST (Loss in gallons per minute per foot)	CORE BOX	PHOTO NO CORE BARREL
Siltstone, laminated, slightly weathered	Buff coloured to pale blue grey, soft, weak rock. Max. core length 4".		NX 5'0"								
Sandstone, fresh to slightly weathered	Buff coloured to pale blue grey, medium to coarse grained hard, strong rock.		NMLC 9'4"				9'6" ½" to very small fragments 9'9"				
Siltstone, laminated, slightly to mod. weathered, with occasional thin beds of fine grained sandstone	Buff coloured to pale blue grey, soft, mod. weak to weak rock. Max. core length 10", mode 5" Bedding at 30°						15'5" 2" to ½" fragments 15'11" 18'3" 2" core lengths to ½" pieces. Top 2" especially broken 22'0" 3 4" split core lengths 22'3" with 1" to ½" fragments				
	Sandstone, mod. weathered fine to medium grained Bedding at 35°		33'4" 35'10" 39'4"								
Sandstone, fresh to mod. weathered	Buff coloured to pale blue grey medium grained, hard strong rock		41'9" 43'0"								
	Thinly interbedded, laminated siltstone and fine grained sandstone. Soft to mod. hard, mod. weak rock.		45'0" 49'3"				43'0" 43'2" 1" broken zones 47'0" 47'2" 49'3"				
	Thinly interbedded, laminated siltstone and fine grained sandstone Bedding at 45°		55'2" 56'7" 57'5" 59'2" 64'3"				56'2" 1" to very small earthy fragments 57'3" 57'7" 2" to ½" fragments Vertical joint splits core from 60'0" to 62'0" 62'6" 2" to ½" fragments				
Siltstone and Sandstone, slightly weathered	Thinly interbedded, laminated siltstone and fine gr. sandstone Mod. soft, weak rock		68'6"				63'10" Vert. fault from 63'6" to 65'0" 64'11" 2" zone of ½" to ¼" pieces				
Sandstone, fresh, silicified	Pale blue grey, medium grained, hard, strong rock. Max. core length 14", mode 9"		73'9"				Small scale faulting from 68'0" to 68'6" 69'2" Small fragments from sheared joint.				
	Thinly interbedded laminated siltstone and fine grained sandstone		74'0" 77'11"								
Siltstone, massive, slightly to mod. weathered	Buff coloured, mod. hard, mod. weak to weak rock. Max. core length 7", mode 4"		86'0"				78'6" Quartz vein 79'1" 85'0" 2 4" core lengths with 85'10" 1" to very small black and yellow brown fragments				
Sandstone, fresh, silicified with occasional thin siltstone bands and laminae	Pale blue grey, fine to medium grained, hard, strong rock. Max. core length 14", mode 9" Bedding at 25°		97'5"				97'0" 1" to ½" fragments 97'5"				
Sandstone	see sheet 2										

M409/10 M409/11 M409/12 TSS/16/E779 TSS/16/E778 TSS/16/E777 NO PHOTOS TAKEN

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple split inner tube
DRILLER PARCELL & McDONALD
COMMENCED 25-5-65
COMPLETED 29-5-65
LOGGED BY G.D.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

0'0" - 53'0" Water return
53'0" - 74'0" Half water return
74'0" - 100'0" No water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blacked in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M409/10)
COLOUR B.M.R. colour slide index system

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT: CORIN DAMSITE

LOCATION: Proposed Quarry, On east side of Cotter 0·8 M upstream from dam axis

ANGLE FROM HORIZONTAL: 90° DIRECTION: —

COORDINATES: 85084 S 52300 W R.L. 3291'

HOLE NO: D.D. 41

SHEET 2 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	PHOTO REF NO CORE BOX	PHOTO REF NO CORE BARREL
Sandstone, fresh, silicified	Pale blue grey, coarse grained, hard, strong rock. Max. core length 48", mode 12"		NMLC 109'0" BMLC								
	Interbedded siltstone and sandstone		113'10" 114'5"								
	Bedding at 10° Laminated siltstone		126'9" 128'5" 129'6"					126'	16/6/65		
	Siltstone interbed		138'2" 139'0"				138'2" 139'0" 1" to very small fragments				
							Many small quartz veins scattered throughout sandstone				
							168'0" 2" quartz vein				
			175'0"								
	END OF HOLE						175' 0"				

PHOTOS TAKEN

IGS/16/E 780

M409/9

IGS/16/E 781

ND

M409/8

DRILL TYPE: Boyles BBS2
FEED: Hydraulic
CORE BARREL TYPE: BMLC triple split inner tube
DRILLER: PARGELL & McDONALD
COMMENCED: 25-5-65
COMPLETED: 29-5-65
LOGGED BY: G.A.M. HENDERSON
VERTICAL SCALE: 10' : 1"

NOTES

FRACTURE LOG - Number of fractures per foot of core. Zones of core loss are blacked in.
BEDDING AND JOINT PLANES - Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

100'0"-175'0" No water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures. Test sections are indicated graphically by blacked in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M409/10)
COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed Quarry, on east side of Cotter 0.8M upstream from dam axis

ANGLE FROM HORIZONTAL 90° DIRECTION —

COORDINATES 8309S 6216W R.L. 3223'

HOLE NO. D.D. 42

SHEET 1 OF 2

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX	PHOTO CORE BOX
No core			4'9"								
Sandstone, slightly to mod. weathered, occasional silty laminae	Buff coloured, fine to med. grained, mod. hard, mod. weak to mod. strong rock. Max. core length 16", mode 6"		NMLC				5'7" 1" to ¼" fragments 8'10" 1" to very small earthy fragments 9'8" 1" to ¼" fragments				
	Laminated siltstone		11'2"								
	Bedding at 40°		11'4"								
			20'				18'2" Broken material in joints 20'8" 3" core lengths to very small fragments 21'10" 1" to ¼" fragments 22'0"				
			30'				28'6" 4" split core lengths to 29'6" ¼" fragments				
	Bedding at 70°		40'				42'2" Split core and broken material associated with 45'7" vertical joint				
			50'				47'10" ¼" to very small fragments 50'8" Broken material in joints 53'9" ¼" to very small fragments 53'0" 55'0" 2" to ¼" fragments 56'10"				
	Bedding at 60°		60'								
occasional patches of fresh rock below 66'			70'								
	Bedding at 30°						76'0" 1" quartz vein				
	Laminated siltstone		86'0" 86'1"								
			95'0"								
Sandstone, fresh, silicified	see sheet 2 Bedding at 30°										

TAKEN ON PHOTOS

ISS/16/E782 M409/22
ISS/16/E783 M409/21
ISS/16/E784 M409/20
ISS/16/E785 M409/19
ISS/16/E786 M409/18

DRILL TYPE Boyles BBS2
FEED Hydraulic
CORE BARREL TYPE NMLC triple & split inner tube
DRILLER PARCELL & McDONALD
COMMENCED 1-6-65
COMPLETED 10-6-65
LOGGED BY G.A.M. HENDERSON
VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG :- Number of fractures per foot of core. Zones of core loss are blocked in.
BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis

DRILLER'S NOTES

0'0" - 13'2" Water return
13'2" - 100'0" No water return

WATER PRESSURE TESTS

PACKER TYPE
SUPPLY LINE
VERTICAL SCALE
Figures given are gauge pressures
Test sections are indicated graphically by blacked-in strips

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number. (e.g. M409/18)
COLOUR B.M.R. colour slide index system.

BUREAU OF MINERAL RESOURCES, GEOLOGY AND GEOPHYSICS

GEOLOGICAL LOG OF DRILL HOLE

PROJECT CORIN DAMSITE

LOCATION Proposed Quarry, on east side of Cotter 0·8M upstream from dam axis

ANGLE FROM HORIZONTAL 90° DIRECTION

COORDINATES 85309S 52153'W R.L. 3223'

HOLE NO **D.D. 42**

SHEET 2 OF 3

ROCK TYPE & DEGREE OF WEATHERING	DESCRIPTION LITHOLOGY, COLOUR, STRENGTH, HARDNESS, ETC	GRAPHIC LOG	DEPTH & SIZE OF CORE	FRACTURE LOG	LIFT & % CORE RECOVERY	CASING	STRUCTURES JOINTS, VEINS, SEAMS, FAULTS, CRUSHED ZONES	WATER LEVEL	WATER PRESSURE TEST Loss in gallons per minute per foot	CORE BOX NO.	PHOTO REF. NO. CORE BARREL
Interbedded sandstone and sandstone with many silty laminae.	Pale blue grey, fine to medium grained, hard, strong rock. Max. core length 14", mode 8"		110'0"								
Sandstone, fresh, silicified	Pale blue grey, fine to medium grained, hard, strong rock.		116'9"								
Interbedded sandstone and sandstone with many silty laminae.	Pale blue grey, fine to medium grained, hard, strong rock. Max. core length 16", mode 9".										
	Laminated siltstone		131'7"								
			131'9"								
			135'0"								
Sandstone, fresh, silicified, occasional silty laminae	Pale blue grey, fine to medium grained, hard, strong rock. Max. core length 24", mode 10"		141'0"								
	Sandstone with many silty laminae		142'1"								
			148'10"								
	Sandstone with many silty laminae		151'9"								
	Sandstone with many silty laminae		157'4"								
			158'2"								
	Sandstone with many silty laminae		173'10"								
			175'0"								
			NMLC								
			BMLC								
			180'5"								
	END OF HOLE						180' 6"				

PHOTOS TAKEN NO

M409/17 TSS/16/E788

M409/13 TSS/16/E789

M409/16 TSS/16/E790

M409/14 TSS/16/E787

M409/15

DRILL TYPE Boyles BBS2

FEED Hydraulic

CORE BARREL TYPE NMLC triple split inner tube

DRILLER PARCELL & McDONALD

COMMENCED 1-6-65

COMPLETED 10-6-65

LOGGED BY G.A.M. HENDERSON

VERTICAL SCALE 10' : 1"

NOTES

FRACTURE LOG :- Number of fractures per foot of core. Zones of core loss are blacked in.

BEDDING AND JOINT PLANES :- Angles are measured relative to a plane normal to the core axis.

DRILLER'S NOTES

100'0" - 180'5" No water return.

WATER PRESSURE TESTS

PACKER TYPE

SUPPLY LINE

VERTICAL SCALE

Figures given are gauge pressures. Test sections are indicated graphically by blacked in strips.

PHOTOGRAPH REFERENCE SYSTEM

BLACK AND WHITE B.M.R. 35mm film number together with frame number (e.g. M409/14)

COLOUR B.M.R. colour slide index system.

APPENDIX 6.

WATER PRESSURE TEST COMPUTATION SHEETS.

The following computation sheets show all the relevant field data for the water pressure tests, and the various corrections applied to the gauge pressures to obtain effective pressure in the test section.

The data in the last two columns of the computation sheets have been used to construct the graphic histograms shown in Plates 26 and 28; they have also been used in a formula to calculate the joint permeabilities of each test section, the results of which are shown graphically in Plates 25 and 27. The permeability formula, which was derived by engineers of the Snowy Mountains Hydro-Electric Authority, is as follows:

$$U = \frac{Q}{H} \cdot \frac{16,200}{L} \quad (1 + 0.825 \log_{10} \frac{L}{R})$$

where U = permeability in feet per year

Q = flow out of test section in gallons per minute

H = effective pressure on test section in lb/sq.in.

L = length of test section in feet

R = radius drill hole in inches

PLATES.

In the following plans of the damsite area, the co-ordinates shown are part of the Canberra Grid for which the origin is Stromlo Trig. It is based on the Australian National Grid but the co-ordinates are expressed in feet. The reduced levels used are height above mean sea level. It should be noted that the datum used in the preliminary investigation (Best and Hill, 1962) is 65 feet above the sea level datum, i.e. the assumed level of 3,000 feet corresponds to a true R.L. of 2,935 feet.

Plates 1 to 14 show factual data only, while Plates 15 to 28 contain some measure of interpretation.

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
	Hole No DD1.			Co-ords.- 79767'S, 51693'W.				RL 2927'		Angle from Horizontal -30°				Direction 282 M			
	Packer Type:- NX mechanical with 4 rubbers, unless otherwise stated.							Water Supply:- via pumps as specified in remarks column.									
29-1-64	34'0"	54'3"	5	12	0-0	39-3	39-3	7·9	20·3	·5		2·5	0·5	1·0	15·0	0·39	Fair Seal
			5	12	39-3	78-6	39-3	7·9									Pump; reciprocating with
			5	18	0-0	50-4	50-4	10·1					1·0	2·0	17·5	0·50	capacity of 20 g.p.m.
			5	18	50-4	100-7	50-3	10·1									
			5	25	0-0	64-7	64-7	13·0			3'0" N						
			5	25	64-7	128-5	63-8	12·7			rod		1·5	3·0	23·0	0·63	
			5	25	128-5	192-3	63-8	12·8									
			5	18	0-0	48-2	48-2	9·6					1·0	2·0	17·5	0·47	
			5	13½	0-0	41-3	41-3	8·3					0·5	1·5	14·5	0·41	
31-1-64	51'9"	73'8"	5	10	34-0	70-0	36-0	7·2	22·0	5		2·5	0·0	5·0	7·5	0·32	Good Seal. BX
			5	10	70-0	105-0	35-0	7·0									hydraulic packer used
			5	10	105-0	140-2	35-2	7·02									Pump; reciprocating
			5	20	22-0	73-3	51-3	10·1					0·5	9·0	13·0	0·46	(20 g.p.m.)
			5	20	73-3	123-6	50-3	10·1									Some water came up
			5	20	123-6	174-0	50-4	10·1									casing during test.
			5	30	0-4	77-0	73-0	14·6			50'		0·5	16·0	15·0	0·66	
			5	30	77-0	150-2	73-2	14·6			EX						
			5	30	150-2	223-2	73-1	14·6			casing						
			5	40	17-0	105-5	88-5	17·6					1·0	22·5	19·0	0·80	
			5	40	105-5	193-7	88-2	17·6									
			5	40	193-7	281-7	88-0	17·6									
			5	30	0-0	78-3	78-3	15·6					0·5	18·5	13·5	0·71	
			5	20	0-0	53-1	53-1	10·1					0·5	10·0	12·5	0·48	
			5	10	0-0	36-4	36-4	7·2					0·0	5·0	7·5	0·33	
31-1-64	61'9"	73'8"	5	10	0-0	20-1	20-1	4·0	12	5		2·5	0·0	2·5	10·5	0·35	Good Seal. BX.
			5	10	20-1	41-0	20-7	4·2									hydraulic packer used.
			5	10	41-0	61-7	20-7	4·2									Pump; reciprocating (20 g.p.m)
			5	25	0-0	37-7	37-7	7·6					0·0	5·0	22·5	0·62	Water came out of casing
			5	25	37-7	74-7	37-0	7·4									during test.
			5	25	74-7	112-0	37-3	7·4									
			5	40	0-0	51-7	51-7	10·3			60'		0·5	9·0	33·0	0·86	
			5	40	51-7	103-5	51-6	10·3			EX						
			5	55	0-0	73-7	73-7	14·8			casing						
			5	55	73-7	146-5	72-8	14·5					1·0	16·0	40·5	1·22	
			5	55	146-5	217-4	72-7	14·6									
			5	40	0-0	57-0	57-0	11·4					0·5	10·5	31·5	0·95	
			5	25	0-0	44-2	44-2	8·8					0·5	7·0	20·0	0·73	
			5	10	0-0	24-5	24-5	4·9					0·0	2·5	10·0	0·41	
1-2-64	73'0"	93'6"	5	10	0-0	10-5	10-5	2·1	20·5	5		2·5	0·0	0·0	12·5	0·10	Good Seal BX hydraulic
			5	10	10-5	21-2	10-5	2·1									packer used.
			5	20	0-0	23-0	23-0	4·6					0·0	2·5	20·0	0·22	Pump, reciprocating type
			5	20	23-0	45-7	22-7	4·6			70'						with capacity of 20 g.p.m.
			5	30	0-0	36-7	36-7	7·4			EX		0·5	5·5	26·5	0·36	Water came out of casing
			5	30	36-7	73-5	36-6	7·3			casing						at gauge pressures of
			5	40	0-0	51-0	51-0	10·3					0·5	9·0	33·0	0·50	30 p.s.i and greater.
			5	40	51-0	102-5	51-5	10·3									
			5	50	0-0	58-5	58-5	11·7									
			5	50	58-5	114-5	56-0	11·2									

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (fft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
	Hole No	DD1	(cont)														
1-2-64	73'0"	93'6"	5	50	114-5	170-5	56-0	11·2	20·5	5		2·5	1·0	10·5	41·0	0·55	
			5	50	0-0	56-0	56-0	11·2			70'						
			5	40	0-0	48-0	48-0	9·6			EX		0·5	8·0	34·0	0·47	
			5	30	0-0	39-0	39-0	7·8			casing		0·5	6·0	26·0	0·38	
			5	20	0-0	30-0	30-0	6·0					0·0	4·0	18·5	0·29	
			5	10	0-0	18-5	18-5	3·7					0·0	1·5	11·0	0·18	
3-2-64	92'0"	112'6"	5	20	0-0	18-3	18-3	3·7	20·5	5		2·5	0·0	1·5	21·0	0·18	Good Seal. BX hydraulic
			5	20	18-3	36-5	18-2	3·7									packer used.
			5	40	0-0	31-3	31-3	6·3					0·5	4·0	38·0	0·31	Pump; reciprocating with
			5	40	31-3	62-6	31-3	6·3									a capacity of 20 g.p.m.
			5	60	0-0	47-0	47-0	9·4			90'		0·5	8·0	54·0	0·46	
			5	60	47-0	94-1	47-1	9·4			EX						
			5	75	0-0	55-3	55-3	11·1			casing		1·0	10·5	66·0	0·54	
			5	75	55-3	110-7	55-4	11·1									
			5	60	0-0	48-0	48-0	9·6					0·5	8·0	54·0	0·47	
			5	40	0-0	35-7	35-7	7·2					0·5	5·0	37·0	0·35	
			5	20	0-0	21-0	21-0	4·2					0·5	2·0	20·0	0·20	
3-2-64	110'6"	130'4"	5	20	0-0	12-4	12-4	2·5	20·0	5		2·5	0·0	0·5	22·0	0·12	Good Seal. BX hydraulic
			5	20	12-4	24-2	12-2	2·4									packer used.
			5	20	24-2	36-2	12-0	2·4									Pump; reciprocating with
			5	40	0-0	19-7	19-7	4·0					0·5	1·5	40·5	0·19	a capacity of 20 g.p.m.
			5	40	19-7	39-4	19-6	3·9									
			5	60	0-0	28-2	28-3	5·6									
			5	60	28-2	55-5	27-2	5·4					0·5	1·5	58·5	0·27	
			5	60	55-5	83-0	28-5	5·7									
			5	80	0-0	36-7	36-7	7·3			110'		0·5	3·5	76·5	0·35	
			5	80	36-7	72-7	36-0	7·2			EX						
			5	100	0-0	47-7	47-4	9·5			casing						
			5	100	47-4	98-6	51-2	10·2					1·0	9·0	92·5	0·50	
			5	100	98-6	150-9	52-1	10·5									
			5	80	0-0	42-4	42-4	8·5					0·5	7·0	75·0	0·41	
			5	60	0-0	32-7	32-7	6·6					0·5	4·5	57·5	0·32	
			5	40	0-0	26-7	26-7	5·4					0·5	3·0	39·0	0·26	
			5	20	0-0	17-0	17-0	3·4					0·5	1·0	21·0	0·16	
4-2-64	130'0"	150'3"	5	25	0-0	14-2	14-2	2·8	20·3	5		2·5	0·5	1·0	26·0	0·15	Good Seal. BX hydraulic
			5	25	12-7	28-1	15-4	3·1									packer used.
			5	25	28-1	43-7	15-6	3·1									Pump; reciprocating with
			5	50	0-0	27-4	27-4	5·5					0·5	3·0	49·0	0·27	a capacity of 20 g.p.m.
			5	50	27-4	54-7	27-3	5·5									
			5	75	0-0	32-0	32-0	6·4									
			5	75	32-0	63-2	31-2	6·2					0·5	4·0	73·0	0·31	
			5	75	63-2	94-3	31-1	6·2			130'						
			5	100	0-0	38-6	38-6	7·7			EX		0·5	6·0	96·0	0·38	
			5	100	38-6	76-5	37-7	7·6			casing						
			5	125	0-0	47-7	47-7	9·6					1·0	8·0	118·5	0·46	
			5	125	47-7	94-7	47-0	9·4									
			5	100	0-0	40-6	40-6	8·1					0·5	6·5	95·5	0·40	Packer split causing
			5	75	0-0	37-2	37-2	7·4					0·5	5·5	71·5	0·36	leakage from test section.
			5	50	0-0	43-2	43-2	8·6					1·0	7·0	64·5	0·42	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD1 (cont.)																	
5-2-64	150'0"	175'9"	5	25	0-0	40-1	40-1	8·0	25·8	5		2·5	1·0	1·0	25·5	0·31	Good Seal.
			5	25	40-1	80-4	40-3	8·1									Pump; centrifugal,
			5	50	0-0	60-0	60-0	12·0			150'						with capacity of
			5	50	60-0	120-2	60-2	12·0			EX		1·5.	3·0	48·0	0·46	140 g.p.m.
			5	50	120-2	176-7	56-5	11·7			casing						
			5	75	0-0	76-1	76-1	15·2					2·0	4·0	71·5	0·59	
			5	75	76-1	150-7	74-6	15·0									
			3	100	0-0	57-1	57-1	19·0					4·0	6·0	92·5	0·74	
6-2-64	175'10"	191'6"	5	25	1-0	12-4	11-4	2·3	15·7	5		2·5	0·0	0·0	27·5	0·15	Good Seal.
			5	25	12-4	24-0	11-4	2·3									Pump; reciprocating type,
			5	25	24-0	35-2	11-2	2·3									capacity of 20 g.p.m.
			5	50	46-0	64-4	18-4	3·7					0·5	0·0	52·0	0·23	
			5	50	64-4	82-3	17-7	3·6									
			5	50	82-3	100-0	17-5	3·5									
			5	75	13-0	40-0	27-0	5·4					0·5	0·5	76·5	0·32	
			5	75	40-0	65-4	25-4	5·1			180'						
			5	75	65-4	91-0	25-4	5·1			EX						
			5	100	11-0	43-0	32-0	6·4			casing		1·0	1·0	100·5	0·41	
			5	100	43-0	75-0	32-0	6·4									
			5	100	11-0	43-0	32-0	6·4									
			5	125	59-0	99-0	40-0	8·0					1·5	1·0	125·0	0·51	
			5	125	99-0	130-2	40-2	8·0									
			5	125	139-2	179-3	40-1	8·0									
10-2-64	189'0"	214'2"	5	25	0-0	1-4	1-4	0·3	25·1	5		2·5	0·0	0·0	27·5	0·01	Good Seal
			5	25	1-4	2-8	1-4	0·3									Pump; reciprocating
			5	50	0-0	2-4	2-4	0·5					0·0	0·0	52·5	0·02	type. capacity of 20 g.p.m
			5	50	2-4	5-0	2-6	0·5									
			5	75	0-0	2-7	2-7	0·6									
			5	75	2-7	5-3	2-4	0·5					0·0	0·0	77·5	0·02	
			5	75	5-3	7-7	2-4	0·5									
			5	100	0-0	3-4	3-4	0·7					0·0	0·0	102·5	0·03	
			5	100	3-4	6-7	3-3	0·7			190'						
			5	125	0-0	4-6	4-6	0·9			EX		0·0	0·0	127·5	0·04	
			5	125	4-6	9-2	4-6	0·9			casing						
			5	150	0-0	4-7	4-7	1·0					0·0	0·0	152·5	0·04	
			5	150	4-7	9-4	4-7	1·0									
			5	125	0-0	3-5	3-5	0·7					0·0	0·0	127·5	0·03	
			5	100	0-0	3-0	3-0	0·6					0·0	0·0	102·5	0·02	
			5	75	0-0	2-5	2-5	0·5					0·0	0·0	77·5	0·02	
			5	50	0-0	2-0	2-0	0·4					0·0	0·0	52·5	0·02	
			5	20	0-0	1-2	1-2	0·2					0·0	0·0	27·5	0·01	
10-2-64	213'3"	233'10"	5	25	7-0	9-4	2-4	0·5	20·7	5		2·5	0·0	0·0	27·5	0·02	Good Seal.
			5	25	9-4	12-0	2-4	0·5									Pump; reciprocating
			5	50	14-4	18-4	4-0	0·8			210'		0·0	0·0	52·5	0·04	type. Capacity 20 g.p.m.
			5	50	18-4	22-4	4-0	0·8			EX						
			5	75	23-4	29-0	5-4	1·1			casing						
			5	75	29-0	34-2	5-2	1·0					0·0	0·0	77·5	0·05	
			5	75	34-2	39-2	5-0	1·0									
			5	100	42-2	48-1	5-7	1·2									

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD1 (cont)																	
10-2-64	213'2"	233'10"	5	100	48-1	53-4	5-3	1·1	20·7	5		2·5	0·5	0·0	102·0	0·05	Good Seal.
			5	100	53-4	59-0	5-4	1·1									
			5	125	66-0	73-0	7-0	1·4					0·5	0·0	127·0	0·07	
			5	125	73-0	80-0	7-0	1·4									
			5	150	85-0	93-4	8-4	1·7			210'		0·5	0·0	152·0	0·08	
			5	150	93-4	102-0	8-4	1·7			EX						
			5	125	6-0	13-1	7-1	1·4			casing		0·5-	0·0	127·0	0·07	
			5	100	14-0	19-2	5-2	1·0					0·0	0·0	102·0	0·05	
			5	75	20-0	24-7	4-7	1·0					0·0	0·0	77·5	0·05	
			5	50	25-5	29-3	3-6	0·8					0·0	0·0	52·5	0·04	
			5	25	26-2	28-5	2-3	0·5					0·0	0·0	27·5	0·02	
Hole No. DD 2. Co-ords:- 79663'S, 51896'W. RL-3020' Angle from Horizontal:-40° Direction:-282°M																	
Packer Type:-NX mechanical with 4 rubbers unless otherwise stated. Water Supply:- Via pumps as specified in remarks column.																	
28-1-64	117'6"	27'6"	5	5	0-0	56-0	56-0	11·2	10	74		5·5	0·5	2·5	7·5	1·12	Good Seal.
			5	5	56-0	112-0	56-0	11·2									Pump:- Centrifugal
			5	10	0-0	70-0	70-0	14·0					1·0	3·5	11·0	1·40	capacity of 140 g.p.m
			5	10	70-0	140-0	70-0	14·0			20'						
			5	10	140-0	210-0	70-0	14·0			EX						
			5	15	0-0	98-0	98-0	19·6			casing		2·0	7·0	11·5	1·96	
			5	15	98-0	196-0	98-0	19·6									
			5	20	0-0	50-0	50-0	10·0					0·5	2·0	8·0	1·00	
			5	10	0-0	64-0	64-0	12·8					1·0	3·0	11·5	1·28	
			5	15	0-0	90-0	90-0	18·0					2·0	5·5	13·5	1·80	
29-1-64	26'1"	41'1"	5	10	0-0	21-1	21-1	4·2	15	74		7·0	0·0	0·5	16·5	0·27	Good Seal.
			5	10	21-1	41-7	20-6	4·1									Pump:-reciprocating.
			5	10	41-7	62-4	20-7	4·1									capacity 20 g.p.m.
			5	15	0-0	25-7	25-7	5·1					0·0	0·5	21·5	0·34	
			5	15	25-7	51-2	25-5	5·1									
			5	20	0-0	29-9	29-9	6·0			25'		0·0	1·0	26·0	0·40	
			5	20	29-7	59-6	29-9	6·0			EX						
			5	25	0-0	34-7	34-9	7·0			casing		0·0	1·0	30·5	0·47	
			5	25	34-7	69-7	35-0	7·0									
			5	20	0-0	30-0	30-0	6·0					0·0	1·0	26·0	0·40	
			5	15	0-0	25-5	25-5	5·1					0·0	0·5	21·5	0·34	
			5	10	0-0	20-8	20-8	4·2					0·0	0·5	16·5	0·28	
31-1-64	40'0"	59'11"	5	10	0-0	0-1	0-1	0·02	20'	74		11·5	0·0	0·0	21·5	0·00	Good Seal
			5	10	0-1	0-2	0-1	0·02									Pump:-centrifugal,
			5	25	0-0	3-2	3-2	0·64					0·0	0·0	36·5	0·03	capacity 140 g.p.m.
			5	25	3-2	6-4	3-2	0·64			40'						
			5	40	0-0	6-1	6-1	1·22			EX		0·0	0·0	51·5	0·06	
			5	40	6-1	12-2	6-1	1·22			casing						
			5	25	0-0	3-5	3-5	0·70					0·0	0·0	36·5	0·03	
			5	10	0-0	0-15	0-15	0·03					0·0	0·0	21·5	0·00	
1-2-64	59'2"	69'2"	5	15	0-0	0-0	0-0	0·0	30	74		17·5	0·0	0·0	32·0	0·00	Good Seal.
			5	15	0-0	0-0	0-0	0·0			60'						Pump:-centrifugal,
			5	20	0-0	0-4	0-4	0·08			EX		0·0	0·0	37·0	0·01	capacity of 140 g.p.m.
			5	20	0-4	0-7	0-3	0·06			casing						
			5	40	0-0	0-7	0-7	0·14					0·0	0·0	57·0	0·01	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No DD2 (cont)																	
1-2-64	59'2"	69'2"	5	40	0-7	1-6	0-7	0·14	10	74		17·4					
			5	20	0-0	0-2	0-2	0·04					0·0	0·0	37·0	0·0	
			5	15	0-0	0-0	0-0	0·0					0·0	0·0	32·0	0·0	
1-2-64	39'2"	69'2"	5	15	0-0	0-0	0-0	0·0	30	74		11·5	0·0	0·0	26·5	0·00	Good Seal.
			5	15	0-0	0-0	0-0	0·0									Pump:-Centrifugal,
			5	30	0-0	1-0	1-0	0·2					0·0	0·0	41·5	0·01	capacity of 140 g.p.m.
			5	30	1-0	2-2	1-2	0·25			40'						
			5	30	2-2	3-4	1-2	0·25			EX						
			5	40	0-0	2-2	2-2	0·45			casing		0·0	0·0	51·5	0·02	
			5	40	2-2	4-5	2-3	0·48									
			5	40	4-5	6-7	2-2	0·45									
			5	30	0-0	1-1	1-1	0·2					0·0	0·0	41·5	0·01	
			5	15	0-0	0-0	0-0	0·0					0·0	0·0	26·5	0·00	
3-2-64	68'3'	88'3"	5	10	0-0	0-2	0-2	0·05	20'	74		20·0	0·0	0·0	30·0	0·00	Good Seal.
			5	10	0-2	0-4	0-2	0·05									Pump:-Centrifugal,
			5	10	0-4	0-6	0-2	0·05									capacity of 140 g.p.m
			5	20	0-0	1-1	1-1	0·22					0·0	0·0	40·0	0·01	
			5	20	1-1	2-2	1-1	0·22									
			5	20	2-2	3-3	1-1	0·22			70'						
			5	40	0-0	2-4	2-4	0·50			casing		0·0	0·0	60·0	0·03	
			5	40	2-4	5-0	2-6	0·55			EX						
			5	40	5-0	7-4	2-4	0·50									
			5	60	0-0	5-0	5-0	1·0					0·0	0·0	80·0	0·05	
			5	60	5-0	10-0	5-0	1·0									
			5	40	0-0	3-0	3-0	0·6					0·0	0·0	60·0	0·03	
			5	20	0-0	2-1	2-1	0·42					0·0	0·0	40·0	0·02	
			5	10	0-0	0-4	0-4	0·1					0·0	0·0	30·0	0·01	
5-2-64	87'0"	107'8"	5	10	0-0	2-1	2-1	0·42	20'	74		25·5	0·0	0·0	35·5	0·02	Good Seal.
			5	10	2-1	4-2	2-1	0·42									Pump:- Centrifugal,
			5	20	0-0	6-3	6-3	1·3					0·0	0·0	45·5	0·04	capacity of 140 g.p.m.
			5	20	6-3	11-2	4-7	0·9									
			5	20	11-2	15-5	4-3	0·9									
			5	20	15-5	19-4	4-1	0·82									
			5	20	19-4	23-5	4-1	0·82									
			5	30	0-0	6-4	6-4	1·3			90'		0·0	0·0	55·5	0·07	
			5	30	6-4	13-1	6-5	1·3			EX						
			5	40	0-0	8-6	8-6	1·75			casing		0·0	0·0	65·5	0·09	
			5	40	8-6	17-3	8-5	1·8									
			5	50	0-0	11-2	11-2	2·2					0·0	0·0	75·5	0·11	
			5	50	11-2	21-7	10-5	2·1									
			5	50	21-7	32-4	10-5	2·1									
			5	40	0-0	8-6	8-6	1·75					0·0	0·0	65·5	0·09	
			5	30	0-0	6-7	6-7	1·4					0·0	0·0	55·5	0·07	
			5	20	0-0	4-7	4-7	1·0					0·0	0·0	45·5	0·05	
			5	10	0-0	3-6	3-6	0·8					0·0	0·0	35·5	0·04	
6-2-64	106'9"	127'3"	5	10	0-0	106-5	106·5	21·3	20'5"	74		31'0"	3·5	8·0	29·5	1·04	Good Seal.
			5	10	106-5	212-5	106·0	21·2									Pump:- Centrifugal,
			5	30	0-0	154-3	154·3	30·9					7·0	16·0	38·0	1·50	capacity of 140 g.p.m.
			5	30	154-3	303-0	148·5	29·7									
			5	30	0-0	152-5	152·5	30·5					10·0	25·0	46·0	1·83	
			5	50	0-0	188-0	188·0	37·6									

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD2 (cont)																	
6-2-64	106' 9"	127' 3"	5	50	0 - 0	188 - 0	188 - 0	37 · 6	20·5	74		31 · 0	10 · 0	25 · 0	46 · 0	1 · 83	
			5	50	188 - 0	375 - 6	187 - 6	37 · 5									
			5	75	375 - 6	564 - 5	188 - 7	37 · 8									
			5	75	0 - 0	231 - 7	231 - 7	46 · 4			110'		15 · 0	39 · 0	52 · 0	2 · 26	
			5	75	231 - 7	463 - 7	232 - 0	46 · 4			EX						
			5	75	0 - 0	231 - 2	231 - 2	46 · 3			casing						
			5	50	0 - 0	187 - 1	187 - 1	37 · 4					10 · 0	25 · 0	46 · 0	1 · 82	
			5	30	0 - 0	155 - 3	155 - 3	31 · 1					7 · 0	17 · 0	37 · 0	1 · 52	
			5	10	0 - 0	121 - 0	121 - 0	24 · 2					4 · 5	10 · 0	26 · 5	1 · 18	
10-2-64	125' 2"	145' 8"	5	10	0 - 0	143 - 0	143 - 0	28 · 6	20·5	74		33·0	7 · 0	14 · 0	22 · 0	1 · 40	Good Seal.
			5	30	0 - 0	177 - 0	177 - 0	35 · 4					11 · 0	22 · 0	30 · 0	1 · 72	Pump:- Centrifugal,
			5	30	0 - 0	176 - 0	176 - 0	35 · 2									capacity of 140 g.p.m.
			5	30	0 - 0	177 - 0	177 - 0	35 · 4									
			5	40	0 - 0	192 - 0	192 - 0	38 · 4					12 · 5	26 · 0	34 · 5	1 · 87	
			5	40	0 - 0	191 - 4	191 - 4	38 · 3			130'						
			5	60	0 - 0	233 - 0	233 - 0	46 · 6			EX		18 · 0	39 · 0	36 · 0	2 · 27	
			5	60	0 - 0	233 - 0	233 - 0	46 · 6			casing						
			5	80	0 - 0	255 - 0	255 - 0	51 · 0					21 · 5	46 · 0	45 · 5	2 · 48	
			5	80	0 - 0	255 - 0	255 - 0	51 · 0									
			5	40	0 - 0	189 - 0	189 - 0	37 · 8					12 · 5	26 · 0	34 · 5	1 · 84	
			5	10	0 - 0	142 - 0	142 - 0	28 · 4					7 · 0	14 · 0	22 · 0	1 · 39	
11-2-64	135' 0"	145' 8"	5	25	0 - 0	19 - 6	19 - 6	3 · 9	20'5"	74		33 · 0	0 · 0	0 · 5	57 · 5	0 · 36	Good Seal.
			5	25	19 - 6	39 - 2	19 - 4	3 · 9									Pump:- Reciprocating,
			5	48	0 - 0	30 - 5	30 - 5	6 · 1					0 · 5	1 · 0	79 · 5	0 · 57	capacity of 140 g.p.m.
			5	48	30 - 5	61 - 2	30 - 5	6 · 1									
			5	75	0 - 0	39 - 7	39 - 7	8 · 0			140'		1 · 0	1 · 0	106 · 0	0 · 75	
			5	75	39 - 7	79 - 6	39 - 6	8 · 0			EX						
			5	88	0 - 0	43 - 1	43 - 1	8 · 6			casing		1 · 0	1 · 5	118 · 5	0 · 80	
			5	88	43 - 1	46 - 1	43 - 0	8 · 6									
			5	40	0 - 0	29 - 1	29 - 1	5 · 8					0 · 5	1 · 0	71 · 5	0 · 54	
			5	25	0 - 0	24 - 5	24 - 5	4 · 9					0 · 5	0 · 5	57 · 0	0 · 46	
11-2-64	145' 0"	161' 1"	5	20	0 - 0	10 - 1	10 - 1	2 · 0	16	74		33 · 0	0 · 0	0 · 0	33 · 0	0 · 11	Good Seal.
			5	20	10 - 1	19 - 6	9 - 5	1 · 9									Pump:- Reciprocating
			5	20	19 - 6	28 - 5	8 - 7	1 · 8									capacity of 12 g.p.m.
			5	20	28 - 5	37 - 4	8 - 7	1 · 8									
			5	40	0 - 0	12 - 7	12 - 7	2 · 6					0 · 0	0 · 0	73 · 0	0 · 16	
			5	40	12 - 7	25 - 3	12 - 4	2 · 5									
			5	60	0 - 0	20 - 5	20 · 5	4 · 1			150'		0 · 5	0 · 5	92 · 0	0 · 25	
			5	60	20 - 5	40 - 3	19 - 6	4 · 0			EX						
			5	60	40 - 3	60 - 3	20 - 0	4 · 0			casing						
			5	80	0 - 0	23 - 6	23 - 6	4 · 7					0 · 5	0 · 5	112 · 0	0 · 29	
			5	80	23 - 6	47 - 3	23 - 5	4 · 7									
			5	100	0 - 0	29 - 3	29 - 3	5 · 9					0 · 5	1 · 0	131 · 5	0 · 37	
			5	100	29 - 3	29 - 4	29 - 4	5 · 9									
			5	60	0 - 0	21 - 7	21 - 7	4 - 4					0 · 5	0 · 5	92 · 0	0 · 27	
Hole No DD3. Co-ords:- 79763'S, 51686'W. RL. - 2927' Angle from horizontal:- 60° Direction:- 068°M.																	
Packer Type:- NX. mechanical with 4 rubbers. Water Supply:- Via pumps as specified in remarks column.																	
13-2-64	9' 8"	32' 4"	5	5	1 · 0	40 · 0	39 · 0	7 · 8	22'7"	5		2 · 5					

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. D D 3. (cont)																	
13-2-64	9' 8"	32' 4"	5	5	1 - 0	40 - 0	39 - 0	7 · 8	22·7	5	10'	2 · 5					Good Seal.
			5	5	40 - 0	80 - 0	40 - 0	8 · 0			EX		0 · 0	1 · 0	8 · 5	0 · 35	Pump:- Reciprocating,
			5	5	80 - 0	120 - 0	40 - 0	8 · 0			casing						capacity of 20g.p.m.
			5	10	31 - 0	83 - 0	52 - 0	10 · 4									
			5	10	83 - 0	135 - 0	52 - 0	10 · 4					0 · 0	2 · 0	10 · 5	0 · 46	
			5	10	135 - 0	187 - 0	52 - 0	10 · 4									
14 - 2 - 64	32' 0"	52' 10"	5	6	0 - 0	44 - 4	44 - 4	9 · 0	20 · 8	5	32'	2 · 5	0 · 0	1 · 5	7 · 0	0 · 43	Good Seal.
			5	6	44 - 4	88 - 7	44 - 4	9 · 0			EX						Pump:- Centrifugal
			5	10	0 - 0	55 - 7	55 - 7	11 · 2			casing		0 · 0	2 · 5	10 · 0	0 · 54	capacity 140g.p.m.
			5	10	55 - 8	110 - 0	54 - 2	11 · 0									
			5	20	0 - 0	76 - 0	76 - 0	15 · 2					0 · 5	4 · 0	18 · 0	0 · 72	
			5	20	76 - 0	151 - 0	75 - 0	15 · 0									
			5	30	0 - 0	100 - 3	100 - 3	20 · 1					1 · 0	7 · 0	24 · 5	0 · 96	
			5	30	100 - 0	200 - 0	100 - 0	21 · 0									
			5	20	0 - 0	75 - 0	75 - 0	15 · 0					0 · 5	4 · 0	18 · 0	0 · 72	
			5	10	0 - 0	55 - 0	55 - 0	11 · 0					0 · 0	2 · 5	10 · 0	0 · 53	
			5	5	0 - 0	40 - 0	40 - 0	8 · 0					0 · 0	1 · 5	6 · 0	0 · 38	
15 - 2 - 64	53' 0"	73' 5"	5	20	0 - 0	50 - 2	50 - 2	10 · 0	20 · 4	5	52'	2 · 5	0 · 5	2 · 0	20 · 0	0 · 49	Good Seal
			5	20	50 - 2	100 - 2	50 - 0	10 · 0			EX						Pump:- Centrifugal,
			5	30	0 - 0	65 - 2	65 - 2	13 · 0			casing		0 · 5	3 · 0	29 · 0	0 · 64	capacity of 140g.p.m
			5	30	65 - 2	130 - 4	65 - 2	13 · 0									
			5	40	0 - 0	83 - 0	83 - 0	16 · 6					1 · 0	5 · 0	38 · 5	0 · 81	
			5	40	83 - 0	166 - 0	83 - 0	16 · 6									
			5	50	0 - 0	96 - 0	96 - 0	19 · 2					1 · 5	6 · 5	45 · 5	0 · 94	
			5	50	0 - 0	96 - 0	96 - 0	19 · 2									
			5	30	0 - 0	68 - 5	68 - 5	13 · 7					0 · 5	3 · 5	28 · 5	0 · 67	
			5	20	0 - 0	52 - 3	52 - 3	10 · 5					0 · 5	2 · 0	20 · 0	0 · 51	
			5	10	0 - 0	35 - 6	35 - 6	7 · 1					0 · 0	1 · 0	11 · 5	0 · 35	
17 - 2 - 64	72' 6"	93' 0"	5	10	0 - 0	71 - 8	71 - 8	14 · 4	20 · 5	5	70'	2 · 5	1 · 0	4 · 0	7 · 5	0 · 69	Good Seal.
			5	10	71 - 8	142 - 4	70 - 6	14 · 1			EX						Pump:- Centrifugal,
			5	20	0 - 0	109 - 6	109 - 6	21 · 9			casing		2 · 0	8 · 0	12 · 5	1 · 07	capacity of 140g.p.m.
			5	20	109 - 2	218 - 8	109 - 2	21 · 8									
			5	30	0 - 0	148 - 7	148 - 7	29 · 8									
			5	30	148 - 7	280 - 0	131 - 1	26 · 2									
			5	30	280 - 0	416 - 5	136 - 5	27 · 3					3 · 5	13 · 0	18 · 0	1 · 33	
			5	30	416 - 5	555 - 0	138 - 5	27 · 7									
			5	40	0 - 0	166 - 7	166 - 7	33 · 4					5 · 0	19 · 0	18 · 5	1 · 62	
			5	40	166 - 7	331 - 7	165 - 0	33 · 0									
			5	50	0 - 0	188 - 2	188 - 2	37 · 4					6 · 5	25 · 0	21 · 0	1 · 82	
			5	50	188 - 2	374 - 5	186 - 3	37 · 2									
			5	40	0 - 0	159 - 0	159 - 0	31 · 8					5 · 0	18 · 0	19 · 5	1 · 55	
			5	30	0 - 0	132 - 5	132 - 5	26 · 5					3 · 0	12 · 0	17 · 5	1 · 29	
			5	20	0 - 0	103 - 7	103 - 7	20 · 7					2 · 0	7 · 5	13 · 0	1 · 01	
			5	10	0 - 0	67 - 0	67 - 0	13 · 4					1 · 0	3 · 5	8 · 0	0 · 65	
18 - 2 - 64	93' 0"	113' 5"	5	20	0 - 0	15 - 0	15 - 0	3 · 0	20 · 7	5	90'	2 · 5	0 · 0	0 · 0	22 · 5	0 · 15	Good Seal.
			5	20	15 - 0	15 - 0	15 - 0	3 · 0			EX						Pump:- Centrifugal,
			5	40	40 - 0	64 - 0	24 - 0	4 · 8			casing		0 · 0	0 · 5	42 · 0	0 · 24	capacity of 140g.p.m.
			5	40	64 - 0	88 - 0	24 - 0	4 · 8									
			5	60	4 - 0	36 - 0	32 - 0	6 · 4					0 · 5	1 · 0	62 · 0	0 · 30	
			5	60	36 - 0	67 - 6	31 - 6	6 · 2									

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD3 (cont.)																	
18-2-64	91 3' 0"	113' 5"	5	60	67 - 6	97 - 7	30 - 1	6 · 0									
			5	80	10 - 0	50 - 0	40 - 0	8 · 0					0 · 5	1 · 0	81 · 0	0 · 39	
			5	60	10 - 0	41 - 0	31 - 0	6 · 2					0 · 5	1 · 0	61 · 0	0 · 30	
			5	40	11 - 0	34 - 2	23 - 2	4 · 6					0 · 0	0 · 5	42 · 0	0 · 23	
			5	20	5 - 0	18 - 6	13 - 6	2 · 6					0 · 0	0 · 0	22 · 5	0 · 13	
19-2-64	114' 4"	135' 0"	5	25	0 - 0	5 - 1	5 - 1	1 · 0	20 · 7	5	114'	2 · 5	0 · 0	0 · 0	27 · 5	0 · 05	Good Seal.
			5	35	5 - 1	10 - 2	5 - 1	1 · 0			EX						Pump:- Reciprocating
			5	50	0 - 0	6 - 4	6 - 4	1 · 3			casing		0 · 0	0 · 0	52 · 5	0 · 06	capacity 20g.p.m.
			5	50	6 - 4	13 - 0	6 - 4	1 · 3									
			5	75	0 - 0	8 - 0	8 - 0	1 · 6					0 · 0	0 · 0	77 · 5	0 · 08	
			5	75	8 - 0	16 - 0	8 - 0	1 · 6									
			5	90	0 - 0	9 - 0	9 - 0	1 · 8					0 · 0	0 · 0	92 · 5	0 · 09	
			5	90	9 - 0	18 - 0	9 - 0	1 · 8									
			5	75	24 - 0	31 - 6	7 - 6	1 · 5					0 · 0	0 · 0	77 · 5	0 · 07	
			5	50	38 - 0	44 - 2	6 - 2	1 · 2					0 · 0	0 · 0	52 · 5	0 · 06	
			5	25	46 - 0	50 - 3	4 - 3	0 · 9					0 · 0	0 · 0	27 · 5	0 · 04	
			5	10	51 - 0	53 - 3	2 - 3	0 5					0 · 0	0 · 0	12 · 5	0 · 02	
20-2-64	135 0"	155' 6"	5	25	0 - 0	18 - 4	18 - 4	3 · 7	20'5"	5	134'	2 · 5	0 · 0	0 · 0	27 · 5	0 · 18	Good Seal.
			5	25	18 - 4	36 - 5	18 - 1	3 · 6			EX						Pump:- Reciprocating,
			5	50	0 - 0	24 - 5	24 - 5	4 · 9			casing		0 · 0	0 · 0	52 · 0	0 · 23	capacity of 20gp.m.
			5	50	24 - 5	47 - 5	23 - 0	4 · 6									
			5	75	0 - 0	25 - 6	25 - 6	5 · 1					0 · 0	0 · 0	77 · 0	0 · 24	
			5	75	25 - 6	49 - 4	23 - 6	4 · 8									
			5	100	0 - 0	26 - 7	26 - 7	5 · 4					0 · 0	0 · 0	102 · 0	0 · 26	
			5	100	26 - 7	52 - 7	26 - 0	5 · 2									
			5	75	0 - 0	20 - 3	20 - 3	5 · 1					0 · 0	0 · 0	77 · 0	0 25	
			5	50	0 - 0	15 - 3	15 - 3	3 · 1					0 · 0	0 · 0	52 · 0	0 · 15	
			5	25	0 - 0	9 - 5	9 - 5	3 · 9					0 · 0	0 : 0	27 · 5	0 · 09	
20-2-64	154' 0'	174' 7"	5	50	11 - 0	11 - 0	0 - 0	0 · 0	20 · 7	5	154'	2 · 5	0 · 0	0 · 0	52 · 5	0 · 00	Good Seal.
			5	75	11 - 4	25 - 0	12 - 4	2 · 5			EX		0 · 0	0 · 0	77 · 5	0 · 12	Pump:- Reciprocating
			5	75	12 - 0	37 - 4	12 - 4	2 · 5			casing						capacity:- 20g.p.m.
			5	100	40 - 4	55 - 4	15 - 4	3 · 1					0 · 5	0 · 0	102 · 0	0 · 15	
			5	100	55 - 4	71 - 0	15 - 4	3 · 1									
			5	120	74 - 0	90 - 1	16 - 1	3 · 2					0 · 0	0 · 0	122 · 0	0 · 16	
			5	120	90 - 1	105 - 7	15 - 6	3 · 2									
			5	100	10 - 0	22 - 5	12 - 5	2 · 5					0 · 0	0 · 0	102 · 5	0 · 12	
			5	75	24 - 4	34 - 4	10 - 0	2 · 0					0 · 0	0 · 0	77 · 5	0 · 10	
			5	50	36 - 0	42 - 6	6 - 6	1 · 4					0 · 0	0 · 0	52 · 5	0 · 07	
			5	25	43 - 5	47 - 1	3 - 4	0 · 7					0 · 0	0 · 0	27 · 5	0 · 03	
24-2-64	174' 4"	195' 0"	5	30	4 - 0	4 - 0	0 - 0	0 · 0	20 · 7	5	174'	2 · 5	0 · 0	0 · 0	32 · 5	0 · 00	Good Seal.
			5	30	4 - 0	4 - 0	0 - 0	0 · 0			EX						Pump:- Reciprocating
			5	60	8 - 1	9 - 5	1 - 4	0 · 3			casing		0 · 0	0 · 0	62 · 5	0 · 01	capacity, 20 g.p.m.
			5	60	9 - 5	11 - 1	1 - 4	0 · 3									
			5	90	11 - 3	13 - 3	2 - 0	0 · 4					0 · 0	0 · 0	92 · 5	0 · 02	
			5	90	13 - 3	15 - 3	2 - 0	0 · 4									
			5	120	15 - 7	18 - 1	2 - 2	0 · 45					0 · 0	0 · 0	122 · 5	0 · 02	
			5	120	18 - 1	20 - 2	2 - 1	0 · 45									
			5	150	21 - 0	23 - 5	2 - 5	0 · 5					0 · 0	0 · 0	152 · 5	0 · 02	
			5	150	23 - 5	26 - 2	2 - 5	0 · 5									
			5	120	26 - 2	28 - 5	2 - 0	0 · 4					0 · 0	0 · 0	122 · 5	0 · 02	
			5	60	30 - 4	31 - 4	1 - 0	0 · 2					0 · 0	0 · 0	62 · 5	0 · 01	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No:- D.D.4.					Coords:- 79653'S, 52146'W.				R.L:- 3127'			Angle from Horizontal:- 45°				Direction:- 047° M	
Packer Type:- NX mechanical with 4 rubbers												Water Supply:- Via pumps as specified in remarks column.					
18-2-64	11'4"	32'5"	5	3	98-5	145-6	47-1	9·4	21·1	>141	12'	3·5	0·0	1·5	5·0	0·45	Good Seal
			5	3	145-6	193-0	47-2	9·4			EX						Pump:-Reciprocating
											casing						Capacity of 12gpm
19-2-64	32'0"	52'8"	5	5	0-0	160-3	160-3	32·0	20·7	>141	32'	10·0	2·0	18·0	→0·0	1·54	
			5	5	160-3	320-7	160-4	32·0			EX						
			5	10	0-0	188-0	188-0	37·6			casing		3·0	25·0	→0·0	1·81	
			5	10	188-0	375-6	187-6	37·6									
			5	5	0-0	160-2	160-2	32·0					2·0	18·0	→0·0	1·54	
24-2-64	52'6"	73'0"	5	5	0-0	108-4	108-4	21·7	20·5	>141	52'	16·0	1·5	8·0	11·5	1·05	Good Seal
			5	5	108-4	215-4	107-0	21·4			EX						Pump:- Centrifugal
			5	10	0-0	120-0	120-0	24·0			casing		1·5	10·0	14·5	1·17	Capacity of 140gpm
			5	10	120-0	240-0	120-0	24·0									
			5	15	0-0	133-1	133-1	26·6					2·0	12·0	17·0	1·30	
			5	15	133-1	266-4	133-3	26·7									
			5	20	0-0	146-5	146-5	29·3					3·0	15·0	18·0	1·43	
			5	20	146-5	293-1	146-4	29·3									
			5	15	0-0	136-0	136-0	27·2					2·5	13·0	15·5	1·33	
			5	10	0-0	118-2	118-2	23·6					1·5	10·0	14·5	1·15	
			5	10	0-0	106-5	106-5	21·3					1·5	8·0	11·5	1·03	
25-2-64	72'6"	93'2"	5	10	0-0	120-0	120-0	24·0	20·7	>141	72'	22·0	2·5	9·0	20·5	1·13	Good Seal
			5	10	120-0	237-0	117-0	23·4			EX						Pump:- Centrifugal
			5	10	237-0	354-0	117-0	23·4			casing						Capacity of 140gpm.
			5	15	0-0	128-4	128-4	25·7					3·0	12·0	22·0	1·25	
			5	15	128-4	258-5	130-1	26·0									
			5	20	0-0	141-6	141-6	28·3					4·0	14·0	24·0	1·37	
			5	20	141-6	383-3	141-5	28·3									
			5	25	0-0	152-0	152-0	30·4					4·5	16·0	26·5	1·47	
			5	25	152-0	304-4	152-4	30·5									
26-2-64	93'0"	113'8"	5	10	0-0	94-0	94-0	18·8	20·7	>141	94'	29·0	2·0	6·0	31·0	0·89	Good Seal
			5	10	94-0	185-4	91-4	18·3			EX						Pump:-Centrifugal
			5	10	185-4	276-7	91-3	18·3			casing						Capacity of 140g.p.m.
			5	20	0-0	112-4	112-4	22·5					3·0	9·0	37·0	1·09	
			5	20	112-4	224-4	112-0	22·4									
			5	30	0-0	133-0	133-0	26·6					4·5	12·0	42·5	1·28	
			5	30	133-0	264-6	131-6	26·4									
			5	20	0-0	115-0	115-0	23·0					3·0	9·0	37·0	1·11	
			5	10	0-0	95-3	95-3	19·1					2·0	6·5	30·5	0·92	
27-2-64	111'9"	132'5"	5	10	0-0	94-3	94-3	18·9	20·7	>141	112'	35·0	3·0	6·0	36·0	0·91	Good Seal
			5	10	94-3	187-7	93-4	18·7			EX						Pump:-Centrifugal
			5	10	187-7	281-5	93-6	18·7			casing						Capacity of 140gpm
			5	20	0-0	110-2	110-0	22·0					3·5	8·0	43·5	1·04	
			5	20	110-2	218-4	108-2	21·6									
			5	20	218-4	326-5	108-1	21·6									
			5	30	0-0	124-0	124-0	24·8					4·5	11·0	49·5	1·20	
			5	30	124-0	147-5	123-3	24·7									
			5	40	0-0	142-0	142-0	28·4					6·0	14·0	55·0	1·37	
			5	40	142-0	283-6	141-6	28·4									

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (fft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No:- D.D.4 (cont.)																	
27-2-64	111'9"	132'5"	5	30	0-0	125-7	125-7	25·2			112'	35·0	4·5	11·0	49·5	1·22	
			5	20	0-0	111-0	111-0	22·2			EX.		3·5	9·0	42·5	1·07	
			5	10	0-0	95-0	95-0	19·0			casing		3·0	3·0	35·0	0·92	
28-2-64	132'0"	152'8"	5	10	0-0	216-0	216-0	43·2	20·7	>141	132'	41·0	16·0	34·0	1·0	2·09	Good Seal
			5	10	0-0	216-0	216-0	43·2			EX.						Pump:- Centrifugal,
			5	25	0-0	243-0	243-0	48·6			casing		20·0	42·0	4·0	2·35	Capacity of 140 gpm
			5	25	0-0	243-2	243-2	48·6									
			5	40	0-0	269-0	269-0	53·8					24·0	51·0	6·0	2·60	
			5	40	0-0	268-6	268-6	53·8									
			5	50	0-0	277-0	277-0	55·4					25·5	54·0	11·5	2·68	
			5	50	0-0	277-0	277-0	55·4									
			1	40	0-0	52-0	52-0	52·0					23·0	48·0	10·0	2·51	
			1	25	0-0	48-0	48-0	48·0					20·0	41·0	5·0	2·32	
29-2-64	151'2"	171'10"	10	10	0-0	312-7	312-7	31·3	20·7	>141	152'	47·0	9·0	17·0	31·0	1·51	Good Seal.
			5	20	0-0	187-0	187-0	37·4			EX.		13·5	25·0	28·5	1·81	Pump:- Centrifugal,
			5	20	0-0	186-0	186-0	37·2			casing						Capacity of 140 gpm
			5	20	0-0	186-0	186-0	37·2									
			5	40	0-0	242-0	242-0	48·4					22·5	42·0	22·5	2·33	
			5	40	0-0	240-0	240-0	48·0									
			5	40	0-0	241-0	241-0	48·2									
			5	50	0-0	285-0	285-0	57·0					30·0	58·0	9·0	2·78	
			5	50	0-0	288-0	288-0	57·6									
			5	50	0-0	287-0	287-0	57·4									
2-3-64	155'0"	200'0"	1	10	0-0	44-0	44-0	44·0	45·0	>141	162'	50·0	20·0	33·0	7·0	0·94	Good Seal
			1	10	44-0	87-0	43-0	43·0			EX.						Pump:- Centrifugal,
			1	10	87-0	129-6	42-6	42·8			casing						Capacity of 140 gpm
			1	10	129-6	171-6	42-0	42·0									Packer jammed at
			1	10	171-6	214-2	42-4	42·5									155', hence the long
			1	10	214-2	256-6	42-4	42·5									test section.
			1	30	0-0	52-0	52-0	52·0					27·0	46·0	7·0	1·14	
			1	30	52-0	103-4	51-4	51·5									
			1	30	103-4	155-4	52-0	52·0									
			1	30	155-4	206-4	51-0	51·0									
			1	30	206-4	257-4	51-0	51·0									30 p.s.i. maximum
			1	20	0-0	46-4	46-4	46·5					22·0	38·0	10·0	1·02	pressure obtainable
			1	20	46-4	92-4	46-0	46·0									
			1	20	92-4	138-4	46-0	46·0									
			1	20	138-4	184-6	46-2	46·3									
			1	20	184-6	230-8	46-0	46·0									
			1	10	0-0	42-4	42-4	42·5					19·5	33·0	7·5	0·95	
			1	10	42-4	85-4	43-0	43·0									

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. D.D. 5. Co-ords :- 79555'S, 52363'W. RL :- 3215' Angle from horizontal :- 90° Direction. —																	
Packer Type :- NX mechanical with 4 rubbers. Water Supply :- Gravity feed from 2,500 gallon tank 135' vertically above drill site.																	
28-2-64	12' 0"	32' 2"	5	5	0 - 0	16 - 0	16 - 0	3 · 2	20' 2"	>32	12'	5 · 5	0 · 0	0 · 0	10 · 5	0 · 16	Good Seal.
			5	5	16 - 0	22 - 0	16 - 0	3 · 2			EX						
			5	5	22 - 0	38 - 0	16 - 0	3 · 2			casing						
29-2-64	30' 0"	50' 3"	5	10	0 - 0	30 - 0	30 - 0	6 · 0	20' 3"	>50	32'	14·0	0 · 0	1 · 0	23 · 0	0 · 30	Good Seal.
			5	10	30 - 0	69 - 7	29 - 7	6 · 0			EX						
			5	20	0 - 0	36 - 4	36 - 4	7 · 3			casing		0 · 0	1 · 0	33 · 0	0 · 36	
			5	20	36 - 4	73 - 3	36 - 9	7 · 0									
			5	25	0 - 0	42 - 0	42 - 0	8 · 4					0 · 0	1 · 5	37 · 5	0 · 42	
			5	25	42 - 0	83 - 6	41 - 6	8 · 3									
			5	15	0 - 0	40 - 6	40 - 5	8 · 0					0 · 0	1 · 0	28 · 0	0 · 40	
			5		0 - 0	38 - 5	38 - 5	7 · 5					0 · 0	1 · 0	18 · 0	0 · 36	
29-2-64	50' 0"	70' 5"	5	20	10 - 0	60 - 1	50 - 1	10 · 0	20' 4"	>70	52'	23·0	0 · 5	2 · 0	40 · 5	0 · 49	Good Seal.
			5	20	60 - 1	110 - 3	50 - 2	10 · 0			EX						
			5	30	2 - 0	66 - 0	64 - 0	12 · 8			casing		0 · 5	3 · 0	49 · 5	0 · 63	
			5	30	66 - 0	130 - 0	64 - 0	12 · 8									
			5	40	1 - 0	83 - 0	82 - 0	16 · 4					1 · 0	4 · 5	57 · 5	0 · 80	
			5	40	83 - 0	164 - 2	81 - 2	16 · 2									
			5	30	7 - 0	68 - 5	61 - 5	12 · 3					0 · 5	3 · 0	49 · 5	0 · 60	
			5	20	0 - 0	46 - 3	46 - 3	9 · 3					0 · 5	1 · 5	41 · 0	0 · 46	
			5	10	11 - 0	47 - 7	36 - 7	7 · 3					0 · 0	1 · 0	32 · 0	0 · 36	
1 - 3 - 64	69' 6"	92 2"	5	15	0 - 0	285 - 0	285 - 0	57 - 0'	20 · 7	>90	72'	31 · 5	14 · 5	58 · 0	→0·0	2 · 76	Good Seal. (15 p.s.i. maximum pressure possible).
											EX casing						
2 - 3 - 64	87' 6"	108' 0"	1	14	0 - 0	48 - 4	48 - 4	48 · 5	20 · 5	>108	92'	40 · 5	14 · 0	42 · 0	→0·0	2 · 36	Good Seal. (14 psi. maximum pressure possible.)
			1	14	48 - 4	97 - 0	48 - 4	48 · 5			EX						
			1	14	0 - 0	49 - 0	49 - 0	49 · 0			casing						
			1	14	49 - 0	96 - 4	47 - 4	47 · 5									
			1	14	0 - 0	49 - 0	49 - 0	49 · 0									
2 - 3 - 64	111' 6"	128 6"	1	10	0 - 0	54 - 5	54 - 5	54 · 5	17' 0"	>128	112'	49 · 5	20 · 5	53 · 0	→0·0	3 · 20	Good Seal. (21 p.s.i. maximum pressure possible.)
			1	10	54 - 5	109 - 5	55 - 0	55 · 0			EX						
			1	10	109 - 5	163 - 7	54 - 2	54 · 2			casing						
			1	10	163 - 7	218 - 5	54 - 6	54 · 8									
			1	15	0 - 0	56 - 7	56 - 7	56 · 7					21 · 0	55 · 0	→0·0	3 · 29	
			1	15	56 - 7	112 - 5	55 - 8	55 · 8									
			1	15	112 - 5	167 - 5	55 - 0	55 · 0									
			1	15	167 - 5	223 - 5	56 - 5	56 · 5									
			1	21	0 - 0	59 - 0	59 - 0	59 · 0					23 · 0	60 · 0	→0·0	3 · 41	
			1	21	59 - 0	117 - 0	58 - 0	58 · 0									
			1	21	117 - 0	175 - 0	58 - 0	58 · 0									
			1	21	0 - 0	54 - 0	54 - 0	54 · 0					20 · 0	52 · 0	→0·0	3 · 17	
			1	10	54 - 0	107 - 7	53 - 7	53 · 7									
			1	0	0 - 0	50 - 6	50 - 6	50 · 6					17 · 5	46 · 0	→0·0	2 · 98	
			1	0	50 - 6	101 - 3	50 - 7	50 · 7									
2 - 3 - 64	127' 6"	138' 0"	1	10	0 - 0	50 - 5	50 - 5	50 · 5	10 · 5	>138	127'	56·0	20 · 5	45·0	0 · 5	4 · 80	Good Seal. (25 p.s.i. maximum pressure possible.)
			1	10	50 - 5	101 - 0	50 - 5	50 · 5			EX						
			1	10	101 - 0	151 - 5	50 - 5	50 · 5			casing						
			1	15	0 - 0	52 - 5	52 - 5	52 · 5					22 · 0	49 · 0	0 · 0	5 · 00	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD 5. (cont)																	
2-3-64			1	15	52 - 5	105 - 0	52 - 5	52 · 5									
			1	25	0 - 0	54 - 0	54 - 0	54 · 0				56·0	23 · 0	53 · 0	5 · 0	5 · 18	
			1	25	54 - 0	109 - 0	55 - 0	54 · 0									
			1	10	0 - 0	51 - 0	51 - 0	51 · 0					20 · 5	46 · 0	→0 · 0	4 · 85	
			1	0	0 - 0	47 - 2	47 - 2	47 · 2					18 · 0	40 · 0	→0 · 0	4 · 50	
			1	0	47 - 2	94 - 5	47 - 3	47 · 3									
3-3-64	138'0"	158'6"	1	10	0 - 0	30 - 5	30 - 5	30 · 5	20·5	>158	138' EX casing	61·0	8 · 5	16 · 0	46 · 5	1 · 49	Good Seal. (40 p.s.i. maximum pressure obtainable.)
			1	10	30 - 5	61 - 0	30 - 5	30 · 5									
			1	10	61 - 0	91 - 5	30 - 5	30 · 5									
			1	20	0 - 0	33 - 0	33 - 0	33 · 0					10 · 0	19 · 0	52 · 0	1 · 59	
			1	20	33 - 0	65 - 5	32 - 5	32 · 5									
			1	20	65 - 5	98 - 5	32 - 0	32 · 0									
			1	30	0 - 0	35 - 5	35 - 5	35 · 5					11 · 5	22 · 0	57 · 5	1 · 72	
			1	30	35 - 5	70 - 3	34 - 8	34 · 8									
			1	30	70 - 3	105 - 3	35 - 3	35 · 3									
			1	40	0 - 0	37 - 5	37 - 5	37 · 5					13 · 0	25 · 0	63 · 0	1 · 83	
			1	40	37 - 5	75 - 0	37 - 5	37 · 5									
			1	40	75 - 0	112 - 0	37 - 0	37 · 0									
			1	30	0 - 0	34 - 5	34 - 5	34 · 5					11 · 0	21 · 0	59 · 0	1 · 68	
			1	20	0 - 0	32 - 3	32 - 3	32 · 3					10 · 0	18 · 0	53 · 0	1 · 58	
			1	10	0 - 0	29 - 7	29 - 7	29 · 8					8 · 5	15 · 0	47 · 5	1 · 45	
			1	0	0 - 0	28 - 3	28 - 3	28 · 3					7 · 5	14 · 0	39 · 5	1 · 38	
			1	0	28 - 3	54 - 5	28 - 2	28 · 2									
3-3-64	155'6"	176'0"	1	15	0 - 0	15 - 5	15 - 5	15 · 5	20·5	>176'	157' EX casing	69·0	2 · 0	4 · 0	78 · 0	0 · 74	Good Seal.
			1	15	15 - 5	30 - 5	15 - 0	15 · 0									
			1	15	30 - 5	45 - 7	15 - 2	15 · 2									
			1	25	0 - 0	16 - 0	16 - 0	16 · 0					2 · 5	4 · 5	87 · 0	0 · 78	
			1	25	16 - 0	32 - 0	16 - 0	16 · 0									
			1	25	32 - 0	48 - 0	16 - 0	16 · 0									
			1	50	0 - 0	19 - 3	19 - 3	19 · 3					4 · 0	6 · 5	108 · 5	0 · 94	
			1	50	19 - 3	38 - 5	19 - 2	19 · 2									
			1	50	38 - 5	58 - 0	19 - 5	19 · 5									
			1	25	0 - 0	16 - 5	16 - 5	16 · 5					2 · 5	4 · 5	87 · 0	0 · 80	
			1	15	0 - 0	15 - 1	15 - 1	15 · 1					2 · 0	4 · 0	78 · 0	0 · 74	
			1	0	0 - 0	13 - 6	13 - 6	13 · 6					2 · 0	3 · 5	63 · 5	0 · 67	
			1	0	0 - 0	14 - 6	14 - 0	14 · 0									
			1	0	0 - 0	13 - 6	13 - 6	13 · 6									
4-3-64	173'4"	194'0"	5	0	0 - 0	14 - 2	14 - 2	2 · 8	20·7	>194	173' EX casing	76·0	0 · 0	0 · 0	76 · 0	0 · 14	Good Seal.
			5	0	14 - 2	28 - 3	14 - 1	2 · 8									
			5	0	28 - 3	42 - 3	14 - 0	2 · 8									
			5	10	0 - 0	16 - 0	16 - 0	3 · 2					0 · 0	0 · 0	86 · 0	0 · 15	
			5	10	16 - 0	31 - 5	15 - 5	3 · 1									
			5	10	31 - 5	47 - 0	15 - 3	3 · 1									
			5	25	6 - 0	25 - 0	19 - 0	3 · 8					0 · 0	0 · 0	101 · 0	0 · 18	
			5	25	19 - 0	38 - 0	19 - 0	3 · 8									
			5	40	0 - 0	23 - 2	23 - 2	4 · 6					0 · 0	0 · 0	115 · 0	0 · 22	
			5	40	23 - 2	46 - 0	22 - 6	4 · 6									
			5	55	0 - 0	24 - 7	24 - 7	5 · 0					0 · 0	0 · 0	130 · 0	0 · 28	
			5	55	24 - 7	49 - 1	24 - 2	4 · 9									
			5	40	0 - 0	20 - 2	20 - 2	4 · 0					0 · 0	0 · 0	115 · 0	0 · 19	
			5	25	0 - 0	18 - 0	18 - 0	3 · 6					0 · 0	0 · 0	101 · 0	0 · 17	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No DD5 (cont).																	
4-3-64	173' 4"	194' 0"	5	10	0 - 0	13 - 0	13 - 0	2 · 6				76·0	0 · 0	0 · 0	86 · 0	0 · 13	
			5	0	0 - 0	12 - 2	12 - 2	2 · 4					0 · 0	0 · 0	76 · 0	0 · 12	
5-3-64	194' 1"	214' 9"	5	10	0 - 0	11 - 2	11 - 2	2 · 2	20·7	>214	193'	85·0	0 · 0	0 · 0	95 · 0	0 · 11	Good Seal.
			5	10	11 - 2	22 - 3	11 - 1	2 · 2			EX						
			5	30	0 - 0	14 - 0	14 - 0	2 · 8			casing		0 · 0	0 · 0	115 · 0	0 · 14	
			5	30	14 - 0	28 - 0	14 - 0	2 · 8									
			5	54	0 - 0	20 - 3	20 - 3	4 · 1					0 · 0	0 · 0	138 · 5	0 · 20	
			5	54	20 - 3	40 - 3	20 - 0	4 · 0									
			5	30	0 - 0	15 - 4	15 - 4	3 · 1					0 · 0	0 · 0	115 · 0	0 · 15	
			5	10	0 - 0	12 - 0	12 - 0	2 · 4					0 · 0	0 · 0	95 · 0	0 · 12	
			5	0	0 - 0	5 - 5	5 - 5	1 · 1					0 · 0	0 · 0	85 · 0	0 · 06	
			5	0	5 - 5	11 - 3	5 - 6	1 · 2									
			5	0	11 - 3	17 - 1	5 - 6	1 · 2									
10-3-64	214' 7"	235' 3"	5	15	0 - 0	35 - 2	35 - 2	7 · 0	20·7	>235	214'	94·0	1 · 0	1 · 0	107 · 0	0 · 36	Good Seal.
			5	15	0 - 0	36 - 6	36 - 6	7 · 4			EX						
			5	15	0 - 0	36 - 7	36 - 7	7 · 4			casing						
			5	40	0 - 0	45 - 0	45 - 0	9 · 0					1 · 5	1 · 5	131 · 0	0 · 43	
			5	40	0 - 0	45 - 0	45 - 0	9 · 0									
			5	60	0 - 0	51 - 0	51 - 0	10 · 2					2 · 0	2 · 0	150 · 0	0 · 49	
			5	60	0 - 0	51 - 2	51 - 2	10 · 2									
			5	40	0 - 0	44 - 3	44 - 3	8 · 9					1 · 5	1 · 5	131 · 0	0 · 43	
			5	20	0 - 0	38 - 2	38 - 2	7 · 6					1 · 0	1 · 0	112 · 0	0 · 37	
			5	10	0 - 0	29 - 6	29 - 6	6 · 0					1 · 0	1 · 0	102 · 0	0 · 29	
			5	0	0 - 0	21 - 2	21 - 2	4 · 2					0 · 5	0 · 5	93 · 0	0 · 20	
11-3-64	234' 5"	255' 1"	5	5	0 - 0	69 - 2	69 - 2	13 · 8	20·7	>255	235'	103·5	3 · 0	3 · 5	102 · 0	0 · 67	Good Seal.
			5	5	69 - 2	139 - 6	70 - 4	14 · 1			EX						
			5	5	139 - 6	209 - 2	69 - 4	13 · 9			casing						
			5	21	0 - 0	74 - 7	74 - 7	15 · 0					3 · 5	4 · 0	117 · 0	0 · 72	
			5	21	74 - 7	149 - 0	74 - 1	14 · 8									
			5	36	0 - 0	79 - 0	79 - 0	15 · 8					4 · 0	4 · 5	131 · 0	0 · 76	
			5	36	79 - 0	157 - 6	78 - 6	15 · 8									
			5	51	0 - 0	83 - 6	83 - 6	16 · 8					4 · 5	5 · 0	145 · 0	0 · 81	
			5	51	83 - 6	167 - 6	84 - 0	16 · 8									
			5	34	0 - 0	76 - 4	76 - 4	15 · 3					3 · 5	4 · 0	130 · 0	0 · 74	
			5	16½	0 - 0	69 - 6	69 - 6	14 · 0					3 · 0	4 · 0	113 · 0	0 · 68	
			5	5	0 - 0	65 - 4	65 - 4	13 · 1					3 · 0	3 · 5	102 · 0	0 · 63	
13-3-64	255' 0	280' 1"	5	15	0 - 0	9 - 4	9 - 4	1 · 8	25'	>255	254'	112' 0"	0 · 0	0 · 0	127 · 0	0 · 06	Good Seal.
			5	15	9 - 4	19 - 0	9 - 4	1 · 9			EX						
			5	30	0 - 0	12 - 2	12 - 2	2 · 4			casing		0 · 0	0 · 0	142 · 0	0 · 08	
			5	30	12 - 2	24 - 4	12 - 2	2 · 4									
			5	52	0 - 0	14 - 5	14 - 5	2 · 9					0 · 5	0 · 0	163 · 5	0 · 10	
			5	52	14 - 5	29 - 2	14 - 5	2 · 9									
			5	30	0 - 0	12 - 2	12 - 2	2 · 4					0 · 0	0 · 0	142 · 0	0 · 08	
"			5	15	0 - 0	9 - 4	9 - 4	1 · 9					0 · 0	0 · 0	127 · 0	0 · 06	

Hole No. DD 6. Co-ord 80452'S 52959'W R.L. 3112' Angle from horizontal :- 70° Direction :- 083° M.

Packer Type :- NX mechanical with 4 rubbers. Water Supply :- Gravity feed from 2500 gallon tank 220' vertically above drill site.

Hole could not be tested from top to 106' 4" due to casing of hole which was necessary after every lift

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD6 (cont)																	
23-3-64	106'4"	127'0"	5	5	0 - 0	220 - 0	220-0	44 · 0	20·7	120	107'	43·5	12 · 5	35 · 0	→0 · 0	2 · 12	Good Seal.
			5	5	220 - 0	440 - 0	220-0	44 · 0			EX						
			5	10	0 - 0	234 - 0	234 - 0	46 · 8			casing		14 · 0	39 · 0	→0 · 0	2 · 25	
			5	10	0 - 0	234 - 0	234 - 0	46 · 8									
			5	20	0 - 0	257 - 0	257 - 0	51 · 4					16 · 5	47 · 0	→0 · 0	2 · 48	
			5	20	0 - 0	257 - 0	257 - 0	51 · 4									
			5	30	0 - 0	272 - 0	272-0	54 · 4					18 · 5	53 · 0	→0 · 0	2 · 63	
			5	30	0 - 0	272 - 0	272-0	54 · 4									
24-3-64	124'6"	146'6"	5	5	0 - 0	52 - 4	52-4	10 · 5	22·0	120	125'	51 · 0	1 · 0	2 · 0	53 · 0	0 · 48	Good Seal
			5	5	0 - 0	53 - 0	53-0	10 · 6			EX						
			5	5	53 - 0	105 - 4	52 - 4	10 · 5			casing						
			5	10	0 - 0	56 - 7	56-4	11 · 4					1 · 0	2 · 5	57 · 5	0 · 52	
			5	10	56 - 7	114 - 1	57-1	11 · 4									
			5	20	0 - 0	68 - 2	68-2	13 · 6					1 · 5	3 · 5	66 · 0	0 · 62	
			5	20	68 - 2	136 - 2	68-0	13 · 6									
			5	30	0 - 0	83 - 5	83-5	16 · 7					2 · 5	5 · 0	73 · 5	0 · 76	
			5	30	83 - 5	167 - 0	83-3	16 · 7									
			5	20	0 - 0	73 - 3	73 - 3	14 · 7					2 · 0	4 · 0	65 · 0	0 · 67	
			5	10	0 - 0	66 - 2	66 - 2	13 · 2					1 · 0	3 · 5	56 · 5	0 · 60	
			5	5	0 - 0	62 - 0	62 - 0	12 · 4					1 · 0	3 · 0	52 · 0	0 · 56	
8-4-64	205'0"	250'1"	5	60	0 - 0	1 - 2	1 - 2	0 · 24	45·0	120	215' N.rod	52·0	0 · 0	0 · 0	112 · 0	0 · 01	Good Seal.
8-4-64	150'0	250'1"	5	60	0 - 0	2 - 0	2 - 0	0 · 50	100·0	120	160' N.rod.	52·0	0 · 0	0 · 0	112 · 0	0 · 01	Good Seal.
Hole No. DD.7. Co-ords 79878'S 51621'W. RL:- 2937' Angle from horizontal :- 30° Direction :- 057°M.																	
Packer Type:- NX mechanical with 4 rubbers. Water Supply:- Gravity feed from 2500 gallon tank 440' vertically above drill site.																	
3-5-64	10' 4"	31' 1"	5	5	0 - 0	70 - 0	70 - 0	14 · 0	20·7	7	12'	3·0	0 · 0	4 · 0	→0 · 0	0 · 68	Good Seal.
			5	5	0 - 0	70 - 0	70 - 0	14 · 0			EX						
			5	10	0 - 0	100 - 0	100 - 0	20 · 0			casing		0 · 5	7 · 0	→0 · 0	0 · 97	
			5	10	0 - 0	100 - 0	100 - 0	20 · 0									
			5	15	0 - 0	110 - 0	110 - 0	30 · 0					1 · 0	15 · 0	→0 · 0	1 · 45	
			5	15	0 - 0	110 - 0	110 - 0	30 · 0									
			5	10	0 - 0	100 - 0	100 - 0	20 · 0					0 · 5	7 · 0	→0 · 0	0 · 97	
			5	5	0 - 0	70 - 0	70 - 0	14 · 0					0 · 0	4 · 0	→0 · 0	0 · 68	
4-5-64	29' 0"	49' 8"	5	5	0 - 0	90 - 5	90 - 5	18 · 1	20·7	7	30'	3·0	1 · 0	6 · 0	1 · 0	0 · 87	Good Seal.
			5	5	90 - 5	180 - 5	90 - 0	18 · 0			EX						
			5	10	0 - 0	115 - 0	115 - 0	23 · 0			casing		1 · 0	9 · 0	3 · 0	1 · 11	
			5	10	115 - 0	230 - 0	115 - 0	23 · 0									
			5	15	0 - 0	136 - 0	136 - 0	27 · 2					1 · 5	13 · 0	3 · 5	1 · 32	
			5	15	136 - 0	272 - 0	136 - 0	27 · 2									
			5	10	0 - 0	110 - 0	110 - 0	22 · 0					1 · 0	8 · 0	4 · 0	1 · 16	
			5	5	0 - 0	86 - 5	86 - 5	17 · 5					1 · 0	5 · 0	2 · 0	0 · 84	
6-5-64	48'6"	69' 2"	5	5	0 - 0	65 - 0	65 - 0	13 · 0	20·7	7	50'	3·0	0 · 5	3 · 5	4 · 0	0 · 63	Good Seal.
			5	5	0 - 0	65 - 2	65 - 2	13 · 0			EX						
			5	15	0 - 0	104 - 0	104 - 0	20 · 8			casing		1 · 5	8 · 0	8 · 5	1 · 02	
			5	15	0 - 0	106 - 0	106 - 0	21 · 2									
			5	15	0 - 0	106 - 1	106 - 1	21 · 2									

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No DD 7 (cont).																	
6-5-64	48' 6"	69' 2"	5	25	0 - 0	123 - 0	123 - 0	24 · 6					2 · 0	11 · 0	15 · 0	1 · 20	
			5	25	0 - 0	124 - 0	124 - 0	24 · 8									
			5	35	0 - 0	145 - 0	145 - 0	29 · 0					3 · 0	14 · 0	21 · 0	1 · 40	
			5	35	0 - 0	145 - 0	145 - 0	29 · 0									
			1	25	0 - 0	24 - 1	24 - 1	24 · 8					2 · 0	10 · 0	16 · 0	1 · 16	
			1	15	0 - 0	21 - 0	21 - 0	21 · 0					2 · 0	8 · 0	8 · 0	1 · 01	
			1	5	0 - 0	10 - 0	10 - 0	13 · 0					0 · 5	3 · 5	4 · 0	0 · 64	
15-5-64	69' 4"	100' 4	5	5	0 - 0	69 - 0	69 - 0	13 · 8	30 · 7	7	70'	3 · 0	1 · 0	3 · 5	→0 · 0	0 · 45	Good Seal.
			5	5	69 - 0	138 - 4	69 - 4	13 · 9			EX						
			5	20	0 - 0	127 - 4	127 - 4	25 · 5			casing		3 · 0	11 · 0	→0 · 0	0 · 83	
			5	20	127 - 4	254 - 4	127 - 4	25 · 4									
			5	35	0 - 0	204 - 0	204 - 0	40 · 8					7 · 5	30 · 0	→0 · 0	1 · 33	
			5	35	204 - 0	409 - 0	205 - 0	41 · 0									
			5	55	0 - 0	258 - 0	258 - 0	51 · 6					11 · 0	47 · 0	→0 · 0	1 · 68	
			5	55	258 - 0	516 - 0	258 - 0	51 · 6									
			5	35	0 - 0	200 - 0	200 - 0	40 · 0					7 · 0	29 · 0	→0 · 0	1 · 30	
			5	20	0 - 0	125 - 0	125 - 0	25 · 0					3 · 0	11 · 0	→0 · 0	0 · 81	
			5	5	0 - 0	50 - 0	50 - 0	10 · 0					0 · 5	2 · 0	→0 · 0	0 · 33	
14-5-64	100' 8"	141' 4"	5	5	0 - 0	4 - 0	4 - 0	0 · 8	40 · 7	7	102'	3 · 0	0 · 0	0 · 0	8 · 0	0 · 02	Good Seal.
			5	5	4 - 0	8 - 0	4 - 0	0 · 8			EX						
			5	25	0 - 0	15 - 2	15 - 2	3 · 05			casing		0 · 0	0 · 0	28 · 0	0 · 07	
			5	25	15 - 2	30 - 4	15 - 2	3 · 05									
			5	50	0 - 0	25 - 5	25 - 5	5 · 1					0 · 5	0 · 5	52 · 0	0 · 13	
			5	50	25 - 5	50 - 7	25 - 2	5 · 1									
			5	75	0 - 0	36 - 4	36 - 4	7 · 3					0 · 5	1 · 0	76 · 5	0 · 18	
			5	75	36 - 4	72 - 7	36 - 3	7 · 3									
			5	100	0 - 0	45 - 3	45 - 3	9 · 1					0 · 5	1 · 5	101 · 0	0 · 22	
			5	100	45 - 3	90 - 7	45 - 4	9 · 1									
			5	75	0 - 0	35 - 4	35 - 4	7 · 1					0 · 5	1 · 0	76 · 5	0 · 17	
			5	50	0 - 0	25 - 6	25 - 6	5 · 1					0 · 5	0 · 5	52 · 0	0 · 13	
			5	25	0 - 0	15 - 6	15 - 6	3 · 15					0 · 0	0 · 0	28 · 0	0 · 07	
Hole No.:- D.D. 8. Co-ords :- 79894' S 51444' W. RL. :- 3050' Angle from horizontal :- 90° Direction. :-																	
Packer Type :- NX Mechanical with 4 rubbers. Water Supply:- Gravity feed from 2500 gallon. tank 330' vertically above site.																	
18-4-64	14' 8"	34' 10"	5	5	0 - 0	104 - 0	104 - 0	20 · 8	20 · 2	> 34'	14'	6 · 0	0 · 5	10 · 0	→0 · 0	1 · 13	Good Seal.
			5	5	104 - 0	223 - 0	119 - 0	23 · 6			EX						
			5	5	223 - 0	343 - 4	120 - 4	24 · 1			casing						
			5	10	0 - 0	145 - 0	145 - 0	29 · 0					1 · 0	11 · 0	→0 · 0	1 · 45	
			5	10	145 - 0	293 - 0	148 - 0	29 · 6									
			5	10	293 - 0	442 - 0	149 - 0	29 · 6									
19-4-64	34' 10"	55' 0"	5	5	0 - 0	3 - 4	3 - 4	0 · 7	20 · 2	> 55	34'	15 · 0	0 - 0	0 - 0	20 · 0	0 · 04	Good Seal.
			5	5	3 - 4	7 - 0	3 - 4	0 · 7			EX						
			5	10	0 - 0	6 - 2	6 - 2	1 · 2			casing		0 - 0	0 - 0	25 · 0	0 · 06	
			5	10	6 - 2	12 - 4	6 - 2	1 · 2									
			5	15	0 - 0	8 - 1	8 - 1	1 · 6					0 · 0	0 · 0	30 · 0	0 · 08	
			5	20	8 - 1	16 - 1	8 - 0	1 · 6									
			5	20	0 - 0	8 - 7	8 - 7	1 · 8					0 · 0	0 · 0	35 · 0	0 · 09	
			5	30	8 - 7	17 - 6	8 - 7	1 · 8									
			5	30	0 - 0	8 - 1	8 - 1	1 · 6					0 · 0	0 · 0	30 · 0	0 · 08	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No D.D.8. (cont)																	
19-4-64	34' 10"	55' 0"	5	10	0 - 0	6 - 1	6 - 1	1 · 2					0 - 0	0 · 0	20 · 0	0 · 04	
			5	5	0 - 0	3 - 4	3 - 4	0 · 7									
20-4-64	55' 0"	75' 3"	5	5	0 - 0	43 - 6	43 - 6	8 · 8	20 · 3	> 75	55'	24·0	0 · 5	1 · 5	27 · 0	0 · 43	Good Seal.
			5	5	43 - 6	86 - 0	42 - 2	8 · 6			EX						
			5	10	0 - 0	47 - 0	47 - 0	9 · 4			casing		0 · 5	1 · 5	32 · 5	0 · 46	
			5	10	47 - 0	93 - 4	46 - 4	9 · 3									
			5	20	0 - 0	67 - 5	67 - 5	13 · 5					1 · 0	3 · 0	40 · 0	0 · 67	
			5	20	67 - 5	136 - 0	68 - 3	13 · 5									
			5	30	0 - 0	89 - 1	89 - 1	17 · 8					1 · 5	7 · 0	45 · 5	0 · 95	
			5	30	89 - 1	189 - 0	100 - 0	20 · 0									
			5	30	189 - 0	189 - 0	100 - 0	20 · 0									
			5	20	0 - 0	92 - 0	92 - 0	18 · 4					1 · 0	6 · 0	37 · 0	0 · 90	
			5	10	0 - 0	80 - 0	80 - 0	16 · 0					1 · 0	4 · 5	23 · 5	0 · 79	
			5	5	0 - 0	71 - 0	71 - 0	14 · 2					1 · 0	4 · 0	24 · 0	0 · 70	
21-4-64	75' 0"	95' 0"	5	5	0 - 0	0 - 7	0 - 7	0 · 2	20 · 4	> 95	75'	33 · 0	0 · 0	0 · 0	38 · 0	0 · 01	Good Seal.
			5	5	0 - 7	1 - 6	0 - 7	0 · 2			EX						
			5	20	0 - 0	2 - 3	2 - 3	0 · 45			casing		0 · 0	0 · 0	53 · 0	0 · 02	
			5	20	0 - 0	2 - 2	2 - 2	0 · 45									
			5	30	0 - 0	2 - 7	2 - 7	0 · 6					0 · 0	0 · 0	63 · 0	0 · 03	
			5	30	0 - 0	3 - 0	3 - 0	0 · 6									
			5	45	0 - 0	5 - 2	5 - 2	1 · 05					0 · 0	0 · 0	78 · 0	0 · 05	
			5	45	0 - 0	5 - 3	5 - 3	1 · 05									
			5	20	0 - 0	2 - 7	2 - 7	0 · 6					0 · 0	0 · 0	53 · 0	0 · 03	
27-4-64	95' 5"	115' 11"	5	5	0 - 0	3 - 4	3 - 4	0 · 7	20 · 5	109	97'	42 · 5	0 · 0	0 · 0	47 · 5	0 · 03	Good Seal.
			5	5	3 - 4	7 - 0	3 - 4	0 · 7			EX						
			5	20	0 - 0	7 - 0	7 - 0	1 · 4			casing		0 · 0	0 · 0	62 · 5	0 · 17	
			5	20	7 - 0	14 - 0	7 - 0	1 · 4									
			5	40	0 - 0	13 - 0	13 - 0	2 · 6					0 · 0	0 · 0	82 · 5	0 · 13	
			5	40	13 - 0	26 - 2	13 - 2	2 · 6									
			5	55	0 - 0	17 - 4	17 - 4	3 · 5					0 · 0	0 · 0	97 · 5	0 · 17	
			5	55	17 - 4	35 - 0	17 - 4	3 · 5									
			5	40	0 - 0	13 - 0	13 - 0	2 · 6					0 · 0	0 · 0	82 · 5	0 · 13	
			5	20	0 - 0	7 - 0	7 - 0	1 · 4					0 · 0	0 · 0	62 · 5	0 · 07	
			5	5	0 - 0	3 - 5	3 - 5	0 · 7					0 · 0	0 · 0	47 · 5	0 · 03	
28-4-64	116' 2"	136' 10"	5	5	0 - 0	18 - 4	18 - 4	3 · 7	20 · 7	109	117'	48 - 0	0 · 0	0 · 0	53 · 0	0 · 18	Good Seal.
			5	5	18 - 4	36 - 7	18 - 3	3 · 7			EX						
			5	25	0 - 0	27 - 3	27 - 3	5 · 5			casing		0 · 5	0 · 5	72 · 0	0 · 27	
			5	25	27 - 3	54 - 4	27 - 1	5 · 4									
			5	45	0 - 0	34 - 0	34 - 0	6 · 8					0 · 5	1 · 0	91 · 5	0 · 32	
			5	45	34 - 0	66 - 0	32 - 0	6 · 4									
			5	65	0 - 0	40 - 5	40 - 5	8 · 1					1 · 0	1 · 0	111 · 0	0 · 39	
			5	65	40 - 5	81 - 0	40 - 3	8 · 1									
			5	45	0 - 0	32 - 5	32 - 5	6 · 5					0 · 5	1 · 0	91 · 5	0 · 32	
			5	25	0 - 0	26 - 5	26 - 5	5 · 3					0 · 5	0 · 5	72 · 0	0 · 26	
			5	5	0 - 0	18 - 0	18 - 0	3 · 6					0 · 0	0 · 0	53 · 0	0 · 17	
29-4-64	136' 11"	157' 7"	5	5	0 - 0	42 - 0	42 - 0	8 · 4	20 · 7	109	137'	48 - 0	1 · 0	1 · 5	50 · 5	0 · 41	Good Seal.
			5	5	42 - 0	84 - 5	84 - 5	8 · 5			EX						
			5	30	0 - 0	60 - 3	60 - 3	12 · 1			casing		1 · 5	3 · 0	73 · 5	0 · 58	
			5	30	60 - 3	119 - 7	59 - 4	11 · 9									

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No.	DD. 8.	(cont)															
29-4-64	136' 11"	157' 7"	5	60	0 - 0	71 - 6	71 - 6	14 · 3					2 · 0	4 · 0	102 · 0	0 · 68	
			5	60	71 - 6	141 - 6	70 - 0	14 · 0									
			5	85	0 - 0	86 - 0	86 - 0	17 · 2					3 · 0	5 · 0	125 · 0	0 · 83	
			5	85	86 - 0	171 - 0	85 - 0	17 · 0									
			5	60	0 - 0	70 - 0	70 - 0	14 · 0					2 · 0	3 · 5	102 · 5	0 · 67	
			5	30	0 - 0	60 - 0	60 - 0	12 · 0					1 · 5	3 · 0	73 · 5	0 · 58	
			5	5	0 - 0	42 - 0	42 - 0	8 · 4					1 · 0	1 · 5	50 · 5	0 · 41	
Hole No. :- DD.9.		Co-ords 79953' S, 51312' W.				R.L. :- 3129'			Angle from horizontal 65°				Direction. 277° M.				
Packer Type :- NX mechanical with 4 rubbers.						Water Supply :- Gravity feed or via reciprocating pump. (see remarks column for details).											
6-4-64	180' 4"	201' 0"	5	5	0 - 0	4 - 2	4 - 2	0 · 85	20 · 7	>165	181'	72 · 5	0 · 0	0 · 0	77 · 5	0 · 04	Good Seal.
			5	5	4 - 2	8 - 4	4 - 2	0 · 85			EX		...			"	Pump :- Reciprocating,
			5	20	0 - 0	6 - 2	6 - 2	1 · 25			casing		0 · 0	0 · 0	92 · 5	0 · 06	capacity of 12g.p.m.
			5	20	6 - 2	12 - 4	6 - 2	1 · 25								"	
			5	35	0 - 0	8 - 4	8 - 4	1 · 70					0 · 0	0 · 0	107 · 5	0 · 08	
			5	35	8 - 4	17 - 0	8 - 4	1 · 70								"	
			5	50	0 - 0	9 - 6	9 - 6	1 · 95					0 · 0	0 · 0	122 · 5	0 · 09	
			5	50	9 - 6	19 - 2	9 - 4	1 · 90								"	
			5	50	19 - 2	29 - 0	9 - 6	1 · 95								"	
			5	35	0 - 0	8 - 5	8 - 5	1 · 70					0 · 0	0 · 0	107 · 5	0 · 08	
			5	20	0 - 0	6 - 4	6 - 4	1 · 30					0 · 0	0 · 0	92 · 5	0 · 06	
			5	5	0 - 0	6 - 7	6 - 7	1 · 00					0 · 0	0 · 0	77 · 5	0 · 05	
7-4-64	159' 0"	180' 0"	5	5	0 - 0	6 - 7	6 - 7	1 · 4	21 · 0	> 165	161'	64 · 5	0 · 0	0 · 0	69 · 5	0 · 07	Good Seal.
			5	5	6 - 7	13 - 5	6 - 6	1 · 35			EX						
			5	5	13 - 5	20 - 3	6 - 6	1 · 35			casing						
			5	20	0 - 0	10 - 0	10 - 0	2 · 0					0 · 0	0 · 0	84 · 5	0 · 10	
			5	20	10 - 0	20 - 0	10 - 0	2 · 0								"	
			5	35	0 - 0	15 - 1	15 - 1	3 · 0					0 · 0	0 · 0	99 · 5	0 · 14	
			5	35	15 - 1	30 - 2	15 - 1	3 · 0								"	
			5	45	0 - 0	19 - 0	19 - 0	3 · 8					0 · 0	0 · 5	109 · 5	0 · 18	
			5	45	19 - 0	38 - 1	19 - 1	3 · 8								"	
			5	35	0 - 0	18 - 4	18 - 4	3 · 7					0 · 0	0 · 5	99 · 0	0 · 17	
7-4-64	139' 0"	160' 0"	5	5	0 - 0	0 - 4	0 - 4	0 · 10	21 · 0	>165	141"	56 · 5	0 · 0	0 · 0	61 · 5	0 · 00	Good Seal.
			5	5	0 - 4	0 - 8	0 - 4	0 · 10			EX					"	Pump :- Reciprocating
			5	15	0 - 0	1 - 2	1 - 2	0 · 25			casing		0 · 0	0 · 0	71 · 5	0 · 01	capacity of 12g.p.m.
			5	15	1 - 2	2 - 4	1 - 2	0 · 25								"	
			5	30	0 - 0	1 - 4	1 - 4	0 · 30					0 · 0	0 · 0	86 · 5	0 · 01	
			5	30	1 - 4	3 - 0	1 - 4	0 · 30								"	
			5	40	0 - 0	1 - 5	1 - 5	0 · 33					0 · 0	0 · 0	96 · 5	0 · 02	
			5	40	1 - 5	3 - 2	1 - 5	0 · 33								"	
			5	30	0 - 0	1 - 4	1 - 4	0 · 30								"	
			5	20	0 - 0	1 - 3	1 - 3	0 · 27					0 · 0	0 · 0	76 · 5	0 · 01	
			5	10	0 - 0	0 - 7	0 - 7	0 · 20					0 · 0	0 · 0	66 · 5	0 · 01	
7-4-64	119' 0"	140' 0"	5	5	0 - 0	26 - 0.	26 - 0	5 · 2	21 · 0	> 165	121'	48 · 5	0 · 5	0 · 5	52 · 5	0 · 25	Good Seal.
			5	5	26 - 0	52 - 0	26 - 0	5 · 2			EX					"	Pump :- reciprocating.
			5	13	0 - 0	60 - 0	60 - 0	12 · 0			casing		1 · 0	3 · 0	57 · 5	0 · 57	capacity of 12g.p.m.
			5	8	60 - 0	121 - 0	61 - 0	12 · 2					1 · 0	3 · 0	52 · 5	0 · 58	Maximum gauge pressure
			5	8	121 - 0	182 - 0	61 - 0	12 · 2								"	was 13p.s.i which dropped
																	to 8p.s.i after 5minutes.

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD9	(cont).																
7-4-64	129'0"	140'0"	5	5	0 - 0	0 - 2	0 - 2	0 · 04	11·0	>165	131'	52·5	0 · 0	0 · 0	57 · 5	0 · 00	Good Seal.
			5	5	0 - 2	0 - 4	0 - 2	0 · 04			EX		"			0 · 00	Pump:- reciprocating,
			5	15	1 - 0	2 - 6	1 - 6	0 · 35			casing		0 · 0	0 · 0	67 · 5	0 · 03	capacity 12g.p.m.
			5	15	1 - 6	4 - 4	1 - 6	0 · 35					"			0 · 03	
			5	25	0 - 0	2 - 1	2 - 1	0 · 40					0 · 0	0 · 0	77 · 5	0 · 04	
			5	25	2 - 1	4 - 1½	2 - 0½	0 · 40					"			0 · 04	
			5	25	4 - 1½	6 - 1½	2 - 0	0 · 40					0 · 0	0 · 0	87 · 5	0 · 04	
			5	35	0 - 0	2 - 2	2 - 2	0 · 45					"			0 · 04	
			5	35	2 - 2	4 - 4	2 - 2	0 · 45					0 · 0	0 · 0	77 · 5	0 · 04	
			5	25	0 - 0	2 - 1	2 - 1	0 · 40					"			0 · 04	
			5	15	0 - 0	1 - 6	1 - 6	0 · 35					0 · 0	0 · 0	67 · 5	0 · 03	
			5	5	0 - 0	0 - 5	0 - 5	0 · 10					0 · 0	0 · 0	57 · 5	0 · 01	
7-4-64	99'0"	120'0"	5	6	0 - 0	2 - 2	2 - 2	0 · 45	21·0	>165	101'	40·5	0 · 0	0 · 0	46 · 5	0 · 02	Good Seal.
			5	6	2 - 2	4 - 4	2 - 2	0 · 45			EX		"			0 · 02	Pump:- reciprocating,
			5	10	0 - 0	3 - 7	3 - 7	0 · 80			casing		0 · 0	0 · 0	50 · 5	0 · 04	capacity, 12g.p.m.
			5	10	3 - 7	7 - 5	3 - 6	0 · 75					"			0 · 04	
			5	20	1 - 0	9 - 1	8 - 1	1 · 60					0 · 0	0 · 0	60 · 5	0 · 08	
			5	20	9 - 1	17 - 2	8 - 1	1 · 60					"			0 · 08	
			5	30	0 - 0	12 - 4	12 - 4	2 · 50					0 · 0	0 · 0	70 · 5	0 · 12	
			5	30	12 - 4	24 - 7	12 - 3	2 · 50					"			0 · 12	
			5	30	0 - 0	10 - 3	10 - 3	2 · 10					0 · 0	0 · 0	60 · 5	0 · 10	
			5	20	0 - 0	6 - 2	6 - 2	1 · 25					0 · 0	0 · 0	50 · 5	0 · 06	
			5	10	0 - 0	4 - 7	4 - 7	1 · 00					0 · 0	0 · 0	46 · 5	0 · 05	
7-4-64	79'0"	100'0"	5	6	0 - 0	4 - 0	4 - 0	0 · 8	21·0	>165	81'	32·5	0 · 0	0 · 0	38 · 5	0 · 04	Good Seal.
			5	6	4 - 0	7 - 7	3 - 7	0 · 8			EX						Pump: reciprocating,
			5	6	7 - 7	11 - 6	3 - 7	0 · 8			casing						capacity, 12g.p.m.
			5	15	0 - 0	9 - 3	9 - 3	1 · 9					0 · 0	0 · 0	47 · 5	0 · 09	
			5	15	9 - 3	18 - 6	9 - 3	1 · 9									
			5	25	0 - 0	19 - 2	19 - 2	3 · 8					0 · 0	0 · 0	57 · 5	0 · 18	
			5	25	19 - 2	37 - 4	18 - 2	3 · 6									
			5	25	37 - 4	56 - 4	19 - 0	3 · 8									
			5	15	0 - 0	13 - 5	13 - 5	2 · 7					0 · 0	0 · 0	47 · 5	0 · 13	
			5	5	0 - 0	9 - 0	9 - 0	1 · 8									
			5	5	9 - 0	18 - 0	9 - 0	1 · 8					0 · 0	0 · 0	37 · 5	0 · 09	
8-4-64	59'0"	80'0"	5	6	0 - 0	5 - 2	5 - 2	1 · 0	21·0	>165	61'	24·5	0 · 0	0 · 0	30 · 5	0 · 05	Good Seal.
			5	6	5 - 2	10 - 5	5 - 3	1 · 1			EX						Pump:- reciprocating,
			5	6	10 - 5	16 - 0	5 - 3	1 · 1			casing						capacity, 12g.p.m.
			5	10	0 - 0	6 - 6	6 - 6	1 · 4					0 · 0	0 · 0	34 · 5	0 · 07	
			5	10	6 - 6	13 - 7	7 - 1	1 · 4									
			5	10	13 - 7	20 - 7	7 - 0	1 · 4									
			5	15	0 - 0	9 - 0	9 - 0	1 · 8					0 · 0	0 · 0	37 · 5	0 · 09	
			5	15	9 - 0	18 - 0	9 - 0	1 · 8									
			5	20	0 - 0	11 - 0	11 - 0	2 · 2					0 · 0	0 · 0	44 · 5	0 · 11	
			5	20	11 - 0	22 - 0	11 - 0	2 · 2									
			5	15	0 - 0	9 - 5	9 - 5	1 · 9					0 · 0	0 · 0	37 · 5	0 · 09	
			5	10	0 - 0	8 - 4	8 - 4	1 : 7					0 · 0	0 · 0	34 · 5	0 · 08	
			5	6	0 - 0	6 - 2	6 - 2	1 · 2					0 · 0	0 · 0	30 · 5	0 · 06	
			5	6	6 - 2	13 - 1	6 - 7	1 · 4									
8-4-64	39'0"	60'0"	5	5	0 - 0	13 - 2	13 - 2	2 · 6	21·0	>165	51'	20·5	0 · 0	0 · 0	25 · 5	0 · 12	Good Seal.
			5	5	13 - 2	26 - 4	13 - 2	2 · 6			EX						Pump:- reciprocating,
											casing						capacity 12g.p.m.

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD9 (cont.)																	
8-4-64	39' 0"	60' 0"	5	5	26 - 0	38 - 6	12 - 6	2 · 8									
			5	10	0 - 0	28 - 1	28 - 1	5 · 6					0 · 0	1 · 0	29 · 5	0 · 28	
			5	10	28 - 1	57 - 0	28 - 7	5 · 8									
			5	10	57 - 0	87 - 0	30 - 0	6 · 0									
			5	15	0 - 0	42 - 0	42 - 0	8 · 4					0 · 5	1 · 0	34 · 0	0 · 40	
			5	15	42 - 0	83 - 0	41 - 0	8 · 2									
			5	15	83 - 0	125 - 0	42 - 0	8 · 4									
			5	5	0 - 0	17 - 4	17 - 4	3 · 5					0 · 0	0 · 0	25 · 5	0 · 19	
			5	5	17 - 4	38 - 0	20 - 4	4 · 1									
			5	5	38 - 0	60 - 0	22 - 0	4 · 4									
8-4-64	39' 0"	50' 0"	5	5	0 - 0	108 - 0	108 - 0	21 · 6	11 · 0	> 165	41' EX casing	16 · 5	1 · 0	8 · 0	12 · 5	1 · 03	Good Seal. Pump:- reciprocating, capacity of 12 g.p.m.
			5	5	108 - 0	218 - 0	110 - 0	22 · 0									
			5	10	0 - 0	120 - 0	120 - 0	24 · 0					1 · 5	10 · 0	15 · 0	1 · 15	
			5	10	120 - 0	241 - 0	121 - 0	24 · 2									
			5	15	0 - 0	130 - 0	130 - 0	26 · 0					2 · 0	12 · 0	17 · 5	1 · 23	
			5	15	130 - 0	258 - 0	128 - 0	25 · 6									
			5	10	0 - 0	96 - 0	96 - 0	19 · 2					1 · 0	6 · 5	19 · 0	0 · 92	
			5	5	0 - 0	88 - 0	88 - 0	17 · 6					1 · 0	10 · 0	15 · 0	0 · 89	
9-4-64	19' 0"	40' 0"	5	5	0 - 0	98 - 0	98 - 0	19 · 6	21 · 0	> 165	21' EX casing	8 · 5	0 · 5	6 · 0	7 · 0	0 · 91	Good Seal. Gravity feed.
			5	5	0 - 0	95 - 2	95 - 2	19 · 0									
			5	5	0 - 0	94 - 4	94 - 4	18 · 9									
Hole No.:- DD 10.					*Co-ords:- 79949'S*		*51309'W.*		*R.L.:- 3131'*			*Angle from horizontal:- 45°*				*Direction :- 063°M*	
Packer Type:- NX mechanical with 4 rubbers												*Water Supply:- Gravity feed or via reciprocating pump. (see remarks column for details.)*					
14-4-64	32' 0"	53' 0"	1	5	0 - 0	23 - 4	23 - 4	23 · 0	21 · 0	> 117	35' EX casing	11 · 0	1 · 0	9 · 0	6 · 0	1 · 10	Good Seal. Gravity feed.
			1	5	23 - 4	46 - 4	23 - 0										
			1	5	46 - 4	69 - 4	23 - 0										
			1	10	0 - 0	27 - 2	27 - 2	27 · 0					1 · 5	12 · 0	7 · 5	1 · 29	
			1	10	27 - 2	54 - 0	26 - 6										
			1	10	54 - 0	81 - 0	27 - 0										
			1	15	0 - 0	29 - 0	29 - 0	30 · 0					2 · 0	15 · 0	9 · 0	1 · 43	
			1	15	29 - 0	59 - 0	30 - 0										
			1	15	59 - 0	89 - 0	30 - 0										
			1	20	0 - 0	34 - 4	34 - 4	34 · 0					3 · 0	20 · 0	8 · 0	1 · 62	
			1	20	34 - 4	68 - 4	34 - 0										
			1	20	68 - 4	102 - 0	33 - 4										
			1	15	0 - 0	30 - 5	30 - 5	30 · 6					2 · 0	17 · 0	7 · 0	1 · 46	
			1	10	0 - 0	27 - 3	27 - 3	27 · 4					1 · 5	13 · 0	6 · 5	1 · 31	
			1	5	0 - 0	23 - 2	23 - 2	23 · 3					1 · 0	9 · 0	6 · 0	1 · 11	
14-4-64	52' 0"	73' 0"	1	5	0 - 0	30 - 0	30 - 0	31 · 0	21 · 0	> 117	55' EX casing	17 · 0	3 · 5	17 · 0	→ 0 · 0	1 · 48	Good Seal. Gravity feed
			1	5	30 - 0	61 - 0	31 - 0										
			1	5	61 - 0	92 - 0	31 - 0										
			1	15	0 - 0	36 - 4	36 - 4	36 · 5					5 · 0	24 · 0	→ 0 · 0	1 · 74	
			1	15	36 - 4	73 - 0	36 - 4										
			1	15	73 - 0	109 - 4	36 - 4										
			1	25	0 - 0	45 - 0	45 - 0	44 · 5					7 · 0	36 · 0	→ 0 · 0	2 · 12	
			1	25	45 - 0	89 - 4	44 - 4										
			1	25	89 - 4	134 - 4	44 - 4										
			1	35	0 - 0	52 - 3	52 - 3	52 · 4					9 · 5	49 · 0	→ 0 · 0	2 · 50	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD 10. (cont.)																	
14-4-64	52' 0"	73' 0"	1	35	52 - 3	104 - 6	52 - 3										
			1	35	104 - 6	157 - 2	52 - 4										
			1	25	0 - 0	46 - 1	46 - 1	46 · 1					7 · 5	38 · 0	→0 · 0	2 · 42	
			1	15	0 - 0	38 - 3	38 - 3	38 · 4					5 · 5	27 · 0	→0 · 0	2 · 02	
			1	5	0 - 0	34 - 0	0 - 0	34 · 0					4 · 0	20 · 0	→0 · 0	1 · 62	
14-4-64	72' 0"	93' 0"	1	5	0 - 0	19 - 0	19 - 0	19 · 0	21 · 0	>117'	75' EX casing	23 · 5	2 · 0	6 · 0	20 · 5	0 · 90	Good Seal. Gravity feed.
			1	5	19 - 0	38 - 0	19 - 0										
			1	5	38 - 0	57 - 0	19 - 0										
			1	20	0 - 0	24 - 2	24 - 2	24 · 2					3 · 0	10 · 0	30 · 5	1 · 15	
			1	20	24 - 2	49 - 0	24 - 2										
			1	20	49 - 0	72 - 4	24 - 2										
			1	35	0 - 0	29 - 0	29 - 0	28 · 5					4 · 0	14 · 0	40 · 5	1 · 36	
			1	35	29 - 0	57 - 4	28 - 4										
			1	35	57 - 0	85 - 0	28 - 0										
			1	50	0 - 0	33 - 0	33 - 0	32 · 5					5 · 5	18 · 0	50 · 0	1 · 55	
			1	50	33 - 0	65 - 4	32 - 4										
			1	50	65 - 4	97 - 4	32 - 0										
			1	35	0 - 0	27 - 4	27 - 4	27 · 5					4 · 0	13 · 0	41 · 5	1 · 31	
			1	20	0 - 0	23 - 2	23 - 2	23 · 3					3 · 0	9 · 0	31 · 5	1 · 11	
			1	5	0 - 0	18 - 3	18 - 3	18 · 4					2 · 0	6 · 0	20 · 5	0 · 88	
14-4-64	92' 0"	113' 0"	1	5	0 - 0	35 - 0	35 - 0	35 · 0	21 · 0	>117'	95' EX casing	29 · 5	8 · 0	22 · 0	4 · 5	1 · 64	Good Seal. Gravity feed.
			1	5	35 - 0	70 - 0	35 - 0										
			1	5	70 - 0	105 - 0	35 - 0										
			1	25	0 - 0	42 - 0	42 - 0	42 · 0					11 · 0	32 · 0	11 · 0	2 · 00	
			1	25	42 - 0	84 - 0	42 - 0										
			1	25	84 - 0	126 - 0	42 - 0										
			1	45	0 - 0	51 - 0	51 - 0	50 · 5					15 · 5	45 · 0	14 · 0	2 · 40	
			1	45	51 - 0	102 - 0	51 - 0										
			1	45	102 - 0	152 - 0	50 - 0										
			1	65	0 - 0	57 - 0	57 - 0	56 · 0					18 · 5	55 · 0	24 · 0	2 · 67	
			1	65	57 - 0	113 - 0	56 - 0										
			1	65	113 - 0	169 - 0	56 - 0										
			1	45	0 - 0	50 - 0	50 - 0	50 · 0					15 · 0	45 · 0	14 · 5	2 · 38	
			1	25	0 - 0	41 - 4	41 - 4	41 · 5					10 · 5	31 · 0	13 · 0	1 · 98	
			1	5	0 - 0	32 - 6	32 - 6	32 · 8					7 · 0	19 · 0	8 · 0	1 · 56	
14-4-64	112' 0	123' 0	1	5	0 - 0	28 - 0	28 - 0	27 · 0	11 · 0	>117'	115' EX casing	36 · 0	6 · 0	13 · 0	22 · 0	2 · 45	Good Seal. Gravity feed.
			1	5	28 - 0	55 - 0	27 - 0										
			1	5	55 - 0	81 - 0	26 - 0										
			1	25	0 - 0	32 - 0	32 - 0	31 · 0					7 · 5	17 · 0	36 · 5	2 · 82	
			1	25	32 - 0	63 - 0	31 - 0										
			1	25	63 - 0	94 - 0	31 - 0										
			1	50	0 - 0	39 - 0	39 - 0	37 · 0					10 · 0	24 · 0	52 · 0	3 · 36	
			1	50	39 - 0	77 - 0	38 - 0										
			1	50	77 - 0	113 - 0	36 - 0										
			1	80	0 - 0	48 - 0	48 - 0	44 · 0					14 · 0	35 · 0	67 · 6	4 · 00	
			1	80	48 - 0	92 - 0	44 - 0										
			1	80	92 - 0	136 - 0	44 - 0										
23-3-64	124' 0"	144' 7"	5	5	0 - 0	1 - 7	1 - 7	0 · 4	20 · 6	>117'	129' EX casing	39 · 0	0 · 0	0 · 0	44 · 0	0 · 02	Good Seal. Pump: Reciprocating, capacity of 12 g.p.m.
			5	5	1 - 7	3 - 4	1 - 7										
			5	30	0 - 0	2 - 0	2 - 0	0 · 5					0 · 0	0 · 0	69 · 0	0 · 03	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD 10 (cont)																	
14-4-64	124' 0"	144' 7"	5	30	2 - 0	4 - 6	2 - 6	0 · 5									
			5	30	4 - 6	6 - 6	2 - 0	0 · 4									
			5	55	0 - 0	3 - 5	3 - 5	0 · 7					0 · 0	0 · 0	94 · 0	0 · 04	
			5	55	3 - 5	7 - 0	3 - 5	0 · 7									
			5	80	0 - 0	4 - 6	4 - 6	0 · 95					0 · 0	0 · 0	119 · 0	0 · 05	
			5	80	4 - 6	9 - 2	4 - 6	0 · 95									
			5	95	0 - 0	6 - 5	6 - 5	1 · 1					0 · 0	0 · 0	134 · 0	0 · 06	
			5	95	6 - 5	11 - 5	5 - 0	1 · 0									
			5	95	11 - 5	16 - 5	5 - 0	1 · 0									
			5	80	0 - 0	4 - 5	4 - 5	0 · 9					0 · 0	0 · 0	119 · 0	0 · 05	
			5	55	0 - 0	3 - 0	3 - 0	0 · 6					0 · 0	0 · 0	94 · 0	0 · 03	
			5	30	0 - 0	2 - 5	2 - 5	0 · 5					0 · 0	0 · 0	69 · 0	0 · 03	
			5	5	0 - 0	1 - 6	1 - 6	0 · 4					0 · 0	0 · 0	44 · 0	0 · 02	
23-3-64	144' 4"	165' 0"	5	5	0 - 0	1 - 2	1 - 2	0 · 2	20 · 7	>117'	144' EX casing	45 · 0	0 · 0	0 · 0	50 · 0	0 · 01	Good Seal. Pump: Reciprocating, capacity of 12 g.p.m.
			5	5	1 - 2	1 - 4	1 - 2	0 · 2									
			5	30	0 - 0	6 - 0	6 - 0	1 · 2					0 · 0	0 · 0	75 · 0	0 · 06	
			5	30	6 - 0	12 - 0	6 - 0	1 · 2									
			5	80	0 - 0	10 - 4	10 - 4	2 · 1					0 · 0	0 · 0	125 · 0	0 · 10	
			5	80	10 - 4	21 - 0	10 - 4	2 · 1									
			5	105	0 - 0	13 - 0	13 - 0	2 · 6					0 · 0	0 · 0	150 · 0	0 · 13	
			5	105	13 - 0	26 - 0	13 - 0	2 · 6									
			5	80	0 - 0	10 - 0	10 - 0	2 · 0					0 · 0	0 · 0	125 · 0	0 · 10	
			5	30	0 - 0	5 - 0	5 - 0	1 · 0					0 · 0	0 · 0	75 · 0	0 · 05	
			5	5	0 - 0	1 - 0	1 - 0	0 · 2					0 · 0	0 · 0	50 · 0	0 · 01	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No: D.D.11					Coords:- 79877'S, 50796'W				R.L:- 3303'			Angle from Horizontal:-90°			Direction:-		
Packer Type:- NX mechanical with 4 rubbers.								Water Supply: Gravity feed or via reciprocating pump (see remarks column for details)									
19·4·64	52'3"	72'11"	5	10	0-0	74-0	74-0	14·8	20·7	283		24·0	1·0	4·0	27·0	0·72	Very good seal.
			5	10	0-0	74-0	74-0	14·8									
			5	15	0-0	84-5	84-5	16·9					1·0	5·0	33·0	0·81	Gravity feed.
			5	15	0-0	83-6	83-6	16·7									
			5	15	0-0	83-5	83-5	16·7									
			5	20	0-0	88-0	88-0	17·6					1·0	5·5	37·5	0·85	
			5	20	0-0	88-0	88-0	17·6									
			5	25	0-0	93-0	93-0	18·6					1·5	6·0	41·5	0·90	
			5	25	0-0	93-0	93-0	18·6									
			1	15	0-0	17-2	17-2	17·2					1·0	5·0	33·0	0·83	
			1	10	0-0	14-2	14-2	14·2					1·0	4·0	29·0	0·69	
			1	5	0-0	13-6	13-6	13·6					1·0	3·5	24·5	0·66	
19-4-64	71'2"	91'10"	5	5	0-0	67-0	67-0	13·4	20·7	283	72'	31·5	1·0	3·5	32·0	0·64	Good Seal.
			5	5	67-0	132-0	65-0	13·0			EX						Gravity feed.
			5	5	132-0	196-4	64-4	12·9			casing						Reciprocating pump
			5	20	0-0	80-0	80-0	16·0					1·0	4·5	46·0	0·77	used for pressures
			5	20	80-0	160-0	80-0	16·0									above 20 p.s.i.
			5	35	0-0	91-0	91-0	18·2					1·5	6·0	59·0	0·87	
			5	35	91-0	182-0	91-0	18·2									
			5	50	0-0	99-0	99-0	19·8					2·0	7·0	73·0	0·95	
			5	50	99-0	198-0	99-0	19·8									
			5	35	0-0	90-3	90-3	18·0					1·5	6·0	59·0	0·87	
			5	20	0-0	80-0	80-0	16·0					1·0	4·5	46·0	0·77	
			5	5	0-0	66-0	66-0	13·5					1·0	3·5	32·0	0·65	
19-4-64	92'0"	112'6"	5	5	0-0	120-0	120-0	24·0	20·5	283	93'	42·0	3·0	10·0	34·0	1·16	Good Seal
			5	5	120-0	238-0	118-0	23·6			EX						Gravity feed
			5	5	238-0	356-0	118-0	23·6			casing						20 p.s.i maximum
			5	20	0-0	140-0	140-0	28·0					4·5	14·0	43·5	1·37	gauge pressure obtained
			5	20	140-0	280-0	140-0	28·0									with gravity feed.
			5	10	0-0	130-0	130-0	26·0					4·0	12·0	36·0	1·27	
			5	5	0-0	117-0	117-0	23·4					3·0	10·0	34·0	1·15	
20-4-64	123'5"	149'1"	5	5	0-0	61-4	61-4	12·3	25·7	283	127'	56·0	1·5	3·0	56·5	0·48	Good Seal.
			5	5	61-4	122-6	61-2	12·3			EX						Gravity feed.
			5	15	0-0	66-1	66-1	13·2			casing		1·5	3·5	66·0	0·51	28 p.s.i. is maximum
			5	15	66-1	132-1	66-0	13·2									gauge pressure
			5	28	0-0	77-3	77-3	15·5					2·0	4·0	78·0	0·60	obtainable.
			5	28	77-3	154-6	77-3	15·5									
			5	22	0-0	74-2	74-2	14·8					2·0	4·0	72·0	0·58	
			5	22	74-2	148-5	74-3	14·9									
			5	15	0-0	70-6	70-6	14·1					2·0	4·0	65·0	0·55	
			5	5	0-0	65-4	65-4	13·1					1·5	3·5	56·0	0·51	
22-4-64	198'4"	219'4"	1	5	0-0	4-5	4-5	4·6	21·0	283	180'		0·5	0·5	92·0	0·22	Good Seal.
			1	5	4-5	9-6	4-6	4·7			EX						Gravity feed.
			1	5	9-6	14-4	4-6	4·7			casing						28 p.s.i. maximum
			1	15	0-0	6-5	6-5	6·6			+		1·0	1·0	101·0	0·31	gauge pressure
			1	15	6-5	13-1	6-4	6·5			20'						obtainable.
			1	25	0-0	6-4	6-4	6·5			N rod		1·0	1·0	111·0	0·31	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DDH (cont)				-													
22-4-64	198'4"	219'4"	1	25	6 - 4	13 - 0	6 - 4	6 · 5									
			1	32	0 - 0	6 - 3	6 - 3	6 · 4					1 · 0	1 · 0	118 · 0	0 · 31	
			1	32	6 - 3	12 - 6	6 - 3	6 · 4									
			1	25	0 - 0	6 - 3	6 - 3	6 · 4					1 · 0	1 · 0	111 · 0	0 · 31	
			1	15	0 - 0	6 - 15	6 - 15	6 · 2					1 · 0	1 · 0	101 · 0	0 · 30	
			1	5	0 - 0	6 - 3	6 - 3	4 · 4					0 · 5	0 · 5	92 · 0	0 · 21	
22-4-64	219'8"	240'4"	1	5	0 - 0	0 - 0	0 - 0	0 · 0	20 · 7	283	180'	97 · 0	0 · 0	0 · 0	102 · 0	0 · 00	Good Seal.
			1	5	0 - 0	0 - 0	0 - 0	0 · 0			EX						Gravity feed.
			1	15	0 - 0	1 - 4	1 - 4	1 · 5			casing		0 · 0	0 · 0	112 · 0	0 · 07	33psi. is maximum.
			1	15	1 - 4	2 - 8	1 - 4	1 · 5			+						gauge pressure
			1	25	0 - 0	1 - 4	1 - 4	1 · 5			40		0 · 0	0 · 0	122 · 0	0 · 07	possible.
			1	25	1 - 4	2 - 8	1 - 4	1 · 5			N rod						
			1	33	0 - 0	1 - 4	1 - 4	1 · 5					0 · 0	0 · 0	130 · 0	0 · 07	
			1	33	1 - 4	2 - 8	1 - 4	1 · 5									
			1	25	0 - 0	1 - 4	1 - 4	1 · 5					0 · 0	0 · 0	122 · 0	0 · 07	
			1	15	0 - 0	0 - 0	1 - 4	1 · 5					0 · 0	0 · 0	112 · 0	0 · 07	
			1	5	0 - 0	0 - 0	0 - 0	0 · 0					0 · 0	0 · 0	102 · 0	0 · 00	
27-4-64	240'3"	260'11"	1	6	0 - 0	8 - 3	8 - 3	8 · 4	20 · 7	283'	180'	105 · 5	1 · 5	1 · 5	108 · 5	0 · 40	Good Seal.
			1	6	8 - 3	16 - 5	8 - 2	8 · 3			EX						Gravity feed.
			1	6	16 - 5	24 - 7	8 - 2	8 · 3			casing						28 p.s.i. is maximum
			1	25	0 - 0	12 - 0	12 - 0	12 · 0			+		3 · 5	3 · 0	124 · 0	0 · 63	gauge pressure
			1	25	12 - 0	25 - 0	13 - 0	13 · 0			60'						possible.
			1	25	25 - 0	38 - 0	13 - 0	13 · 0			N rod						
			1	28	0 - 0	14 - 0	14 - 0	14 · 0					4 · 0	4 · 0	125 · 5	0 · 68	
			1	28	14 - 0	28 - 0	14 - 0	14 · 0									
			1	28	28 - 0	42 - 1	14 - 1	14 · 1									
			1	25	0 - 0	13 - 5	13 - 5	13 · 6					4 · 0	3 · 5	123 · 0	0 · 66	
			1	20	0 - 0	13 - 1	13 - 1	13 · 1					3 · 5	3 · 5	118 · 5	0 · 63	
			1	10	0 - 0	11 - 6	11 - 6	11 · 8					3 · 0	2 · 5	110 · 0	0 · 57	
			1	6	0 - 0	10 - 2	10 - 2	10 · 3					2 · 5	2 · 0	107 · 0	0 · 50	
27-4-64	260'10	281'6"	1	5	0 - 0	10 - 2	10 - 2	10 · 3	20 · 7	283	262'	114 · 5	2 · 5	2 · 0	115 · 0	0 · 50	Good Seal.
			1	5	0 - 0	10 - 2	10 - 2	10 · 3			EX						Gravity feed
			1	5	0 - 0	10 - 2	10 - 2	10 · 3			casing						28 p.s.i. is maximum
			1	25	0 - 0	10 - 7	10 - 7	10 · 9					2 · 5	2 · 0	135 · 0	0 · 53	gauge pressure
			1	25	0 - 0	10 - 7	10 - 7	10 · 9									possible.
			1	25	0 - 0	10 - 7	10 - 7	10 · 9									
			1	28	0 - 0	10 - 7	10 - 7	10 · 9					2 · 5	2 · 0	138 · 0	0 · 53	
			1	28	0 - 0	10 - 7	10 - 7	10 · 9									
			1	28	0 - 0	10 - 7	10 - 7	10 · 9									
			1	25	0 - 0	10 - 7	10 - 7	10 · 9					2 · 5	2 · 0	135 · 0	0 · 53	
			1	20	0 - 0	10 - 4	10 - 4	10 · 5					2 · 5	2 · 0	130 · 0	0 · 51	
28-4-64	281'9"	302'5"	5	5	0 - 0	78 - 0	78 - 0	15 · 6	20 · 7	283	282	124 · 0	4 · 5	4 · 0	120 · 5	0 · 75	Good Seal.
			5	5	0 - 0	77 - 0	77 - 0	15 · 4			EX						Gravity feed
			5	5	0 - 0	77 - 3	77 - 3	15 · 5			casing						Maximum gauge
			5	10	0 - 0	80 - 0	80 - 0	16 · 0					5 · 0	4 · 5	124 · 5	0 · 77	pressure obtainable
			5	10	0 - 0	80 - 0	80 - 0	16 · 0									was 28 p.s.i.
			5	20	0 - 0	82 - 5	82 - 5	16 · 5					5 · 5	5 · 0	133 · 5	0 · 80	
			5	20	0 - 0	82 - 5	82 - 5	16 · 5									
			5	28	0 - 0	85 - 0	85 - 0	17 · 0					6 · 0	5 · 0	141 · 0	0 · 82	
			5	28	0 - 0	85 - 0	85 - 0	17 · 0									

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. D.D. 11 (cont)																	
28-4-64	281'9"	302'5"	5	20	0 - 0	82 - 4	82 - 4	16 · 5					5 · 5	5 · 0	133 · 5	0 · 80	
			5	10	0 - 0	80 - 0	80 - 0	16 · 0					5 · 0	4 · 5	124 · 5	0 · 77	
			5	5	0 - 0	77 - 0	77 - 0	15 · 4					4 · 5	4 · 0	120 · 5	0 · 74	
+ 29-4-64	301'8"	322'4"	5	10	0 - 0	10 - 0	10 - 0	2 · 0	20 · 7	283'	302'	124·5	0 · 0	0 · 0	134 · 5	0 · 10	Good Seal.
			5	10	10 - 0	20 - 0	10 - 0	2 · 0			EX						Gravity feed.
			5	25	0 - 0	29 - 0	29 - 0	5 · 8			casing						Packer not sealing.
			5	25	29 - 0	61 - 0	32 - 0	6 · 4									Good Seals using
			5	25	61 - 0	94 - 4	33 - 4	6 · 7									Reciprocating pump
			5	50	0 - 0	15 - 0	15 - 0	3 · 0									(12 g.p.m) from 50p.s.i.
			5	50	15 - 0	29 - 5	14 - 5	2 · 9					0 · 5	0 · 0	174 · 0	0 · 14	
			5	75	0 - 0	18 - 3	18 - 3	3 · 7									
			5	75	18 - 3	36 - 4	18 - 1	3 · 6					0 · 5	0 · 5	198 · 5	0 · 18	
			5	100	0 - 0	22 - 0	22 - 0	4 · 4									
			5	100	22 - 0	43 - 7	21 - 7	4 · 4					1 · 0	0 · 5	223 · 0	0 · 21	
			5	75	0 - 0	18 - 2	18 - 2	3 · 6									
			5	50	0 - 0	18 - 7	14 - 7	3 · 0					0 · 5	0 · 5	198 · 5	0 · 17	
			5	25	0 - 0	12 - 1	12 - 1	2 · 4					0 · 0	0 · 0	174 · 0	0 · 15	
			5	10	0 - 0	10 - 2	10 - 2	2 · 0					0 · 0	0 · 0	149 · 5	0 · 12	
+ 29-4-64	321'11"	342'7"	5	6	0 - 0	37' - 0"	37' - 0	7 · 4	20 · 7	283'	322'	124·5	1 · 5	1 · 0	128 · 0	0 · 36	Good Seal.
			5	6	37 - 0	73 - 4	36 - 4	7 · 3			EX						Pump:- Reciprocating
			5	20	0 - 0	40 - 4	40 - 4	8 · 1			casing		2 · 0	1 · 5	141 · 0	0 · 39	capacity 12 g.p.m.
			5	20	40 - 4	80 - 5	40 - 1	8 · 0									
			5	43	0 - 0	51 - 6	51 - 6	10 · 4					3 · 0	2 · 0	162 · 5	0 · 50	
			5	43	51 - 6	102 - 4	50 - 6	10 · 2									
			5	30	0 - 0	46 - 2	46 - 2	9 · 2					2 · 5	1 · 5	150 · 5	0 · 44	
			5	19	0 - 0	42 - 0	42 - 0	8 · 4					2 · 0	1 · 5	140 · 0	0 · 41	
			5	6	0 - 0	38 - 6	38 - 6	7 · 7					1 · 5	1 · 0	128 · 0	0 · 37	
+ → 30-4-64	342'3"	362'11"	5	2	0 - 0	222 - 0	222 - 0	44 - 4	20 · 7	283	342'	124·5	42 · 0	36 · 0	46 · 5	2 · 14	Packer not sealing?
			5	2	222 - 0	444 - 0	222 - 0	44 - 4			EX						Gravity feed
			5	2	444 - 0	666 - 0	222 - 0	44 - 4			casing						
→ 1-5-64	362'8"	383'4"	5	0	0 - 0	218 - 0	218 - 0	43 - 6	20 · 7	283	363'	124·5	44 · 0	34 · 0	<46 · 5	2 · 10	Packer not sealing?
			5	0	0 - 0	219 - 0	219 - 0	43 - 8			EX						Gravity feed.
			5	0	0 - 0	216 - 0	216 - 0	43 - 2			casing						
→ 2-5-64	383'3"	403'11"	5	5	0 - 0	0 - 0	0 - 0	0 · 0	20 · 7	283	383'	124·5	0 · 0	0 · 0	129 · 5	0 · 00	Good Seal.
			5	25	0 - 0	0 - 0	0 - 0	0 · 0			EX		0 · 0	0 · 0	149 · 5	0 · 00	Pump:- Reciprocating,
			5	25	0 - 0	0 - 0	0 - 0	0 · 0			casing						capacity of 12. g.p.m.
			5	50	0 - 0	0 - 0	0 - 0	0 · 0					0 · 0	0 · 0	174 · 5	0 · 00	
			5	75	0 - 0	0 - 0	0 - 0	0 · 0					0 · 0	0 · 0	199 · 5	0 · 00	
			5	100	0 - 0	0 - 025	0 - 025	0 · 0					0 · 0	0 · 0	224 · 5	0 · 00	
			5	75	0 - 0	0 - 0	0 - 0	0 · 0									
			5	50	0 - 0	0 - 0	0 - 0	0 · 0									
			5	25	0 - 0	0 - 0	0 - 0	0 · 0									
			5	5	0 - 0	0 - 0	0 - 0	0 · 0									
→ 3-5-64	400'0"	420'6"	5	5	0 - 0	5 - 1	5 - 1	1 · 0	20 · 5	283	400'	124·5	0 · 0	0 · 0	129 · 5	0 · 05	Good Seal.
			5	5	5 - 1	10 - 1	5 - 0	1 · 0			EX						Pump:- Reciprocating
			5	25	0 - 0	7 - 4	7 - 4	1 · 5			casing		0 · 0	0, · 0	149 · 5	0 · 08	
			5	25	7 - 4	14 - 7	7 - 3	1 · 5									
			5	50	0 - 0	9 - 2	9 - 2	1 · 8					0 · 5	0 · 0	174 · 0	0 · 09	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No D.D. 11 (cont)																	
3-5-64	400' 0"	420'6"	5	50	9 - 2	18 - 2	9 - 0	1 · 8									
			5	75	0 - 0	9 - 7	9 - 7	2 · 0					1 · 0	0 · 0	198 · 5	0 · 10	
			5	75	9 - 7	19 - 4	9 - 5	1 · 9									
			5	100	0 - 0	10 - 1	10 - 1	2 · 0					1 · 0	0 · 0	223 · 0	0 · 10	
			5	100	10 - 1	20 - 1	10 - 0	2 · 0									
			5	75	0 - 0	8 - 2	8 - 2	1 · 6					0 · 5	0 · 0	199 · 0	0 · 08	
			5	50	0 - 0	7 - 0	7 - 0	1 · 4					0 · 0	0 · 0	174 · 5	0 · 07	
			5	25	0 - 0	6 - 2	6 - 2	1 · 2					0 · 0	0 · 0	149 · 5	0 · 06	
			5	5	0 - 0	4 - 4	4 - 4	0 · 9					0 · 0	0 · 0	129 · 5	0 · 05	

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UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM ((ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No:- D.D. 12.					Coords:- 79999'S, 51134'W.				R.L:- 3211			Angle from Horizontal:- 50°				Direction:- 097° M.	
Packer Type:- NX mechanical with 4 rubbers.								Water Supply:- Gravity feed from 2500 gallon tank 160 feet vertically above drill site.									
11-5-64	14'8"	35'4"	5	5	0-0	8-0	8-0	1·6	20·7	>135		5·0	0·0	0·0	10·0	0·08	Very good seal.
			5	5	8-0	15-7	7-7	1·6									
			5	5	15-7	23-6	7-7	1·6									
			5	10	0-0	10-4	10-4	2·1					0·0	0·0	15·0	0·10	
			5	10	10-4	21-0	10-4	2·1			15'						
			5	10	21-0	31-4	10-4	2·1			EX						
			5	15	0-0	13-1	13-1	2·6			casing		0·0	0·0	20·0	0·13	
			5	15	13-1	26-3	13-2	2·6									
			5	15	26-3	39-4	13-1	2·6									
			5	10	0-0	11-6	11-6	2·3					0·0	0·0	15·0	0·11	
			5	5	0-0	9-0	9-0	1·8					0·0	0·0	10·0	0·09	
12-5-64	34'4"	55'0"	5	5	0-0	55-0	55-0	11·0	20·7	>135		12	0·5	2·5	14·0	0·53	Good seal.
			5	5	0-0	55-2	55-2	11·0									
			5	5	0-0	55-1	55-1	11·0									
			5	10	0-0	80-1	80-1	16·0					0·5	4·5	17·0	0·77	
			5	10	0-0	80-0	80-0	16·0									
			5	10	0-0	80-0	80-0	16·0			34'						
			5	15	0-0	90-4	90-4	18·1			EX.		1·0	6·0	20·0	0·87	
			5	15	0-0	90-5	90-5	18·1			casing						
			5	15	0-0	90-5	90-5	18·1									
			5	20	0-0	110-0	110-0	22·0					1·0	8·0	23·0	1·06	
			5	20	0-0	110-0	110-0	22·0									
			5	15	0-0	95-0	95-0	19·0					1·0	6·0	20·0	0·92	
			5	10	0-0	80-0	80-0	16·0					0·5	4·5	17·0	0·77	
			5	5	0-0	55-0	55-0	11·0					0·5	2·5	14·0	0·53	
12-5-64	54'4"	75'0"	5	5	0-0	16-0	16-0	3·2	20·7	>135		19·0	0·0	0·0	24·0	0·15	Good seal.
			5	5	16-0	32-05	16-05	3·2									
			5	15	0-0	22-0	22-0	4·4					0·0	0·5	33·5	0·21	
			5	15	22-0	44-1	22-1	4·4									
			5	25	0-0	50-0	50-0	10·0			55'		0·5	2·0	41·5	0·48	
			5	25	50-0	100-0	50-0	10·0			EX.						
			5	35	0-0	76-0	76-0	15·2			casing		1·0	4·0	49·0	0·73	
			5	35	76-0	152-2	76-2	15·2									
			5	25	0-0	71-0	71-0	14·2					0·5	4·0	39·5	0·69	
			5	15	0-0	45-0	45-0	9·0					0·5	1·5	32·0	0·44	
			5	5	0-0	31-0	31-0	6·2					0·0	1·0	23·0	0·30	
13-5-64	75'0"	95'8"	5	5	0-0	32-0	32-0	6·4	20·7	>135		25·5	0·0	1·0	29·5	0·31	Good seal.
			5	5	0-0	32-0	32-0	6·4									
			5	20	0-0	46-5	46-5	9·3					0·0	1·5	44·0	0·45	
			5	20	0-0	46-5	46-5	9·3									
			5	35	0-0	60-0	60-0	12·0			75'		0·5	2·5	57·5	0·58	
			5	35	0-0	60-0	60-0	12·0			EX.						
			5	45	0-0	72-0	72-0	14·4			casing		1·0	4·0	65·5	0·69	
			5	45	0-0	72-0	72-0	14·4									
			5	35	0-0	66-6	66-6	13·4					1·0	3·5	56·0	0·65	
			5	20	0-0	47-0	47-0	9·4					0·0	1·5	44·0	0·45	
			5	5	0-0	32-5	32-5	6·5					0·0	1·0	29·5	0·31	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (fft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No D.D. 12 (cont.)																	
13·5·64	915'1"	115'9"	5	5	0-0	0-0	0-0	0·0	20·7	>135		32·5	0·0	0·0	37·5	0·00	Good seal.
			5	5	0-0	0-0	0-0	0·0									
			5	20	0-0	8-1	8-1	1·6					0·0	0·0	52·5	0·08	
			5	20	8-1	16-2	8-1	1·6									
			5	40	0-0	20-3	20-3	4·1					0·0	0·5	72·0	0·20	
			5	40	20-3	40-4	20-1	4·0			95'						
			5	60	0-0	31-0	31-0	6·2			EX		0·5	1·0	91·0	0·30	
			5	60	31-0	62-0	31-0	6·2			casing						
			5	40	0-0	21-0	21-0	4·2					0·0	0·5	72·0	0·20	
			5	20	0-0	15-3	15-3	3·1					0·0	0·0	52·5	0·15	
			5	10	0-0	13-1	13-1	2·6					0·0	0·0	42·5	0·13	
			5	5	0-0	10-5	10-5	2·1					0·0	0·0	37·5	0·10	
14·5·64	1114'4"	135'0"	5	7	0-0	7-4	7-4	1·5	20·7	>135		39·0	0·0	0·0	46·0	0·07	Good seal.
			5	7	7-4	14-7	7-3	1·5									
			5	25	0-0	33-0	33-0	6·6					0·5	1·0	62·5	0·32	
			5	25	33-0	66-0	33-0	6·6									
			5	50	0-0	80-0	80-0	16·0			115'		1·5	4·5	83·0	0·77	
			5	50	80-0	159-6	79-6	16·0			EX						
			5	70	0-0	100-3	100-3	20·1			casing		3·0	7·0	99·0	0·97	
			5	70	100-3	200-4	100-1	20·0									
			5	50	0-0	82-0	82-0	16·4					2·0	4·5	82·5	0·79	
			5	25	0-0	62-0	62-0	12·4					1·0	3·0	60·0	0·60	
			5	7	0-0	54-0	54-0	10·8					1·0	2·0	43·0	0·52	
15·5·64	134'9"	155'5"	5	5	0-0	8-1	8-1	1·6	20·7	>135		46·0	0·0	0·0	51·0	0·08	Good seal.
			5	5	8-1	16-2	8-1	1·6									
			5	25	0-0	27-6	27-6	5·5					0·5	0·5	70·0	0·27	
			5	25	27-6	55-1	27-5	5·5									
			5	50	0-0	58-4	58-4	11·7			135'		1·5	2·5	92·0	0·56	
			5	50	58-4	117-1	58-5	11·7			EX						
			5	68	0-0	81-4	81-4	16·3			casing		2·5	4·5	107·0	0·79	3·3 g.p.m. up casing.
			5	68	81-4	162-7	81-3	16·3									
			5	50	0-0	61-5	61-5	12·3					1·5	3·0	91·5	0·59	0·5 g.p.m. up casing.
			5	25	0-0	34-3	34-3	6·9					0·5	1·0	69·5	0·33	
			5	5	0-0	16-4	16-4	3·3					0·0	0·0	51·0	0·16	
16·5·64	155'0"	175'8"	5	5	0-0	0-0	0-0	0·0	20·7	>135		52·5	0·0	0·0	57·0	0·00	Good seal
			5	5	0-0	0-0	0-0	0·0									
			5	25	0-0	0-7	0-7	0·2					0·0	0·0	77·5	0·01	
			5	25	0-7	1-5	0-6	0·2									
			5	50	0-0	18-6	18-6	3·7					0·5	0·5	101·5	0·18	
			5	50	18-6	37-3	18-5	3·7			155'						
			5	71	0-0	27-0	27-0	5·4			EX		0·5	0·5	122·5	0·26	71 p.s.i. is maximum gauge pressure is obtainable under gravity.
			5	71	27-0	54-0	27-0	5·4			casing						
			5	100	0-0	41-0	41-0	8·2					1·0	1·5	150·0	0·40	Reciprocating pump (12 g.p.m) used.
			5	100	41-0	82-0	41-0	8·2									
			5	71	0-0	34-0	34-0	6·8					1·0	1·0	121·5	0·33	
			5	50	0-0	22-6	22-6	4·5					0·5	0·5	101·5	0·22	
			5	25	0-0	17-3	17-3	3·5					0·5	0·5	76·5	0·17	
			5	5	0-0	12-1	12-1	2·4					0·0	0·0	57·5	0·12	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall.pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. DD 26			Co-ords:- 793005		51382W			RL 2991'		Angle from horizontal:- 60°			Direction:- 126°M				
Packer Type			NX hydraulic				Water Supply :-		Gravity Feed								
20-2-65	52' 11"	73' 7"	5	5	0·0	112·5	112·5	22·50	20·7	60·6	53'	20·0	3·0	7·0	15·0	1·09	
			5	5	112·5	225·0	112·5				NX						
			5	20	0·0	152·0	152·0	30·40			rod		5·5	14·0	20·5	1·48	
			5	20	152·0	304·0	152·0										
			5	35	0·0	190·25	190·25	38·05					8·0	22·0	25·0	1·85	
			5	35	190·25	380·5	190·25										
			5	50	0·0	225·0	225·0	45·00					11·0	31·0	28·0	2·18	
			5	50	225·0	450·0	225·0										
			5	35	0·0	190·25	190·25	38·05					8·0	22·0	25·0	1·85	
			5	20	0·0	155·0	155·0	31·00					5·5	14·0	20·5	1·50	
			5	5	0·0	112·5	112·5	22·50					3·0	7·0	15·0	1·09	
21-2-65	70' 4"	91' 0"	5	5	0·0	109·2	109·2	21·84	20·7	60·6	71'	26·5	4·0	7·0	20·5	1·05	
			5	5	109·2	218·4	109·2				NX						
			5	25	0·0	159·0	159·0	31·80			rod		8·0	15·0	28·5	1·54	
			5	25	159·0	318·0	159·0										
			5	50	0·0	202·0	202·0	40·40					12·5	25·0	39·0	1·95	
			5	50	202·0	404·0	202·0										
			5	70	0·0	230·0	230·0	46·00					16·0	32·0	48·5	2·22	
			5	70	230·0	460·0	230·0										
			5	50	0·0	197·5	197·5	39·50					12·0	23·5	41·0	1·91	
			5	25	0·0	142·0	142·0	28·40					6·5	12·0	33·0	1·37	
			5	5	0·0	91·5	91·5	18·30					3·0	4·5	24·0	0·88	
21-2-65	89' 6"	100' 2"	5	5	0·0	15·0	15·0	3·00	10·7	60·6	90'	26·5	0·0	0·0	31·5	0·28	
			5	5	15·0	30·0	15·0				NX						
			5	30	0·0	100·0	100·0	20·00			rod		4·5	5·5	46·5	1·87	
			5	30	100·0	200·0	100·0										
			5	60	0·0	145·0	145·0	29·00					9·0	12·5	65·0	2·70	
			5	60	145·0	290·0	145·0										
			5	90	0·0	162·0	162·0	32·40					11·0	16·0	89·5	3·03	
			5	90	162·0	324·0	162·0										
			5	60	0·0	140·0	140·0	28·00					8·5	11·5	66·5	2·62	
			5	30	0·0	89·9	89·9	17·98					4·0	4·0	48·5	1·68	
			5	5	0·0	14·5	14·5	2·90					0·0	0·0	31·5	0·27	
Hole No. DD 29			Co-ords:- 803195		51606W			RL 3000'		Angle from horizontal:- 55°			Direction:- 210°M				
Packer Type			NX mechanical with 4 rubbers					Water Supply :-		Gravity Feed							
24-3-65	70' 2"	90' 10"	1	6	0·0	2·5	2·5	2·5	20·7	56·5	70'	25·0	0·0	0·0	31·0	0·12	
			1	5·5	2·5	5·0	2·5	2·5			NX		0·0	0·0	30·5	0·12	
			1	5	5·0	7·4	2·4	2·4			rod		0·0	0·0	30·0	0·12	
			1	25	0·0	3·4	3·4	3·3					0·0	0·0	50·0	0·16	
			1	25	3·4	6·6	3·2										
			1	25	6·6	10·0	3·4										
			1	50	0·0	4·7	4·7	4·6					0·5	0·5	74·0	0·22	
			1	50	4·7	9·1	4·4										
			1	50	9·1	13·8	4·7										
			1	75	0·0	6·0	6·0	5·9					0·5	1·0	98·5	0·29	
			1	75	6·0	11·8	5·8										

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. D.D. 29 (cont.)																	
24-3-65	70' 2"	90' 10"	1	100	0·0	8·7	8·7	10·3	20·7	56·5	70'	25·0	1·0	2·0	122·0	0·50	
			1	100	0·0	9·7	9·7				NX						
			1	100	9·7	20·2	10·5				rod						
			1	100	20·2	31·3	11·1										Supply line hose burst while
			1	100	31·3	43·0	11·7										increasing pressure to 125 p.s.i.
			1	125	0·0	54·5	54·5	54·3					21·5	55·0	73·5	2·63	Line was reconnected and test
			1	125	54·5	108·5	54·0										section stabilised at 125 p.s.i.
			1	150	0·0	62·0	62·0	61·7					27·5	73·0	74·5	2·98	
			1	150	62·0	123·4	61·4										
			1	175	0·0	78·0	78·0	78·0					44·5	113·0	42·5	3·77	Hose burst at 175 p.s.i.
25-3-65	89' 4"	110' 0"	1	5	0·0	3·5	3·5	3·5	20·7	56·5	90'	25·0	0·0	0·0	30·0	0·17	
			1	5	3·5	7·0	3·5				NX						
			1	25	0·0	5·2	5·2	5·2			rod		0·5	0·5	49·0	0·25	
			1	25	5·2	10·4	5·2										
			1	50	0·0	8·2	8·2	8·3					1·0	1·5	72·5	0·41	
			1	50	8·2	16·5	8·3										
			1	75	0·0	10·6	10·6	10·7					1·5	2·0	96·5	0·52	
			1	75	10·6	21·3	10·7										
			1	100	0·0	12·4	12·4	12·4					2·0	3·5	119·5	0·60	
			1	100	12·4	24·8	12·4										
			1	125	0·0	16·7	16·7	16·7					3·5	6·0	140·5	0·81	
			1	125	16·7	33·4	16·7										
			1	150	0·0	20·3	20·3	20·4					4·5	8·5	162·0	0·99	
			1	150	20·3	40·7	20·4										
			1	175	0·0	25·6	25·6	25·5					7·0	13·0	180·0	1·23	
			1	175	25·6	50·9	25·3										
			1	200	0·0	30·4	30·4	30·3					9·5	17·5	198·0	1·46	
			1	200	30·4	60·6	30·2										Supply hose started leaking
Hole No. D.D. 30 Co-ords:- 804335 51710W RL. 2950' Angle from horizontal:- 30° Direction:- 030°M																	
Packer Type:- NX mechanical with 4 rubbers Water Supply:- Gravity Feed																	
19-3-65	62' 4"	88' 0"	1	5	0·0	10·5	10·5	10·3	25·7	22·5	70'	10·0	1·0	2·0	12·0	0·41	
			1	5	10·5	20·6	10·1				NX						
			1	25	0·0	23·0	23·0	23·1			rod		4·5	9·5	21·0	0·90	
			1	25	23·0	46·1	23·1										
			1	50	0·0	35·0	35·0	33·6					9·0	20·0	31·0	1·31	
			1	50	35·0	68·5	33·5										
			1	50	68·5	102·2	33·7										
			1	75	0·0	40·2	40·2	43·7					14·5	33·5	37·0	1·70	
			1	75	40·2	84·0	43·8										
			1	75	84·0	127·7	43·7										
			1	92	0·0	51·5	51·5	50·9					19·5	45·0	37·5	1·97	
			1	92	51·5	101·7	50·2										
			1	75	0·0	45·0	45·0	45·0					15·0	35·5	34·5	1·75	
			1	50	0·0	35·0	35·0	35·0					9·5	22·0	28·5	1·36	
			1	25	0·0	24·7	24·7	24·7					5·5	11·0	18·5	0·96	
			1	5	0·0	14·7	14·7	15·1					2·0	4·0	9·0	0·59	
			1	5	0·0	15·4	15·4										
N.B Tried to test from 54' to 74' and also 64' to 74' — in both instances neither hydraulic nor mechanical packers would seal																	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall. pts.)	WATER METER READINGS FINISH (gall. pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. D.D 31			Co-ords:- 80238S	51527W				R.L. 3023'		Angle from horizontal:- 90°			Direction:- -				
Packer Type:-		NX mechanical with 4 rubbers								Water Supply:- Gravity Feed							
31-3-65	8'9"	29'5"	1	5	0·0	16·0	16·0	16·0	20·7	80·0	10'	4·5	0·5	5·0	4·0	0·77	
			1	5	16·0	32·0	16·0				NX						
			1	25	0·0	22·2	22·2	22·2			rod		0·5	9·0	20·0	1·08	
			1	25	22·2	44·5	22·3										
			1	50	0·0	34·0	34·0	34·0					1·5	21·0	32·0	1·64	
			1	50	34·0	68·0	34·0										
			1	75	0·0	52·4	52·4	45·3					2·0	35·0	42·5	2·18	
			1	75	52·4	98·0	45·6										
			1	75	98·0	142·7	44·7										
			1	75	142·7	188·2	45·5										
			1	100	0·0	56·5	56·5	56·5					3·5	54·0	47·0	2·73	
			1	100	56·5	113·0	56·5										
			1	75	0·0	48·5	48·5	48·5					2·5	42·0	35·0	2·34	
			1	50	0·0	39·0	39·0	39·0					1·5	25·0	28·0	1·88	
			1	25	0·0	28·7	28·7	28·7					1·0	15·0	13·5	1·39	
			1	5	0·0	19·8	19·8	19·8					0·5	7·5	1·5	0·96	
31-3-65	29'4"	50'0"	1	5	0·0	5·4	5·4	5·4	20·7	80·0	30'	13·0	0·0	0·5	17·5	0·26	
			1	5	5·4	10·8	5·4				NX						
			1	25	0·0	8·5	8·5	8·5			rod		0·5	1·5	36·0	0·41	
			1	25	8·5	17·0	8·5										
			1	50	0·0	11·5	11·5	11·5					0·5	2·5	60·0	0·55	
			1	50	11·5	23·0	11·5										
			1	75	0·0	21·2	21·2	21·2					1·5	8·5	78·0	1·02	
			1	75	21·2	42·4	21·2										
			1	100	0·0	29·0	29·0	29·0					3·0	16·0	94·0	1·40	
			1	100	29·0	58·0	29·0										
			1	75	0·0	25·0	25·0	25·0					2·5	12·0	73·5	1·21	
			1	50	0·0	21·3	21·3	21·3					1·5	8·5	53·0	1·03	
			1	25	0·0	16·5	16·5	16·5					1·0	5·5	31·5	0·80	
			1	5	0·0	11·9	11·9	11·9					0·5	2·5	15·0	0·58	
31-3-65	50'1"	70'9"	1	5	0·0	4·2	4·2	4·2	20·7	80·0	50'	22·0	0·0	0·5	26·5	0·20	
				5	0·0	4·2	4·2				NX						
				25	0·0	7·4	7·4	7·4			rod		0·5	1·0	45·5	0·36	
				25	0·0	7·4	7·4										
				50	0·0	10·0	10·0	10·0					0·5	2·5	69·0	0·48	
				50	0·0	10·0	10·0										
				75	0·0	19·4	19·4	19·4					2·5	7·5	87·0	0·94	
				75	0·0	19·4	19·4										
				100	0·0	26·5	26·5	26·5					4·0	12·5	105·5	1·28	
				100	0·0	26·5	26·5										
				75	0·0	22·1	22·1	22·1					3·0	10·0	84·0	1·07	
				50	0·0	13·6	13·6	13·6					1·5	4·0	66·5	0·66	
				25	0·0	10·2	10·2	10·2					0·5	2·5	44·0	0·49	
				5	0·0	6·1	6·1	6·1					0·5	0·5	26·0	0·30	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. D.D. 31 (cont.)																	
1-4-65	70'2"	90'10"	1	5	0·0	2·5	2·5	2·5	20·7	80·0	70'	31·0	0·0	0·0	36·0	0·12	
			1	5	2·5	5·0	2·5				NX						
			1	25	0·0	5·3	5·3	5·3			rod		0·5	0·5	55·0	0·26	
			1	25	5·3	10·6	5·3										
			1	50	0·0	6·7	6·7	6·7					0·5	1·0	79·5	0·32	
			1	50	6·7	13·4	6·7										
			1	75	0·0	7·4	7·4	7·4					0·5	1·0	104·5	0·36	
			1	75	7·4	14·8	7·4										
			1	100	0·0	10·2	10·2	10·2					1·0	2·5	127·5	0·49	
			1	100	10·2	20·4	10·2										
			1	125	0·0	13·6	13·6	13·6					2·0	4·0	150·0	0·66	
			1	125	13·6	27·2	13·6										
			1	150	0·0	16·4	16·4	16·4					2·5	5·0	173·5	0·79	
			1	150	16·4	32·8	16·4										
			1	175	0·0	18·5	18·5	18·5					3·0	7·0	196·0	0·90	
			1	175	18·5	37·0	18·5										
			1	200	0·0	22·6	22·6	22·6					4·5	10·0	216·5	1·09	
			1	200	22·6	45·2	22·6										
			1	175	0·0	19·3	19·3	19·3					3·5	7·5	195·0	0·93	
			1	150	0·0	17·5	17·5	17·5					3·0	6·0	172·0	0·85	
			1	125	0·0	14·7	14·7	14·7					2·0	4·5	149·5	0·71	
			1	100	0·0	11·7	11·7	11·7					1·5	3·0	126·5	0·57	
			1	75	0·0	8·8	8·8	8·8					1·0	2·0	103·0	0·43	
			1	50	0·0	7·9	7·9	7·9					0·5	1·5	79·0	0·38	
			1	25	0·0	6·6	6·6	6·6					0·5	1·0	54·5	0·32	
			1	5	0·0	3·8	3·8	3·8					0·0	0·5	35·5	0·19	
1-4-65	89'4"	110'0"	1	5	0·0	13·1	13·1	13·2	20·7	80·0	90'	35·0	2·5	4·0	33·5	0·64	
			1	5	13·1	26·3	13·2				NX						
			1	25	0·0	17·1	17·1	17·0			rod		3·5	5·5	51·0	0·82	
			1	25	17·1	34·0	16·9										
			1	50	0·0	21·5	21·5	21·5					5·0	8·5	71·5	1·04	
			1	50	21·5	42·9	21·4										
			1	75	0·0	26·7	26·7	26·7					7·5	12·5	90·0	1·29	
			1	75	26·7	53·4	26·7										
			1	100	0·0	29·0	29·0	29·0					9·0	16·0	110·0	1·40	
			1	100	29·0	58·0	29·0										
			1	125	0·0	33·6	33·6	33·5					11·5	21·5	127·0	1·62	
			1	125	33·6	66·9	33·3										
			1	150	0·0	35·0	35·0	35·1					12·5	24·0	148·5	1·70	
			1	150	35·0	70·1	35·1										
			1	175	0·0	39·0	39·0	38·9					15·0	29·5	165·5	1·87	
			1	175	39·0	77·8	38·8										
			1	150	0·0	36·2	36·2	36·2					13·5	25·0	146·5	1·75	
			1	125	0·0	34·0	34·0	34·0					11·5	22·5	126·0	1·64	
			1	100	0·0	30·0	30·0	30·0					9·5	17·0	108·5	1·45	
			1	75	0·0	27·2	27·2	27·2					8·0	13·5	88·5	1·31	
			1	50	0·0	22·0	22·0	22·0					5·5	9·0	70·5	1·06	
			1	25	0·0	18·0	18·0	18·0					3·5	7·0	49·5	0·87	
			1	5	0·0	14·0	14·0	14·0					2·5	4·0	33·5	0·68	

BUREAU OF MINERAL RESOURCES

UPPER COTTER DAMSITE "E"

WATER PRESSURE TEST RESULTS

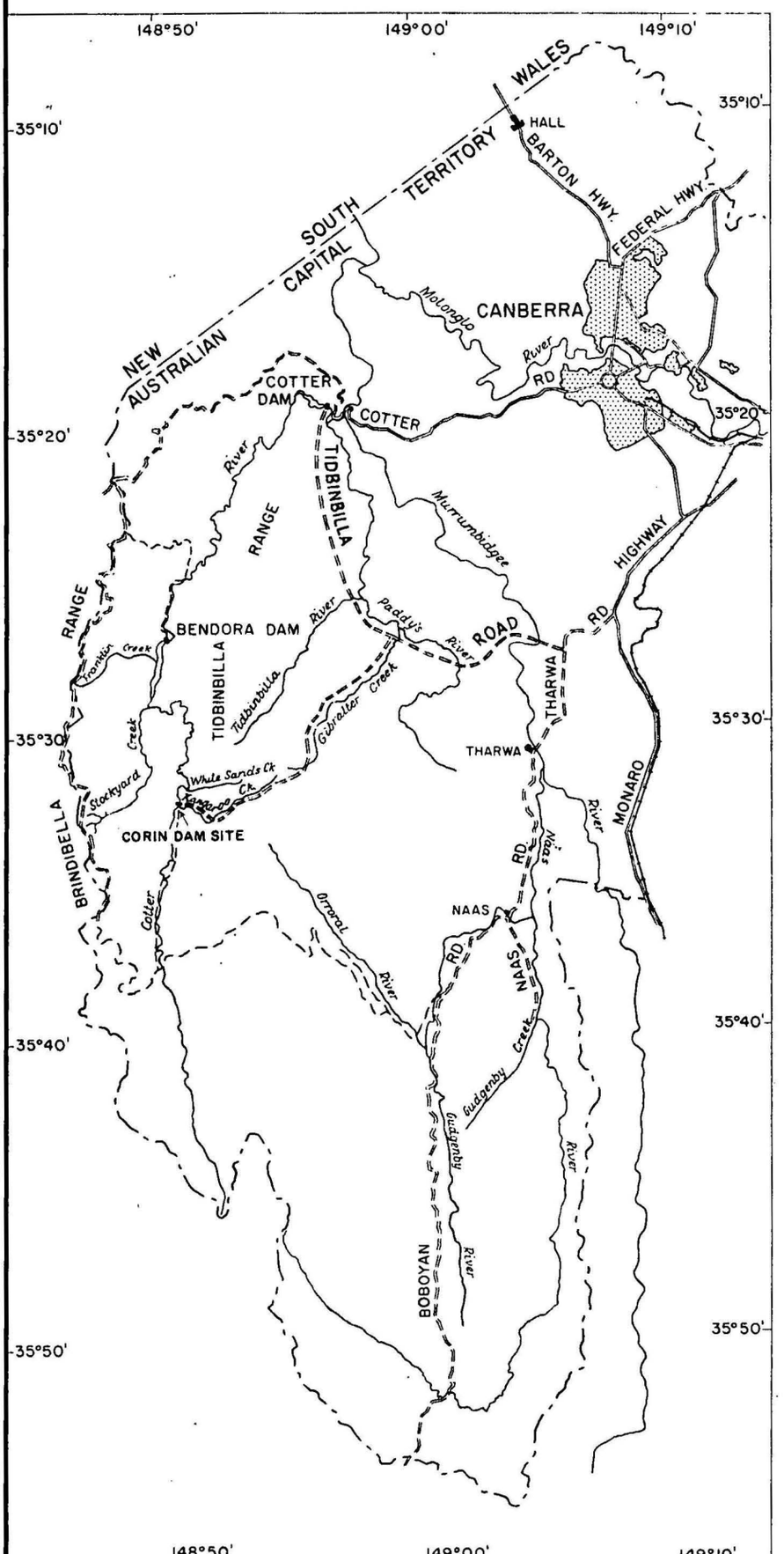
DATE	SECTION TESTED FROM (ft.)	SECTION TESTED TO (ft.)	TIME OF TEST (min.)	GAUGE PRESSURE (p.s.i.)	WATER METER READINGS START (gall.pts.)	WATER METER READINGS FINISH (gall.pts.)	WATER LOSS (gall. pts.)	LEAKAGE RATE (g.p.m.)	LENGTH OF SECTION (ft.)	VERTICAL DEPTH STANDING WATER (ft.)	LENGTH & SIZE OF SUPPLY LINE	WATER COLUMN PRESSURE (p.s.i.)	FRICTION LOSSES SUPPLY LINE (p.s.i.)	FRICTION LOSSES PACKER (p.s.i.)	EFFECTIVE TEST PRESSURE (p.s.i.)	WATER LOSS (g.p.m. per ft.)	REMARKS
Hole No. D.D. 31 (cont.)																	
2-4-65	109'7"	130'3"	1	5	0·0	7·5	7·5	7·6	20·7	80·0	110'	35·0	1·0	2·0	37·0	0·37	
			1	5	7·5	15·1	7·6				NX						
			1	25	0·0	25·0	25·0	25·1			rod.		8·5	12·0	39·5	1·21	
			1	25	25·0	50·1	25·1										
			1	50	0·0	32·1	32·1	32·2					13·0	19·0	53·0	1·55	
			1	50	32·1	64·3	32·2										
			1	75	0·0	42·0	42·0	42·0					21·0	34·0	55·0	2·03	
			1	75	42·0	84·0	42·0										
			1	100	0·0	51·0	51·0	51·0					30·5	49·0	55·5	2·46	
			1	100	51·0	102·0	51·0										
			1	125	0·0	56·0	56·0	56·0					36·5	60·0	63·5	2·71	
			1	125	56·0	112·0	56·0										
			1	150	0·0	62·0	62·0	62·0					44·0	74·0	67·0	2·99	
			1	150	62·0	124·0	62·0										
			1	175	0·0	75·0	75·0	75·1					65·0	105·0	40·0	3·63	
			1	175	75·0	150·1	75·1										
			1	200	0·0	83·0	83·0	82·0					76·0	125·0	34·0	3·96	
			1	200	83·0	164·0	81·0										
			1	175	0·0	77·1	77·1	77·1					68·0	110·0	32·0	3·72	
			1	150	0·0	64·1	64·1	64·1					47·0	79·0	59·0	3·10	
			1	125	0·0	58·6	58·6	58·6					39·5	66·5	44·0	2·83	
			1	100	0·0	53·4	53·4	53·4					33·0	55·0	47·0	2·58	
			1	75	0·0	45·0	45·0	45·0					24·0	39·0	47·0	2·18	
			1	50	0·0	34·6	34·6	34·6					15·0	23·0	47·0	1·67	
			1	25	0·0	28·6	28·6	28·6					10·5	15·0	34·5	1·38	
			1	5	0·0	10·1	10·1	10·1					1·5	2·5	36·0	0·49	

PLATE 1

LOCALITY MAP

CORIN DAMSITE

0 6 12 18 MILES.



155 A16/358 J.W.C.

Bureau of Mineral Resources, Geology and Geophysics. March, 1964.

To accompany Record 1965/200

PLATE 2

CORIN DAMSITE

GEOLOGICAL MAP OF KANGAROO CREEK-WHITE SANDS CREEK DIVIDE AND THE COTTER FAULT ZONE

SCALE

200 0 200 400 600 800 FEET

REFERENCE

- Quartzite; silicified fine to coarse grained quartz sandstone
- Massive siltstone
- Laminated siltstone
- Cleaved siltstone; shale
- Interbedded quartz sandstone and siltstone
- Interbedded phyllite and quartz sandstone
- Quartz porphyry
- Fault breccia
- 40 Dip and strike of bedding
- 80 Dip and strike of jointing
- 70 Dip and strike of cleavage
- 75 Dip and strike of foliation
- Strike of vertical foliation
- 50 Direction and plunge of lineation (usually slickensides)
- Anticlinal axis
- Synclinal axis
- Drag fold
- 65 Fault, position accurate, with dip indicated
- 65 Fault, position approximate, with dip indicated
- 60 Reverse fault, position approximate
- Road or bulldozed track, position accurate
- Road or bulldozed track, position approximate
- Cliff or bluff face; embankment
- Bulldozed costean
- DD2 Diamond drill hole collar
- Trigonometrical station

Base map compiled from aerial photographs. Geology mapped by plane table survey and compass, tape and Abney level traverses. Geology by D.F. Maggs, W. Oldershaw, E.J. Best, J.K. Hill and D.E. Gardner.

Bureau of Mineral Resources, Geology and Geophysics. June 1965

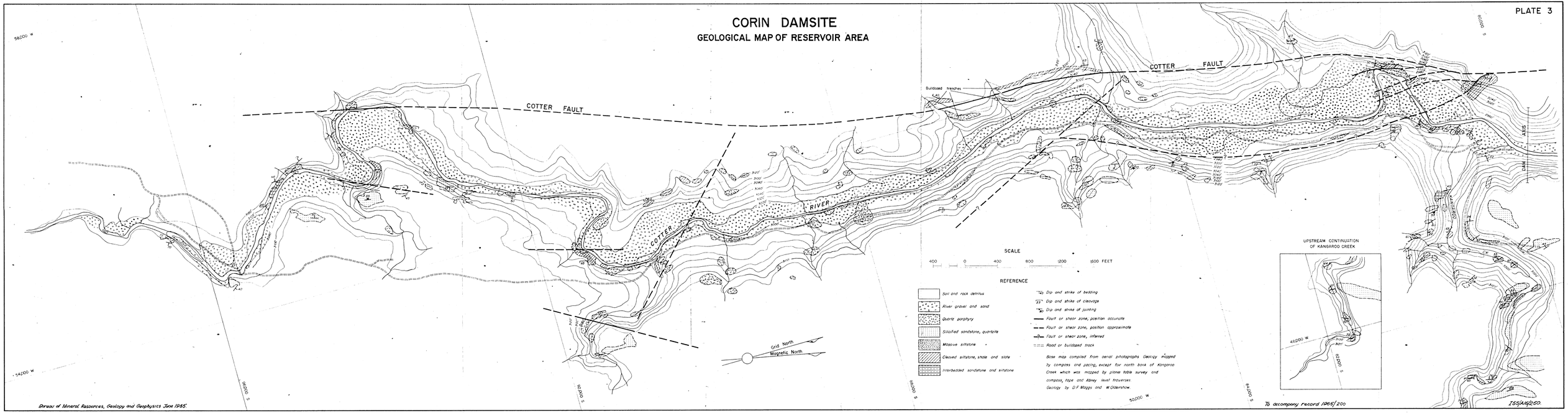
155/A16/249

To accompany Record 1965/200

PLATE 3

CORIN DAMSITE

GEOLOGICAL MAP OF RESERVOIR AREA



Bureau of Mineral Resources, Geology and Geophysics June 1965.

To accompany record 1965/200

155/AUG/20.

PLATE 4.

CORIN DAMSITE

COMBINED GEOLOGICAL AND TOPOGRAPHICAL MAP OF DAMSITE AND APPURTENANT STRUCTURES

100 50 0 100 200 Feet

- Silicified sandstone, quartzite
- Laminated siltstone
- Cleaved siltstone
- Strike and dip of bedding
- Anticline, position accurate
- Syncline, position accurate
- Syncline, position approximate
- Fault showing angle of dip
- Vertical fault
- Normal fault showing downthrown sides
- Fault showing relative horizontal movement
- Shear zone
- Interbedded sandstone and siltstone
- Interbedded sandstone and phyllite
- Fault breccia
- Strike and dip of cleavage
- Strike and dip of foliation
- Strike and dip of jointing
- Boundary of outcrop
- Hand dug pit or trench
- Area cleaned by sluicing
- Diamond drill hole showing slope length and angle to horizontal
- Contours
- Approximate contours

Contour interval, 20 feet

COTTER RIVER

KANGAROO CREEK

DAM AXIS

CREST OF PROPOSED COFFERDAM

Proposed downstream toe of dam embankment

Proposed upstream toe of dam embankment

PROPOSED SIDE CHANNEL SPILLWAY

PROPOSED TUNNEL LINE

OUTLET PORTAL

INLET PORTAL

VALVE TOWER

ACCESS BRIDGE

DOWNSTREAM SLOPE 1 in 1

UPSTREAM SLOPE 1 in 1

DIKE

Bulldozed track

Bulldozed pit face

Bulldozed trench

Flaggy sandstone, olive-green phyllite

Flaggy sandstone, interbedded black shale

Bureau of Mineral Resources, Geology and Geophysics, June 1965

To accompany Record 1965/200

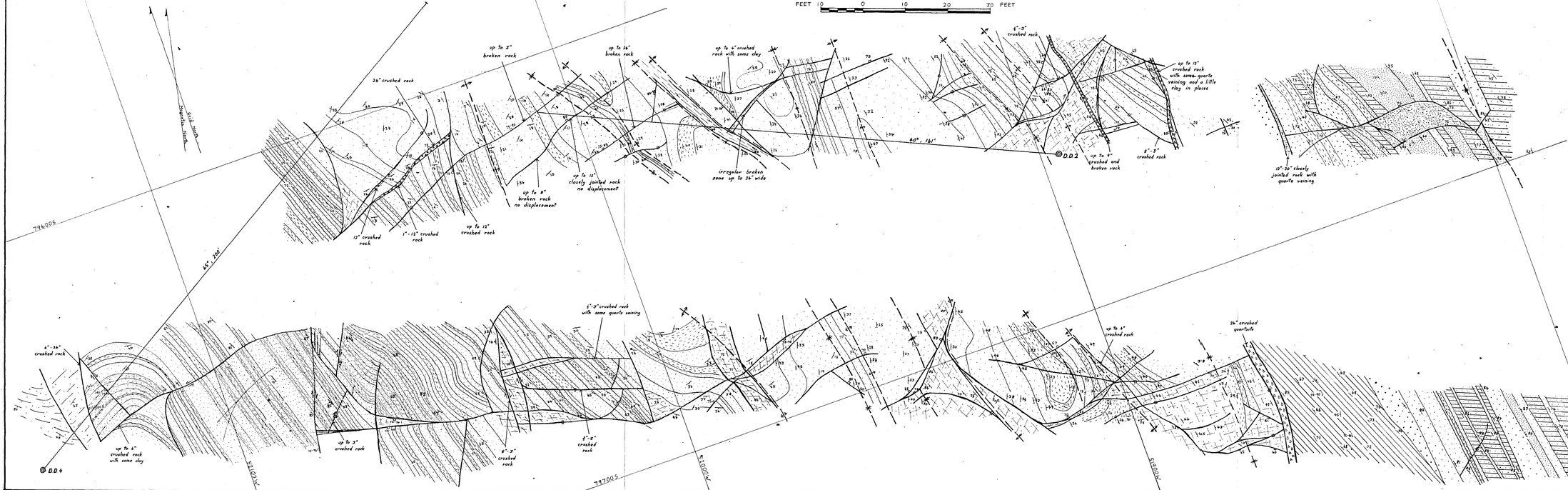
I 55/A16/185

PLATE 5

CORIN DAMSITE - GEOLOGICAL MAP OF SLUICED AREAS ON WEST BANK

(For location see plate 4.)

FEET 10 0 10 20 30 FEET



REFERENCE

- Bedded quartzite with interbeds of quartzite containing numerous irregular silty laminae. Where the interbeds with silty laminae have a true thickness of 6" or more, they are represented as individual beds. Where they are less than 6" thick the surface trace of each bed is shown by a single line.
- Coarse grained silicified sandstone
- Fine grained silicified sandstone
- Interbedded sandstone & siltstone
- Thickly bedded siltstone
- Cleaved siltstone
- Fault zone material
- 65 — Dip & strike of bedding
- Strike of vertical beds
- 70 — Dip & strike of joint
- 75 — Dip & strike of cleavage
- 75 — Surface trace of major joint (commonly a plane of displacement) with dip. Direction of horizontal movement indicated if known
- Surface trace of vertical major joint
- Closely jointed rock, commonly with minor displacements
- Anticline, position accurate
- Syncline, position accurate
- D.D.4 — Diamond drill hole showing slope length and angle to horizontal

ISS/A16/251

To accompany Record 1965/200

Bureau of Mineral Resources, Geology & Geophysics; June 1965.

CORIN DAMSITE

GEOLOGICAL MAP OF SLUICED AREAS ON EAST BANK

(For location see plate 4.)

FEET 10 5 0 10 20 30 40 50 FEET

798005

799005

800005

S1500W

S1400W

S1300W

Grid North

Magnetic North

△S.P.21

△S.P.23

△S.P.34

△S.P.35

△S.P.38

△S.P.20

△E

△F

D.D.7

D.D.8 90°, 158°

D.D.10

D.D.9

D.D.60 90°, 60°

D.D.38 90°, 83°

D.D.39 90°, 76°

6'-12' crushed rock

9"-18" crushed rock

Very sheared and cleaved siltstone forming V notch up to 3' deep in section of surface.

Shear zone forming notch up to 2' deep in bedrock surface.

Blocky quartzite.

Sheared siltstone, ½' remnant adjacent clay to fault.

6" sheared siltstone adjacent to boundary with quartzite.

Sheared siltstone

Footwall of major Fault.

Hanging wall of major Fault.

Contorted, dislocated, cleaved, laminated siltstone.

Slightly contorted and dislocated laminated siltstone — in core of anticline

Open joints

Right joint

Crushed rock.

Up to 2' of crushed rock.

Very dislocated and contorted siltstone.

Shattered rock

2' of crushed rock narrowing to open joint to 2' Slickensides indicate reverse movement.

Zone of silicified rock with many quartz veins up to 2" wide — some flats of quartz up to 5" across.

General strike of veins 140°-155° dip, 70°-90° E. and 65° W.

Fault breccia present at margins

1'-2" slip.

Broken rock.

6"-15" sheared siltstone with moderate amount of clay

Blocky quartzite

Sheared siltstone

Contorted and dislocated siltstone

Crushed rock

Fault zone, 30' wide, striking N.E. and dipping S.E. at 70°. Contains sheared siltstone with moderate amount of clay.

REFERENCE.

Quartz sandstone; quartzite.

- Fine grained.
- Medium grained.
- Coarse grained

Quartz siltstone.

- Laminated.
- Cleaved.
- Interbedded siltstone and sandstone.
- Irregular broken masses of sandstone with squeezed out siltstone between sandstone blocks.
- Strike and dip of bedding.
- Strike of vertical bedding.
- Trace of joint showing true strike and dip.
- Trace of fault or shear showing strike and dip.
- Strike and dip of cleavage.
- Major shear zone.
- S.P.36 △ Survey control peg.
- G △ Plane table station.
- D.D.10 Drill hole showing slope length and angle to horizontal.
- Closely jointed rock with minor displacements.

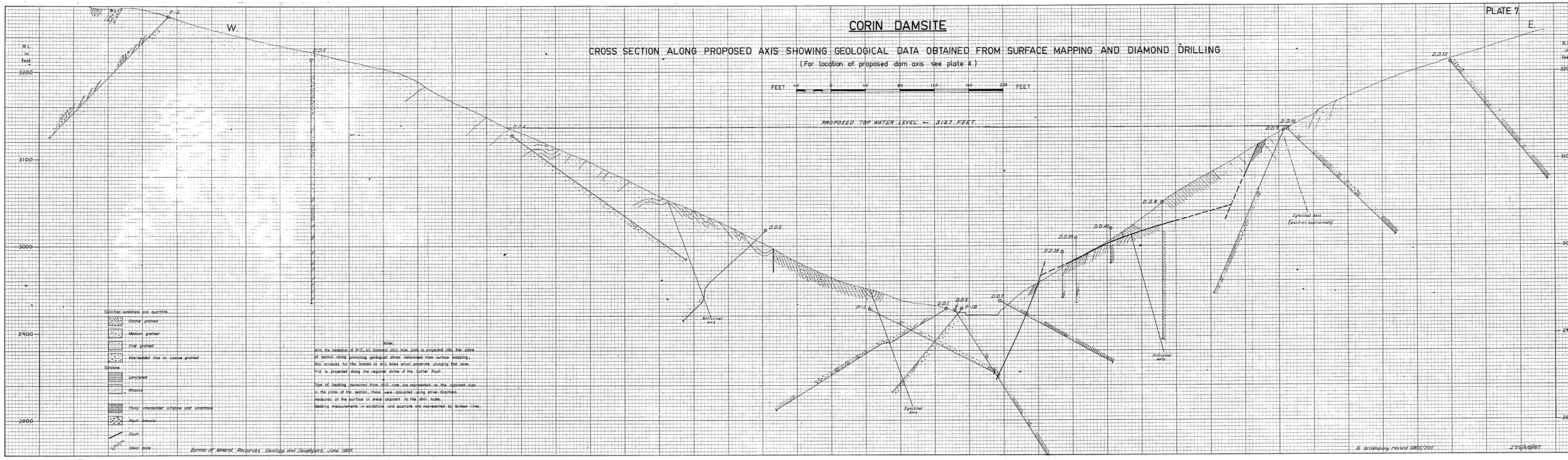
I55/A16/252

PLATE 7

CORIN DAMSITE

CROSS SECTION ALONG PROPOSED AXIS SHOWING GEOLOGICAL DATA OBTAINED FROM SURFACE MAPPING AND DIAMOND DRILLING

(For location of proposed dam axis see plate 4.)



Notes:

With the exception of P-2, all diamond drill hole data is projected into the plane of section along prevailing geological strike determined from surface mapping. This accounts for the breaks in drill holes which penetrate plunging fold axes.

P-2 is projected along the regional strike of the Cotter Fault.

Type of bedding measured from drill core are represented as the apparent dips in the plane of the section; these were calculated using strike directions measured at the surface in areas adjacent to the drill holes.

Bedding measurements in sandstone and quartzite are represented by broken lines.

Bureau of Mineral Resources, Geology and Geophysics, June 1965.

To accompany record 1965/100

2554/1/67

PLATE 8.

GEOLOGICAL MAP OF PROPOSED INLET PORTAL AREA, CORIN DAMSITE.

10 0 10 20 30

SCALE IN FEET

D.D. 29

I.P. 1

2990' 2995' 2985' 2980' 2975' 2970' 2965' 2960' 2955'

110' ∠ 55°

80350 S

80400 S

MAGNETIC NORTH

GRID NORTH

very sheared siltstone with quartz veining

very cleaved siltstone

DD 30

51650 W

51600 W

REFERENCE

- SILICIFIED SANDSTONE, QUARTZITE
- THINLY INTERBEDDED SANDSTONE & SILTSTONE
- LAMINATED SILTSTONE
- CLEAVED SILTSTONE
- 20 — DIP & STRIKE OF BEDDING
- 173/85 — DIP & STRIKE OF MAJOR JOINT OR FAULT RECORDED AGAINST SURFACE TRACE.
- 65 — DIP & STRIKE OF CLEAVAGE
- CLOSELY JOINTED ROCK
- 88' : 30° — DIAMOND DRILL HOLE SHOWING SLOPE LENGTH & ANGLE FROM HORIZONTAL

Bureau of Mineral Resources, Geology and Geophysics June 1965.

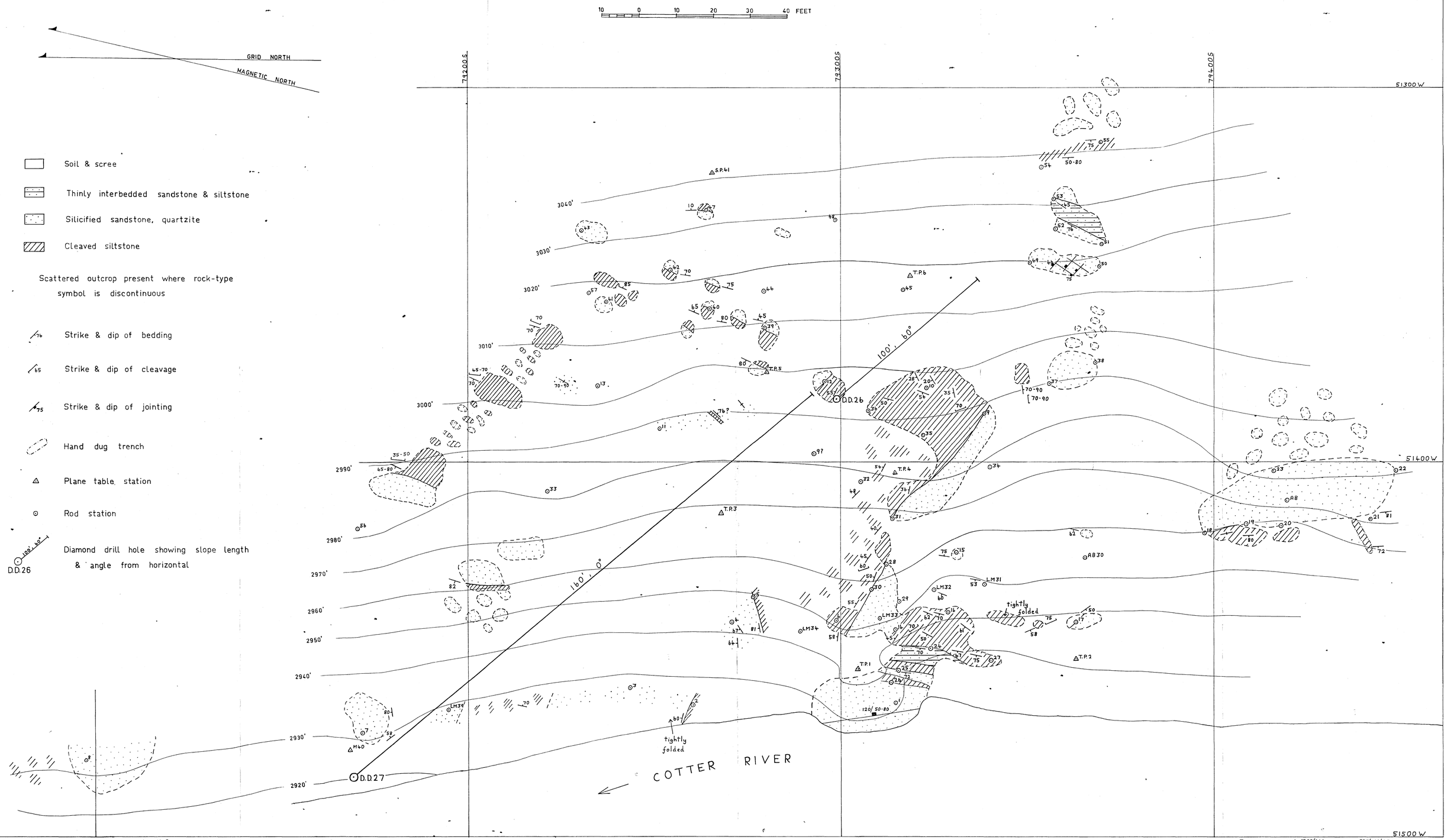
To accompany record 1965/200

I55/A16/253.

PLATE 9.

CORIN DAMSITE.

GEOLOGICAL MAP OF PROPOSED OUTLET PORTAL AREA



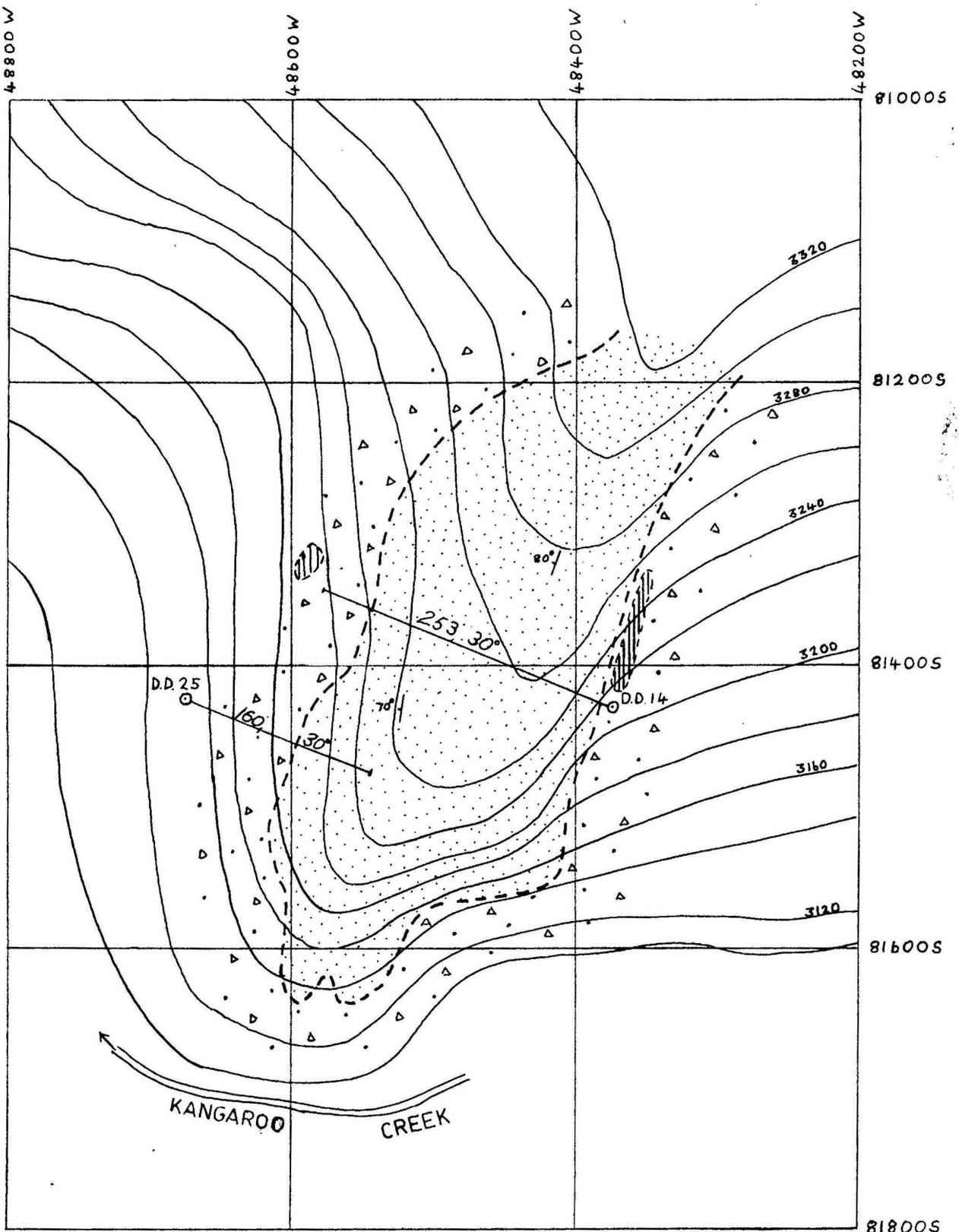
Bureau of Mineral Resources, Geology and Geophysics June 1965.

To accompany record 1965/200. 165/A16/254.

PLATE 10.

GEOLOGICAL MAP
NORTH KANGAROO CREEK QUARRY AREA

SCALE 0 100 200 FEET



160'30°
D.D.25 DIAMOND DRILL HOLE SHOWING SLOPE LENGTH AND ANGLE TO HORIZONTAL.

SOIL & SCREE
QUARTZITE
LAMINATED SILTSTONE

GEOLOGICAL BOUNDARY

T.N

Bureau of Mineral Resources, Geology and Geophysics; June 1965.

I55/A16/255.
To accompany record 1965/200

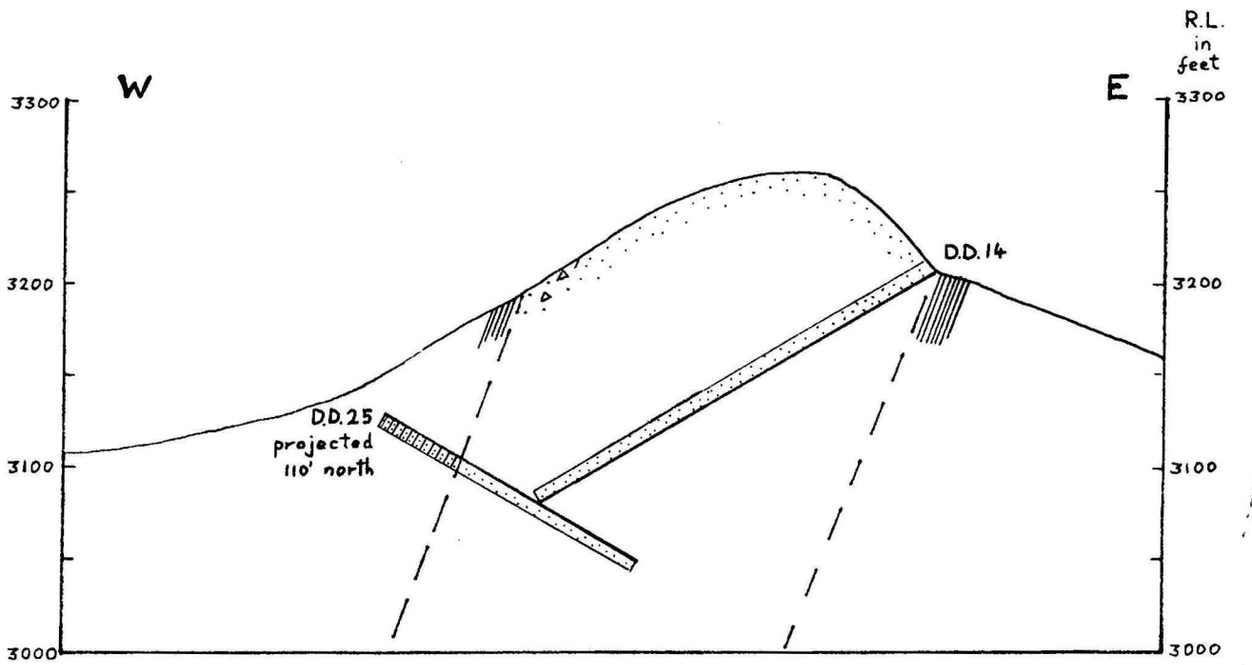
PLATE 11.

NORTH KANGAROO CREEK QUARRY AREA

Geological section along D.D.14

(For location see plate 10)

SCALE 0 100 200 FEET



SOIL & SCREE

QUARTZITE

LAMINATED SILTSTONE

INTERBEDDED SILTSTONE & SANDSTONE

Table showing true stratigraphic thickness of quartzite for various average angles of dip.

Angle of Dip (to west)	60°	70°	80°	90°
Stratigraphic Thickness	170'	205'	235'	255'

I55/A16/256.

Bureau of Mineral Resources, Geology and Geophysics; June 1965.

To accompany record 1965/200

SOUTH KANGAROO CREEK QUARRY AREA

PLATE 12.

GEOLOGICAL MAP OF OUTCROPS AND BULLDOZED TRENCHES

SK27 SK5 SK4 SK3 SK26 SK25 SK29 SK28 SK30 SK31 SK21 SK22 SK23 SK24 SK32 SK1 SK15 SK14 SK13 SK12 SK11 SK10 SK9 SK6 SK7 SK8 SK16 SK20 SK17 SK18 SK19

H45 D.D.28

Scattered outcrop

Laminated Sandstone

Soil & Scree

3260 3300 3320 3340 3360 3380 3400

48200W 48400W 48600W

822000S 822200S 822400S

818800S

40 0 40 80 120 feet

SCALE

MN TN

Scree

Laminated Siltstone

Sandstone & Quartzite

238' 30° D.D.28 Diamond Drill Hole showing Slope Length & Angle to Horizontal

62° Dip & Strike of Bedding

Shear Zone

SK21 Survey Station

Bulldozed Trench

Bureau of Mineral Resources, Geology and Geophysics, June 1965.

To accompany record 1965/200

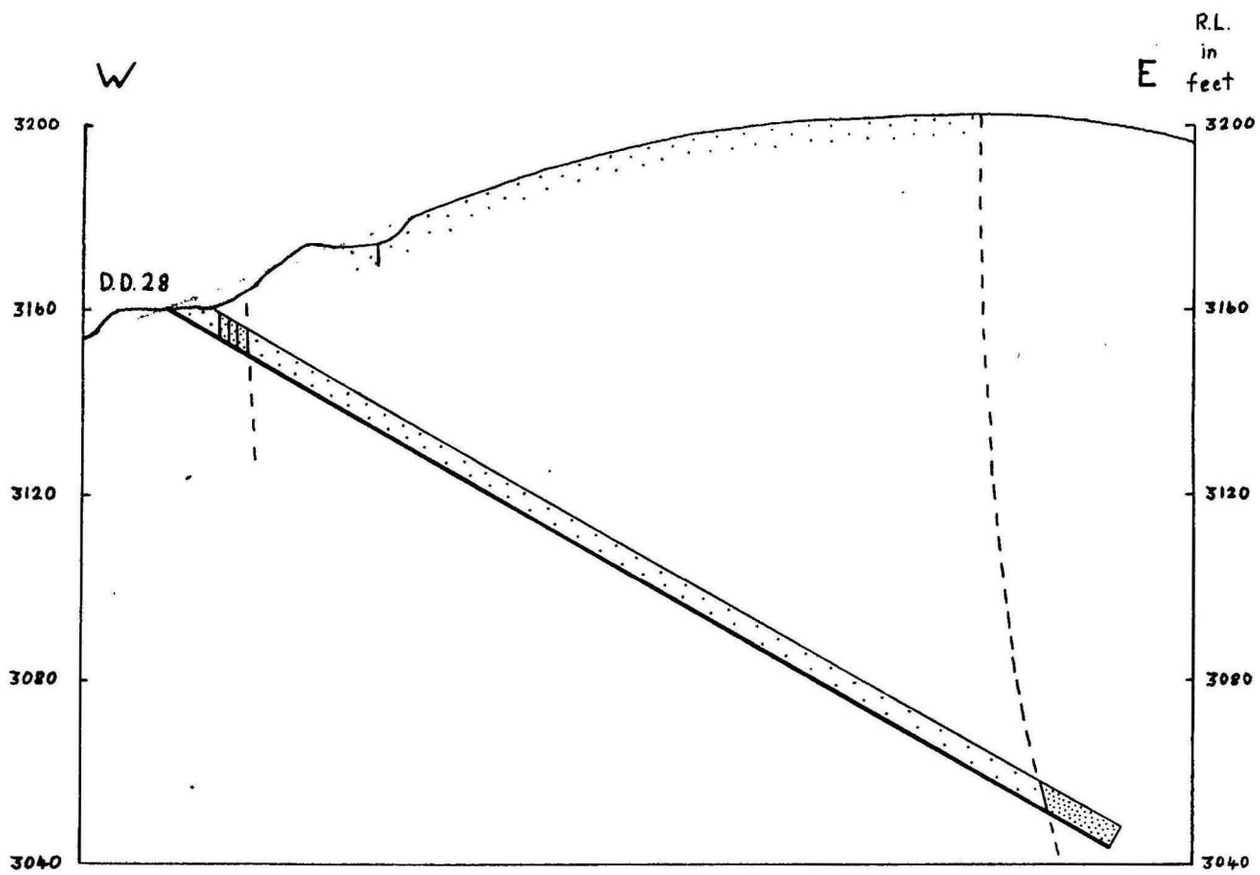
I55/A16/257.

SOUTH KANGAROO CREEK QUARRY AREA

Geological section along D.D.28

(For location of Section see plate 12.)

0 40 80 feet



QUARTZITE

SILTSTONE, LAMINATED TO THICKLY BEDDED.

LAMINATED SANDSTONE

Near-vertical bed of quartzite, 160ft. thick suitable for rock fill

Bureau of Mineral Resources, Geology and Geophysics June 1965. To accompany record 1965/200 I55/A16/258.

CORIN DAMSITE

MAP OF PROPOSED QUARRY FOR ROCKFILL ON EAST BANK OF COTTER RIVER

PLATE 14

SCALE

40 0 40 80 120 160 Feet

REFERENCE

- Dacite Porphyry
- Silicified Sandstone, Quartzite
- Thickly bedded Siltstone
- Dip & Strike of Bedding
- Vertical Fault
- Bulldozed Track
- Bulldozed Costean
- Cliff
- Q23 — Survey Station
- D.D.33 (185', 55°) — Diamond Drill hole showing slope length & angle to horizontal
- Trace of fault showing strike & dip
- Approximate position of faulted contact between dacite & quartzite
- A — B — Section line-see Plates 15 & 16.

84600S

85000S

85400S

52800 W

52400 W

52000 W

THICKLY BEDDED QUARTZITE

QUARTZITE CONTAINING INTERBEDS OF QUARTZITE WITH NUMEROUS IRREGULAR SILTY LAMINAE

BRECCIA BED 2' THICK MARKING TRANSITION FROM QUARTZITE WITH SILTY LAMINAE TO VERY THICKLY BEDDED QUARTZITE

BRECCIA BED

THICKLY BEDDED QUARTZITE

TOP OF SILICIFIED SANDSTONE BED (3' STRATIGRAPHICALLY BELOW BEDDING PLANE CLOSE TO Q61)

TOP OF 8' QUARTZITE BED

TOP OF 4' QUARTZITE BED

TOP OF 3' QUARTZITE BED

QUARTZITE SCREE

SCATTERED QUARTZITE OUTCROPS

TOP OF 8' QUARTZITE BED

OUTCROP ?

MOSTLY SILICIFIED SANDSTONE WITH A FEW THIN INTERBEDS OF SILTSTONE

WEATHERED SILTSTONE LAMINATED IN A FEW PLACES

SOIL AND SCREE

TOP OF 6' QUARTZITE BED

SCATTERED QUARTZITE OUTCROPS

TOP OF QUARTZITE BED (16' STRATIGRAPHICALLY ABOVE BEDDING PLANE CLOSE TO Q43)

TOP OF 7' QUARTZITE BED

TOP OF 3' QUARTZITE BED (58' STRATIGRAPHICALLY BELOW BEDDING PLANE CLOSE TO Q43)

TOP OF 6' QUARTZITE BED

LAMINATIONS EVIDENT IN PLACES

MOSTLY QUARTZITE OUTCROPS

SCATTERED QUARTZITE OUTCROPS

D.D.34 256', 90°

D.D.35 218', 90°

D.D.41 175', 90°

D.D.32 269', 90°

D.D.33 (185', 55°)

D.D.42 180', 90°

A.A.

CREEK

CREEK

MAGNETIC NORTH

GRID NORTH

Bureau of Mineral Resources, Geology and Geophysics June 1965.

To accompany record 1965/200

I55/A16/188.

PLATE 15

COTTER QUARRY

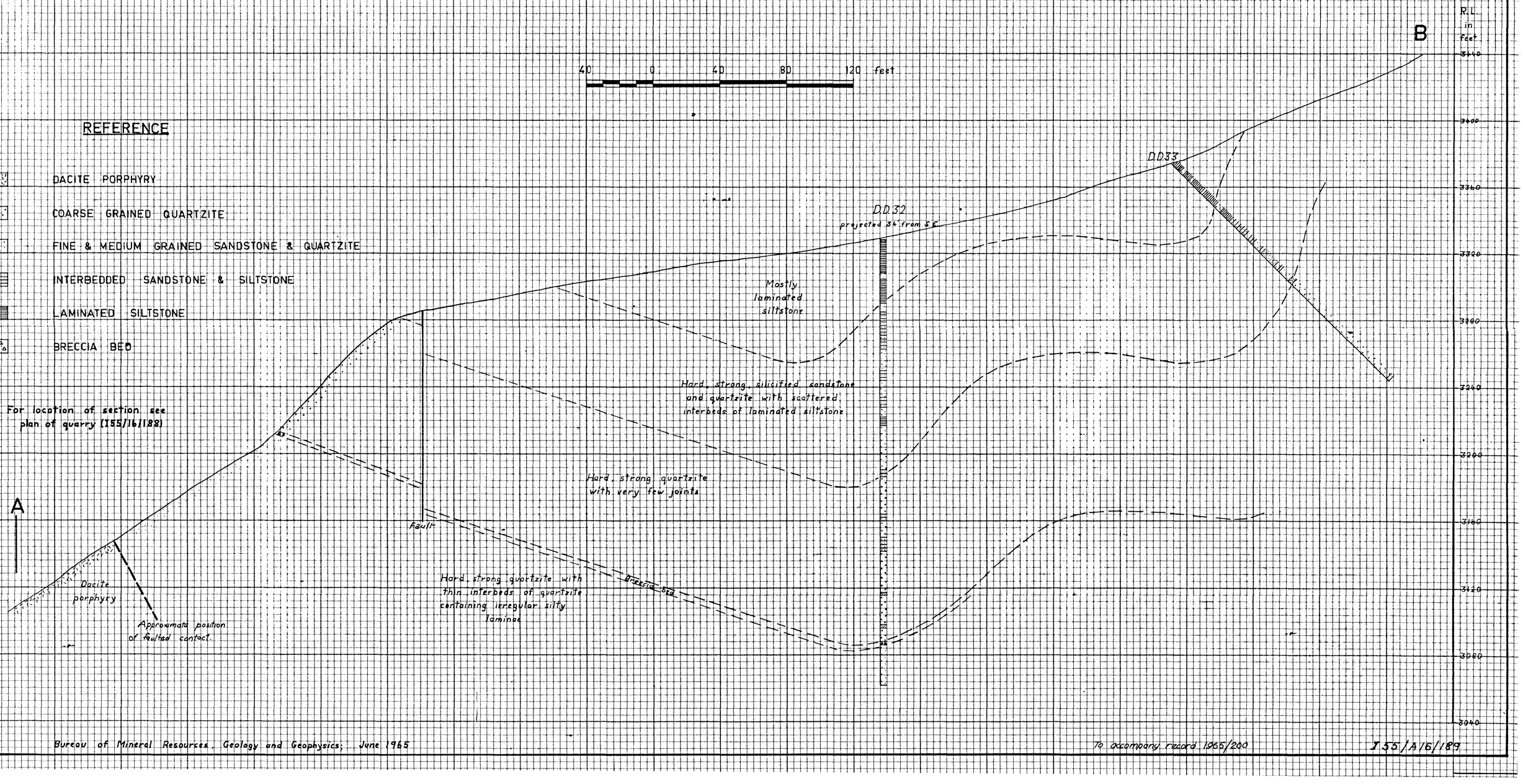
INTERPRETIVE GEOLOGICAL SECTION ALONG AB OF PLATE 14

40 0 40 80 120 feet

REFERENCE

- DACITE PORPHYRY
- COARSE GRAINED QUARTZITE
- FINE & MEDIUM GRAINED SANDSTONE & QUARTZITE
- INTERBEDDED SANDSTONE & SILTSTONE
- LAMINATED SILTSTONE
- BRECCIA BED

For location of section see plan of quarry (155/16/128)



Bureau of Mineral Resources, Geology and Geophysics; June 1965

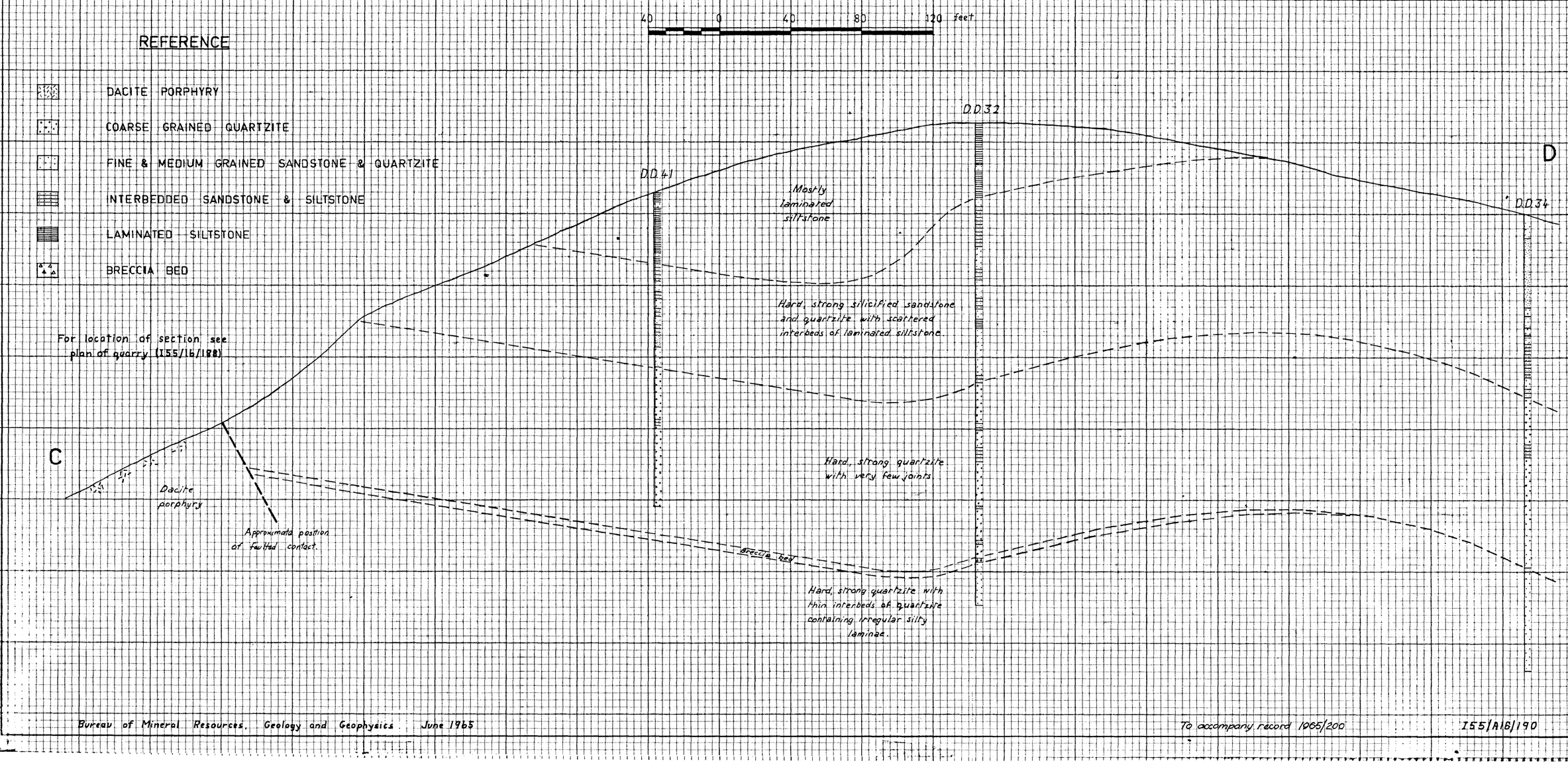
To accompany record 1965/200

155/A16/189

PLATE 16.

COTTER QUARRY

INTERPRETIVE GEOLOGICAL SECTION ALONG CD OF PLATE 14.



Bureau of Mineral Resources, Geology and Geophysics June 1965

To accompany record 1965/200 I55/A16/190

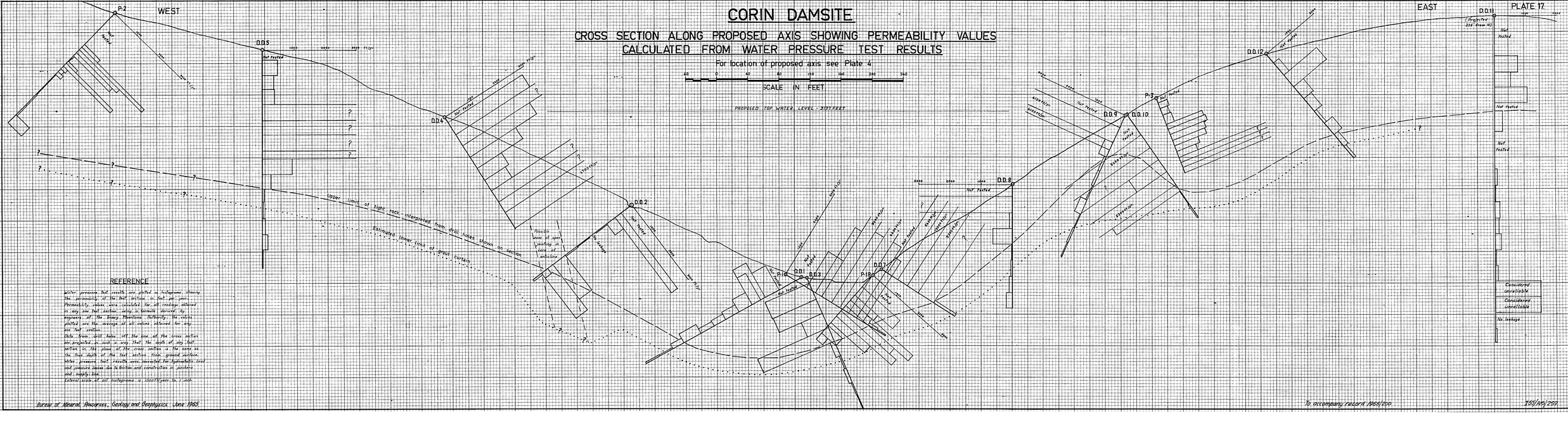
CORIN DAMSITE

CROSS SECTION ALONG PROPOSED AXIS SHOWING PERMEABILITY VALUES CALCULATED FROM WATER PRESSURE TEST RESULTS

For location of proposed axis see Plate 4

SCALE IN FEET

PROPOSED TOP WATER LEVEL - 3177 FEET



REFERENCE

Water pressure test results are plotted as histograms showing the permeability of the test sections in feet per year. Permeability values were calculated for all readings obtained in any one test section using a formula derived by engineers of the Snowy Mountains Authority. The values plotted are the average of all values obtained for any one test section.

Data from drill holes off the line of the cross section are projected in such a way that the depth of any test section in the plane of the cross section is the same as the true depth of the test section from ground surface.

Water pressure test results were corrected for hydrostatic head and pressure losses due to friction and construction in packers and supply line.

Lateral scale of all histograms is 1 cm = 1 unit.

Bureau of Mineral Resources, Geology and Geophysics June 1965

To accompany record 1965/200

1965/109/259

PLATE 17

PLATE 18.

(See plate 4 for location.)

CORIN DAMSITE

STRUCTURE CONTOUR MAP OF FAULTS EXPOSED ON EAST ABUTMENT

FEET 10 0 10 20 30 40 50 FEET

FAULT C

FAULT A

FAULT B

2980·6

2983·2

2980·9

2976·4

2973·2

2969·2

2963·7

2958·4

2958·3

2958·0

2962·5

2967·1

2944·1

2946·3

2950·2

2947·5

2921

2985·5

2990·9

2994·5

2998·9

3006·9

3009·5

3004·9

D.D.8 3023·5

D.D.40 2998

D.D.38 2963·1 [2943·1]

D.D.39 2955·4 [2955·4]

D.D.7 2937' (drill hole collar)

75-85° cleaved siltstone with clay;

Fault B offsets Fault A by an unknown amount.

141°, 30°

Grid North

Magnetic North

79900 S

51600 W

3020

3010

3000

2990

2980

2970

2960

2950

2940

2930

2920

REFERENCE

FAULT A :- Dips at 40°-45° to S.W.; consists of 6"-24" crushed rock with clay.

- 3010·5 — Surface trace of footwall of fault with spot heights.
- 2995·4 — R.L. of footwall of fault in vertical drill hole.
- 2990 — Structure contour of Fault A.

FAULT B :- Dips at 70°-75° to W. and follows a bed of laminated siltstone which is 10' thick; it displaces Fault A by an unknown amount.

- 2958·0 — Surface trace of footwall of fault with spot heights.
- 2921 — R.L. of footwall of fault in D.D.7.
- 2930 — Structure contour of footwall of Fault B.

FAULT C :- Dips at 60° to S.W. and is present only in footwall of Fault A; much clay is present only in proximity of Fault A.

- 2980·6 — Surface trace of footwall of fault with spot heights.
- [2943·1] — R.L. of footwall of fault in vertical drill hole (interpreted)
- 2970 — Structure contour of Fault C using interpreted data from drill holes.

Bureau of Mineral Resources, Geology and Geophysics June 1965.

To accompany record 1965/200

I55/A16/260.

PLATE 19.

CORIN DAMSITE

GEOLOGICAL SECTION ALONG LINE OF D.D.7

(For location see plate 4.)

FEET 10 0 10 20 30 40 FEET

W.N.W. E.N.E.

3000
2980
2960
2940
2920
2900
2880

R.L. in Feet.

FAULT A
FAULT B
FAULT C
cleaved siltstone with clay
D.D.7

REFERENCE

- Silicified sandstone.
- Thickly bedded siltstone.
- Laminated siltstone.
- Cleaved siltstone.
- Interbedded sandstone and siltstone.
- Footwall of fault dipping 40°-45° to S.W.
- Small fault present in footwall of main fault.
- Broken zones in drill hole.
- Footwall of fault dipping 70°-75° to W.

Correlations between surface and drillhole and projections below surface represent interpretations only.

Bureau of Mineral Resources, Geology and Geophysics. June 1965.

To accompany Record 1965/200

155/A16/261

PLATE 20

CORIN DAMSITE

INTERPRETATION OF STRUCTURE AND DISTRIBUTION OF ROCK TYPES

FEET 100 0 100 200 300 FEET

REFERENCE

- Silicified sandstone & quartzite
- Quartzite with interbeds of quartzite with silty laminae
- Interbedded sandstone & siltstone
- Laminated siltstone
- Phyllite with interbeds of quartzite
- Geological boundary, position accurate
- Geological boundary, position approximate
- Geological boundary, position inferred
- 45 Dip & strike of bedding
- Anticline, position accurate, showing direction of plunge
- Anticline, position approximate
- Anticline, position inferred
- Syncline, position accurate, showing direction of plunge
- Syncline position approximate
- Syncline, position inferred
- Vertical fault, position accurate
- 75 Fault, position accurate, showing amount & direction of dip
- Fault, position approximate
- Fault, position inferred
- SSSSS Shear zone

Outlines of engineering structures are superimposed on the plan.

Cotter Fault Zone

COTTER RIVER

DAM AXIS

True North
Magnetic North

7920mS
7960mS
8000mS
8040mS
5120mW
5160mW
5200mW
5240mW

Bureau of Mineral Resources, Geology and Geophysics, October 1965

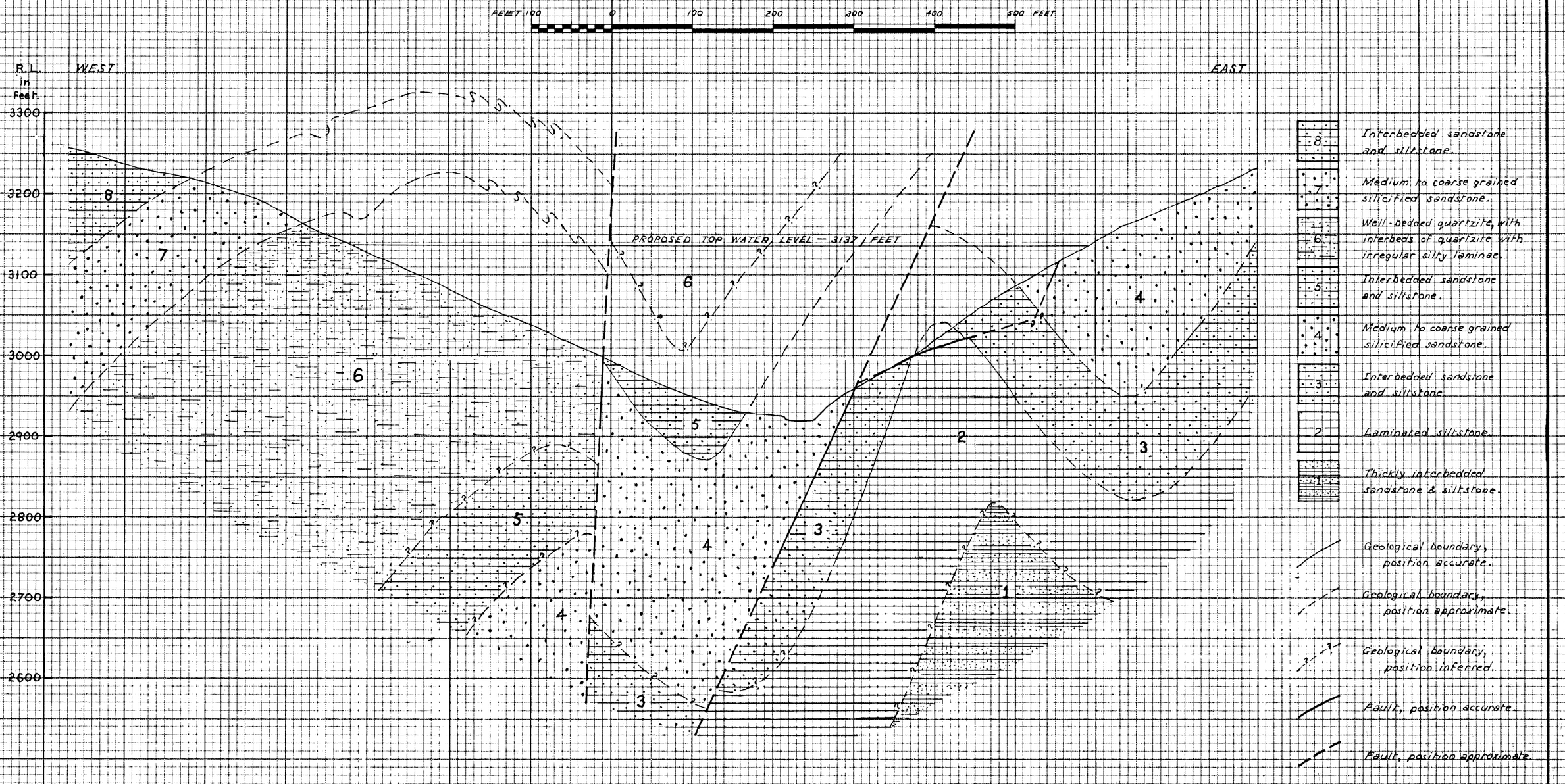
155/A16/271

To accompany record 1965/200

PLATE 21

CORIN DAMSITE

GEOLOGICAL SECTION ALONG DAM AXIS SHOWING INTERPRETATION OF STRUCTURE AND STRATIGRAPHY



I 55/A16/272

Bureau of Mineral Resources, Geology & Geophysics; October 1965

To Accompany Record 1965/200

PLATE 22

CORIN DAMSITE

GEOLOGICAL SECTION THROUGH PROPOSED INLET PORTAL

(For location see plate 4.)

10 0 10 20 30 40 feet

S.W. N.E.

R.L. in feet

3010 3000 2990 2980 2970 2960 2950 2940 2930 2920 2910 2900

DD30

Permeability in feet per year 3000 1000

bedding plane

DD29

Permeability in feet per year 1000

Drill hole not water pressure tested above 70 feet

PROPOSED PORTAL FACE

PROPOSED TUNNEL

A B C D

Sections of drill hole above 62 feet could not be water pressure tested as packers would not seal properly

REFERENCE

- Medium to coarse grained silicified sandstone
- Fine grained silicified sandstone
- Laminated siltstone
- Cleaved siltstone
- Fault
- Inferred extension of fault
- Geological boundary, accurate
- Geological boundary, inferred
- Zone of broken drill core

Bureau of Mineral Resources, Geology and Geophysics: June 1965

To accompany record 1965/200

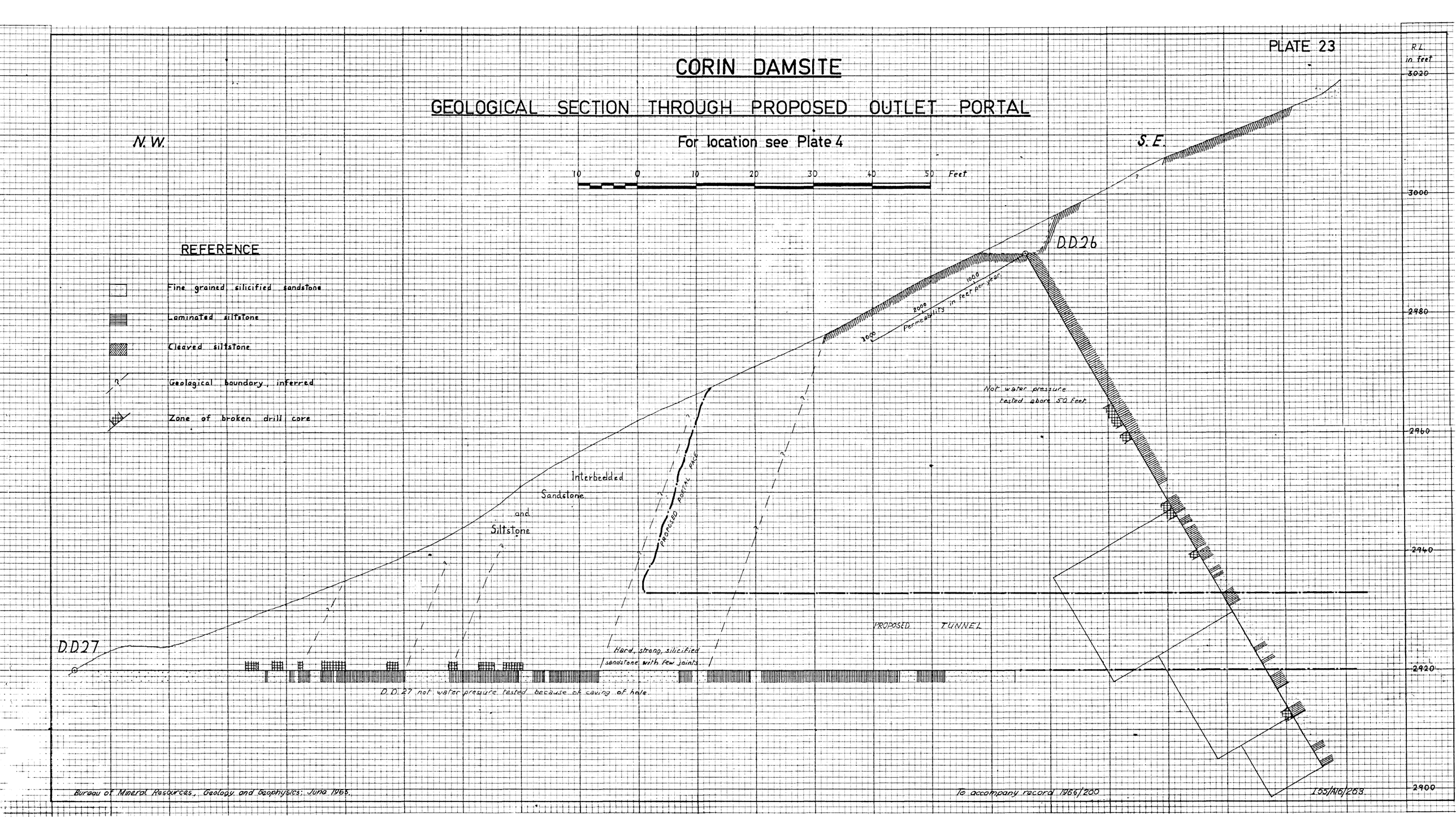
T55/A16/262

PLATE 23

CORIN DAMSITE

GEOLOGICAL SECTION THROUGH PROPOSED OUTLET PORTAL

For location see Plate 4



Bureau of Mineral Resources, Geology and Geophysics: June 1965.

To accompany record 1966/200

155/A16/203.

PLATE 24

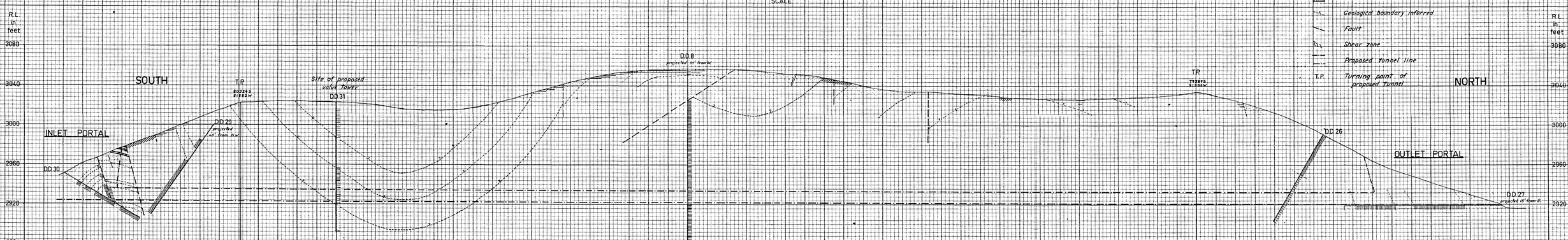
CORIN DAMSITE

INTERPRETIVE CROSS SECTION ALONG PROPOSED TUNNEL LINE SHOWING GEOLOGICAL DATA OBTAINED FROM SURFACE MAPPING AND DIAMOND DRILLING

For location see Plate No. 4

FEET 40 0 40 80 120 160 200 FEET

SCALE



REFERENCE

- Silicified sandstone & quartzite
- Interbedded sandstone & siltstone
- Laminated siltstone
- Cleaved siltstone
- Geological boundary inferred
- Fault
- Shear zone
- Proposed Tunnel line
- T.P. Turning point of proposed Tunnel

Bureau of Mineral Resources Geology and Geophysics August 1965

To accompany record 1965/200

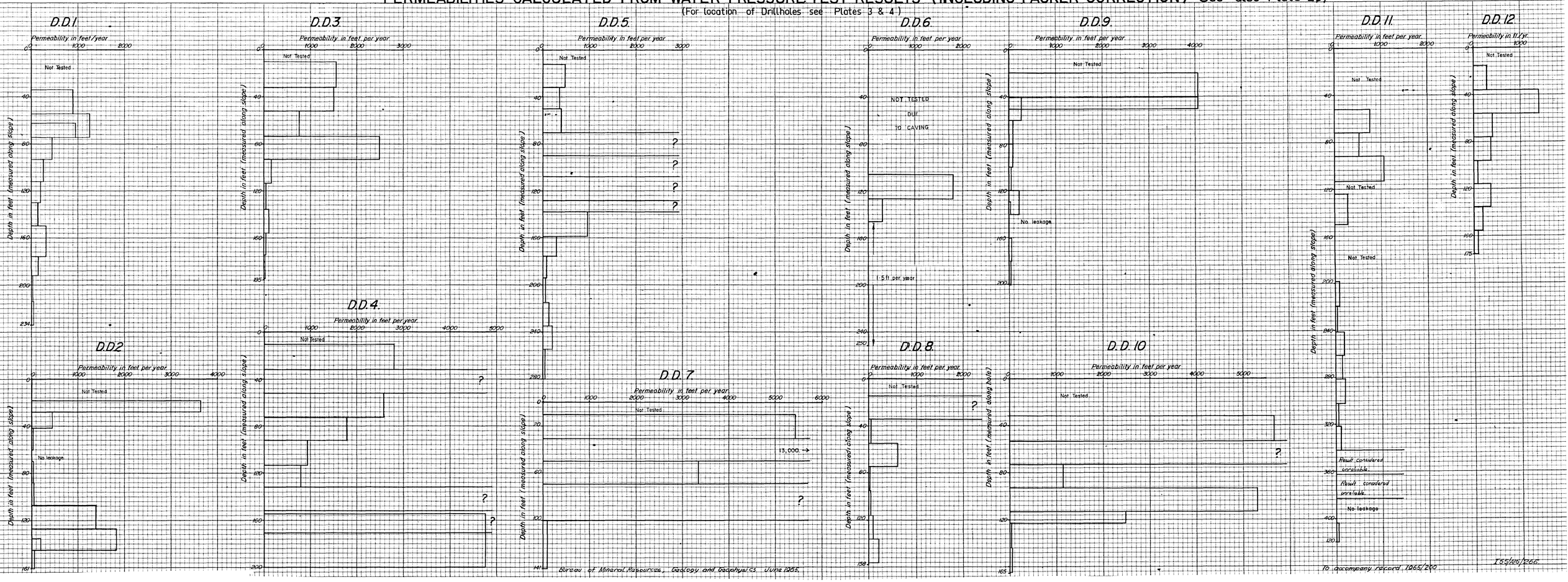
1555/A18/264

UPPER COTTER DAMSITE "E" (CORIN DAMSITE.)

PLATE 25

PERMEABILITIES CALCULATED FROM WATER PRESSURE TEST RESULTS (INCLUDING PACKER CORRECTION)–See also Plate 26?

(For location of Drillholes see Plates 3 & 4)



Bureau of Mineral Resources, Geology and Geophysics. June 1965.

To accompany record 1965/200

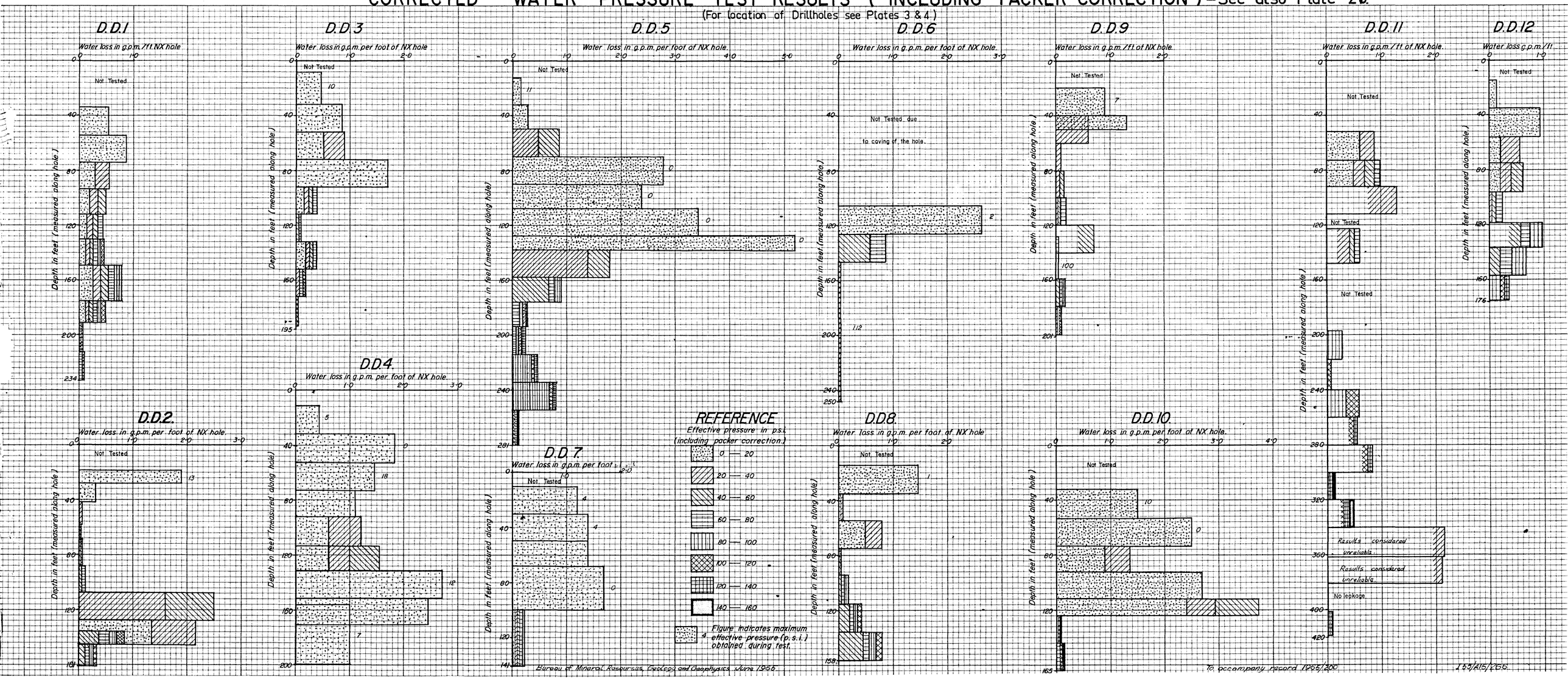
155/115/265

UPPER COTTER DAMSITE "E" (CORIN DAMSITE)

PLATE 26

CORRECTED WATER PRESSURE TEST RESULTS (INCLUDING PACKER CORRECTION) – See also Plate 28.

(For location of Drillholes see Plates 3 & 4.)



Bureau of Mineral Resources, Geology and Geophysics June 1965

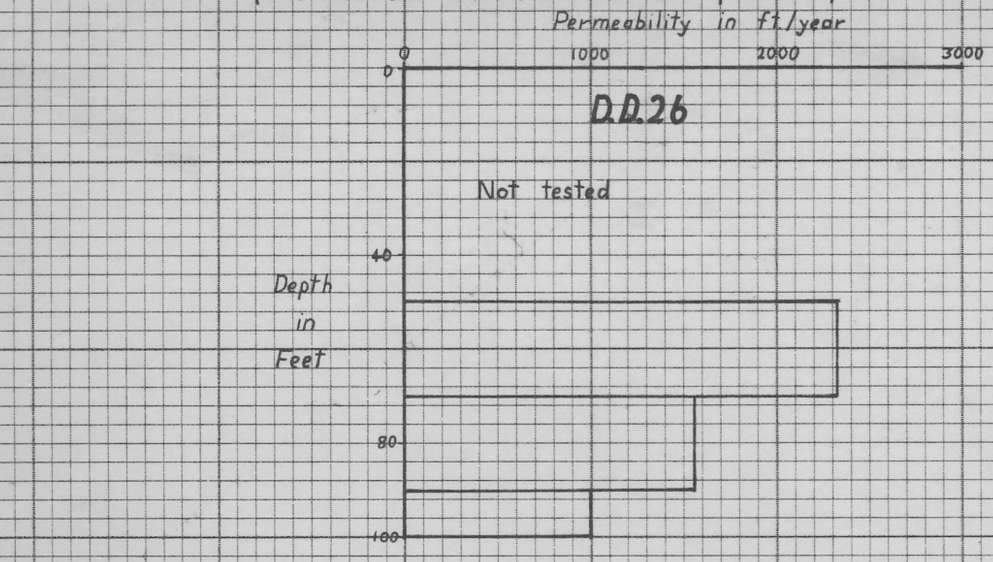
To accompany record 1965/200

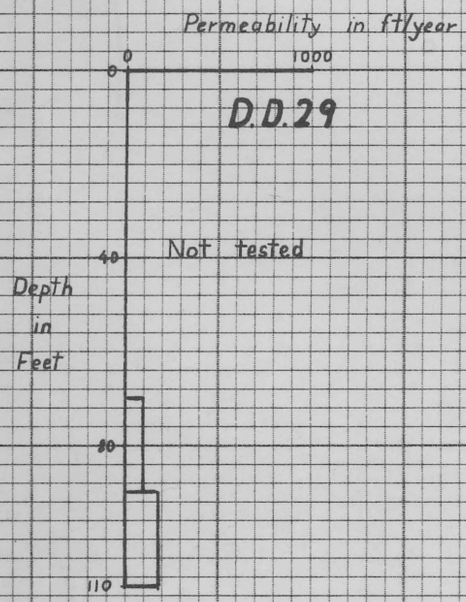
155/A15/265

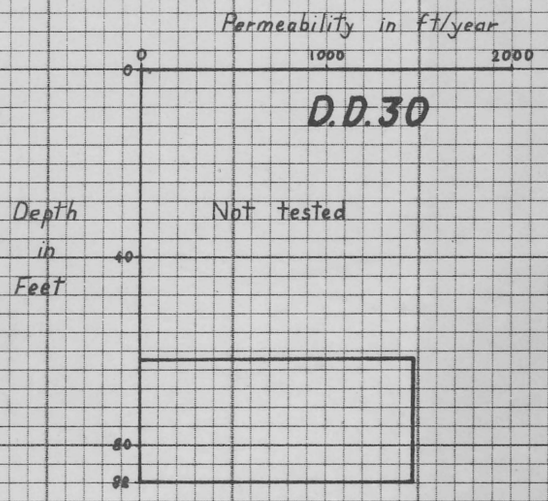
CORIN DAMSITE

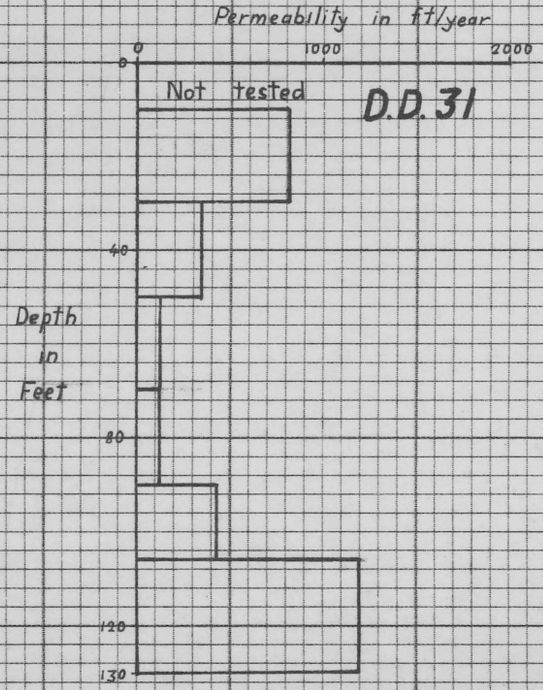
PERMEABILITIES CALCULATED FROM CORRECTED WATER PRESSURE TEST RESULTS (INCLUDING PACKER CORRECTION)

(For location of Drillholes see plate 4.)







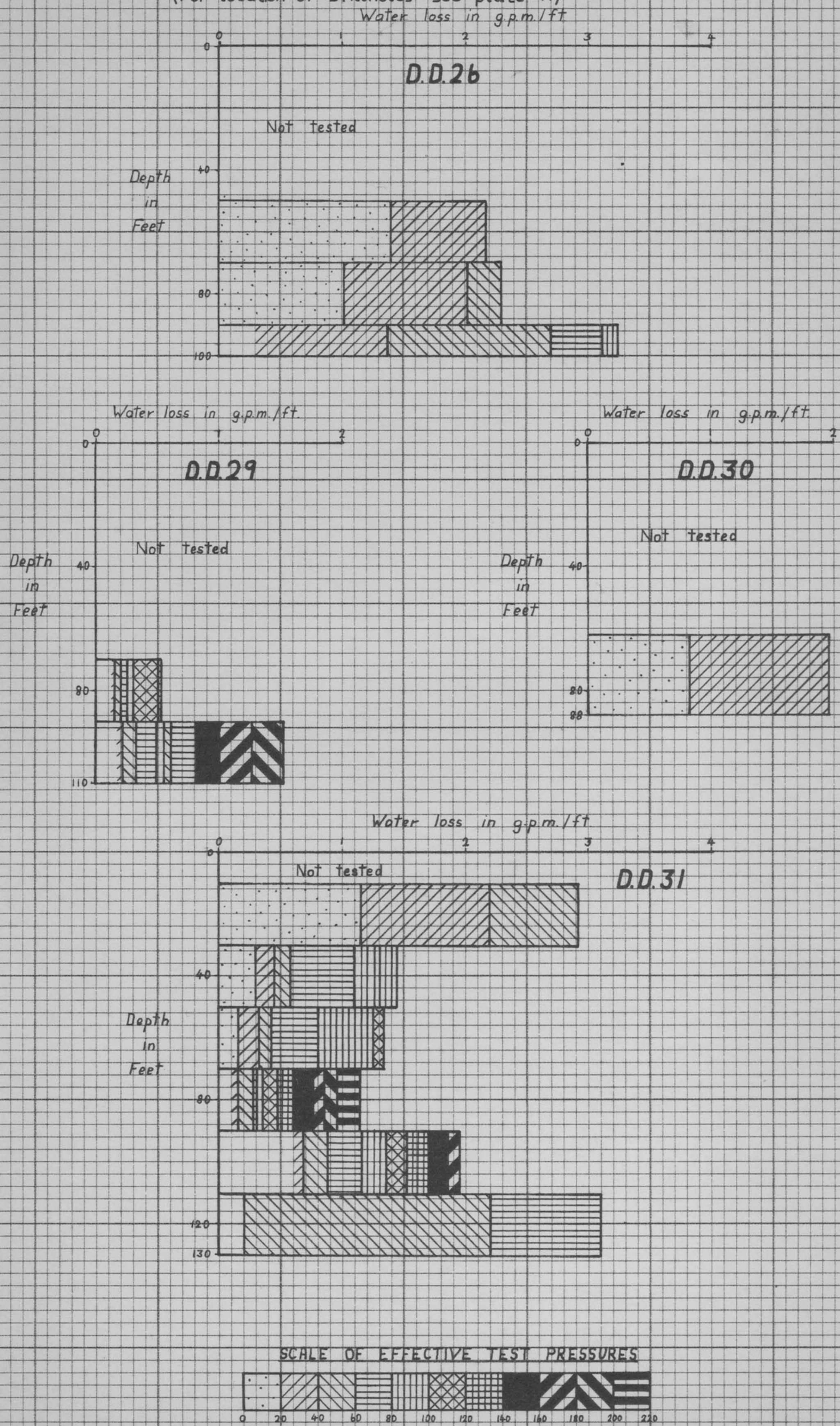


CORIN DAMSITE

PLATE 28

CORRECTED WATER PRESSURE TEST RESULTS
(INCLUDING PACKER CORRECTION)

(For location of Drillholes see plate 4.)



Bureau of Mineral Resources, Geology and Geophysics June 1965 To accompany record 1965/200 I55/A16/268.