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SOUTH AUSTRALIA

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CHOWILLA DAMSITE - GEOLOGICAL INVESTIGATION

SUPPLEMENTARY REPORT - DAMSITE TESTING

by

R. D. Steel
Geologist

GEOLOGICAL SURVEY

URANIUM & FUEL SECTION

SUPPLEMENTARY APPENDICES I, II, III.

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CHOWILLA DAMSITE - GEOLOGICAL INVESTIGATION

SUPPLEMENTARY REPORT - DAMSITE TESTING

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DEPARTMENT OF MINES
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CHOWILLA DAMSITE - GEOLOGICAL INVESTIGATIONS

SUPPLEMENTARY REPORT 1 -

DAMSITE TESTING

1. ABSTRACT

This report discusses the results of the second geological investigation at Chowilla, based on recommendations proposed in the preliminary text.

Supplementary drilling has in no way altered the general geological concepts previously expressed. Amendments have been included as a revised set of geological cross sections and an appendix of descriptive borelogs.

Experiments indicate that the total water leakage beneath the dam will be considerably less than previously estimated, with maximum and minimum values within much closer limits.

Leakage beneath the western abutment will be less than earlier apparent, due to the deeper succession of impermeable sediments revealed by boring.

In some areas, sediments immediately underlying the blanket cover will have specific permeabilities somewhat greater than the average, but generally this will not be so. The probability of piping through these upper materials should thus be substantially reduced, even without mechanical compaction.

2. INTRODUCTION

This report presents the results of the supplementary testing programme at Chowilla Dam Site. The work has been based on recommendations proposed in the preliminary report of Geological Investigations, (Johnson, Hiern and Steel, 1960).

These included proposals for additional percussion sampling, to clarify areas of the geology where detail was considered inadequate and a series of In Situ field tests, to further evaluate the permeabilities of water bearing sediments below the proposed structure.

A programme of 44 geological holes, three full aquifer permeability patterns and four Two Well tests was proposed and

approved by the investigating committee. One additional permeability and velocity test were later included, to rectify paucity of data in the test pile area.

Three drilling plants were despatched to the site in February 1961 and operated until May 1st, when this phase of the investigation was completed. A total of 107 holes were constructed, involving a footage of 3414'.

Results of the geological drilling are included as an appendix of descriptive borelogs and a revised set of geological cross sections.

The main part of the investigation has been directed at more accurate appraisal of the permeabilities of the succession of sediments underlying the blanket cover. Some refinements to the experimental technique were introduced, which have produced better and more consistent results. It has further been possible to identify anomalous drawdown data and assess them in the calculations. Further improvements to the method now apparent, should produce even more satisfactory results in any future programme.

A system of measuring water velocities at shallow depths was used for the first time. This was the so called "Two Well Method", Childs (1942). The first experiment was conducted under the superivision of J. W. Holmes, who participated in the development of the method in England. All other experiments and geological drilling were supervised by the author.

The three phases of this investigation are discussed separately below. Calculations, borelogs and experimental details are included as three supplementary appendices.

3. GEOLOGICAL DRILLING

1. General Considerations

Drilling has been confined to a number of relatively shallow holes, constructed to clarify certain areas of the geology considered to be inadequately represented on the cross sections. This will apply mainly to areas beneath the proposed dam abutments and adjacent to the main water channels.

The information gained does not necessitate any alteration to the opinions expressed in the original report, nor change the classification of sediments into environmental features and specific groups. A revised set of geological cross sections have been produced, which have amended boundaries and symbols in accordance with the additional data. Colours and legends depicted on these sections also remain unaltered. Detailed descriptions of these amendments cannot be discussed here, but it is significant to note that the more impervious materials of the "blanket" extend much deeper below the surface on lines C, E and F under the western abutment, than previously determined. This is more in accordance with that shown on line D. Materials penetrated have been fully described in the set of borelogs appended, which should be read in conjunction with the sections.

Skeletonized samples of each significant change of strata have been retained and are available for inspection at the E. & W. S. Department depot Sassafras.

4. FULL AQUIFER FIELD PERMEABILITY TESTS

1. General Considerations

Permeability tests were conducted at four widely separated sites. Pump holes were located at F7725, D4300, C+300, 14800 and F+10, 16330 respectively. Experimental details were based on those of the previous programme considered to have produced the most reliable results.

Each pattern consisted of a central pump hole, screened to the full depth of the aquifer. Observation wells were spaced at 25', 50' and 100' radii from the pump well, in four mutually perpendicular directions. Each was screened below the static water level.

It is essential that observation bores be designed to be in complete hydraulic contact with the aquifer, so that the drawdowns of the cone of depression can be correctly measured as pumping proceeds. Most anomalous readings are

considered to be the result of some hydraulic barrier between the bore and surroundings, rather than any real irregularity in the cone of depression, or abnormal permeability variation in different directions.

Future investigations could be improved by altering the mode of observation well recording. At least five such wells would be required for each direction, and be fully screened below the static water level. They should be separated from the surrounding sediments by a layer of fine gravel which would prevent clogging of the screen mesh by fine clayey materials and permit free hydraulic contact. Drawdowns would be measured at longer intervals and pumping extended longer to reach true equilibrium.

The results would be plotted graphically to produce a profile of the cone of depression along each line of holes, calculations thence based on graphic mean values at arbitary chosen radii, rather than on specific drawdown measurements at predetermined points.

Very anomalous drawdowns have been excluded from the following calculations as they give rise to misleading results. Contrary to former opinion, the present series of tests tends to confirm that the permeability is essentially the same in all directions, ruling out the probability of marked directional flow. On this basis, it has been possible at three sites, to graph the respective drawdowns (see diagrams, appendix II), and derive a graphical mean drawdown for sets of observation wells at 25', 50' and 100' radii. The results show a uniform cone of depression and produce permeability figures in good agreement with those based on individual drawdowns.

The figures quoted represent a mean permeability value for the whole aquifer, which comprises sediments of varying grain size, compaction and porosity. Certain horizons will therefore have specific permeabilities greater or less than the average. Furthermore as the method used applies strictly to a homogeneous medium, values must be regarded as approximate.

Permeability values are within much closer and consistent limits than previously calculated, the range of values given should thus represent a fairly reliable approximation of those existing at the site.

2. Individual Field Tests

1. Pattern at F7725

The pump hole was screened from 5'8" to the base of the aquifer at 139'. Pumping commenced at 3.00 p.m. 28/2/61 and was maintained at an average discharge of 3137 gallons per hour for 46 hours. Observation bores were read at 10 minute intervals for the first hour, extending to hourly readings after six hours. A few anomalous drawdowns were recorded, but in general, the results were consistent and reliable.

2. Pattern at D4300'

Pumping commenced at 4.00 p.m. on 8/3/61 in a fully screened hole and was maintained at a uniform discharge rate of 3228 gallons per hour, for a period of 46 hours. Drawdowns were generally consistent and uniform in all directions measured.

3. Pattern at C+300, 14800'

This pattern was sited on the Eastern River flats in an area relatively clear of vegetation. Pumping commenced at 1.20 p.m. on 11/4/61 and maintained at a uniform discharge rate of 2900 gallons per hour for 48 hours, whence equilibrium had been effectively reached. Some anomalous drawdowns were recorded, indicating lack of hydraulic contact between observation wells and aquifer. Other evidence implies that the cone of depression is similar in all directions, hence permeabilities based on graphical mean values, maybe more reliable than an average of individual results calculated on possible incorrect readings.

4. Pattern at F+10, 16330

Pattern was tested at the request of Mr. G. G. Poole, E. & W. S. Department, to explain certain irregularities in pile driving behaviour.

This area had been subjected to severe vibration and periodic flushing with fresh water for several months

prior to the actual test. The upper sand horizons were thus poorly compacted and subjected to the influence of the adjacent River waters.

It is not surprising therefore that drawdown readings were inconsistent and fluctuating. Either true equilibrium could not be reached, or some bores were not in free hydraulic contact with the surrounding aquifer.

Pumping commenced at 10.45 a.m. on 2/5/61 and was maintained for 48 hours at a discharge rate of 3110 gallons per hour.

Calculations based on recorded drawdowns have been found to be contradictory and unreliable.

3. Summary of Results

The following permeability values have been based on the Thiem Equilibrium Formula, described in United States Department of the Interior Water Supply Paper 887.

"Methods of Determining Permeability of Water Bearing Materials - with specific Reference to Discharging Well Methods." L. K. Wenzel, 1942.

Values have been converted to gallons per hour per square foot, per foot head of water per linear foot, which is further defined as the number of gallons per hour passing through one square foot of aquifer under unit gradient. This is 1/24th of a Meinzer unit (Wenzel 1942) and approximately 2.436×10^{-3} darcy at $60^{\circ}F$.

Full discussions of individual drawdown calculation of results and graphic mean values are included in Appendix II.

1. Pattern at F7725

Maximum:-	24.8 gallons per hour per square foot.
Minimum:-	5.04 gallons per hour per square foot.
Arithmetric Mean:-	13.7 gallons per hour per square foot.
Graphic Mean:-	9.5 gallons per hour per square foot.

2. Pattern at D4300'

Maximum:- 19.4 gallons per hour per square foot.

Minimum:- 7.8 " " " " " "

Arithmetic Mean:- 13.3 " " " " " "

Graphic Mean:- 10.1 " " " " " "

3. Pattern at C+300, 14800'

Maximum:- 30.6 gallons per hour per square foot - Value high due to experimental inconsistency in data.

Minimum:- 9.6 gallons per hour per square foot.

Arithmetric Mean:- 18.3 " " " " " " Maybe somewhat high as abnormal high values used in result.

Graphic Mean:- 16.5 gallons per hour per square foot.

4. Pattern at F+10, 16330

Maximum:- 30.6 gallons per hour per square foot. - Value may be considered high as data unreliable.

Minimum:- 5.4 gallons per hour per square foot. - Value low:- All other evidence suggests Permeability in this area is greater than elsewhere.

Arithmetic Mean: 17.3 gallons per hour per square foot.

The above results are evaluated at the end of this report in conjunction with those obtained from Two Well Velocity Test measurements.

5. TWO WELL VELOCITY TESTS

1. General Considerations

This phase of the investigation was designed to measure a range of water velocities in the sediments immediately underlying the so called impervious blanket.

A previous experiment with radioactive and chemical tracers, indicated that these sediments might be the most permeable. As they are also the most critical, further information on their behaviour was advocated.

A two well method, developed by E. C. Childs, N. Collis-George and J. W. Holmes and used successfully for determining permeabilities in agricultural soils, was thought to be applicable to the problem. The work is written up in

Vol. 8, Number 1 The Journal of Soil Science (1957)

"Permeability Measurements in the Field as an Assessment of Anisotrophy and Structural Development."

The first experiment at C(3400'-3410'6") was conducted under the personal supervision of J. W. Holmes, who participated in the development of the method. Subsequent patterns were supervised by the writer on advice from the above. Tests were conducted at five sites eg. C(3400-3410'6"), F(4200-4210'3"), F(7390-7400'3"), D(16,550-16,559.5) and a site not surveyed adjacent to the line of test piles.

Each pattern consisted of two identical 18" diameter wells, spaced approximately 10' apart initially cased to the full depth drilled. A special $\frac{1}{4}$" mesh screen was centrally placed in each hole and surrounded with fine gravel, to an arbitary point above the static water level. Holes were pumped clean of drilling water and fines and the outer casing withdrawn to a predetermined height.

The net result is two 18" diam. wells, permitting free water passage below the outside casing. The inner screen serves to allow accurate recording of the water status during pumping.

Water is pumped at constant rate from one (pump) hole into a settling tank, thence into the other (sink) hole until equilibrium is reached. The respective roles of pump and sink hole are reversed and the experiment repeated.

The potential difference expressed as head of water between the two wells can be directly calculated to give a horizontal permeability for the sediments tested.

These experiments were conducted with little difficulty apart from small technical trouble. Results are in fairly close agreement with those obtained by the full aquifer method. Values have been obtained for both fine and coarser grain sediments, therefore the range represented should be a true indication of that existing across the site.

2. Individual Sites

No. 1 C(3400-3410'6")

The depth of sediment initially tested was between 14'1" and 17'0". The outer casing was progressively raised to 11'11" for the second experiment, and thirdly to 10'0". Materials were essentially similar throughout and are described as:-

"Light brown generally medium grain sand, with some finer fraction and scattered coarser sand and grit fragments."

Pumping was maintained at a constant rate for each individual test, although flow rate varied from 92 to 176 gallons per hour for separate experiments.

Static water level: - approximately 7'7½"

Wells were 18" diameter constructed 10'6" apart.

No. 2 F(4200'-4210'3")

One test only was conducted in each direction, in sediments between 9'0" and 15'0" depth, ie

"Light brown to yellow-brown mottled fine silty sands, becoming clayey to fine sandy silt in part" to 12'0", and thence

"Light brown to light and dark yellow-brown mottled fine silty sand, coarser grained at depth."

Wells 18" diameter, 10'3" apart, with Static Water level: - 8'6". Pumping was maintained at a constant rate of 163 gallons per hour throughout.

No. 3 F(7390-7400'3")

The depth here tested was from Static water level: 11'2" to 16'0" in

"Light brown to yellowish-brown generally very fine silty sand. Somewhat micaceous and friable."

One test was performed in each direction using much lower pump rates (95 and 101 gallons per hour respectively) due to greater hydraulic lift. Wells 18" diameter, 10'3" apart.

No. 4

This test was conducted at the request of Mr. G. G. Poole to investigate the sands in the pile driving area to a possible depth of 50'. Holes could not be drilled beyond 18", due to blowing sands and inability to keep the oversize casing watertight.

The sediments finally tested were between 8'3" and 14'6"

"In loosely consolidated fine to medium grain sands, slightly clayey in part and containing coarser sand and grit fragments with depth."

Water velocity values, as expected, were very high, as sediments had been subject to vibration and repeated flushing for months prior to the test. If significant, these figures should represent a maximum permeability for any material immediately underlying the blanket cover anywhere on the site.

No. 5 D(16550-16559.5')

In contrast to No. 4 above, the sediments tested at this site between 6'0" and 13'4" were essentially fine grained:-

"Slightly clayey to finely silty sands, slightly micaceous, but becoming medium grained from 11'0"."

Static water level was close to the surface at 3'6" depth. Casing was withdrawn to only 6' as sediments above this level were essentially impermeable. Pumping was maintained at constant rates of 107 and 110 gallons per hour for respective tests. Velocity figures for such fine grain sediments are low and probably a minimum for materials not actually constituting the so called blanket.

3. Summary of Results

Results have been calculated on a formula referred to in Journal of Soil Science, Vol. 8 No. 1, by Childs, Collis-George and Holmes referred to above.

An explanation of this formula, terms used, diagrams and calculations, are included in appendix III accompanying this report.

Throughout, horizontal Permeability denoted K_H, has been converted to centimetres per second, actual water velocity.

SITE No. 1

Test 1 Depth Tested: 14'1"-17'0" S.W.L. 7'7¼"

(A) 3400'

(B) 3410'6"

A (Pump) → B (Sink) $K_H = 6.3 \times 10^{-2}$ cms/sec.

B (Pump) → A (Sink) $K_H = 5.81 \times 10^{-2}$ cms/sec.

Av. Both directions $K_H = 6.05 \times 10^{-2}$ cms/sec.

Test 2 Depth Tested: 11'11"-17'0" S.W.L. 7'7¼"

A (Pump) → B (Sink) $K_H = 3.70 \times 10^{-2}$ cms/sec.

B (Pump) → A (Sink) $K_H = 3.32 \times 10^{-2}$ cms/sec.

Av. Both directions $K_H = 3.51 \times 10^{-2}$ cms/sec.

Test 3 Depth Tested: 10'0"-17'0" S.W.L. 7'7¼"

A (Pump) → B (Sink) $K_H = 3.47 \times 10^{-2}$ cms/sec.

B (Pump) → A (Sink) $K_H = 3.43 \times 10^{-2}$ cms/sec.

Av. Both directions $K_H = 3.47 \times 10^{-2}$ cms/sec.

Average SITE 1

A (Pump) → B (Sink) $K_H = 4.49 \times 10^{-2}$ cms/sec.

B (Pump) → A (Sink) $K_H = 4.13 \times 10^{-2}$ cms/sec.

Av. Both directions $K_H = 4.33 \times 10^{-2}$ cms/sec.

SITE No. 2

Depth Tested 9'0" - 15'0" S.W.L. 8'6"

(A) F4200'

(B) F4210'3"

A (Pump) → B (Sink) $K_H = 3.35 \times 10^{-2}$ cms/sec.

B (Pump) → A (Sink) $K_H = 3.46 \times 10^{-2}$ cms/sec.

Av. Both directions $K_H = 3.40 \times 10^{-2}$ cms/sec.

SITE No. 3

Depth Tested 11'2" - 16'0" S.W.L. 10'6"

(A) F7390

(B) F7400'3"

A (Pump) → B (Sink) $K_H = 4.04 \times 10^{-2}$ cms/sec.

B (Pump) → A (Sink) $K_H = 3.72 \times 10^{-2}$ cms/sec.

Av. Both directions $K_H = 3.88 \times 10^{-2}$ cms/sec.

SITE No. 4 Pile Driver Test

Depth Tested 8'3" - 14'6" S.W.L. 7'3"

(A) Nearest River

(B) Furthest River

A (Pump) → B (Sink): $K_H = 11.2 \times 10^{-2}$ cms/sec.

B (Pump) → A (Sink): $K_H = 14.2 \times 10^{-2}$ cms/sec.

Av. Both directions: $K_H = 12.7 \times 10^{-2}$ cms/sec.

SITE No. 5

Depth Tested 6'0" - 13'4" S.W.L. 3'6"

(A) D16550

(B) D16559.5'

A (Pump) → B (Sink): $K_H = 1.14 \times 10^{-2}$ cms/sec.

B (Pump) → A (Sink): $K_H = 1.07 \times 10^{-2}$ cms/sec.

Average for both directions: $K_H = 1.10 \times 10^{-2}$ cms/sec.

6. DISCUSSION OF RESULTS

Results based directly on experimental drawdowns, indicate a maximum average permeability of 30.6 gallons per hour per square foot (g.p.h. f^2) under unit gradient, for the full depth of aquifer at any point tested. The corresponding minimum value is 5.04 g.p.h. f^2.

These figures are both considered extreme, as drawdown readings used to derive them were to some extent anomalous.

Arithmetic mean values are within the range (13.7-18.3) g.p.h.$f.^2$ and those based on graphically plotted mean values (9.5 to 16.5) g.p.h.$f.^2$.

Allowing the maximum possible latitude for experimental inconsistency in recorded data, the average permeability for the whole aquifer at any point tested is not considered to be greater than 25 g.p.h.f^2 or less than 9 g.p.h.$f.^2$. Probable values would be more within the range (9.5 to 18.3) g.p.h.f^2.

The total cross sectional area of the permeable sediments beneath the dam has been estimated at 1,947,000 square feet, with an additional area of 480,000 square feet under the

narrow peninsula of high ground, formed between the two reaches of the meander loop of Queens Bend east of Nil Nil.

The estimated total leakage beneath the dam, assuming unit gradient would be

At Maximum	Calculated	Permeability	= 74	million	gallons/hour
"	Estimated	"	= 61	"	"
"	Average	"	= 44	"	"
Minimum	Calculated	"	= 12	"	"
"	Estimated	"	= 22	"	"
"	Average	"	= 23	"	"
Arithmetic Mean		"	= 38	"	"
Graphic Mean		"	= 29	"	"

These figures are approximately half of those previously estimated and lie within significantly closer limits. In practice, natural gradients would be much greater than unity, with corresponding reductions in average permeabilities.

Reduced to natural gradients as proposed in the preliminary report, the total water loss would be distributed as follows:-

(Assume maximum estimated permeability:- 25 g.p.h.f^2 (under unit gradient)).

1.	Under Earth Bank West of Murray:- (Gradient 1 in 200).	=	169,000 gallons/hour
2.	Under Sluiceways:- (Gradient 9 in 100)	=	284,000 gallons/hour
3.	Under Earth Bank East of Murray:- (Gradient 1 in 100)	=	115,000 gallons/hour
4.	Under Peninsula:- (Gradient 1 in 100)	=	119,000 gallons/hour
			687,000 gallons/hour

The maximum total estimated loss under the proposed dam is thus 687,000 g.p.h.(30.5 cusecs.) or 439,000 g.p.h. (19.5 cusecs.) based on the mean average permeability of 15 g.p.h.f^2. (unit gradient).

Actual gradients finally applying may be less than those estimated above, with average permeabilities probably 30% less than the maximum estimated value. Furthermore no

allowance has been made for remedial action eg. mechanical consolidation of the sediments, which should significantly reduce porosity and subsequently, average permeabilities.

It has been stated in the preliminary report that sediments immediately underlying the blanket cover, might in some cases be the most permeable, giving rise to the danger of piping. This has been confirmed to some extent by this investigation, but applies only in limited areas, where coarser sediments underly the blanket. In general the converse is probably true. Permeability values based on two well velocity tests, have indicated minimum velocities of 1.10×10^{-2} cms/sec. and maximum velocities of 12.7×10^{-2} cms/sec. respectively. These figures are converted to 2.43 g.p.h.f^2. and 28.1 g.p.h.f^2. (assuming unit gradient and 30% porosity). Values thus compare favourably with the average of those from full aquifer tests, in so far that specific horizons are considered to possess individual permeabilities greater or less than the average.

At the maximum calculated velocity of 12.7×10^{-2}cms/sec. the possibility of piping would be greatest. This figure only applies under unit gradient and would be substantially reduced under the much lower gradient which will occur under the structure.

The volume of water in the permeable sand under each sluiceway (and lock in the Murray) is as follows (again assuming 30% porosity).

Murray	45×10^6 gallons
Monoman	12×10^6 "
Chowilla	12×10^6 "

This water would be completely replaced in 47 hours under unit gradient, (assuming average mean permeability of 15 g.p.h./ft^2/ft. and in 530 hours under a probable maximum gradient of 9 in 100*.

7. CONCLUSIONS

1. Additional geological drilling does not alter the general concepts formulated in the original report. Data has been fully recorded on an amended set of geological cross

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* Dimensions used in this calculation.
1. Sluiceway width 400'
2. Total sluiceway (and lock) length.
Murray 600 feet: Chowilla 160 feet: Monoman 160 feet.

sections and appendix of descriptive borelogs.

2. Recent investigations indicate that the average permeability of the whole aquifer is not as great as previously calculated and that possible maximum and minimum values are within much closer limits. Total water loss beneath the dam at the estimated natural gradients should not be greater than 690,000 gallons per hour or 31 cusecs. (assuming maximum permeability) or 440,000 g.p.h. (20 cusecs) at mean average permeabilities.

3. Permeability would appear to be similar in all directions, except adjacent to the main river streams. This effectively rules out the probability of significant natural gradients or marked directional flow.

4. Sediments immediately underlying the blanket cover may in certain limited areas, be more permeable than the average for the whole aquifer. This would apply mainly to the coarser grained, poorly sorted materials, especially adjacent to the main Murray channel. Generally these upper horizons are no more permeable than the average and if of smaller average grain size than fine sands, probably considerably less.

5. Water movements under the western bank will be less than expected, due to the thicker succession of impervious sediments, exposed up and downstream of the proposed dam site axis.

T he advice of J. W. Holmes, C.S.I.R.O. on Two Well Velocity Tests is gratefully acknowledged.

R. D. Steel
Geologist
URANIUM & FUEL SECTION

RDS:CERF
4/8/61

DEPARTMENT OF MINES
SOUTH AUSTRALIA

CHOWILLA DAM SITE - GEOLOGICAL INVESTIGATION

SUPPLEMENTARY REPORT

APPENDIX I

DETAILED DESCRIPTIVE BORELOGS AND DRILLING PROCEDURES
SECOND PROGRAMME. 2/2/61 - 1/5/61

1. BOREHOLE DETAILS

In the second programme at the Chowilla Dam Site, 107 bores were completed involving a total footage of 3414'. Drilling commenced on 2/2/61 and was completed on 1/5/61 using three percussion rigs in the project.

The following tabulation lists briefly the number of bores and the footage involved in the three main phases of the investigation.

PURPOSE	NO. OF BORES	TOTAL FOOTAGE	LOCATION
GEOLOGICAL INTERPRETATION.	44	1391	LINES C, D, E and F
FIELD PERMEABILITY TESTING	52	1829	Pump holes at D4300 F7725, C+300, 14800 F+10, 16330
TWO WELL VELOCITY TESTING	11	194	C(3400-3410) F(4200-4210) F(7390-7400) Pile Driver D(16550-16560)

The sampling methods employed were similar to those used in the initial programme, with special effort applied to securing tube samples.

Penetration rate figures for comparative hardness, have again been recorded where possible, along with information on the subsurface water status. These figures are attached to the appropriate borelogs appended.

Cores have been logged in detail and skeletonized samples of all significant changes in material held for future reference. Details of coring and logging methods have been described in

Appendix IV of the preliminary report and need no repetition here.

A more comprehensive tabulation is given below listing the individual bores as progressive chainages east of the datum along lines C, D, E and F and points progressively upstream from same

GRID LINE	HOR. DISTANCE East of Datum	Serial No.	R.L. Surface	Depth	Static Water Level	Purpose
C	-400	808/61	226.01'	50'	-	Geological
C	-100	809/61	212.77'	80'	-	"
C	3400	872/61	169.65'	17'	7'7¼"	Velocity Test
C	3410	884/61	169.71'	17'	7'7¼"	" "
C+300	4300	860/61	168.36'	25'	5.80'	Permeability observn.
C+350	4300	861/61	168.40'	25'	5.86'	" "
C+375	4300	862/61	168.31'	25'	5.73'	" "
C	5800	847/61	168.98'	25'	10'	Geological.
C	9700	852/61	174.67'	35'	10'	"
C	11800	880/61	170.21'	30'	5'	"
C	11985	879/61	172.27'	30'	6'	"
C+300	14700	913/61	172.53'	20'	5.20'	Permeabilityobservn.
C+300	14750	912/61	173.52'	20'	6.28'	" "
C+300	14775	911/61	173.70'	20'	6.46'	" "
C+200	14800	910/61	173.82'	20'	6.62'	" "
C+250	14800	909/61	173.99'	20'	6.75'	" "
C+275	14800	895/61	173.92'	20'	6.70'	" "
C+300	14800	898/61	173.39'	134'	6.15'	" Pump.
C+325	14800	903/61	173.53'	20'	6.29'	" observn.
C+350	14800	904/61	173.62'	20'	6.45'	" "
C+300	14825	902/61	173.80'	20'	6.55'	" "
C+300	14850	901/61	173.06'	20'	5.80'	" "
C+300	14900	894/61	173.33'	20'	6.09'	" "
C	17350	960/61	171.76'	15'	4'	Geological
C	17600	957/61	169.11'	15'	2'1"	"
C	17800	920/61	191.77'	40'	-	"
C	18100	921/61	227.27'	40'	-	"
D	600	810/61	197.66'	80'	-	"
D	900	813/61	176.39'	60'	17.5'	"
D	4200	868/61	168.74'	25'	5.15'	Permeability observn.
D	4250	867/61	168.24'	25'	5.66'	" "
D	4275	866/61	168.09'	25'	5.54'	" "

GRID LINE	HOR. DISTANCE East of Datum	Serial No.	R.L. Surface	Depth	Static Water Level	Purpose
D	4300	836/61	168.13'	143'	5.63'	Permeability Pump.
D+25	4300	859/61	168.09'	25'	5.62'	" observn.
D+50	4300	857/61	168.47'	25'	6.12'	" "
D+100	4300	850/61	168.51'	25'	5.97'	" "
D	4325	870/61	168.44'	25'	5.83'	" "
D	4350	871/61	168.52'	25'	5.86'	" "
D	4400	869/61	169.17'	25'	6.40'	" "
D	5800	846/61	169.02'	20'	10'	Geological
D	12945	878/61	173.58'	35'	5'	"
D	14800	905/61	173.55'	20'	6.25'	Permeability Observn.
D	16550	945/61	170.94'	20'	3'6"	Velocity Test
D	16560	944/61	171.11'	20'	3'6"	" "
D	17900	958/61	191.45'	24'	-	Geological
E	00	817/61	219.80'	20'	-	"
E	300	818/61	208.57'	80'	-	"
E	700	812/61	176.64'	35'	18'	"
E	5850	846/61	169.42'	30'	10'	"
E+300	7725	828/61	172.98'	40'	10.36'	Permeability observn.
E+350	7725	827/61	172.98'	60'	10.62'	" "
E+375	7725	826/61	172.97'	50'	10.76'	" "
E	9500	853/61	174.50'	30'	10'	Geological
E	9900	877/61	167.70'	25'	6'	"
E	12100	876/61	171.10'	30'	5'	"
E	12650	875/61	173.20'	25'	6'	"
E	14770	959/61	174.95'	15'	-	"
E+310	16330	932/61	175.20'	20'	6.63'	Permeability observn.
E+360	16330	930/61	174.95'	20'	6.24'	" "
E+385	16330	929/61	174.78'	20'	6.06'	" "
E	17400	907/61	175.31'	20'	8'6"	Geological
E	17756	908/61	170.17'	20'	2'6"	"
E	18100	917/61	183.60'	15'	-	"
F	600	811/61	176.72'	20'	-	"
F	1000	849/61	172.20'	20'	-	"
F	1700	863/61	170.50'	35'	10'	"
F	2500	864/61	168.92'	35'	10'	"
F	4200	873/61	170.61'	18'	6'6"	Velocity Test
F	4210	885/61	170.42'	16'	6'6"	" "
F	5500	865/61	170.15'	35'	10'	Geological
F	7390	890/61	173.01'	18'	10'6"	Velocity Test
F	7400	892/61	172.96'	17'	10'6"	" "
F	7625	835/61	173.15'	30'	11.36'	Permeability Observn.
F	7675	833/61	173.10'	41'	10.75'	" "

GRID LINE	HOR. DIS-TANCE East of Datum	Serial No.	R.L. Surface	Depth	Static Water Level	Purpose
F	7700	832/61	173.04'	40'	10.69'	Permeability observn.
F	7725	823/61	173.09'	141'	10.74'	" Pump
F+25	7725	834/61	173.07'	30'	10.75'	" observn.
F+50	7725	825/61	173.18'	60'	10.81'	" "
F+100	7725	824/61	173.37'	46'	10.92'	" "
F	7750	829/61	173.00'	40'	10.19'	" "
F	7775	830/61	173.00'	30'	10.62'	" "
F	7825	831/61	173.14'	30'	10.80'	" "
F	7900	891/61	173.00'	16'	-	Velocity Test
F	9850	854/61	165.97'	25'	7'	Geological
F	10270	855/61	165.85'	25'	6'	"
F	10700	856/61	169.13'	25'	5'	"
F	11900	874/61	171.89'	35'	6'	"
F	15600	906/61	176.09'	20'	7'	"
F+10	16230	932/61	175.32'	20'	6.48'	Permeability observn.
F+10	16280	935/61	174.63'	20'	5.86'	" "
F+10	16305	936/61	174.35'	20'	5.57'	" "
F+10	16330	939/61	174.35'	135'	5.74'	" Pump
F+35	16330	928/61	174.92'	20'	6.16'	" observn.
F+60	16330	927/61	175.22'	20'	6.37'	" "
F+110	16330	937/61	175.68'	20'	6.74'	" "
F+10	16355	934/61	174.60'	20'	6.05'	" "
F+10	16380	937/61	174.90'	20'	6.19'	" "
F+10	16430	931/61	174.90'	20'	6.25'	" "
F+	Pile Driv.	923/61	174.86'	100'	6'2"	Geological
F+	Two Well	919/61	175.82'	18'	7'3"	Velocity Test
F+	Two Well	922/61	175.71'	16'	7'3"	" "
F	17480	956/61	175.56'	20'	7'1"	Geological
F	17800	955/61	174.70'	20'	6'2"	"
F	18100	954/61	176.89'	15'	-	"
F	18250	918/61	178.89'	10'	-	"

"C" - 400'
Serial No. 808/61
DM 765/60

PERCUSSION DRILL LOG "C" - 400'

PROJECT: CHOWILLA DAM SITE; RIVER MURRAY. Cnt. Hamley.
Location: LINE "C", 400' downstream of Dam Site Axis
Horizontal Distance from Datum; 400' West.
Purpose: Test of Subsurface Foundation Conditions
Geological Hole.

R.L. Surface 226.01 — Depth 50'
Plant No. 24 — Driller W. HENDERSON
Date Commenced: 2.2.61 — Date Completed 2.2.61
Bore Logged R.D. STEEL — Date 7.2.61

DEPTH	DESCRIPTION	DEPTH	Type of Sample.	Blows p/ft
0 - 1'0"	Reddish-brown fine sandy loam with some gritty fragments.	0-1	open tube	14
1'0" - 2'0"	Red-brown generally fine sandy loam. Compact but friable. Scattered grit fragments and slightly limey in part.	1-2	"	25
		2-3	"	33
2'0" - 4'0"	Yellowish, pale brown and off-white clayey sand, becoming limey in irregular pockets. Very compact, slightly friable. Scattered grit fragments.	3-4	"	2c
4'0" - 5'10"	Salmon pink, yellowish and light yellowish-grey mottled fine clayey sand, with some dark yellow ochreous mottling. Compact and somewhat friable.	4-5	"	35
		5-6	"	19
5'10" - 8'6"	Salmon pink, light brown and light grey medium to fairly coarse sand, with irregularly prominent clay binding. Prominent dark grey dendritic staining. Very compact and slightly friable.	6-7	"	12
		7-8	"	17
8'6" - 10'	Brownish, light brown, light grey-brown, light grey and yellowish mottled, medium to slightly coarse clayey sand. Very compact and slightly friable.	8-9	"	12
		9-10	"	12
10' - 11'	Light brown, light grey-brown and off-white mottled, generally medium grained, slightly clayey sand. Somewhat limey in part, with scattered grit, fragments. Compact and fairly friable.	10-11	"	11
11' - 14'	Off-white, pale yellowish, light brown and light pinkish medium grain sand, with slight clay binding. Compact and friable, slightly limey in part.	11-12	open	7
		12-13	tube	11
		13-14	"	9
14' - 18'	Light yellow to light yellow-grey medium grain sand, with slight clay binding. Becoming coarser at depth. Compact but friable.	14-15	"	9
		15-16	"	9
		16-17	"	7
		17-18	"	7

C - 400' Cont. - 2 -

DEPTH	DESCRIPTION	DEPTH	Type of Sample	Blows p/ft.
18' - 20'	Pale yellow medium to fairly coarse sand, with slight clay binding and some darker brown mottling. Compact and friable.	18-19	open	6
		19-20	tube	7
20' - 24'	Yellow-brown medium to fairly coarse sand with slight clay binding. Slight reddish-brown mottling in part. Compact but friable.	20-21	"	11
		21-22	"	11
		22-23	"	20
		23-24	"	24
24' - 26'	Pale yellow to pale yellow-grey fairly coarse rounded sand, with some finer fraction. Friable.	24-25	"	18
		25-26	"	42
26' - 29'	Yellowish to light yellowish-brown, medium to fairly coarse sand, with some finer sand fraction and few grit fragments. Compact and friable.	26-27	"	22
		27-28	"	21
		28-29	"	22
29' - 31'	Pale yellowish to pale yellowish-grey medium grain sand, with some coarser fraction. Compact, but friable.	29-30	"	25
		30-31	"	40
31' - 40'	Yellow to yellowish-brown medium to coarse sand, with some fine fraction and grit fragments. Compact and friable.	31-32	"	20
		32-33	"	30
		33-34	"	24
		34-35	"	30
		35-36	"	22
		36-37	"	25
		37-38	"	28
		38-39	"	20
		39-40	"	16
40' - 44'	Light grey generally medium to slightly coarse sand, with vague yellowish mottling. Some finer fraction. Friable.	41-42	"	24
		42-43	"	40
		43-44	"	28
44' - 48'	Light brown to yellowish-brown fairly coarse sand, with some finer fraction and few grit fragments. Friable.	44-45	"	25
		45-46	"	25
		46-47	"	30
		47-48	"	52
48'6" -50'	Brown to yellowish-brown and light grey mottled, fairly coarse sand, with some finer fraction and few grit fragments. Friable.	48-49	"	30
		49-50	"	25
	END OF HOLE 50'			
	WATER CUT -			
	WATER LEVEL -			

"C" - 100'.
Serial No. 765/60
D.M. 765/60

PERCUSSION DRILL LOG "C" - 100

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY. Cnty. Hamley.
LOCATION: LINE "C", 400' downstream from Dam Axis
Horizontal distance from datum 400', West.
PURPOSE: Test of Subsurface Foundation Conditions
Geological Hole.
R.L. Surface: 212.77 **Depth:** 80'
Plant No: 24 **Driller:** W. Henderson
Date Commenced: 2.2.61 **Date Completed:** 6.2.61
Bore Logged: R.D. STEEL **Date:** 7.2.61

Depth	Description	Depth	Type of Sample	Blow p/ft.
0 - 2'0"	Brown fine sandy loam with grit fragments and small plant remains. Friable.	0 - 1'	Open	12
		1'- 2'	Tube	19
2'0"- 3'0"	Red-brown fine sandy loam, becoming offwhite and limey in part. Few small lime nodules.	2'- 3'	"	50
3'0"- 7'0"	Red-brown fine clayey sand to sandy clay. Becoming offwhite and limey irregularly. Compact and somewhat friable.	3'- 4'	"	50
		4'- 5'	"	54
		5'- 6'	"	40
		6'- 7'	"	40
7'0"-10'0"	Red-brown clayey fine sand, becoming offwhite to pale red-brown and limey in patches. Very compact and slightly friable. Scattered grit fragments.	7'- 8'	"	31
		8'- 9'	"	19
		9'-10'	"	30
10'0"-11'0"	Red-brown fine sand, with some clay binding. Compact and fairly friable Some reddish-brown lime patches, and small nodules.	10'-11'	"	23
11'0"-13'0"	Red-brown fine grain sand, with some clay binding and few grit fragments. Compact and somewhat friable, Few lime nodules.	11'-12'	"	28
		12'-13'	"	26
13'0"-15'6"	Red-brown generally fine grain sand, with fairly prominent clay binding and scattered coarse grit fragments. Compact but somewhat friable.	13'-14'	"	17
		14'-15'	"	12
		15'-16'	"	10
15'6"-27'0"	Red-brown slightly clayey, generally fine grain sand, with some coarser grit fragments. Compact and fairly friable. Slightly limey in small pockets.	16'-17'	"	10
		17'-18'	"	10
		18'-19'	"	15
		19'-20'	"	15
		20'-21'	"	24
		21'-22'	"	24
		22'-23'	"	30
		23'-24'	"	17
		24'-25'	"	25
		25'-26'	"	17
		26'-27'	"	19
27'0"-31'0"	Red-brown to reddish fine to medium sand, with some clay binding and patches of greyish mottling. Very compact and somewhat friable. Scattered grit fragments. Limey in small pockets.	27'-28'	"	20
		28'-29'	"	20
		29'-30'	"	20
		30'-31'	"	18

PERCUSSION DRILL LOG "C" - 100. Continued

Depth	Description	Depth	Type of Sample	Blows p/ft.
31'0"-35'0"	Brick-red and red-brown medium to coarse sand, with some slight clay binding. Some patches of light grey and light brown mottling. Scattered grit fragments and few lime nodules. Compact and friable.	31'-32'	Open	22
		32'-33'	Tube	22
		33'-34'	"	18
		34'-35'	"	17
35'0"-38'0"	Red-brown and brick-red medium sand, with some clay binding. Faint yellowish and greyish mottling. Compact and somewhat friable.	35'-36'	"	15
		36'-37'	"	18
		37'-38'	"	20
38'0"-40'6"	Brick-red to red-brown and light grey mottled clayey sand, with small patches of offwhite and yellowish mottling. Very compact and slightly friable.	38'-39'	"	15
		39'-40'	"	15
40'6"-42'0"	Brick-red and light grey somewhat clayey, medium to fairly coarse sand. Some offwhite to yellowish mottling. Some coarse grit fragments and lime nodules.	40'-41'	"	20
		41'-42'	"	20
42'0"-43'0"	Light grey clayey silt to silty clay, with prominent brick-red and yellowish mottling. Stiff and moist.	42'-43'	"	25
43'0"-46'0"	Light grey clayey silt, with prominent brick-red and slight yellowish mottling. Firm and somewhat friable.	43'-44'	"	15
		44'-45'	"	12
		45'-46'	"	12
46'6"-49'0"	Light grey, brick-red and lesser yellowish mottled, slightly clayey silt. Firm and moist. Slightly micaceous.	46'-47'	"	15
		47'-48'	"	15
		48'-49'	"	15
49'0"-52'0"	Pale grey and light brownish mottled clayey silt. Slightly sandy and micaceous. Compact and slightly friable.	49'-50'	"	15
		50'-51'	"	15
		51'-52'	"	20
52'0"-53'6"	Pale grey, light brown, light yellow and yellowish-brown slightly clayey to finely sandy silt. Slightly micaceous. Compact and slightly friable.	52'-53'	"	12
53'6"-56'0"	Greyish to greyish-brown fine silty sand, slightly micaceous. Compact and somewhat friable.	53'-54'	"	18
		54'-55'	"	20
		55'-56'	"	15
56'0"-58'0"	Light greyish fine silty sand, slightly micaceous, with some brown and yellowish mottling. Firm and moist.	56'-57'	"	12
		57'-58'	"	12
58'0"-60'0"	Light greyish to light greyish-brown fine grain moist sand.	58'-59'	"	12
		59'-60'	"	15

PERCUSSION DRILL LOG "C" - 100. Continued

Depth	Description	Depth	Type of Sample	Blows p/ft.
60'0"-61'0"	Light brown to yellow-brown compact, moist and generally fine sand, slightly micaceous.	60'-61'	Open Tube	18
61'0"-64'0"	Light grey-brown, yellowish-brown mottled silty clay to clayey silt. Slightly micaceous. Firm, moist and somewhat friable.	61'-62' 62'-63' 63'-80'	" " "	12 12 not recorded.
64'0"-71'0"	Yellowish to yellowish-brown medium to coarse sand, somewhat clayey in part. Scattered grit fragments.			
71'0"-80'0"	Yellow-to yellow-brown medium to coarse sand, with some lighter mottling irregularly. Somewhat clayey in part. Few grit fragments. Compact moist and fairly friable.			
	END OF BORE 80'			
	WATER CUT NIL			
	WATER LEVEL -			

C3400'

Bore Serial No 872/61
D.M. 765/60

PERCUSSION DRILL LOG C 3400

PROJECT: CHOWILLA DAM SITE RIVER MURRAY County Hamley
LOCATION: LINE "C" 400' downstream from Dam Site Axis
Horizontal Distance East of Datum 3400'
PURPOSE: Geological Hole for No 1 Two Well Permeability Test.
PLANT No 40 DRILLER W.F. FARROW
R.L. SURFACE 169.65' DEPTH 17'
DATE COMMENCED 9.3.61 DATE COMPLETED 9.3.61
BORE LOGGED R.D. STEEL DATE 23.3.61

Depth	Description	Depth	Type of	Blow
0 - 1'0"	Grey-brown fine sandy clay, becoming clayey fine sand in pockets. Compact and friable. Few grit fragments and numerous plant root remains.	0-1'	open tube	38
1'0"- 2'2"	Light greyish to slight brownish-grey, very stiff silty clay, maybe finely sandy in part. Scattered grit fragments and plant remnants.	1-2'	"	36
2'2"- 3'0"	Light brown and light grey-brown very silty clay. Compact and very stiff. Numerous pockets of white crystalline gypsum and few grit fragments.	2'-3'	"	16
3'0"- 5'0"	Light grey, light brown, light grey-brown and yellow-brown slightly clayey silt, becoming clayey to silty fine sand in part.	3'-4' 4-5' 5-6'	" " "	22 22 20
5'0"- 7'6"	Light brown to light yellowish brown fine silty sand, with few mica flecks, some coarser sand and grit fragments.	6-7'	"	21
7'6" - 17'	Light brownish generally medium grain sand, with some finer fraction and scattered coarse sand and grit fragments.	7-8'	" slush	19 -

END OF HOLE 17'
WATER CUT 7'
WATER LEVEL 7'7¼"
BLANKET THICKNESS 5'0"

4300' C+300
Serial No. 860/6
D.M. 765/60

PERCUSSION DRILL LOG: 4300' C+300

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, County Hamley.
LOCATION: 700' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 4300'.
PURPOSE: Observation Hole for No. 5 Permeability Test at D4300'.

PLANT NO: 20 DRILLER: J. Doecke
R.L. Surface: 168.36 Depth: 25'
Date Commenced: 7/3/61 Date Completed: 7/3/61
Bore Logged: R. D. Steel Date: 18/3/61

Depth	Description	Depth	Type of Sample	Blow p/ft.
0'0" - 2'0"	Greyish to light brownish-grey fine sandy clay, becoming clayey fine sand in pockets. Some vague brownish mottling. Compact and fairly friable. Few grit fragments and plant remnants.	0- 1' 1- 2'	Open tube	25 21
2'0" - 3'6"	Light grey to slight green-grey, very stiff and compact silty to very silty clay, with scattered grit fragments, plant remnants and dark organic blobs.	2- 3' 3- 4'	" "	17 10
3'6" - 5'0"	Light grey to light green-grey clayey silt to very silty clay, with vague yellow-grey mottling. Somewhat gypseous in part and with some selenite crystals and ochreous nodules.	4- 5'	"	13
5'0" - 10'0"	Light brown medium grain sand, with some fine fraction and numerous coarse sand and grit fragments. Scattered mica flecks.	5-10'	Slush	-
10'0" - 25'0"	Light brown to light yellowish-brown generally fairly fine to medium grain sand, but with numerous sand and rounded grit fragments.	10-25'	"	-

END OF HOLE 25'
WATER CUT 6'
WATER LEVEL 5.80'
BLANKET THICKNESS 5'.

4300' C+350'
Serial No. 861/61
D.M. 765/60

PERCUSSION DRILL LOG 4300' C+350'

PROJECT: CHOWILLA DAMSITE: RIVER MURRAY. Cnty. Hamley.
LOCATION: 50' downstream from Dam Site Axis.
Horizontal Distance East of Datum: 4300'
PURPOSE: Observation Hole for No. 5 Field Permeability test at D.4300'

PLANT NO: 20 — DRILLER: J. DOECKE
R.L. SURFACE: 168.40' — DEPTH: 25'
DATE COMMENCED: 7.3.61 — DATE COMPLETED: 7.3.61
BORE LOGGED: R.D. STEEL — DATE: 19.3.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0 - 1'9"	Light grey to light green-grey fine sandy clay, becoming clayey fine sand in pockets. Compact and fairly friable. Few grit fragments and plant remains.	0 - 1' 1'-2'	Open Tube	15 9
1'9"- 3'0"	Light grey to light greenish-grey very silty clay. Very stiff and compact. Few grit fragments, lime nodules and some organic matter.	2'- 3'	"	7
3'0"- 4'2"	Light grey to light greenish-grey very silty clay to very clayey silt in part. Very compact and slightly friable. Somewhat gypseous in pockets, and with numerous selenite crystals.	3'- 4'	"	11
4'2"- 5'0"	Light greenish-grey very silty clay to very clayey silt. Some light and dark yellow-brown mottling. Very compact and slightly friable. Few plant remnants, small grit fragments, and iron oxide stains. Becoming sandy at depth.	4'- 5'	"	12
5'0"- 6'6"	Light greyish very clayey sand, but with few pockets of silty to sandy clay. Some dark yellow-brown mottling and large patches of dark iron oxide.	5'- 6'	"	10
6'6"-16'0"	Light brown fine to medium grain sand, but with numerous coarser sand and grit fragments. Few mica flecks.	6'-16'	slush	-
16'0"-20'0"	Light brown medium grain sand, with abundant coarse sand and grit fragments. Some finer fraction and few mica flecks.	16'-20'	"	-
20'0"-25'0"	Light brown fine to medium sand, with numerous coarse sand and grit fragments. Few mica flecks etc.	20'-25'	"	-

END OF HOLE 25'
WATER CUT 6'
WATER LEVEL 5.86'
BLANKET THICKNESS 5'0".

4300. C+375'
Serial No. 862/61
D.M. 765/60

PERCUSSION DRILL LOG 4300. C+375'

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY. Cnty. Hamley.
LOCATION: 25' downstream from Dam Site Axis.
Horizontal Distance East of Datum: 4300'
PURPOSE: Observation Hole for No. 5 Field Permeability Test at D.4300'

PLANT NO: 20 — DRILLER: J. DOECKE
R.L. SURFACE: 168.31 — DEPTH: 25'
DATE COMMENCED: 168.31 — DATE COMPLETED: 8.3.61
BORE LOGGED: R.D. Steel — DATE: 19.3.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0 - 1'6"	Light grey to light brownish-grey fine sandy clay, becoming clayey fine sand in pockets. Very compact, but fairly friable. Few grit fragments and plant remnants.	0 - 1' 1'- 2'	Open Tube	10 12
1'6"- 3'0"	Light grey to light green-grey very silty clay. Very stiff and compact. Few grit fragments, plant remains, iron-oxide blobs and gypsum pockets.	2'- 3'	"	10
3'0"- 4'2"	Light grey to light green-grey very silty clay. Very compact and slightly friable. Numerous pockets of whitish gypsum and small selenite crystals. Vague yellowish mottling.	3'- 4'	"	13
4'2"- 5'2"	Light grey to light yellow-grey and light yellowish very silty clay to clayey silt. Very stiff and compact. Small white lime blobs and nodules. Becoming sandy at depth.	4'- 5'	"	12
5'2"- 5'10"	Light grey clayey sand, with numerous coarse sand and grit fragments. Compact and slightly friable.	5'- 6'	"	10
5'10"-8'0"	Light grey to dark brown and dark yellow-brown slightly clayey medium grain sand. Scattered coarse grit fragments.	6'- 8'	slush	-
8'0"-12'0"	Brown to yellow-brown fine to medium grain sand, with numerous coarse sand and grit fragments.	8'-12'	"	-
12'0"-20'0"	Light brown fine to medium sand, with irregularly abundant coarse sand and grit fragments.	12'-20'	slush	-
20'0"-25'0"	Light brownish grey fine to medium sand, with numerous coarse sand and grit fragments. Few mica flecks etc.	20'-25'	"	-

END OF HOLE 25'
WATER CUT 6'
WATER LEVEL 5.75'
BLANKET THICKNESS 5'2".

C5800
Serial No 847/61
D.M. 765/60

PERCUSSION DRILL LOG C5800'

PROJECT: CHOWILLA DAM SITE RIVER MURRAY County Hamley
LOCATION LINE "C" 400' downstream from Dam Site Axis
Horizontal Distance East of Datum 5800'
Test of Subsurface Foundation Conditions Geological Hole

PLANT NO 20 — DRILLER J. DOECKE
R.L. SURFACE 168.98 — DEPTH 25'
DATE COMMENCED: 27.2.61 — DATE COMPLETED 27.2.61
BORE LOGGED BY R.D. STEEL — DATE 8.3.61

Depth	Description	Depth	Type of Sample	Blow p/foo
0'0" 1'6"	Greyish to slight brownish-grey fine sandy clay, becoming clayey fine sand in part. Few grit fragments, plant remnants etc. Compact and fairly friable.	0-1'	open tube	20
1'6"- 3'0"	Greyish to brownish-grey very silty clay, maybe finely sandy in part. Very stiff. Few grit fragments.	1'-2' 2'-3'	" "	20 14
3'0"- 5'0"	Greyish to slight brownish-grey very stiff and very silty clay, with scattered small whitish gypsum pockets. Odd grit fragments etc.	3'-4' 4'-5'	" "	9 6
5'0"- 6'0"	Greyish to greenish-grey very clayey silt, with some yellow-brown and dark brown ferruginous mottling. Few pockets of whitish gypsum. Compact, and somewhat friable.	5'-6'	"	4
6'0"- 8'2"	Light greyish slightly clayey silt with some yellow-brown and dark grey iron oxide mottling, Very compact, slightly friable.	6'-7' 7'-8'	" "	5 12
8'2"- 10'	Light grey to light yellow-grey clayey silt to clayey fine sand. Some darker brown and yellow-brown mottling. Patches of dark organic matter. Very compact, somewhat friable.	8'-9' 9'-10'	" "	19 24
10' -16'	Light greyish fine clayey to silty sand, possibly with light yellow grey and yellow brown mottling. Wet.	10'-16'	slush	-
16' -25'	Light greyish fine silty sand. Slightly micaceous and with scattered grit fragments. Wet.	16'-25'	"	-

END OF HOLE 25'
WATER CUT 10'
WATER LEVEL 10'
BLANKET THICKNESS 10'

C9700
Serial No 852/61
D.M. 765/60

PERCUSSION DRILL LOG C9700'

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, County Hamley
LOCATION LINE "C" 400' downstream from Damsite Axis
Horizontal distance E of datum 9700'
PURPOSE: Test of subsurface foundation conditions
Geological Hole

PLANT NO 24
R.L. SURFACE 174.67
DATE COMMENCED 27.2.61
BORE LOGGED R.D. STEEL

DRILLER W. HENDERSON
DEPTH 35'
DATE COMPLETED 27.2.61
DATE 2/3/61

Depth	Description	Depth	Type of Sample	Blows p/f
0'0" - 1'6"	Greyish to brownish-grey fine sandy clay, becoming clayey fine sand in pockets. Few grit fragments and plant remnants. Compact and fairly friable.	0-1'	open tube	36
1'6" - 2'0"	Brownish grey very silty clay, becoming finely sandy in small pockets. Few grit fragments. Very stiff and compact.	1'-2"	"	36
2'0" - 3'0"	Brownish-grey to light brown very silty clay to clayey silt, with few grit fragments and charcoal pockets.	2'-3'	"	36
3'0" - 4'0"	Greyish-brown very silty clay, with vague yellow-brown mottling. Few grit fragments and plant remnants. Very stiff.	3'-4'	"	16
4'0" - 4'7"	Light brown, light grey-brown and yellow-brown mottled, very silty clay to clayey silt. Few whitish gypsum pockets and plant root remnants. Compact to stiff and somewhat friable.	4'-5'	"	14
4'7" - 7'0"	Light grey to light grey-brown slightly clayey silt, with prominent yellow-brown mottling. Compact and somewhat friable. Few plant fragments and mica flecks.	5'-6' 6'-7'	" "	12 11
7'0" - 11'0"	Greyish to light bluish-grey silty clay, with prominent brown& yellow-brown mottling. Few small wood fragments and iron-oxide stains. Stiff and moist.	7'-8' 8'-9' 9'-10' 10'-11'	" " " "	9 13 16 13
11'0"- 13'6"	Light greyish silty clay, with prominent dark brown mottling. Numerous small dark iron-oxide stains. Very firm to stiff and moist.	11'-12' 12'-13' 13'-14'	" " "	12 12 9
13'6"- 16'	Bluish to light bluish-grey slightly clayey silt, with prominent brown and dark yellow-brown mottling. Slightly micaceous and with few root remnants and dark iron oxide pockets. Firm, but fairly friable.	14'-15' 15'-16'	" "	20 8

Depth	Description	Depth	Type of Sample	Blows p/foot
16'0" - 17'0"	Greyish-brown to light and dark yellow-brown mottled slightly clayey silt. Slightly micaceous. Fairly firm and friable.	16'-17'	open tube	8
17'0" - 19'6"	Light greyish to light bluish-grey very clayey silt to very silty clay. Soft and moist.	17'-18' 18'-19' 19'-20'	" " "	7 5 5
19'6" - 22'	Light brown grey fine grain sand. Slightly micaceous and with pockets of greyish silty clay. Soft and wet.	20'-21' 21'-22'	" "	10 20?
22'0"- 26'0"	Greyish to greyish-brown fine grain sand, with pockets of greyish silty clay. Accumulation of black biotite and dark charcoal matter irregularly. Soft and wet.	22'-23' 23'-24' 24'-26'	" " slush	- - -
26'0" - 30'	Light brown-grey to grey-brown fairly fine grain sand, slightly micaceous and somewhat clayey in part. Soft and wet.	26'-30'	"	-
30' - 35'0"	Light brownish to light greyish brown fine to medium grain sand with few grit and mica fragments.	30'-35'	"	-

END OF HOLE 35'
WATER CUT 20'
WATER LEVEL 10'
BLANKET THICKNESS 19'6"

C 11800'
Serial No 880/51
DM 765/60

PERCUSSION DRILL LOG - C 11800

PROJECT: CHOWILLA DAMSITE RIVER MURRAY County Hamley
LOCATION: Line "C" 400' downstream from DamSite Axis
Horizontal Distance East ofDatum 11,800'
PURPOSE: Test of subsurface Foundation Conditions Geological Hole
PLANT NO 24 DRILLER W. HENDERSON
R.L. SURFACE 170.21' DEPTH 30'
DATE COMMENCED 17.3.61 DATE COMPLETED 20.3.61
BORE LOGGED R.D. STEEL DATE 24.3.61

Depth		Description	Depth	Type of Sample	Blow p/ft.
0'	3'0"	Light grey to light brown grey fine sandy clay, becoming clayey fine sand in part. Compact and fairly friable. Few grit fragments and plant remnants. Very stiff from 2'0".	0'-1' 1'-2' 2'-3'	open tube "	20 19 12
3'0"-	5'0"	Light grey to light brown-grey silty to very silty clay, becoming almost clayey silt in part. Very stiff and compact. Few grit plant and charcoal fragments.	3'-4' 4'-5'	" "	12 9
5'0" -	8'0"	Light grey, light brown-grey and slight yellow mottled clayey silt, with few pockets of greenish-grey to bluish-grey silty clay near top. Very compact and slightly friable. Some pockets of dark iron oxide.	5'-6' 6'-7' 7'-8'	" " "	18 29 13
8'0"-	10'0"	Light grey to slight yellowgrey fine silty sand to sandy silt, Some prominent dark brown and dark yellow-brown mottling. Few large pockets of dark iron oxide.	8'-9' 9'-10'	" "	24 19
10'0"-	16'0"	Bluish grey to greenish-grey clayey silt to fine sandy silt irregularly. Prominent yellow-brown and greenish-brown mottling. Slightly micaceous. Firm and moist. Few pockets of fine silty sand,	10'-11' 11'-12' 12'-13' 13'-14 14'-15' 15'-16' 16'-17' 17'-18'	" " " " " " " "	20 20 5 6 7 7 - -
18'0"-	19'0"	Greyish fine silty sand, slightly clayey.	18'-19'	"	6
19'0" -	20'0"	Light grey to light blue-grey green-brown dark brown and yellow-brown mottled slightly clayey to fine sandy silt generally but becoming fine silty sand in pockets. Slightly micaceous. Soft and very moist.	19'-20'	"	7
20'0"-	22'0"	Greyish to light greyish slightly clayey fine silty sand, becoming very silty clay in small pockets. Slightly micaceous	20'-21' 21'-30'	" "	7 no record

Depth	Description	Depth	Type of Sample	Blows p/ft,
22'0" - 27'0"	Light greyish to light brownish grey fine silty sand, slightly micaceous and slightly clayey in part.	21'-30'	open tube	not recorde
27'0" - 30'0"	Light brown-grey to light grey brown fine grain sand. Slightly micaceous			

END OF HOLE 30'
WATER CUT 10'
WATER LEVEL 5'
BLANKET THICKNESS 22'

C11985
Serial No. 879/61
D.M. 765/60

PERCUSSION DRILL LOG C 11985

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY. Cnty. Hamley.
Location: LINE "C" 400' downstream from Dam Site Axis.
Horizontal Distance East of Datum: 11,985
Purpose: Test of Subsurface Foundation Conditions
Geological Hole.

Plant No: 24 — Driller: W. Henderson
R.L. Surface: 172.27' — Depth: 30'
Date Commenced: 17.3.61 — Date Completed: 17.3.61
Bore Logged: R.D. Steel — Date 24.3.61

Depth	Description	Depth	Type of Sample.	Blows p/ft.
0 - 2'0"	Light greyish to light grey-brown fine silty to sandy clay, becoming clayey fine sand in small pockets. Very compact and slightly friable. Few grit fragments, plant remnants and dark iron oxide blobs.	0-1 1-2	open tube	26 20
2'0" - 5'6"	Light grey, light brown-grey and yellow-brown mottled very silty clay. Very stiff and compact. Few grit fragments, mica flecks etc. and dark organic pockets.	2-3 3-4 4-5 5-6	" " " "	16 7 6 6
5'6" - 7'0"	Light grey, pale grey, dark brown and yellow brown mottled clayey silt. Very compact and slightly friable. Few grit fragments, mica flecks etc.	6-7	"	6
7'0" - 9'0"	Light grey, light grey-brown and yellow-brown clayey to finely sandy silt. Numerous small grit fragments and some dark organic pockets	7-8 8-9	" "	4 5
9'0" - 14'0"	Light grey, light brown and slight yellowish-brown clayey silt, becoming very silty clay in part. Very firm. Few mica flecks. Pockets of bluish-grey very silty clay.	9-10' 10-11' 11-12' 12-13' 13'-14'	" " " " "	5 5 20 15 10
14' - 17'	Light grey-brown and light grey ish fine silty sand. Slightly clayey and with few grit fragments, mica flecks etc.	14-15 15-16 16-17'	" "	- - -
17' - 18'	Bluish grey silty clay with some dark brown and dark yellow-brown clayey silt. Firm and moist.	17'-18'	"	10
18'- 25'	Greyish to bluish-grey firm and moist silty clay. Few small plant remnants etc. and lumps of dark grey charcoal.	18-19 19-20 20-21	" " "	12 12 12
25' - 27'	Light grey fine silty sand. Few mica flecks and grit fragments.	21-22' 22-23'	"	10 8

C11985

Depth			Description	Depth	Type of Sample	Blows p/foot
27'	-	28'	Light grey to light grey brown fine silty sand, with few small pockets of bluish-grey silty clay. Slightly micaceous.	23-24' 24-25' 25-30'	" " "	8 8 not recorded.
28'	-	30'	Light grey brown to light grey fine silty sand, with few grit fragments and mica flecks			

END OF HOLE 30'
WATER CUT 12'
WATER LEVEL 6'
BLANKET THICKNESS 25'

C + 300, 14700
Serial No. 913/61
D.M. 765/60.

PERCUSSION DRILL LOG C + 300, 14700

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY. Hd. Murtho
LOCATION: 100' downstream from Dam Site Axis
Horizontal Distance East of Datum, 14,700'
Observation hole for No. 6 Field Permeability Test at C+300, 14800

PLANT NO.: 24
R.L. SURFACE: 172.53'
DATE COMMENCED: 6/4/61
BORE LOGGED: R.D. Steel

DRILLER: W. Henderson
DEPTH: 20'
DATE COMPLETED: 6/4/61
DATE: 19/4/61

Depth	Description	Depth	Type of Sample	Blo p/ft
0'0" - 1'0"	Greyish to greyish-brown fine sandy clay, becoming clayey fine sand in part. Vague yellow ochreous mottling. Compact and somewhat friable.	0-1'	Open Tube	12
1'0" - 3'0"	Dark grey-brown silty to finely sandy clay, with pockets of bluish-grey to yellow mottled clayey silt or fine sand. Generally stiff and very compact.	1'-2'	"	12
		2-3'	"	9
3'0" - 4'0"	Offwhite fine to medium grain sand, but with pockets of greyish-brown clayey sand.	3-4'	"	10
4'0" - 5'0"	Light grey to light grey-brown clayey silt to clayey fine sand, with some yellowish and blue-grey mottling. Very compact, but generally somewhat friable. Few plant remains, mica flecks etc.	4'-5'	"	9
5'0" - 6'0"	Pale grey to pale grey-brown and yellowish mottled slightly clayey silt. Very compact, slightly friable and micaceous.	5'-6'	"	10
6'0" - 9'0"	Light grey to light bluish-grey slightly clayey fine sand, with light and dark yellow-brown mottling. Compact and fairly friable. Some pockets of iron oxide staining.	6'-7'	"	10
		7'-8'	"	20
		8'-9'	Slush	-
9'0" - 12'	Light brownish medium grain sand, but with few coarser grit fragments.	9'-12'	"	-
12' - 13'	Dark brown medium to slightly coarser grain sand, with some lighter brown and yellow-brown mottling.	12'-13'	"	-
13' - 14'	Light yellow-brown to brown medium grain sand, with patches of lighter, clayey fine sand. Few grit fragments etc.	13'-14'	"	-
14' - 17'	Light brown to light grey-brown generally medium grain sand, slightly coarser in part. Some pockets of greyish-brown slight-	14'-17'	"	-

Depth	Description	Depth	Type of Sample	Blow p/ft
14' - 17' (Contd.)	ly clayey fine sand. Few grit fragments etc.			
17' - 20'	Dark yellow-brown, medium to some- what coarse grain sand, with some fine interstitial fraction. Pockets of light grey-brown slight- ly clayey fine sand.	17'-20'	Slush	-

END OF HOLE	20'
WATER CUT	9'
WATER LEVEL	5.20'
BLANKET THICKNESS	3'0"

C+300, 14759
Serial No. 912/61
D.M. 765/60

PERCUSSION DRILL LOG C+300, 14750

PROJECT: CHOWILLA DAMSITE: RIVER MURRAY, Hd. Murtho.
LOCATION: 100' downstream from Dam Site Axis.
Horizontal Distance East of Datum: 14,750'
PURPOSE: Observation hole for No. 6 Field Permeability Test at C+300, 14800

PLANT NO.: 24
R.L. SURFACE: 173.52'
DATE COMMENCED: 6/4/61
BORE LOGGED: R.D. Steel

DRILLER: W. Henderson
DEPTH: 20'
DATE COMPLETED: 6/4/61
DATE: 19/4/61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0" - 1'0"	Greyish to slight bluish-grey sandy clay, with vague yellow mottling. Very compact. Few grit, wood and plant remains	0-1'	Open Tube	20
1'0" - 1'10"	Mid-grey silty clay, with vague yellow-grey mottling. Very stiff and compact. Few grit fragments, plant remnants, charcoal pockets and small ochre nodules.	1-2'	"	30
1'10" - 3'0"	Greenish to light grey-brown and vague yellow mottled, clayey silt to clayey fine sand. Very compact, slightly friable. Few small lime patches, plant remmants and charcoal pockets.	2-3'	"	19
3'0" - 4'0"	Light grey to light greyish-brown and yellow mottled, clayey fine sand. Very compact, slightly friable. Few small grit fragments, iron oxide nodules etc.	3-4'	"	16
4'0" - 7'0"	Offwhite very fine silty sand. Friable and slightly micaceous	4-7'	"	Not recorded
7'0" - 10'0"	Greenish-grey, light brown and yellowish-brown mottled clayey silt to fine sand, but with pockets of light brown medium grain sand. Slightly micaceous	7-10'	"	"
10'0" - 15'0"	Generally light brown to light grey-brown medium grain sand, becoming slightly clayey in pockets.	10-15'	Slush	-
15'0" - 17'	Greyish-brown generally fairly fine grain sand. Slightly micaceous and clayey in part. Few grit fragments etc.	15-17'	"	-
17' - 20'	Generally light brown to light yellow-brown medium grain sand, becoming light greenish-brown and clayey in pockets. Few mica flecks etc.	17-20'	"	-

END OF HOLE 20' WATER CUT 10' WATER LEVEL 6.28'
BLANKET THICKNESS 3'0".

C + 300, 14775
Serial No. 911/61
D.M. 765/60

PERCUSSION DRILL LOG C+300, 14775

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY. Hd. Murtho
LOCATION: 100 feet downstream from Dam Site Axis.
Horizontal Distance East of Datum: 14,775'
Observation hole for No. 6 Field Permeability Test at C+300, 14,800

PLANT NO.: 24
R.L. SURFACE: 173.70
DATE COMMENCED: 5/4/61
BORE LOGGED: R.D. Steel

DRILLER: W. Henderson
DEPTH: 20'
DATE COMPLETED: 5/4/61
DATE: 19/4/61

Depth	Description	Depth	Type of Sample	Blow p/ft
0'0" - 1'6"	Greyish to slight bluish-grey sandy clay, with vague yellowish mottling. Very compact. Few grit, wood, plant and charcoal fragments.	0-1'	Open tube	22
1'6" - 2'0"	Greyish to yellow-grey very silty to sandy clay, becoming clayey silt in part. Few grit fragments, iron oxide pockets and charcoal lumps.	1-2'	"	9
2'0" - 3'0"	Pale yellow-grey clayey silt to clayey fine sand, with some light and dark yellow mottling. Few pockets of iron oxide stains. Very compact and slightly friable.	2-3'	"	4
3'0" - 4'0"	Offwhite very fine silty sand, slightly clayey in part. Friable. Scattered mica flecks, etc.	3-4'	"	-
4'0" - 8'0"	Light to pale brown very fine silty sand, with some darker yellow-brown mottling in part. Friable.	4-5' 5-8'	" Slush	- -
8'0" - 11'	Light grey to light brown slightly clayey silt to fine sand. Slightly micaceous. Some light and dark yellow-brown mottling. Pockets coarser grain sand intermittently.	8-11'	"	-
11' - 15'	Light greyish to light brown and yellowish-brown fine silty sand, with pockets of fairly coarse sand increasing with depth. Few pockets of bluish-grey silty clay.	11-15'	"	-
15' - 18'	Light brown to light yellow-brown generally medium to fairly coarse sand, but with some finer interstitial fraction. Numerous grit fragments.	15-18'	"	-
18' - 19'	Light greyish to light brown and yellowish-brown fine silty sand, with some pockets of fairly coarse sand. Few pockets of bluish-grey	18-19'	"	-

Depth	Description	Depth	Type of Sample	Blow p/ft
19' - 20'	Light brown to yellow-brown fairly fine grain sand, with some pockets of coarse sand. Scattered grit fragments etc.	19-20'	Slush	

END OF HOLE 20'
WATER CUT 8'
WATER LEVEL 6.46'
BLANKET THICKNESS 3'0"

C+200, 14800
Serial No. 910/61
D.M. 765/60

PERCUSSION DRILL LOG C+200, 14800

PROJECT: CHOWILLA DAMSITE: RIVER MURRAY. Hd. Murtho.
LOCATION: 200' downstream from Dam Site Axis, Horizontal Distance East of Datum: 14,800'.
PURPOSE: Observation Hole for No. 6 Field Permeability Test at C+300, 14800

PLANT NO.: 20
R.L. SURFACE: 173.82'
DATE COMMENCED: 5/4/61
BORE LOGGED: R.D. Steel

DRILLER: W. Henderson
DEPTH: 20'
DATE COMPLETED: 5/4/61
DATE: 20/4/61

Depth	Description	Depth	Type of Sample	Blow p/ft
0'0" - 1'0"	Grey-brown fine sandy clay, becoming clayey fine sand in pockets. Very compact, but somewhat friable in part. Few grit fragments, plant remains etc.	0-1'	Open Tube	40
1'0" - 2'0"	Mid-grey to bluish-grey very silty clay, with vague yellowish mottling. Very stiff and compact. Few grit fragments, plant remains etc.	1'-2'	"	19
2'0" - 4'6"	Light grey to light yellow-grey very clayey silt, with prominent yellow mottling. Becoming finely sandy at depth. Very compact, slightly friable and micaceous.	2'-3' 3'-4'	" "	9 12
4'6" - 6'0"	Light grey to yellow-grey, slightly clayey to finely sandy silt, with prominent yellow mottling. Compact and somewhat friable. Numerous dark iron oxide pockets.	4'-5' 5'-6'	" "	16 13
6'0" - 8'0"	Generally light brown silty fine sand, with some darker mottling. Becoming light grey to offwhite in patches.	6'-8'	"	-
8'0" - 9'0"	Light brown medium grain sand, becoming light grey clayey fine sand in pockets.	8'-9'	"	-
9'0" - 10'0"	Light grey to light brown fine silty sand, with some darker brown mottling.	9'-10'	"	-
10'0" - 11'0"	Brownish generally medium grained sand, becoming mid-grey and clayey in pockets.	10'-11'	"	-
11'0" - 16'0"	Light brown medium to somewhat coarser grain sand, with some light grey and yellow-brown mottling. Numerous grit fragments.	11'-16'	Slush	-
16'0" - 17'	Light grey-brown fairly coarse sand, with some finer fraction and numerous grit fragments.	16'-17'	"	-

Depth	Description	Depth	Type of Sample	Blow p/ft
17' - 20'	Dark yellow-brown medium grain sand, with abundant light grey-brown to off-white and somewhat finer grained pockets in part.	17'-20'	Slush	-

END OF HOLE 20'
WATER CUT 8'
WATER LEVEL 6.62'
BLANKET THICKNESS 6'

C+250, 14800
Serial No. 909/61
D.M. 765/60

PERCUSSION DRILL LOG C+250, 14800

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY. Hd. Murtho
LOCATION: 150' downstream from Dam Site Axis.
Horizontal distance East of Datum: 14,800'.
PURPOSE: Observation hole for No. 6 Field Permeability Test at C+300, 14800

PLANT NO.: 24
R.L. SURFACE: 173.99'
DATE COMMENCED: 4/4/61
BORE LOGGED: R.D. Steel

DRILLER: W. Henderson
DEPTH: 20'
DATE COMPLETED: 4/4/61
DATE: 21/4/61

Depth	Description	Depth	Type of Sample	Blow p/ft
0'0" - 2'10"	Grey to slight bluish-grey silty to finely sandy clay, with some vague yellow-brown mottling. Very compact, but somewhat friable clayey sand in part. Some grit fragments, plant remains etc.	0-1' 1'-2' 2'-3'	Open Tube " "	20 20 11
2'10" - 6'0"	Greyish to slight greenish-grey and yellow mottled clayey silt. Very compact, slightly friable and micaceous.	3'-4' 4'-5' 5'-6'	" " "	10 9 10
6'0" - 8'0"	Grey to greenish-grey clayey silt to fine sandy silt, with prominent light and dark yellow mottling.	6'-7' 7'-8'	" "	8 No recorded
8'0" - 10'0"	Light brown medium grain sand, becoming bluish-grey clayey fine sand in pockets.	8'-10'	"	"
10'0" - 13'0"	Light brown generally medium grain sand. Slightly clayey and micaceous in part.	10'-13'	"	-
13'0" - 17'0"	Light brown fine to medium grain sand, becoming light grey silty fine sand in part.	13'-17'	Slush	-
17'0" - 20'	Light brown medium grain sand, becoming bluish-grey and slightly clayey in part.	17'-20'	"	-

END OF HOLE 20'
WATER CUT 12'
WATER LEVEL 6.75'
BLANKET THICKNESS 8'

C+275' 14800
Serial No. 895/61
D.M. 765/60

PERCUSSION DRILL LOG C+275. 14800

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY. Hd. Murtho
LOCATION: 125' downstream from Damsite Axis.
Horizontal Distance East of Datum: 14,800'
PURPOSE: Observation Hole for No. 6 Field Permeability Test at C+300 14800.

PLANT NO.: 24
R.L. SURFACE: 173.92'
DATE COMMENCED: 27/3/61
BORE LOGGED: R.D. Steel

DRILLER: W. Henderson
DEPTH: 20'
DATE COMPLETED: 4/4/6
DATE: 21/4/6

Depth	Description	Depth	Type of Sample	Blow p/f
0'0" - 2'10"	Grey to slight bluish-grey silty to finely sandy clay, with some vague yellow-brown mottling. Very compact. Becoming somewhat friable clayey sand in part. Few grit fragments, plant remains etc.	0-1' 1'-2' 2'-3'	Open Tube " "	12 14 10
2'10" - 5'0"	Greyish to slight greenish-grey and yellow mottled clayey silt. Very compact, slightly friable and micaceous.	3'-4' 4'-5'	" "	6 5
5'0" - 6'6"	Light grey to slight green-grey clayey to finely sandy silt, with some light and dark yellow-brown mottling. Slightly micaceous and becoming fine sandy silt in part. Compact, but slightly friable.	5'-6' 6'-7'	" "	9 10
6'6" - 9'0"	Light greenish-grey and light yellow-brown fine sandy silt, becoming fine silty sand at depth. Compact, but somewhat friable. Numerous small iron oxide flecks.	7'-8' 8'-9'	" "	14 14
9'0" - 11'0"	Light brown fine to medium grain sand, with pockets of light grey clayey fine sand. Slightly micaceous.	9'-10'" 10'-11'"		24 20
11'0" - 14'0"	Light brown medium grain sand, becoming light grey to light grey-brown fine sand in part.	11'-14'"		Not recorded
14'0" - 17'6"	Light brown medium to slightly coarser grain sand, with few grit fragments.	14'-17'	Slush	-
17'6" - 20'	Dark yellow-brown and off-white coarsely mottled, medium to fairly coarse grain sand, but with prominent fine-fraction interstitially.	17'-20'	"	-

END OF HOLE 20'
WATER CUT 14'
WATER LEVEL 6.70'
BLANKET THICKNESS 6'6"

C + 300,14800
Serial No. 898/61
D.M. 765/60

PERCUSSION DRILL LOG C + 300, 14800

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, Hd. Murtho
LOCATION: 100' downstream from Dam Site Axis.
Horizontal Distance East of Datum: 14,800'
PURPOSE: Pump Hole for No. 6 Field Permeability Test.
PLANT NO.: 40 DRILLER: W. Farrow
R.L. SURFACE: 173.39 DEPTH: 134'
DATE COMMENCED: 4/4/61 DATE COMPLETED: 7/4/61
BORE LOGGED: R.D. Steel DATE: 13/6/61

Depth	Description	Depth	Type of Sample	Blow p/ft
0 - 2'0"	Greyish to greyish-brown sandy clay, becoming clayey fine sand in part. Compact, fairly friable. Few grit fragments, plant remains etc.	0-1' 1'-2'	Open Tube	17 9
2'0" - 4'0"	Light grey, pale grey and grey-brown mottled slightly clayey to finely sandy silt. Compact, fairly friable. Few grit fragments, mica flecks etc. Becoming fine silty sand from 3'2"	2-3' 3'-4'	" "	11 13
4'0" - 10'	Light brownish, fairly fine grained sand, with few grit fragments and mica flecks.	4-10'	Slush	-
10' - 12'	Light brownish to light yellow-brown medium grained sand, with some coarser sand and grit fragments.	10'-12'	"	-
12' - 18'	Light brownish to pale brown medium grained sand, with fairly numerous coarser sand and grit fragments.	12'-18'	"	-
18' - 22'	Light yellow-brown, fairly fine grained sand, with few grit fragments and mica flecks.	18'-22'	"	-
22' - 34'	Pale brownish medium grained sand, with few coarser sand and grit fragments.	22'-34'	"	-
34' - 42'	Light greyish-brown medium grained sand, with fairly numerous coarser sand and grit fragments.	34'-42'	"	-
42' - 58'	Light grey fine grained sand, slightly micaceous, with few grit fragments. May be slightly clayey in parts.	42'-58'	"	-
58' - 72'	Light greyish to light brownish-grey fine grained sand, slightly micaceous and with frequent coarse milky quartz grit fragments.	58'-72'	"	-
72' - 86'	Greyish-brown slightly clayey fine sand, with few mica flecks and milky quartz grit fragments.	72'-86'	"	-
86' - 110'	Greyish-brown fine silty sand, with few mica flecks and milky quartz grit fragments.	86'-110'	"	-

Depth	Description	Depth	Type of Sample	Blows p/ft.
110' - 128'	Greyish-brown fine silty sand. Bluish-grey and slightly clayey in parts. Few small mica flecks and odd grit fragments.	110-128'	Slush	-
128' - 134'	Greyish-brown fine silty sand, with discrete pockets of bluish-grey silty clay.	128-134'	"	-

END OF HOLE 134'
WATER CUT 6'6"
WATER LEVEL 6.15'
BLANKET THICKNESS 4'

C + 325, 14800
Bore Serial No. 903/61
D.M. 765/60

PERCUSSION DRILL LOG C+325, 14,800

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY. Hd. Murtho
LOCATION: 75' downstream from Dam Site Axis.
Horizontal Distance East of Datum: 14,800'.
PURPOSE: Observation Hole for No. 6 Field Permeability Test at C+300 14,800.

PLANT NO.: 20
R.L. SURFACE: 173.53'
DATE COMMENCED: 5/4/61
BORE LOGGED: R.D. Steel

DRILLER: J. Doecke
DEPTH: 20'
DATE COMPLETED: 5/4/61
DATE: 20/4/61

Depth	Description	Depth	Type of Sample	Blows p/ft
0'0" - 1'1"	Greyish to slight bluish silty to finely sandy clay. Very stiff and compact. Few plant remains.	0-1' 1-2'	Open Tube	12 8
1'1" - 2'6"	Light grey to light yellow-grey clayey silt, with some darker yellow-brown mottling. Very compact, slightly friable. Few grit fragments, organic blobs, mica flecks.			
2'6" - 5'0"	Light grey to light yellow-grey, slightly clayey to fine sandy silt, with some yellow-brown mottling. Few grit fragments etc.	2-3' 3-4' 4-5'	" " "	9 10 14
5'0" - 10'0"	Light grey to light yellow-grey and light brownish fine sandy silt, becoming silty fine sand at depth. Compact and somewhat friable.	5-6' 6-7' 7-8' 8-11'	" " " "	12 15 18 Not recorded
10'0" - 11'0"	Light brown generally medium grain sand, with pockets of light grey slightly clayey fine sand.			
11'0" - 12'0"	Light greyish-brown generally very fine sand, slightly clayey in part.	11-12'	"	"
12'0" - 14'0"	Light brown medium grain sand, with pockets of light bluish-grey clayey fine sand.	12-14'	"	"
14'0" - 16'0"	Light brownish fine to medium sand, with some dark brown and dark grey-brown mottling. Scattered grit fragments and mica flecks.	14-16'	"	"
16'0" - 20'	Dark yellow-brown medium to somewhat coarser grain sand, with pockets of light greyish slightly clayey fine sand.	16-20'	Slush	-

END OF HOLE 20'
WATER CUT 8'
WATER LEVEL 6.29'
BLANKET THICKNESS 2'6".

C+350, 14800
Serial No. 904/61
D.M. 765/60

PERCUSSION DRILL LOG C+350, 14800

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY Hd. Murtho
LOCATION: 50' downstream from Dam Site Axis.
Horizontal distance East of Datum: 14,800'
PURPOSE: Observation hole for No. 6 Field Permeability Test at C+300, 14,800

PLANT NO.: 20
R.L. SURFACE: 173.62'
DATE COMMENCED: 6/4/61
BORE LOGGED: R. D. Steel

DRILLER: J. Doecke
DEPTH: 20'
DATE COMPLETED: 6/4/61
DATE: 20/4/61

Depth	Description	Depth	Type of Sample	Bl p/
0'0" - 1'3"	Greyish to slight bluish, silty to finely sandy clay, with few plant remains. Very stiff and compact.	0-1'	Open Tube	1
1'3" - 2'0"	Mid-grey to slight blue-grey silty clay, with vague yellow mottling. Very stiff and compact. Some grit fragments, plant remains, organic matter etc.	1-2'	"	1
2'0" - 2'9"	Grey to slight greenish-grey very silty clay, with light brown and yellow mottling. Very stiff and compact. Few grit fragments, charcoal pockets, etc.	2-3'	"	6
2'9" - 4'0"	Light grey to slight greenish-grey clayey silt, with some light yellow-brown mottling. Very compact, somewhat friable.	3-4'	"	1
4'0" - 5'6"	Light grey to slight greenish-grey slightly clayey to finely sandy silt, with some light and dark yellow-brown mottling. Compact, friable.	4-5'	"	1
5'6" - 8'0"	Light grey to slight bluish-grey fine sandy silt, with irregular brown and yellow mottling. Numerous iron oxide nodules and mica flecks.	5-6' 6-7' 7-8'	" " "	2 2
8'0" - 9'0"	Pale brown fairly fine grain sand.	8-9'	"	No reco
9'0" - 10'0"	Light brown fairly fine grain sand, with few pockets of light grey-brown slightly clayey fine sand.	9-10'	"	"
10'0" - 11'0"	Light brown medium grain sand, with pockets of light blue-grey slightly clayey fine sand.	10-11'	"	"
11'0" - 13'0"	Light brown to light grey-brown fairly fine grain sand. Slightly clayey in part.	11-13'	Slush	-
13'0" - 15'	Light brown medium grain sand, with some dark brown and dark grey-brown mottling. Slightly clayey in part.	13-15'	"	-

Depth	Description	Depth	Type of Sample	Blows p/ft.
15' - 17'	Offwhite medium to fairly coarse grain sand, with some finer fraction. Becoming dark yellow-brown and finer grained in irregular patches.	15-17'	Slush	-
17' - 20'	Yellow-brown medium grain sand, but with numerous coarse grit fragments. Becoming light grey to light yellow-grey clayey fine sand in part.	17-20'	"	-

END OF HOLE 20'
WATER CUT 8'
WATER LEVEL 6.45'
BLANKET THICKNESS 4'0"

Perm. at C + 300
14,800

C+300, 14825
Serial No. 902/61
D.M. 765/60

PERCUSSION DRILL LOG C+300, 14825

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY. Hd. Murtho.
LOCATION: 100' downstream from Dam Site Axis.
Horizontal distance East of Datum: 14,825'
PURPOSE: Observation Hole for No. 6 Field Permeability Test at C+300, 14800.

PLANT NO.: 20
R.L. SURFACE: 173.80'
DATE COMMENCED: 5/4/61
BORE LOGGED: R.D. Steel

DRILLER: J. Doecke
DEPTH: 20'
DATE COMPLETED: 5/4/61
DATE: 20/4/61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0" - 1'6"	Greyish to slight bluish silty to fine sandy clay. Very stiff and compact. Few plant remains etc.	0-1'	Open Tube	1[illegible]
1'6" - 2'0"	Mid-grey to slight blue-grey silty clay, with vague yellow mottling. Very stiff and compact. Few plant, grit and organic fragments.	1-2'	"	1[illegible]
2'0" - 3'4"	Light grey to slight yellow-grey clayey silt, with some light and dark yellow mottling. Compact and slightly friable.	2-3'	"	1[illegible]
3'4" - 5'0"	Light grey to slight yellow-grey clayey to slightly sandy silt, with some light and dark yellow mottling.	3-4' 4-5'	" "	10 1[illegible]
5'0" - 7'0"	Light grey, off-white and light grey-brown mottled fine silty sand, becoming darker brown and somewhat clayey in pockets.	5-6' 6-7'	" "	1[illegible] 2[illegible]
7'0" - 11'0"	Light brown and slight greyish clayey to silty fine sand, with some darker brown and yellow mottling. Somewhat more clayey in pockets.	7-8' 8-11'	"	Not recorded
11'0" - 12'0"	Light brown fine silty sand, with some darker brown and offwhite mottling. Slightly clayey in part.	11-12'	Slush	-
12'0" - 14'	Yellow-brown medium grain sand, becoming light grey and somewhat clayey in part.	12-14'	"	-
14' - 17'	Light brown to yellow-brown generally very fine grain sand, with scattered grit fragments. Becoming darker yellow-brown and coarser grain in part.	14-17'	"	-
17' - 20'	Brown to grey-brown generally medium grain sand, becoming light grey-brown slightly clayey fine sand in irregular patches.	17-20'	"	-

END OF HOLE 20'
WATER CUT 12'
WATER LEVEL 6.55'
BLANKET THICKNESS 5'

C + 300, 14,850
Serial No. 901/61
D.M. 765/60

PERCUSSION DRILL LOG C+300 14,850'

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, Hd. Murtho.
LOCATION: 100' downstream from Dam Site Axis
Horizontal Distance East of Datum: 14,850'
PURPOSE: Observation hole for No. 6 Permeability Test at C+300 14800

PLANT NO.: 20 — DRILLER: J. Doecke
R.L. SURFACE: 173.06' — DEPTH: 20'
DATE COMMENCED: 4/4/61 — DATE COMPLETED: 4/4/61
BORE LOGGED: R.D. Steel — DATE: 20/4/61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0" - 2'0"	Grey to light grey very silty to sandy clay, with yellow mottling. Very compact, slightly friable. Few grit fragments and plant remains.	0-1'	Open Tube	11
		1'-2'	"	10
2'0" - 6'0"	Light grey to light brown-grey clayey silt, with some light and dark brown and yellow mottling. Very compact, slightly friable. Few mica flecks, organic blobs. Becoming clayey to finely sandy silt from 4'0".	2-3'	"	10
		3-4'	"	8
		4-5'	"	10
		5-6'	"	11
6'0" - 7'0"	Light grey-brown, yellow-brown and bluish-grey mottled clayey sand. Compact and somewhat friable. Some grit fragments, mica flecks and organic blobs.	6-7'	"	10
7'0" - 8'0"	Light bluish-grey, brown and dark yellow-brown mottled slightly clayey to finely sandy silt. Compact and slightly friable. Slightly micaceous and with some small organic blobs.	7-8'	"	23
8'0" - 10'0"	Light grey, light brown and dark brown mottled fine silty sand. Slightly micaceous. Some pockets of light brown medium grain sand from 9'0"	8-9'	"	14
		9-10'	"	17
10'0" - 15'0"	Light brown medium grain sand, with some slightly darker brownish mottling. Becoming bluish-grey clayey fine sand in irregular pockets.	10-11'	"	21
		11'-15'	"	Not recorded
15'0" - 20'	Light brown, light grey-brown fine silty sand, with scattered grit fragments. Becoming medium to slightly coarser grain sand in irregular patches.	15'-20'	Slush	-

END OF HOLE 20'
WATER CUT 8'
WATER LEVEL 5.80'
BLANKET THICKNESS 8'

C + 300, 14900
Serial No. 894/61
D.M. 765/60

PERCUSSION DRILL LOG C+300, 14900

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, Hd. Murtho.
LOCATION: 100' downstream from Dam Site Axis
Horizontal Distance East of Datum: 14,900'
PURPOSE: Observation hole for No. 6 Field Permeability Test at C+300, 14,800

PLANT NO.: 20 **DRILLER:** J. Doecke
R.L. SURFACE: 173.33' **DEPTH:** 20'
DATE COMMENCED: 4/4/61 **DATE COMPLETED:** 4/4/61
BORE LOGGED: R.D. Steel **DATE:** 20/4/61

Depth		Depth	Type of Sample	Blows p/ft.
0'0" - 1'10"	Grey-brown fine sandy clay, becoming clayey fine sand in pockets. Very compact and somewhat friable in part. Few grit fragments, plant remains etc.	0-1' 1-2'	Open tube	20 14
1'10" - 4'0"	Light yellow-grey very clayey silt, with some darker yellow mottling. Very compact, slightly friable.	2-3' 3-4'	" "	11 9
4'0" - 6'0"	Light grey, light and dark yellow-brown mottled, clayey to slightly sandy silt, but with some pockets of very silty clay. Very compact, slightly friable. Somewhat micaceous.	4-5' 5-6'	" "	5 6
6'0" - 8'0"	Light brown-grey to light bluish-grey clayey silt to fine sand, with some yellow and dark yellow-brown mottling. Very compact, slightly friable.	6-7' 7-8'	" "	7 10
8'0" - 12'0"	Light brown fine grain sand, with pockets of bluish-grey clayey fine sand.	8-9' 9-10'	" "	14 18
12'0" - 17'0"	Generally light brown fine to medium grain sand, with some darker brown mottling. Becoming bluish-grey to greenish-brown clayey silt to fine sand in pockets.	10-11' 11-12' 12-17'	" " "	21 31 Not recorded
17'0" - 18'0"	Brownish generally medium grain sand, but with few coarse grit fragments.	17-18'	Slush	-
18'0" - 20'	Light brown to light yellow-brown fine silty sand, with few grit fragments.	18-20'	"	-

END OF HOLE: 20'
WATER CUT: 7'
WATER LEVEL: 6.09'
BLANKET THICKNESS: 8'

C 17,350
Bore Serial No. 960/61
D.M. 765/60

PERCUSSION DRILL LOG C 17,350

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, Hd. Murtho.
LOCATION: LINE "C", 400' downstream of Dam Site Axis.
Horizontal Distance East of Datum: 17,350'
PURPOSE: Test of Subsurface Foundation Conditions: Geological Hole.

PLANT NO: 40 — DRILLER: W.F. Farrow
R.L. SURFACE: 171.76 — DEPTH: 15'
DATE COMMENCED: 1.5.61 — DATE COMPLETED: 1.5.61
BORE LOGGED: R.D. STEEL — DATE: 3.5.61

Depth	Description	Depth	Type of Sample	Blow p/ft
0'0"- 1'0"	Grey to grey-brown fine sandy clay, becoming clayey fine sand in pockets. Compact, granular and somewhat friable. Few grit fragments and plant remains.	0 - 1'	Open Tube	Not recorde
1'0"- 2'0"	Greyish to slight bluish-grey silty to very silty clay, with some plant remains. Fairly stiff.	1'- 2'	"	"
2'0"- 2'10"	Greyish to slight bluish-grey and vague yellow mottled silty clay, with few plant remains etc. Very firm, moist.	2'- 4'	"	"
2'10"-4'0"	Grey to slight bluish-grey and some yellowish-brown mottled silty clay. Firm and moist.			
4'0"- 6'10"	Light greyish to light blue-grey slightly silty clay. Firm and moist. Some brown and yellowish-brown mottling. Pockets of dark organic matter.	4'- 7'	"	"
6'10"-8'0"	Light greyish to light blue-grey clayey silt to clayey fine sand. Some brown and yellowish mottling. Compact, somewhat friable and slightly micaceous.	7'- 8'	"	"
8'0"-13'0"	Light brownish to light greyish-brown fine silty sand. Slightly micaceous. Some slight greenish and yellow-brown mottling. Becoming bluish-grey and clayey in numerous small pockets.	8'-13'	Slush	-
13'0"-15'0"	Light brownish to yellowish-brown medium grain sand. Slightly micaceous and with some bluish-grey clayey pockets.	13'-15'	Slush	-

END OF HOLE 15'

WATER CUT 5'

WATER LEVEL 4'

BLANKET THICKNESS 8'.

C 17,600
Bore Serial No.957/61
D.M. 765/60

PERCUSSION DRILL LOG C 17,600

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY. Hd. Murtho
LOCATION: LINE "C", 400' downstream from Dam Site Axis.
Horizontal Distance East of Datum: 17,600
PURPOSE: Test of Subsurface Foundation Conditions:
Geological Hole.

Plant No: 20 — Driller: W. O'FARRELL
R.L. Surface: 169.11 — Depth: 15'
Date Commenced: 2.5.61 — Date Completed: 2.5.61
Bore Logged: R.D. Steel — Date: 3.5. 61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0 - 2'0"	Light brownish medium grained sand, becoming light bluish-grey to darker grey and clayey in pockets.	0 - 1'	Open	5
		1'- 2'	Tube	3
2'0"-11'0"	Bluish-grey, soft moist, slightly silty clay, with vague greenish and brownish mottling. Few grit fragments and small plant remains.	2'- 3'	"	-
		3'- 4'	"	5
		4'- 5'	"	-
		5'- 6'	"	11
		6'- 7'	"	11
		7'- 8'	"	14
		8'- 9'	"	14
11'0"-15'0"	Light brownish medium grain sand, with few grit fragments and mica flecks. Unconsolidated. Greenish-brown and clayey in odd small pockets.	9'-15'	slush	-

END OF HOLE 15'

WATER CUT 10'

WATER LEVEL 2'1"

BLANKET THICKNESS 11'

C 17,800
Bore Serial No.920/61
D.M. 765/60

PERCUSSION DRILL LOG C 17,800

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY. Hd. Murtho
LOCATION: LINE "C" 400' downstream from Damsite Axis. Horizontal Distance East of Datum: 17,800'.
PURPOSE: Test of Subsurface Foundation Conditions: Geological Hole.

PLANT NO: 24 — DRILLER: W. Henderson
R.L. SURFACE: 191.77 — DEPTH: 40'
DATE COMMENCED: 10.4.61 — DATE COMPLETED: 10.4.61
BORE LOGGED: R.D. STEEL — DATE: 19.4.61

Depth	Description	Depth	Type of Sample	Blows p.ft.
0 - 1'0"	Light brown medium to fairly coarse rounded sand, with some grit fragments. Friable.	0 - 1'	Open Tube	9
1'0"- 5'0"	Chocolate-brown fairly coarse grain sand, but with some finer interstitial fraction and few coarse grit fragments. Compact, but friable.	1'- 2'	"	8
		2'- 3'	"	8
		3'- 4'	"	16
		4'- 5'	"	16
5'0"- 6'0"	Offwhite, salmon pink and light brown mottled, lime cemented sandstone. Very hard.	5'- 6'	"	18
6'0"- 9'0"	Light brown generally medium to fairly coarse rounded sand. Some slight reddish mottling. Some finer fraction, with grit fragments etc. Compact, but friable.	6'- 7'	"	11
		7'- 8'	"	16
		8'- 9'	"	11
9'0"-11'0"	Light brown to pale brown generally medium grain rounded sand, with some finer fraction and few grit fragments.	9'-10'	"	15
		10'-11'	"	30
11'0"-12'0"	Light brown to light red-brown generally fairly coarse grain sand, but with some finer sand and clay binding. Few limey pockets and nodules. Compact and somewhat friable.	11'-12'	"	53
		12'-13'	"	50
		13'-14'	"	29
		14'-15'	"	32
12'0"-19'0"	Light brown to orange-brown and slight reddish-brown fairly coarse sand, with fairly prominent fine sand and clay binding. Very compact and slightly friable. Odd small-lime pockets and nodules.	15'-16'	"	24
		16'-17'	"	30
		17'-18'	"	21
		18'-19'	"	21
19'0"-22'6"	Light brown to orange-brown and salmon-pink mottled, medium to slightly coarse grain sand, but with abundant fine sand and clay binding. Few grit fragments etc. Compact, and fairly friable.	19'-22'	slush	-
22'6"-27'0"	Offwhite to pale yellow-brown fairly coarse grain sand, but with some finer interstitial fraction. Few grit fragments. Compact and friable near top, becoming slightly friable lower.	22'6" - 27'	"	-

PERCUSSION DRILL LOG C 17,800. Continued

Depth	Description	Depth	Type of Sample	Blows p.ft
27'0"-30'0"	Offwhite to light brown and light yellow-brown very coarse subrounded grit, but with some finer sand fraction.	27'-30'	slush	-
30'0"-40'0"	Light brown, brown, grey-brown and yellowish-brown mottled subrounded, very coarse gritty sand, but with some finer interstitial sand or silt fraction. Abundant very coarse rounded milky quartz grit and small gravel fragments.	30'-40'	"	-

END OF HOLE 40'

WATER CUT -

WATER LEVEL -

BLANKET THICKNESS -

C 18,100
Serial No. 921/61
D.M. 765/60

PERCUSSION DRILL LOG C 18,100

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY. HD. MURTHO
LOCATION: LINE "C", 400' downstream from Dam Site Axis. Horizontal Distance East of Datum: 18,100'.
PURPOSE: Test of subsurface Foundation Conditions: Geological Hole.

PLANT NO: 24 — DRILLER: W. Henderson
R.L. SURFACE: 227.27' — DEPTH: 40'
DATE COMMENCED: 11.4.61 — DATE COMPLETED: 11.4.61
BORE LOGGED: R.D. Steel — DATE: 21.4.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0 - 4'0"	Reddish-brown fine sandy loam, with fairly numerous fine grit fragments. Generally compact, but fairly friable.	0 - 1'	Open Tube	11
		1'- 2'	"	16
		2'- 3'	"	16
		3'- 4'	"	16
4'0"- 7'0"	Reddish-brown generally fairly fine grain sand, but with numerous scattered coarse sand and grit fragments. Compact, but fairly friable.	4'- 5'	"	16
		5'- 6'	"	12
		6'- 7'	"	14
		7'- 8'	"	12
7'0"- 9'0"	Light yellow-brown generally medium grain rounded sand. Some fine salmon-pink mottling. Compact and fairly friable.	8'- 9'	"	12
9'0"-13'0"	Light yellow-brown medium to somewhat coarser grain sand, with some irregular salmon-pink and reddish mottling. Slight clay binding. Generally compact, but fairly friable.	9'-10'	"	12
		10'-11'	"	12
		11'-12'	"	14
		12'-13'	"	22
13'0"-15'0"	Offwhite fairly coarse rounded sand, with slight fine grain binding. Some prominent dark yellow-brown mottling.	13'-14'	"	16
		14'-15'	"	17
15'0"-18'0"	Offwhite medium to slightly coarser grain, subrounded sand, but with some finer clay and silt binding. Slight reddish mottling in part. Some grit fragments etc.	15'-16'	"	17
		16'-17'	"	19
		17'-18'	"	24
18'0"-19'0"	Offwhite fairly coarse subrounded sand, with some reddish patches of fine ochreous binding. Compact, friable.	18'-19'	"	24
19'0"-20'0"	Offwhite medium to coarse grain subrounded sand, but with some finer fraction, grit fragments etc. Compact, friable.	19'-20'	"	49
20'0"-21'0"	Light yellow medium to coarse subrounded sand, with some finer fraction. Some dark yellow mottling. Compact, friable.	20'-21'	"	50

PERCUSSION DRILL LOG C 18.100 Continued

Depth	Description	Depth	Type of Sample	Blo p/ft
21'0"-23'0"	Yellow to orange and orange-brown medium to fairly coarse sand, with few coarser grit fragments. Some fine interstitial fraction. Compact, friable.	21'-22'	Open Tube	50
		22'-23'	Tube	62
23'0"-25'0"	Light to dark salmon-pink and light brown mottled, generally medium grain (subrounded) sand. Some finer silt binding, coarse sand and grit fragments. Compact and friable.	23'-24'	"	31
		24'-25'	"	38
25'0"-26'0"	Yellow, yellow-brown and orange mottled, fine to medium grain sand, with few coarse grit fragments etc. Compact and friable.	25'-26'	"	46
26'0"-30'0"	Light brownish to light pinkish medium to slightly coarser grain subrounded sand, with fairly prominent fine clay or silt binding. Few grit fragments. Compact, friable.	26'-27'	"	5
		27'-28'	"	5
		28'-29'	"	52
		29'-30'	"	61
30'0"-32'0"	Brownish to reddish-brown, subrounded, medium to slightly coarser grain sand, fairly prominent clay or silt binding. Compact, friable.	30'-31'	"	5
		31'-32'	"	51
		32'-33'	"	3
32'0"-34'0"	Yellowish fairly coarse grain subrounded sand, with some reddish-brown mottling in part.	33'-34'	"	5
		34'-35'	"	5
34'0"-40'0"	Yellowish to light yellowish, medium grain subrounded sand, with some reddish mottling. Scattered grit fragments. Some finer fraction.	35'-36'	"	6
		36'-37'	"	49
		37'-38'	"	49
		38'-39'	"	3
		39'-40'	"	3

END OF HOLE 40'

WATER CUT -

WATER LEVEL -

BLANKET THICKNESS -

D 600
Serial No 810/61
D.M. 765/60

PERCUSSION DRILL LOG D 600

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY Cnty Hamley
LOCATION Axial Line of Dam : Line "D"
Horizontal Distance East of Datum 600'
PURPOSE: Test if Subsurface foundation conditions:
Geological Hole

PLANT: 40 DRILLER: W. FARROW
R.L. SURFACE 197.66 DEPTH 80'
DATE COMMENCED 3.2.61 DATE COMPLETED 8.2.61
BORE LOGGED R.D. STEEL DATE 9.2.61

DEPTH	DESCRIPTION	Depth	Type of Sample	Blow p/ft
0 - 1'0"	Light red-brown fine sandy loam with few grit fragments and plant remnants. Friable.	0-1'	open tube	50
1' - 2'	Brownish to light red-brown fine clayey sand to sandy cla y. Compact and fairly friable. Few grit fragments, slightly limey in part.	1-2'	"	30
2' - 5'	Light brown to light red-brown clayey sand, becoming off-white and limey in irregular patches. Some small lime nodules. Compact, slightly friable.	2'-3'	"	35
		3'-4'	"	40
		4'-5'	"	33
5' - 6'	Red-brown clayey sand, with numerous scattered grit fragments. Slightly limey in small pockets, Compact and somewhat friable.	5'-6'	"	27
6' - 8'	Red-brown fine to medium grain sand with some clay binding. Numerous coarse grit fragments and odd small lime nodules.	6'-7'	"	20
		7'-8'	"	20
		8'-9'	"	23
		9'-10'	"	30
8' - 15'	Red-brown and slight reddish clayey fine sand. Compact and slightly friable. Isolated lime pockets and grit fragments.	10'-11'"		29
		11'-12'"		27
		12'-13'	"	24
		13'-14'	"	24
15' - 17'	Reddish to red-brown clayey sand with occasional whitish lime nodules and scattered grit fragments. Very compact, slightly friable.	14'-15'	"	23
		15'-16'	"	22
		16'-17'	"	20
17' - 21'6"	Reddish to reddish-brown clayey sand with scattered grit fragments. Small patches of light grey mottling. Very compact and slightly friable.	17'-18'	"	26
		18'-19'	"	38
		19'-20'	"	34
		20'-21'	"	26
21'6"- 22'	Red to red-brown silty clay, with pockets of red-brown clayey sand. Very stiff.	21'-22'	"	29
22' - 24'	Red to reddish-brown clayey sand with light grey mottling. Some grit fragments. Very compact, slightly friable.	22'-23'	"	40
		23'-24'	"	43

DPETH	DESCRIPTION	Depth	Type of Sample	Blows p/foo
24' - 27'9"	Reddish-brown, brownish and light grey mottled fine clayey sand. Compact and somewhat friable.	24'-25'	open	46
		25'-26'	tube	43
		26'-27'	"	50
27'9"- 29'	Light grey very silty clay to clayey silt, with prominent red and dark yellow mottling.	27'-28'	"	40
		28'-29'	"	42
29' - 31	Light blue-grey very silty clay, with prominent reddish mottling. Very stiff.	29'-30'	"	49
		30'-31'	"	46
31' - 32'6"	Light blue-grey, stiff and moist. Silty to very silty clay, with prominent yellowish and dark yellow-brown mottling. Very stiff.	31'-32'	"	46
		32'-33'	"	36
32'6" - 33'	Light blue-grey clayey silt, with prominent reddish and dark yellow mottling. Stiff, moist and slightly micaceous.			
33' - 36'	Light grey, yellowish-brown and reddish mottled clayey to slightly sandy silt. Slightly micaceous. Very firm to firm and moist.	33'-34'	"	34
		34'-35'	"	32
		35'-36	"	30
36' - 37'	Light grey-brown and reddish-brown slightly clayey and finely sandy silt. Slightly micaceous. Firm and moist.	36'-37'	"	31
37' - 40'	Brick-red, brownish and yellowish brown clayey silt. Slightly micaceous Firm and very moist.	37'-38'	"	31
		38'-39'	"	31
		39'-40'	"	28
40' - 42'	Greyish, red, reddish-brown and yellowish mottled, clayey to slightly sandy silt. Slightly micaceous. Firm and moist.	40'-41'	"	28
42' - 67	Greyish to bluish-grey silty clay perhaps finely sandy in pockets. Slightly micaceous.	41'-67'	slush	not recorded
		67'-80'		
67' - 80'	Greyish slightly clayey fine sand Slightly micaceous.			

END OF HOLE 80'
WATER CUT 41'
WATER LEVEL 35'
ANALYSIS Saline.

"D" 900
Serial No 813/61
D.M. 265/60

PERCUSSION DRILL LOG "D" 900

PROJECT: CHOWILLA DAM SITE River Murray Cnty Hamley
LOCATION: Dam Site Axis Line "d"
Horizontal Distance East of Datum 900'
PURPOSE: Test of Subsurface Foundation Conditions
Geological Hole

PLANT No 40 — DRILLER W. FARROW
R.L. SURFACE 176.39' — DEPTH 60'
DATE COMMENCED: 9.2.61 — DATE COMPLETED 10.2.61
BORE LOGGED: R.D. STEEL — DATE 14/2/61

Depth	Description	Depth	Type of Sample	Blows p/foot
0' - 3'0"	Red-brown fine sandy loam, with scattered grit fragments and plant remnants. Unconsolidated	0-1' 1-2' 2-3'	open tube "	42 42 67
3'0" - 5'0"	Brownish and light red-brown slightly clayey fine sand, with scattered grit fragments. Compact and fairly friable.	3'-4' 4'-5'	" "	40 38
5'0" - 5'10"	Reddish brown brown and greyish brown clayey sand, becoming sandy clay in part. Offwhite to pale reddish-brown and limey in part, with scattered iron-oxide nodules. Stiff and very compact.	5'-6'	"	30
5'10"- 8'0"	Light brown to light and dark yellow brown mottled clayey silt. Stiff and slightly friable. Scattered mica flecks and Fe-oxide pockets. Finely sandy in part.	6'-7' 7'-8'	" "	28 20
8'0" - 12'0"	Light brown to light and dark yellow brown mottled sandy silt. Slightly micaceous, with some dark organic staining. Compact and fairly friable.	8'-9' 9'-10' 10'-11' 11'-12'	" " " "	24 20 28 26
12'0"- 17'0"	Light greyish to brown and yellow-brown mottled fine sandy silt. Slightly micaceous. Compact and friable.			
17'0"- 21'0"	Light grey, light and dark yellow brown mottled fine silty sand Slightly micaceous. Compact and friable.	17'-18' 18'-21'	" "	22 18
21'0"- 27'	Light grey to light bluish-grey silty clay to clayey silt, with some yellow brown mottling. Soft and very moist.	21'-27'	slush	-
27' - 45'	Light grey and light brown-grey very fine sand. Unconsolidated. Slightly micaceous.	27'-45'	"	-
45' - 51'	Greyish and slight brownish-grey slightly clayey and slightly micaceous fine grain sand.	45'-52'	"	-

Depth		Description	
51'	61'	Yellow-brown fine to medium grain sand, with scattered grit fragments and mica flecks. Unconsolidated.	51'-61" -

END OF HOLE 61'
WATER CUT 25'
STATIC LEVEL 17'

D 4200'
Serial No. 868/61
D.M. 765/60

PERCUSSION DRILL LOG D 4200'

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY, Cnty. Hamley.
LOCATION: A XIAL LINE OF DAM: LINE "D"
Horizonta l Distance East of Datum: 4200'
PURPOSE: Observation hole for No. 5 Field Permeability Test at "D" 4300'

PLANT NO: 24
R.L. SURFACE: 168.74
DATE COMMENCED: 7.3.61
BORE LOGGED: R.D. STEEL

DRILLER: W. HENDERSON
DEPTH: 25'
DATE COMPLETED: 7.3.61
DATE: 18.3.61

DEPTH	DESCRIPTION	Depth	Type of Sample.	Blows p/ft.
0 — 2'9"	Light grey to light brown-grey fine sandy clay, becoming clayey fine sand in pockets. Very compact, somewhat friable Numerous small grit fragments and plant root remnants.	0 -1' 1'-2' 2'-3'	open tube " "	50 23 17
2'9" - 3'6"	Light grey to light green-grey very silty clay. Very stiff & compact, Scattered grit fragments and numerous small plant fragments.	3'-4'	"	17
3'6" - 4'9"	Light grey to light green-grey very silty clay. Very stiff and compact. Slightly gypseous in part, but abundant gypsum between 3'10" and 4'1".	4'-5'	"	8
4'9" - 6'6"	Light grey to light yellow-grey and yellow-brown mottled very clayey silt. Very compact and slightly friable. Few grit fragments, mica f lecks, plant remnants and iron-oxide stains.	5'-6'	"	8
6'6" - 7'0"	Light greyish fine sandy silt, becoming fine silty sand in part, with some grit fragments and m ica flecks. Compact, becoming friable.	6'-7'	"	10
7'0" — 11'0"	Light greyish to light brownish-grey fine grain sand. Some grit fragments and mica flecks. Slightly clayey in part.	7'-11'	slush	-
11'0" - 15'	Light brown generally medium grain sand, but w ith numerous coarser sand and grit fragments and few mica flecks.	11'-15'	"	-
15' - 25'	Light brownish medium to somewhat coarse grain sa nd. Some finer interstitial fraction, but with abundant coarse sand a nd grit fragments. etc.	15'-25'	"	-

END OF HOLE 258
WATER CUT 8'
WATER LEVEL 5.15'
BLANKET THICKNESS 7'0"

D 4250'
Serial No.867/61
D.M. 765/60

PERCUSSION DRILL LOG "D" 4250'

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY, County Hamley.
LOCATION: DAMSITE AXIS: LINE "D"
Horizontal Distance East of Datum 4250'
PURPOSE: Observation hole for No.5 Field Permeability Test at D4300

PLANT NO: 24 — DRILLER: Henderson
R.L. SURFACE: 168.24 — DEPTH: 25'
DATE COMMENCED: 6.3.61 — DATE COMPLETED: 7.3.61
BORE LOGGED BY: R.D.STEEL — DATE: 18/3/61

DEPTH	DESCRIPTION	DEPTH	TYPE OF SAMPLE	BLOWS P/ft.
0'0" - 2'6"	Light grey to light brownish-grey fine sandy clay, becoming clayey fine sand in pockets. Generally very compact, but somewhat friable in part. Few grit fragments, plant remnants etc.	0-1' 1'-2' 2'-3'	open tube "	30 47 40
2'6" - 4'0"	Light greyish to slight greenish-grey very silty clay, maybe finely sandy in part. Generally stiff and very compact. Few grit and plant fragments. White gypsum pockets and selenite crystals from 3'2".	3'-4'	"	19
4'0" - 4'6"	Light grey to light green-grey very silty clay, with some hard lime coated lumps and ochre nodules. Few mica flecks. Stiff.	4'-5'	"	12
4'6" - 6'0"	Pale grey to pale green-grey clayey silt, with prominent dark yellow-brown mottling. Very compact and slightly friable. Few pockets of dark iron-oxide staining.	5'-6'	"	12
6'0" - 12'0"	Pale brown to pale yellow-brown medium to somewhat coarse grain sand, with few mica flecks and numerous grit fragments.	6'-12'	slush	-
12'0" - 25'	Light brown medium to coarse sand with abundant coarse to very coarse rounded milky quartz grit fragments. Some finer interstitial fraction. Few mica flecks etc.	12-25'	"	-

END OF HOLE 25'
WATER CUT 7'
WATER LEVEL 5.66'
BLANKET THICKNESS. 6'0"

D.4275'
Serial No. 866/61
D.M. 765/60

PERCUSSION DRILL LOG D 4275

PROJECT: CHOWILLA DAMSITE: RIVER MURRAY, Cnty. Hamley
LOCATION: A xial Line of Dam : Line D
Horizontal Distance East of Datum: 4275'
PURPOSE: Observation Hole for No. 5 Field Permeability Test at D4275.
PLANT NO: 24 DRILLER: W. HENDERSON
R.L. SURFACE: 168.09 DEPTH: 25'
DATE COMMENCED: 6.3.61 DATE COMPLETED: 6.3.61
BORE LOGGED: R.D. Steel DATE: 19/3/61

Depth	Description	Depth	Type of Sample.	Blows p/ft.
0 - 2'1"	Light grey to slight greenish-grey sandy clay, becoming clayey fine sand in pockets. Very compact and somewhat friable. Few grit fragments, plant remains etc.	0'-1' 1'-2'	open tube	17 20
2'1" - 2'11"	Light grey to slight greenish-grey very silty clay. Very stiff and compact. Few grit fragments, plant remains lime nodules etc.	2'-3'	"	17
2'11" - 4'9"	Light grey to slight greenish-grey very silty clay. Compact but somewhat friable. Gypsum pockets, selenite crystals and laterite nodules.	3'-4' 4'-5'	" "	12 9
4'9" - 6'2"	Light green-grey, pale grey and yellow-brown mottled clayey silt. Very compact and somewhat friable. Slightly micaceous, and with scattered dark iron oxide pockets. Becoming sandy at depth.	5'-6'	"	10
6'2" - 10'0"	Light brown medium to coarse sand, with abundant coarse grit fragments. Some finer interstitial fraction.	6'-10'	slush	-
10' - 16'	Light brown generally medium grain sand, with fairly abundant coarse sand and grit fragments.	10'-16'	"	-
16' - 20'	Light brown fine t o medium grain sand, but with numerous coarse sand and grit fragments.	16'-20'	"	-
20' - 25'	Light brown to pale brown fine to medium grain sand, but with abundant coarse sand and grit fragments.	20'-25'	"	-

END OF HOLE 25'
WATER CUT: 8'
WATER LEVEL : 5.54'
BLANKET THICKNESS: 6'2"

D 4300'
Serial No 836/61
D.M. 765/60

PERCUSSION DRILL LOG D 4300'

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY Cnty Hamley
LOCATION: AXIAL LINE OF DAM, LINE "D"
HORIZONTAL DISTANCE E of Datum 4300'
PURPOSE: Pump Hole for No 5 Field Permeability Test
PLANT NO 40 DRILLER W.F. FARROW
R.L. SURFACE 168.13' DEPTH 143'
DATE COMMENCED 24.2.61 DATE COMPLETED 2.3.61
BORE LOGGED R.D. STEEL DATE 8.3.61

Depth	Description	Depth	Type of Sample	Blow p/foo
0 - 1'0"	Greyish fine sandy clay, be-coming clayey fine sand in part. Some patches of light brown fine sandy silt. Compact and somewhat friable. Few grit fragments and plant remnants.	1'-3'	open tube	20
1'0"- 4'0"	Light grey to light green-grey very silty clay, maybe finely sandy in part. Few whitish lime pockets and grit fragments. Very stiff and compact.	3'-4'	"	18
4'0"- 4'8"	Light grey to slight greenish-grey very silty clay. Off-white and limey in small pockets. Scattered mica flecks, laterite nodules and grit fragments. Very stiff and compact.	4'-5'	"	16
4'8" - 5'0"	Pale grey fine clayey silt, with fairly prominent yellow-brown ochreous mottling. Becoming somewhat sandy in part. Very compact.			
5'0"- 5'9"	Light grey to green-grey very sandy clay, becoming clayey sand in part, and elsewhere very silty clay. Some dark yellow-brown mottling and patches of dark grey iron oxide. Compact.			
5'9"- 6'	Light grey generally medium grain sand with some coarser grit fragments and few mica flecks. Some brown and yellow-brown mottling.	5'-6'		
6'0"- 12'	Light brown to yellow-brown slightly clayey, medium grain sand, with scattered coarse rounded grit fragments.	6'-12'	slush	-
12' - 19'	Light brown to light yellow-brown medium grain sand, with some mica flecks and coarse grit fragments.	12'-19'	slush	-
19' - 24'	Light brown to light yellow-brown fine to medium grain sand, with scattered mica flecks and grit fragments.	19'-24'	"	-
24' - 25'	Light brown fairly fine sand, with numerous coarse grit fragments.	24'-25'	"	-

Depth	Description	Depth	Type of Sample	Blows p/ft.
25' - 30'	Light brown to yellow-brown medium to slightly coarser sand, with fairly numerous rounded milky quartz grit fragments.	25'-30'	slush	-
30' - 32'	Pale greyish-brown fairly fine grain sand, with fairly abundant coarse rounded grit fragments.	30'-32'	"	-
32' - 35'	Pale grey-brown medium sand, with numerous coarse grit fragments.	32'-35'		
35' - 41'	Pale grey fine to medium grain sand, but with very abundant coarse rounded grit fragments.	35'-41'	"	-
41' - 47'	Light grey-brown medium grain sand with very abundant coarse to very coarse grit fragments.	41'-47'	"	-
47' - 50'	Light grey coarse rounded quartz grit, with some fine interstitual sand fraction. Slight yellow-brown mottling. Wood fragments at 49'-50'.	47'-50'	"	-
50' - 55'	Mid-grey fine to medium sand, with abundant coarse quartz and dark coloured grit fragments. Few pockets charcoal.	50'-55'	"	-
55' - 60'	Pale grey coarse subrounded sand but with abundant coarse grit fragments.	55'-60'	"	-
60' - 66'	Pale grey generally fine sand, with irregularly very abundant coarse to very coarse rounded milky quartz grit fragments.	60'-66'		
66' - 72'	Light grey generally fine grain sand, with some coarse milky quartz grit fragments.	66'-72'		
72' - 85'	Light grey generally fine to medium grain sand, with fairly numerous coarse rounded grit fragments,	72'-85'	slush	-
85' - 90'	Light grey fine to medium grain sand, with numerous coarser sand and some very coarse rounded grit fragments.	85'-90'	"	-
90' - 96'	Light grey to light grey-brown fine to medium grain sand, with numerous coarse grit fragments.	90'-96'	"	-
96' - 102'	Grey-brown generally fine grain sand, with numerous coarse rounded grit fragments.	96'-102'	"	-
102' - 111'	Grey-brown generally fine grain sand, with numerous coarse to very coarse grit fragments, and some small blue-grey clay pockets.	102'-111'	"	-

Depth	Description	Depth	Type of Sample	Blo p.ft.
111' - 113'	Grey brown fine grain sand, slightly micaceous and with some coarse rounded grit fragments and few small clay pockets.	111'-113'	slush	-
113' - 120'	Grey-brown to brown-grey fine grain sand. Slightly micaceous and with few small clay pockets.	113'-120'	"	-
120' - 136'	Light grey-brown fine grain sand, slightly micaceous and with occasional small clay pockets.	120'-136'	"	-
136' - 139'	Brownish-grey clayey fine sand	136'-139'	"	-
139' - 143'	Brown grey fine grain sand, in discrete pockets with blue-grey silty clay.	139'-143'	"	-

END OF HOLE 143'
WATER CUT 8'
WATER LEVEL 5.63'
BLANKET THICKNESS 5'9".

4300' D + 25'
Serial No. 859/61
D.M. 765/60

PERCUSSION DRILL LOG 4300' D + 25'

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY Cnty. Hamley.
LOCATION: 25' Upstream from Dam Site Axis
Horizontal Distance East of Datum 4300'
PURPOSE: Observation Hole for No. 5 Permeability Test at D 4300'
PLANT NO: 20 DRILLER: J. DOECKE
R.L. SURFACE: 168.09' DEPTH: 25'
DATE COMMENCED: 6.3.61 DATE COMPLETED: 6.3.61
BORE LOGGED: R.D. STEEL DATE: 19.3.61

DEPTH	DESCRIPTION	DEPTH	TYPE OF SAMPLE.	BLOWS P/FT.
0 - 2'1"	Light greyish to light brownish grey fine sandy clay, becoming clayey fine sand in pockets. Compact and some-what friable. Few grit fragments and plant remnants.	0 -1' 1'-2'	open tube	19 20
2'1" - 4'6"	Light grey to slight greenish-grey very silty clay. Very stiff and compact. Numerous small grit fragments, plant remains, small organic blobs and occasional iron oxide nodules.	2'-3' 3'-4' 4'-5'	" " "	19 13 14
4'6" - 5'9"	Pale grey to slight greenish-grey very silty clay, becoming clayey silt in pockets. Compact, somewhat friable in part and slightly micaceous			
5'9" - 6'3"	Light greyish fine sandy silt, becoming fine to medium grain sand, with scattered coarse grit fragments.	5'6'	"	9
6'3" - 16'	Light brown medium grain sand, but with some finer fraction and numerous coarse sand and grit fragments.	6'-16'	slush	-
16' - 22'	Light brown fine to medium grain sand, with irregularly abundant sand and grit fragments.	16'-22'	"	-
22' - 25'	Light brown medium grain sand, some finer fraction, but with abundant coarse sand, and grit fragments.	22'-25'	"	-

END OF HOLE 25'
WATER CUT 6'
WATER LEVEL 5.62'
BLANKET THICKNESS 5'9"

4300 D+50
Serial No. 857/61
D.M. 765/60

PERCUSSION DRILL LOG 4300' D+50'

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, Cnty. Hamley
LOCATION: 50' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 4300'
PURPOSE: Observation Hole for No. 5 Permeability Test at D4300'
PLANT NO: 20 DRILLER: J. DOECKE
R.L. SURFACE: 168.47 DEPTH: 25'
DATE COMMENCED: 2.3.61 DATE COMPLETED: 3.3.61
BORE LOGGED: R.D. STEEL DATE: 18.3.61

Depth	Description	Depth	Type of Sample	Blows p/ft
0 - 1'2"	Greyish to light brownish-grey fine sandy clay, becoming clayey fine sand in pockets. Vague brownish mottling. Compact and fairly friable, with few grit fragments and plant remains.	0 - 1'	Open Tube	16
1'2"- 2'2"	Light grey to light greenish-grey silty to finely sandy clay, with few small pockets of clayey sand. Few grit fragments, plant remnants etc.	1'- 2'	"	15
2'2"- 3'4"	Light grey to light greenish-grey very silty clay. Very stiff and compact. Scattered small white gypsum pockets.	2'- 3'	"	16
3'4"- 5'2"	Light grey to light greenish-grey very silty clay. Very stiff and compact. Numerous gypsum pockets and some selenite crystals. Vague yellow mottling at depth.	3'- 4' 4'- 5'	" "	15 12
5'2"- 5'10"	Light grey to light greenish-grey very clayey silt, with some light yellowish mottling. Few mica flecks etc.	5'- 6'	"	13
5'10"- 6'3"	Light greyish generally fairly fine grain sand, but with some coarser sand and grit fragments and few mica flecks.			
6'3"-14'0"	Light brownish generally medium grain sand, but with some coarser sand and grit fragments and few mica flecks.	6'-14'	slush	-
14'0"-16'0"	Light brownish medium to slightly coarse sand, with some finer fraction and numerous coarse sand and grit fragments.	14'-16'	"	-
16'0"-25'0"	Light brownish fine to medium grain sand, but with fairly numerous coarse sand and grit fragments.	16'-25'	"	-

END OF HOLE 25'
WATER CUT 7'
WATER LEVEL 6.12'
BLANKET THICKNESS 5'10".

4300' D+100
Serial No. 850/61
D.M. 765/60

PERCUSSION DRILL LOG 4300' D+100

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, County Hamley.
LOCATION: 100' upstream from Dam Site Axis.
Horizontal Distance E. of Datum: 4300'.
PURPOSE: Observation Hole for No. 5 Field Permeability Test at D4300
PLANT NO: 20 DRILLER: J. Doecke.
R.L. SURFACE: 168.51' DEPTH: 25'
DATE COMMENCED: 1.3.61 DATE COMPLETED: 2.3.61
CORE LOGGED: R.D. Steel DATE: 18.3.61

Depth	Description	Depth	Type of Sample	Blows p/ft,
0'0"- 2'0"	Light grey to light brown-grey fine sandy to silty clay. Some faint yellowish mottling. Compact, but somewhat friable. Numerous small root remnants.	0 - 1' 1'- 2'	Open Tube	10 9
2'0"- 5'0"	Light grey to light greenish-grey very stiff and very silty clay, becoming offwhite and gypseous in scattered small blobs, with few gypsum crystals and some small organic blobs.	2'- 3' 3'- 4' 4'- 5'	" " "	9 9 10
5'0"- 6'0"	Pale grey to pale green-grey and yellow-brown mottled very clayey silt, becoming finely sandy in part. Very stiff and slightly friable.	5'- 6'	"	11
6'0"-12'0"	Light brown to brown and yellow-brown mottled, medium to somewhat coarser grain sand, with numerous grit fragments and few mica flecks.	6'- 7' 7'- 8' 8'-12'	" " Slush	12 13 -
12'0"-18'0"	Light brown medium to coarse sand, with numerous coarse to very coarse rounded milky quartz grit fragments. Some finer interstitial fraction.	12'-18'	"	-
18'0"-25'0"	Light brown medium to coarse grain sand, with numerous coarse and some very coarse rounded milky quartz grit fragments.	18'-25'	"	-

END OF HOLE 25'
WATER CUT 9'
WATER LEVEL 5.97'
BLANKET THICKNESS 6'0".

D 4325
Serial NO.870/61
D.M.765/60

PERCUSSION DRILL LOG
D4325

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, Cnty.Hamley.
LOCATION: Axial Line of Dam LINE "D"
Horizontal Distance East of Datum: 4325'.
PURPOSE: Observation Hole for No. 5 Permeability Test at D4300'
Plant No: 40 Driller: W.F. Farrow
R.L. Surface: 168.44 Depth: 25'
Date Commenced: 6.3.61 Date Completed: 6.3.61
Bore Logged: R.D. Steel Date: 18.3.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0 - 1'6"	Greyish to light brownish-grey fine sandy clay, becoming clayey fine sand in part. Compact and fairly friable. Few grit fragments and plant remnants.	0 -1' 1'-2'	open tube	26 25
1'6" - 3'7"	Greyish to slight greenish-grey slightly sandy to silty clay. Very stiff and compact. Scattered grit fragments, plant root remnants and white gypseous pockets.	2'-3' 3'-4'	" "	30 21
3'7" - 4'4"	Light grey very silty clay. Very stiff and compact. Some grit fragments and numerous whitish gypsum pockets.	4'-5'	"	13
4'4" - 5'0"	Light grey to slight greenish-grey very silty clay, with prominent dark yellow-brown mottling. Few grit fragments, lime pockets and dark iron-oxide blobs.			
5'0" - 5'8"	Light grey to light yellow-brown and yellow-grey slightly clayey to finely sandy silt, becoming fine sand in part.	5'-6'	"	16
5'8" - 6'2"	Light greyish generally fairly fine grain sand, but with some coarser sand and grit fragments.	6'-7'	"	14
6'2" - 9'0"	Light brown to yellow-brown generally fairly fine grain sand, but with some coarse sand grit fragments.	7'-8' 8'-9'	" slush	14 -
9'0" - 16'	Light brownish generally medium grain sand, but with fairly numerous coarse sand and grit fragments.	9'-16'	"	-
16' - 25'	Light brownish medium to somewhat coarse grain sand, with numerous coarse sand and grit fragments. Some finer interstitial sand fraction.	16'-25'	"	-

END OF BORE 25'
WATER CUT 6'
WATER LEVEL 5.83'
BLANKET THICKNESS 5'8"

D. 4350'
Serial No 871/61
D.M. 765/60

PERCUSSION DRILL LOG D 4350'

PROJECT: CHOWILLA DAM SITE RIVER MURRAY Cnty Hamley
LOCATION: Axial Line of Dam, Line D
PURPOSE Observation Hole for No 5 Field Permeability Test at D 4300

PLANT NO 40
R.L. SURFACE 168.52
DATE COMMENCED: 6.3.61
BORE LOGGED R.D. STEEL

DRILLER W. Farrow
DEPTH 25'
DATE COMPLETED 6/3/61
DATE 19/3/61

Depth	Description	Depth	Type of Sample	Blow p/ft
0 - 3'0"	Light greyish to light brownish-grey and slight greenish-grey sandy clay, becoming clayey fine sand in pockets. Very compact and somewhat friable. Few grit fragments, plant remains and dark organic pockets.	0'-1 1'-2' 2'-3'	open tube	26 34 32
3'0"- 4'4"	Greyish to brownish-grey very silty clay. Very stiff and compact. Numerous pockets whitish gypsum, some lime nodules and grit fragments.	3'-4'	"	20
4'4"- 5'6"	Greyish to brownish-grey and greenish-grey very silty clay, becoming clayey silt at depth. Very stiff and compact. Some dark iron oxide pockets.	4'-5' 5'-6'	" "	23 22
5'6"- 6'2"	Light grey to light brown medium grain sand, but with some clayey pockets and coarse grit fragments. Semi-consolidated.			
6'2"- 10'	Light brown fine to medium grain sand, with numerous coarse sand and grit fragments. Few small clayey pockets and mica flecks.	6'-10'	slush	-
10' - 16'	Light brown medium grain sand, with abundant coarser sand and grit fragments. Few mica flecks etc.	10'-16'	slush	-
16' - 20'	Light brown fine to medium grain sand, with numerous sand and grit fragments.	16'-20'	"	-
20' - 25'	Light brown medium grain sand, but with abundant coarse sand and grit fragments, increasing with depth. Few mica flecks etc.	20'-25'	"	-

END OF HOLE 25'
WATER LEVEL 5.86'
WATER CUT 6'
BLANKET THICKNESS 5'6"

D 4400
Serial No 869/61
D.M. 765/60

PERCUSSION DRILL LOG D4400

PROJECT: CHOWILLA DAM SITE RIVER MURRAY Cnty Hamley
LOCATION: Axial Line of Dam: Line ".
Horizontal Distance from Datum 4400'
PURPOSE: Observation hole for No 5 Field Permeability test at D 4400'

PLANT NO 24
R.L. SURFACE 169.17
DATE COMMENCED 7.3.61
BORE LOGGED R.D. STEEL

DRILLER W. Henderson
DEPTH 25'
DATE COMPLETED 8.3.61
DATE 18.3.61

Depth	Description	Depth	Type of Sample	Blow p/foo
0' - 6'0"	Slush samples	0-25'	slush	-
6' - 18'	Light brown medium to fairly coarse sand with very coarse milky quartz grit fragments. Few mica flecks etc,			
18' - 25'	Light brown medium to fairly coarse sand, but with some-what less numerous coarse grit fragments.			

END OF BORE 25'
WATER CUT 8'
WATER LEVEL 6.40'
BLANKET THICKNESS 6'0"

D5800
Serial No 846/61
D.M. 765/60

PERCUSSION DRILL LOG D5800

PROJECT: CHOWILLA DAMSITE RIVER MURRAY County Hamley
LOCATION: LINE "D", DAMSITE AXIS
Horizontal Distance East of datum 5800'
PURPOSE: Test of Subsurface Foundation Conditions Geological Hole
PLANT NO: 20 DRILLER J. DOECKE
R.L. SURFACE: 169.02' DEPTH 20'
DATE COMMENCED 27.2.61 DATE COMPLETED 27.2.61
BORE LOGGED R.D. STEEL DATE: 8.3.61

Depth		Description	Depth	Type of Sample	Blows p/foc
0'0" -	1'6"	Greyish to slight brownish-grey fine sandy clay, becoming clayey fine sand in part. Few grit fragments and plant remnants. Compact and fairly friable.	0-1'	open tube	16
1'6" -	4'0"	Greyish to slight brownish-grey very stiff, silty to very silty clay. Maybe finely sandy in small pockets Scattered grit fragments and small plant root remnants.	1'-2' 2'-3' 3'-4'	" " "	12 9 6
4'0" -	5'0"	Greyish to brownish-grey very stiff silty clay, with numerous small whitish gypsum pockets.	4'-5'	"	6
5'0" -	6'0"	Greyish to slight brownish-grey very silty clay. Stiff. Few small organic pockets etc.	5'-6'	"	6
6'0" -	7'0"	Light grey to greenish-grey very silty to sandy clay. Slight brown and yellow-brown mottling. Few mica flakes grit fragments. Stiff.	6'-7'	"	5
7'0" -	9'0"	Pale grey to light greenish-grey fine sandy silt. Slight clay binding. Faint yellow mottling in part. Very compact, somewhat friable.	7'-8' 8'-9'	" "	13 11
9'0" -	11'6"	Light grey to light greenish-grey slightly clayey to finely sandy silt with light and dark yellow-brown mottling. Very compact, somewhat friable.	9'-10' 10'-11'	" "	9 7
11'6" -	12'	Light greyish fine silty sand may be with some slight yellow-brown mottling. Slightly micaceous, few grit fragments.	11'-12'	"	16
12' -	13'	Light grey, light grey-brown and light yellow-brown mottled, fine to medium sand. Few coarse grit fragments, Unconsolidated	12'-13'	"	13

Depth	Description	Depth	Type of Sample	Blows p/foot
13' - 20'	Light grey, generally fine to medium grained sand, but with irregularly abundant coarse to very coarse, rounded grit fragments.	13'-20'	Slush	-

END OF HOLE 20'
WATER CUT 13'
WATER LEVEL 10'
BLANKET THICKNESS 11'6"

D 12,945
Serial No. 878/61
D.M. 765/60

PERCUSSION DRILL LOG D 12945

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY. Cnty. Hamley.
LOCATION: LINE "D", AXIAL LINE OF DAM.
HORIZONTAL EAST OF DATUM: 12,945'
PURPOSE: TEST OF SUBSURFACE FOUNDATION CONDITIONS: GEOLOGICAL HOLE.

PLANT NO: 24 DRILLER: W. Henderson
R.L. Surface: 173.58 Depth: 35'
Date Commenced: 16.3.61 Date Completed: 17.3.61
Bore Logged: R.D. Steel Date: 26.3.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0 - 2'0"	Light grey fine silty to sandy clay, becoming clayey fine sand in pockets. Generally very compact, but somewhat friable in part. Few grit fragments and plant remnants.	0 - 1'	open tube	40
		1'- 2'	tube	43
2'0"- 3'0"	Light grey fine sandy clay to fine clayey sand, with few grit fragments and plant remnants. Compact and slightly friable.	2'- 3'	"	19
3'0"- 7'0"	Light grey to light grey-brown and yellow-brown fine clayey sand, with few grit fragments, plant remnants and organic pockets. Very compact and slightly friable.	3'- 4'	"	20
		4'- 5'	"	16
		5'- 6'	"	25
		6'- 7'	"	24
7'0"-11'0"	Light grey, light brown, brown and greyish-brown clayey silt to clayey fine sand. Compact, moist and somewhat friable. Few grit fragments, small organic blobs, slightly micaceous.	8'- 9'	"	23
		7'- 8'	"	25
		9'-10'	"	23
		10'-11'	"	15
		11'-12'	"	-
		12'-13'	"	-
		13'-14'	"	-
11'0"-18'0"	Light greyish-brown generally fine grain sand. Slightly silty and micaceous. Pockets of light grey to grey-brown and greenish mottled silty clay from 17'0".	14'-15'	"	-
		15'-16'	"	-
		16'-17'	"	-
		17'-18'	"	12
18'0"-20'0"	Light grey to light green-grey silty clay, with patches of dark yellow-brown and green-brown mottling. Few organic pockets. Firm and moist.	18'-19'	"	14
		19'-20'	"	12
20'0"-22'0"	Bluish-grey silty to very silty clay, with some darker yellow-brown mottling. Slightly micaceous and finely sandy in pockets. Some dark greenish mottling at depth.	20'-21'	"	12
		21'-22'	"	14
22'0"-24'0"	Light greyish fine grain sand, with few coarse grit fragments and mica flecks.	22'-23'	"	12
		23'-24'	"	not recorded
24'0"-26'0"	Greenish to light grey fine silty sand, somewhat clayey in part. Some blue-grey and yellow-brown mottling. Few grit fragments and mica flecks.	24'-26'	"	"

PERCUSSION DRILL LOG D 12945 Continued

Depth	Description	Depth	Type of Sample	Blows p/ft.
31'0"-35'0"	Light grey fine grain sand, somewhat darker grey and clayey in pockets.	31 -35'	open not retube corded	

END OF HOLE 35'

WATER CUT 11'

WATER LEVEL 5'

BLANKET THICKNESS 11'

D14,800
Serial No. 905/61
D.M. 765/60

PERCUSSION DRILL LOG D 14,800'

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY. Hd. Murtho
LOCATION: LINE "D", Dam Site Axis
Horizontal Distance East of Datum: 14,800'
PURPOSE: Observation Hole for No. 6 Field Permeability Test at C+300 14,800

PLANT NO.: 20
R.L. SURFACE: 173.55
DATE COMMENCED: 6/4/61
BORE LOGGED: R.D. Steel

DRILLER: J. Doecke
DEPTH: 20'
DATE COMPLETED: 6/4/61
DATE: 20/4/61

Depth	Description	Depth	Type of Sample	Blow p/f
0'0" - 1'0"	Greyish to slight bluish-grey silty to finely sandy clay, with few plant remains. Very stiff and compact.	0-1'	Open Tube	15
1'0" - 2'0"	Light yellow-grey very silty clay, with few whitish lime pockets. Very compact and slightly friable.	1'-2'	"	10
2'0" - 3'8"	Light grey to light yellow-grey clayey silt, with some darker yellow-brown mottling. Compact and slightly friable. Few grit fragments, organic blobs and mica flecks.	2-3' 3-4'	" "	16 14
3'8" - 7'0"	Light grey to light yellow-grey, clayey to finely sandy silt, with some yellow-brown mottling. Few grit fragments, organic blobs etc.	4'-5' 5'-6' 6-7'	" " "	14 21 22
7'0" - 10'0"	Light grey, light brown and darker brown slightly clayey to finely sandy silt, becoming fine silty sand in part. Compact and somewhat friable. Few grit fragments etc.	7'-8' 8'-10'	" "	21 Not recorde
10'0" - 11'0"	Offwhite, light grey and light brown mottled clayey to finely sandy silt, with some pockets of light brown sand.	10'-11'	"	"
11'0" - 14'0"	Light brownish medium to somewhat coarser grain sand, with few pockets of bluish-grey clayey fine sand.	11'-14'	"	"
14'0" - 15'0"	Light yellow-brown fairly fine grain sand, with few grit fragments and mica flecks.	14'-15'	"	"
15'0" - 18'0"	Dark brown to dark yellow-brown medium to somewhat coarser grain sand, with some pockets of light brown and light grey, slightly clayey fine sand.	15'-18'	Slush	-
18'0" - 20'	Yellowish-brown medium to fairly coarse sand, but with pockets of light grey to light yellow-grey clayey fine sand.	18'-20'	"	-

END OF HOLE 20'
WATER CUT 10'
WATER LEVEL 6.25'
BLANKET THICKNESS 3'8".

D16,560
Serial No 944/61
D.M. 765/60

PERCUSSION DRILL LOG D 16,560

PROJECT CHOWILLA DAM SITE RIVER MURRAY Hd. Murtho
LOCATION DAM SITE AXIS LINE "-"
Horizontal Distance East of Datum 16,560
PURPOSE Geological Hole for No 5 Two Well Velocity Test
PLANT NO 20 DRILLER W. O'FARRELL
R.L. SURFACE 171.11 DEPTH 20'
DATE COMMENCED 24.4.61 DATE COMPLETED 27.4.61
BORE LOGGED R.D. STEEL DATE 3.5.61

Depth		Description	Depth	Type of Sample	Blow p/
0 -	1'0"	Greenish to bluish-grey and greyish - brown silty clay. Firm and moist Few grit fragments etc.	0-1'	open tube	8
1'0" -	5'0"	Light greyish to slight yellowish-grey very silty clay, with some yellow mottling. Firm, moist, becoming clayey silt in part. Some small charcoal pockets.	1-2' 2-3' 3-4' 4-5' 5-6'	" " "	9 8 6 9 7
5'0" -	6'0"	Light grey to slight bluish-grey and yellow-grey clayey silt. Firm and moist. Numerous hard ochreous nodules and pockets charcoal.			
6'0" -	9' 0"	Light grey to light brown-grey fine silty sand, with some light brown and yellowish mottling. Slightly clayey and micaceous in part.	6-7' 7-8' 8-9'	" " "	7 7 1
9'0" -	11' 0"	Light greyish, slightly clayey to fine silty sand, with some yellowish-brown mottling. Slightly micaceous.	9-10' 10-11'	" slush	9 -
11' -	13'	Light to pale greyish-brown generally medium grain sand, slightly micaceous Somewhat bluish-grey and clayey in pockets.	11-13'	"	-
13' -	14'	Light to pale greyish-brown medium to slightly coarse grain sand, slightly micaceous. Bluish-grey and somewhat clayey in part.	13014'	"	-
14' -	20'	Brown to dark yellow-brown generally medium grain sand, with some offwhite mottling. Occasional light greyish clayey pockets.	14-20'	"	-

END OF HOLE 20'
WATER CUT 7'
WATER LEVEL 3'6"
BLANKET THICKNESS 6'

D 17900
Serial No. 958/61
D.M. 765/60

PERCUSSION DRILL LOG D 17900

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY. Hd. Murtho
LOCATION: LINE "D", Axial Line of Dam.
Horizontal Distance East of Datum: 17,900'.
PURPOSE: Test of Subsurface Foundation Conditions: Geological Hole.

Plant No: 20 — Driller: W. O'Farrell
R.L. Surface: 191.45 — Depth: 24
Date Commenced: 3/5/61 — Date Completed: 3.5.61
Bore Logged: R.D. Steel — Date: 13/6/61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0"- 1'3"	Light brown fine sandy loam, with numerous small grit fragments, few plant remains etc. Friable.	0 - 1'	Open Tube	5
1'3"- 2'0"	Chocolate-brown sandy loam, with numerous small grit fragments. Generally fairly friable.	1'- 2'	"	6
2'0"- 4'0"	Brownish medium to slightly coarser grain rounded sand, with some finer clay and silt binding. Few grit fragments, small lime blobs. Compact, somewhat friable.	2'- 3' 3'- 4'	" "	7 12
4'0"- 6'0"	Brownish medium grain sand, with some finer clay and silt binding. Friable. Few grit fragments, small lime blobs.	4'- 5' 5'- 6'	" "	10 15
6'0"-10'0"	Greyish-brown medium grain sand, with fairly abundant fine silty fraction. Few small grit fragments etc. Friable	6'- 7' 7'- 8' 8'- 9' 9'-10'	" " " "	19 18 20 18
10'0"-12'0"	Light brownish medium to slightly coarse rounded sand, with fairly abundant fine sand and silt binding. Few grit fragments etc. Compact, fairly friable.	10'-11' 11'-12'	" "	20 15
12'0"-16'0"	Light reddish-brown medium to slightly coarser grain sand (subrounded). Prominent fine clay and silt binding interstitially. Generally compact, fairly friable.	12'-13' 13'-14' 14'-15' 15'-16'	" " " "	7 7 7 8
16'0"-21'0"	Light brownish to light yellowish-brown fairly coarse subrounded sand, with some slight finer fraction interstitially.	16'-17' 17'-18' 18'-19' 19'-20' 20'-21'	" " " " "	19 19 20 40 22
21'0"-24'0"	Light greyish fairly coarse subrounded sand, but with subordinate fine interstital silt binding.	21'-22' 22'-23' 23'-24'	" " "	22 - -

END OF HOLE 25'

WATER CUT -

WATER LEVEL -

E 00
Serial No. 817/61
D.M.765/60

PERCUSSION DRILL LOG E 00

PROJECT: Chowilla Dam site, River Murray. Cnty. Hamley.
LOCATION: LINE "E", 400' upstream from proposed dam axis.
Horizontal Distance from Datum - Nil
PURPOSE: Test of Subsurface Foundation conditions:
Geological Hole.

PLANT: 20 DRILLER: J. Doecke
R.L. SURFACE: 219.80 DEPTH: 20'
DATE COMMENCED: 7.2.61 DATE COMPLETED: 7.2.61
BORE LOGGED: R.D. Steel DATE: 9.2.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0"- 1'6"	Red-brown fine sandy loam, with scattered grit fragments and plant material. Unconsolidated.	0- 1'	Open Tube	19
1'6"- 1'9"	Red-brown fine clayey sand, with small limey pockets. Compact and friable.	1- 2'	"	38
1'9"- 3'3"	Red-brown and dark brown clayey fine sand, with scattered grit fragments. Light brown and slightly limey in part. Compact and friable.	2'-3'	"	49
3'3"- 7'6"	Brown to red-brown very clayey sand, with scattered grit fragments. Becoming off white to light reddish-brown and limey in irregular patches. Compact and slightly friable.	3-4' 4-5' 5-6' 6-7'	" " " "	57 20 67 48
7'6"-11'0"	Red-brown sandy clay to very clayey sand, becoming offwhite to light red-brown in abundant limey patches. Scattered grit fragments and lime nodules. Very compact and slightly friable.	7-8' 8-9' 9-10' 10-11'	" " " "	72 68 46 28
11'0"-15'0"	Light brown to light red-brown fine grain sand, with some clay binding. Compact, becoming fairly friable. Some small whitish lime pockets and grit fragments.	11-12' 12-13' 13-14' 14-15'	" " " "	30 38 21 22
15'0"-16'0"	Red-brown, light brown and light grey mottled, generally fairly fine sand, with some clay binding and few grit fragments. Compact and fairly friable.	15-16'	"	37
16'0"-18'0"	Brown, orange-brown, reddish-brown and yellowish-brown mottled clayey sand, with pockets medium grain sand. Very compact and slightly friable. Odd small limey patches and irregularly abundant grit fragments.	16-17' 17-18'	" "	37 39
18'0"-20'0"	Light brown to dark-brown fairly fine sand, with some clay binding and slight reddish and yellow-brown mottling. Very compact and somewhat friable.	18-19' 19-20'	" "	34 ?

END OF HOLE: 20'
WATER CUT: Nil. WATER LEVEL:

E 300
Serial No. 818/61
D.M.765/60.

PERCUSSION DRILL LOG "E" 300.

PROJECT: Chowilla Dam Site, River Murray. Cnty. Hamley.
LOCATION: Line "E", 400' upstream from Dam Axis.
Horizontal Distance E of datum: 300'.
PURPOSE: Test of Subsurface Foundation Conditions: Geological Hole.

PLANT NO: 20 DRILLER: J. DOECKE
R.L. SURFACE: 208.57 DEPTH: 80'
DATE COMMENCED: 8.2.61 DATE COMPLETED: 10.2.61
BORE LOGGED: R.D. STEEL. DATE: 10.2.61

Depth	Description	Depth	Type of Sample.	Blows P/ft.
0 - 9"	Brown to red-brown fine clayey sand, slightly limey in part, with scattered grit fragments. Compact and somewhat friable.	0-1'	Open tube	18
9"- 3'0"	Light brown to pale red-brown sandy and limey clay, with offwhite limey pockets, and scattered grit fragments. Compact and somewhat friable.	1-2'	"	20
		2-3'	"	60
3'0"- 6'0"	Brown to red-brown sandy clay to fine clayey sand. Very compact, slightly friable. Offwhite to pale reddish-brown limey patches irregularly scattered grit fragments.	3-4'	"	40
		4-5'	"	37
		5-6'	"	35
6'0"- 8'6"	Brown to red-brown and light brown fine sand, with some clay binding. Compact and fairly friable. Few grit fragments, lime pockets and nodules.	6-7'	"	22
		7-8'	"	24
		8-9'	"	24
8'6"-11'6"	Brown to light brown clayey sand, with numerous lime pockets and hard lime nodules. Scattered grit fragments.	9-10'	"	31
		10-11'	"	31
11'6"-15'0"	Brown to orange-brown fine to medium sand, with some clay binding and numerous coarse grit fragments, odd lime blobs etc. Compact and fairly friable.	11-12'	"	22
		12-13'	"	25
		13-14'	"	29
		14-15'	"	26
15'0"-16'0"	Reddish-brown, orange-brown and dark brown clayey sand, with scattered grit fragments. Compact and slightly friable.	15-16'	"	23
16'0"-19'0"	Brown to orange-brown and red-brown fine to medium sand, with some clay binding. Slight yellowish and light grey mottling. Occasional lime nodules.	16-17'	"	28
		17-18'	"	40
		18-19'	"	27
		19-20'	"	21
19'0"-22'0"	Brown to orange-brown and yellowish-brown fine to medium sand, with some clay binding and numerous grit fragments. Compact and friable. Yellowish and offwhite mottling.	20-21'	"	31
		21-22'	"	35

PERCUSSION DRILL LOG E300. Continued.

Depth	Description	Depth	Type of Sample	Blows p/ft
22'0"-24'0"	Yellow-brown and orange-brown medium grain sand, with some slight clay binding and numerous coarse grit fragments. Compact and friable.	22-23'	Open	48
		23-24	Tube	45
24'0"-26'0"	Red-brown and light red-brown fine to medium grain, clayey sand. Very compact and somewhat friable. Scattered coarse grit fragments.	24-25'	"	33
		25-26'	"	40
26'0"-27'0"	Red-brown medium grain sand, with irregularly prominent clay binding. Very compact, somewhat friable. Becoming coarsely sandy to gritty in part.	26-27'	"	33
27'0"-30'0"	Light brown, orange-brown and reddish-brown fine sand, with some clay binding. Compact and fairly friable. Scattered grit fragments and small lime pockets.	27-28'	"	36
		28-29'	"	37
		29-30'	"	40
30'0"-31'0"	Light brown to light grey-brown and orange-brown fine to medium grain sand, with some clay binding. Very compact, somewhat friable. Scattered grit fragments.	30-31'	"	42
31'0"-33'0"	Light grey and light orange-brown mottled fine sand, with some clay binding. Compact and somewhat friable. Scattered grit fragments and odd limey pockets.	31-32'	"	43
		32-33'	"	42
33'0"-35'0"	Light grey to light grey-brown slightly clayey sand, with few lime pockets and grit fragments. Compact and fairly friable.	33-34'	"	43
		34-35'	"	40
35'0"-37'6"	Brown, reddish, red-brown and light greyish mottled, slightly clayey fine sand. Compact and fairly friable. Scattered grit fragments.	35-36'	"	27
		36-37'	"	25
		37-38'	"	28
37'6"-38'0"	Light grey silty clay, with some red, red-brown and slight yellow-brown mottling. Becoming very silty in pockets. Very stiff.			
38'0"-41'6"	Light green-grey and brick-red mottled silty clay, with small pockets of clayey silt. Some purple and yellow-brown staining.	38-39'	"	22
		39-40'	"	16
		40-41'	"	11
41'6"-43'0"	Greyish, brick-red and yellow-brown mottled clayey to finely sandy silt, with some pockets of very silty clay. Slightly micaceous.	41-42'	"	16
		42-43'	"	11
43'0"-47'0"	Light grey and yellow-brown mottled clayey to finely sandy silt, with some pockets of silty clay. Slightly micaceous. Compact and slightly friable.	43-44'	"	11
		44-45'	"	11
		45-46'	"	15
		46-47'	"	16

PERCUSSION DRILL LOG E300. Continued.

Depth	Description	Depth	Type of Sample.	Blows p/ft.
47'0"-54'0"	Red-brown and grey-brown silty to sandy clay, with some red and yellow-brown mottling. Soft and wet. Scattered grit fragments and small lime nodules.	47-54'	Slush	-
54'0"-62'0"	Greyish to blue-grey silty clay, with some yellow-brown mottling near top. Finely sandy in part. Soft and moist.	54-62'	"	-
62'0"-66'0"	Greyish to light grey clayey silt, finely sandy in part. Slightly micaceous. Soft and wet.	62-66'	"	-
66'0"-80'0"	Light grey and light blue-grey clayey to finely sandy silt, with prominent yellow-brown mottling. Slightly micaceous and with coarse gravel and rock fragments at 72'-74'. Soft and moist.	66-80'	"	-

END OF HOLE 80'

WATER CUT 50'

WATER LEVEL -

E 700
Serial No. 812/61.
D.M. 765/60

PERCUSSION DRILL LOG E 700.

PROJECT: Chowilla Damsite: River Murray. Cnty. Hamley.
LOCATION: Line "E", 400' upstream from Dam Site Axis.
Horizontal Distance E of datum: 700'.
PURPOSE: Test of Subsurface Foundation Conditions.
Geological Hole.

PLANT NO: 24 — DRILLER: W. Henderson
R.L. SURFACE: 176.64 — DEPTH: 35'
DATE COMMENCED: 8.2.61 — DATE COMPLETED: 9.2.61
BORE LOGGED: R.D. Steel — DATE: 14.2.61.

Depth	Description	Depth	Type of Sample.	Blow P.f
0 - 2'0"	Grey to grey-brown clayey sand, with few grit fragments and plant remnants.	0-1'	Open	?
		1-2'	tube	40
2'0"- 4'0"	Greyish-brown clayey fine sand, with some yellowish and orange-brown mottling. Compact and fairly friable. Scattered grit fragments.	2-3'	"	64
		3-4'	"	50
4'0"- 6'0"	Red-brown to orange-brown and light brown clayey fine sand. Slightly limey in part. Compact and fairly friable.	4-5'	"	40
		5-6'	"	55
6'0"- 9'0"	Brownish to orange-brown and dark grey-brown clayey fine sand, with scattered limey pockets. Compact and friable.	6-7'	"	6
		7-8'	"	?
		8-9'	"	32
9'0"-12'0"	Greyish, greyish-brown and orange-brown mottled silty clay, offwhite and limey in irregular pockets. Some Fe-oxide staining.	9-10'	"	20
		10-11'	"	22
		11-12'	"	20
12'0"-18'0"	Light blue-grey very stiff silty clay, with brown and yellow-brown mottling. Some dark grey Fe-oxide staining.	12-13'	"	17
		13-14'	"	12
		14-15'	"	10
15'0"-19'0"	Light greyish-brown and yellow-brown mottled very silty clay, with mica flecks and Fe-oxide stains. Very stiff.	15-16'	"	8
		16-17'	"	10
		17-18'	"	8
		18-19'	"	-
19'0"-23'0"	Light blue-grey and brownish mottled silty clay, with scattered mica flecks. Stiff and moist.	19-20'	"	8
		20-21'	"	10
		21-22'	"	10
		22-23'	"	10
23'0"-25'0"	Grey to bluish-grey firm, moist silty clay.	23-24'	"	10
		24-25'	"	10
		25-26'	"	10
25'0"-33'0"	Grey to bluish-grey silty clay. Soft and moist. Scattered mica flecks.	26-27'	Slush	-
		27-28'	"	-
		28-29'	"	-
		29-30'	open tube	-
33'0"-35'0"	Grey to bluish-grey silty clay, with pockets of greenish-grey fine sandy silt. Fairly firm, moist.	30-31'	"	-
		31-32'	"	-
		32-33'	"	-
		33-34'	"	-
		34-35'	"	-

END OF HOLE 35'.
WATER CUT: 20'.
WATER LEVEL: 18'.

E 5850
Serial No. 846/61
D.M. 765/60

PERCUSSION DRILL LOG E 5850

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY. Cnty. Hamley
LOCATION: LINE "E", 400' Upstream from Dam Site Axis.
Horizontal Distance East of datum: 5,850'.
PURPOSE: Test of Subsurface Foundation Conditions;
Geological Hole.

Plant No: 20 — Driller: J. Doecke
R.L. Surface: 169.42' — Depth: 30'
Date Commenced: 28.2.61 — Date Completed: 28.2.61
Bore Logged: R.D. Steel — Date: 9.3.61

Depth	Description	Depth	Type of Sample.	Blows p/ft.
0 - 1'0"	Light grey to light brown-grey fine sandy clay, becoming clayey fine sand in pockets. Very compact and somewhat porous. Few grit, plant and charcoal fragments.	0-1'	Open tube	11
1'0"- 2'0"	Grey to slight blue-grey silty clay, with some light grey and vague yellow-brown mottling. Very stiff. Few grit and wood fragments.	1-2'	"	10
2'0"- 4'2"	Blue-grey silty clay, with vague yellowish mottling. Very stiff. Some decomposed wood matter.	2-3' 3-4'	" "	11 12
4'2"- 5'0"	Greyish to yellow-grey clayey silt, with some dark iron oxide pockets. Very stiff.	4-5'	"	8
5'0"- 6'0"	Green-grey to yellow-grey very clayey to finely sandy silt, with numerous dark iron oxide pockets. Very stiff.	5'-6'	"	14
6'0"- 7'0"	Light greenish-grey slightly clayey to finely sandy silt, with some light and dark yellow-brown mottling. Some pockets of dark iron oxide.	6-7'	"	17
7'0"- 9'0"	Light grey clayey to finely sandy silt, with very prominent greenish, dark yellow and dark yellow-brown mottling. Very compact and somewhat friable.	7-8' 8'-9'	" "	20 30
9'0"-10'0"	Light green-grey, dark brown and dark yellow-brown mottled clayey silt to clayey fine sand.	9-10'	"	35
10'0"-14'0"	Light brown to light yellow-brown fine to medium grain sand, with some pockets of bluish-grey silty clay.	10'-14'	slush	-
14'0"-26'0"	Light brown to light yellow-brown fine to medium grain sand, with some slight greyish mottling. Scattered mica flecks.	14-26'	"	-

E+310, 16330
Serial No. 932/61
D.M. 765/60

PERCUSSION DRILL LOG E+310, 16330

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY. Hd. Murtho
LOCATION: 710' downstream from Dam Site Axis.
Horizontal Distance East of Datum: 16,330.
PURPOSE: Observation hole for No. 7 Field Permeability Test at E+360, 16330

PLANT NO.: 20
R.L. SURFACE: 175.20'
DATE COMMENCED: 18/4/61
BORE LOGGED: R.D. Steel

DRILLER: W. O'Farrell
DEPTH: 20'
DATE COMPLETED: 18/4/61
DATE: 28/4/61

Depth	Description	Depth	Type of Sample	Blows p/f
0'0" - 2'2"	Light brown to brown and grey-brown fine sandy to silty clay loam. Few grit fragments etc. Compact, but fairly friable.	0-1' 1'-2'	Open Tube	11 22
2'2" - 4'0"	Greyish to slight yellow-grey and light yellow-brown fine clayey silt to clayey fine sand, with some darker yellow mottling. Very compact, somewhat friable. Few mica flecks etc.	2'-3' 3'-4'	" "	21 21
4'0" - 5'0"	Light yellow-grey to light yellow-brown clayey fine sand. Fairly friable and compact. Slightly micaceous.	4'-5'	"	1
5'0" - 7'0"	Light greyish slightly clayey silt, with some light and dark yellow-brown mottling. Compact, but somewhat friable. Some orange coloured ochreous nodules etc.	5'-6' 6'-7'	" "	2 20
7'0" - 10'0"	Dark brown to dark grey-brown clayey fine sand to sandy clay, but also with pockets of light grey-brown fine grain sand. Some yellow-brown mottling in part.	7'-8' 8'-9' 9'-10'	" " "	26 2 1
10'0" - 12'0"	Light grey-brown slightly clayey fine sand, with few small grit fragments.	10'-12'	Slush	-
12'0" - 16'	Light grey-brown to slight grey-brown and yellow-brown mottled, fine to medium grain sand. Scattered grit fragments, mica flecks etc.	12'-16'	"	
16' - 20'	Light brown generally medium grain sand. Slightly micaceous and with few grit fragments.	16'-20'	"	

END OF HOLE 20'
WATER CUT 9'
WATER LEVEL 6.63'
BLANKET THICKNESS 5'

E + 360, 16330
Serial No. 930/61
D.M. 165/60

PERCUSSION DRILL LOG E + 360, 16330

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY. Hd. Murtho
LOCATION: 760' upstream from dam site axis.
Horizontal Distance East of Datum: 16,330'
PURPOSE: Observation hole for No. 7 Field Permeability Test at F + 10, 16,330

PLANT NO.: 20 — DRILLER: W. O'Farrell
R.L. SURFACE: 174.95' — DEPTH: 20'
DATE COMMENCED: 18/4/61 — DATE COMPLETED: 18/4/61
DATE COMPLETED: R.D. Steel — DATE: 28/4/61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0" - 1'0"	Dark grey to dark grey-brown silty clay loam, with few grit fragments. Compact, but fairly friable.	0-1' 1'-2'	Open Tube	12 16
1'0" - 3'0"	Dark grey to dark grey-brown fine silty to fine sandy clay, becoming clayey fine sand in part. Compact and somewhat friable. Few grit fragments, plant remains and charcoal pockets.	2'-3'	"	20
3'0" - 7'0"	Light grey to slight yellow-grey very silty clay, becoming clayey silt in part, with some darker yellow and yellow-brown mottling. Compact and somewhat friable. Becoming slightly clayey to fine sandy silt from 6'.	3'-4' 4'-5' 5'-6' 6'-7'	" " " "	21 19 15 -
7'0" - 10'	Grey and greyish-brown sandy clay with pockets of fine grain sand.	7'-10'	Slush	-
10' - 18'	Light brown to light yellow-brown, generally fairly fine to medium grain sand, with few grit fragments, etc. Slightly clayey in part. Some pockets of dark yellow-brown fine silty clay to clayey silt from 16'.	10'-18'	"	-
18' - 20'	Light brown to slight yellow-brown and slight grey-brown fine grain sand. May be slightly clayey in few small pockets.	18'-20'	"	-

END OF HOLE 20'
WATER CUT 9'
WATER LEVEL 6.24'
BLANKET THICKNESS 10'

Perm. at E+10 16330

E + 385, 16330
Serial No. 929/61
D.M. 765/60

PERCUSSION DRILL LOG E + 385, 16,330

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY. Hd. Murtho
LOCATION: 785' upstream from Dam Site Axis
Horizontal Distance East of Datum: 16,330'
PURPOSE: Observation hole for No. 7 Field Permeability Test at F + 10, 16330

PLANT NO.: 20
R.L. AT SURFACE: 174.78
DATE COMMENCED: 19/4/61
BORE LOGGED: R.D. Steel

DRILLER: W. O'Farrell
DEPTH: 20'
DATE COMPLETED: 19/4/61
DATE: 28/4/61

Depth	Description	Depth	Type of Sample	Blow p/ft
0 - 1'2"	Brown to grey-brown silty clay loam, with few grit fragments and plant remains. Compact, but fairly friable.	0-1'	Open Tube	14
1'2" - 4'0"	Grey to greenish-grey and light yellow mottled, very silty to finely sandy clay. Compact but somewhat friable. Few whitish lime pockets. Becoming clayey sand from 3'0", with large chalky limestone lumps.	1'-2' 2'-3' 3'-4'	" " "	15 12 15
4'0" - 8'0"	Grey to slight greenish-grey clayey silt, finely sandy in part. Some light and dark yellow-brown mottling. Compact, but fairly friable. Few mica flecks and lime pockets.	4'-5' 5'-6' 6'-7' 7'-8'	" " " "	16 18 18 17
8'0" - 12'	Light brown to light yellow-brown generally medium grain sand, with few mica flecks and grit fragments.	8'-12'	Slush	-
12' - 16'	Light brown to light grey-brown medium grain sand, with some grit fragments and small clay pockets.	12'-16'	"	-
16' - 20'	Light brown and light yellow-brown slightly clayey, medium grain sand, but with few grit fragments.	16'-20'	"	-

END OF HOLE 20'
WATER CUT 8'
WATER LEVEL 6.06'
BLANKET THICKNESS 5'

E 17,400
Serial No. 907/61
D.M. 765/60

PERCUSSION DRILL LOG E 17,400

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY. Hd. MURTHO
LOCATION: LINE "E", 400' upstream from Dam Site Axis, Horizontal Distance East of Datum: 17,400
PURPOSE: Test of Subsurface Foundation Conditions; Geological Hole.

PLANT NO: 20 — DRILLER: J. DOECKE
R.L. SURFACE: 175.31' — DEPTH: 20'
DATE COMMENCED: 7.4.61 — DATE COMPLETED: 7.4.61
BORE LOGGED: R.D. STEEL — DATE: 21.4.61

Depth	Description	Depth	Type of Sample	Blow p/ft
0 - 2'0"	Light greyish-brown to brownish-grey slightly clayey to silty loam, with some darker brown mottling. Few plant remains, grit fragments and small charcoal pockets. Compact, but fairly friable.	0-1' 1-2'	Open Tube	12 14
2'0"- 3'0"	Light grey to light grey-brown clayey to finely sandy silt, with prominent yellow mottling. Compact and somewhat friable. Few grit fragments, mica flecks and dark organic blobs.	2-3'	"	15
3'0"- 4'2"	Light grey to light brownish-grey, clayey silt to clayey fine sand, with vague yellowish mottling. Compact and slightly friable. Numerous pockets of dark charcoal matter.	3-4'	"	13
4'2"- 5'0"	Greyish to slight greenish-grey fine sandy clay to clayey sand. Stiff and Compact. Some dark organic matter and light brown ochre nodules.	4-5'	"	12
5'0"- 8'0"	Light greyish to greyish-brown clayey silt to clayey fine sand in part. Some light and dark yellow-brown mottling. Compact, firm but slightly friable. Few organic blobs, iron oxide stains etc.	5-6' 6-7' 7-8	" " "	12 10 11
8'0"-10'0"	Light grey to greenish-grey, clayey to finely sandy silt, with some greenish and yellow-brown mottling. Some small pockets of fine grain sand. Compact to stiff and slightly friable.	8-9' 9-10'	" "	12 13
10'0"-12'0"	Mid-grey to slight bluish-grey, grey-brown and dark yellow-brown silty to very silty clay, with few grit fragments. Compact and stiff.	10-11' 11-12'	" "	11 15
12'0"-15'0"	Greyish to slight bluish-grey very silty clay, to clayey silt in part. Some greenish and dark yellow-brown mottling. Scattered plant fragments, organic blobs etc. Stiff	12-13' 13-14' 14-15'	" " "	14 16 16

PERCUSSION DRILL LOG E 17.400. Continued

Depth	Description	Depth	Type of Sample	Blow p/ft
15'0"-16'0"	Light grey to bluish-grey slightly clayey to finely sandy silt, with some prominent greenish and dark yellow-brown mottling. Compact, becoming somewhat friable.	15-16'	Open Tube	16
16'0"-17'0"	Light brown generally medium grain sand, becoming lighter grey-brown fine clayey sand in pockets. Scattered grit fragments etc.	16-17'	"	26
17'0"-20'0"	Dark yellow to dark yellow-brown generally medium grain sand. Some finer fraction, few coarse grit fragments. Some light yellow-brown mottling in part.	17-20'	slush	

END OF HOLE 20'
WATER CUT 17'
WATER LEVEL 8'6"
BLANKET THICKNESS 16'.

E 17756
Bore Serial No. 908/61
D.M. 765/60

PERCUSSION DRILL LOG E 17756.

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY. Hd. Murtho
LOCATION: LINE "E", 400' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 17,756'.
PURPOSE: Test of Subsurface Foundation Conditions:
Geological Hole.

Plant No: 20 — Driller: J. Doecke
R.L. Surface: 170.17' — Depth: 13'
Date Commenced: 7.4.61 — Date Completed: 7.4.61
Bore Logged: R.D. Steel — Date: 21.4.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0 - 1'1"	Reddish fine silty clay loam, with some light greyish mottling.	0- 1'	Open Tube	10
1'1"- 2'2"	Mid-grey to slight bluish-grey and brownish-grey silty to finely sandy clay. Fairly soft and moist. Few grit fragments plant remains.	1- 2'	"	8
2'2"- 4'0"	Bluish-grey to grey and brownish-grey very silty clay, with vague greenish mottling. Few grit fragments, plant remains, organic blobs etc. Firm, moist. Becoming clayey silt in part from 3'0".	2- 3' 3- 4'	" "	8 9
4'0"- 6'0"	Light grey to light yellow-grey clayey silt, becoming finely sandy in part. Prominent dark yellow mottling. Few gypsum pockets and organic blobs. Compact, but somewhat friable.	4-5' 5- 6'	" "	13 13
6'0"-13'0"	Light brownish generally fairly fine grain sand, becoming greyish to light bluish-grey fine clayey sand in isolated pockets.	6- 7' 7- 8' 8- 9' 9-10' 10-13'	" " " " slush	11 8 9 10 -

END OF HOLE 13'

WATER CUT 7'

WATER LEVEL 2'6"

BLANKET THICKNESS 6'.

E 18100
Bore Serial No.917/61
D.M. 765/60

PERCUSSION DRILL LOG E 18100

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY. Hd. Murtho
LOCATION: LINE "E", 400' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 18,100'
PURPOSE: Test of Subsurface Foundation Conditions.
Geological Hole.

Plant No: 20 — Driller: J. Doecke
R.L. Surface: 183.60' — Depth: 15'
Date Commenced: 10.4.61 — Date Completed: 10.4.61
Bore Logged: — Date: 4.5.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0 - 3'6"	Light reddish-brown fine sandy loam, with some coarse grit fragments.	0- 1'	open tube	9
		1- 2'	"	16
3'6"- 5'0"	Brown to dark brown generally fine sand, but with numerous coarse grit fragments.	2- 3'	"	25
		3- 4'	"	16
		4- 5'	"	12
5'0"- 6'0"	Chocolate brown, slightly clayey, medium grain sand, but with some coarse grit fragments.	5- 6'	"	18
6'0"- 8'0"	Light brownish generally fine grain clayey sand, but with numerous coarse grit fragments.	6- 7'	"	28
		7- 8'	"	25
8'0"- 9'0"	Light brown to light orange-brown clayey sand, medium to slightly coarse grained. Compact and slightly friable.	8- 9'	"	19
9'0"-14'0"	Light greyish-brown and slight orange-brown medium to slightly coarser grain sand, but with prominent clay binding, Offwhite and limey in patches.	9-10'	"	12
		10-11'	"	14
		11-12'	"	13
		12-13'	"	14
		13-14'	"	14
14'0"-15'0"	Light brown to grey-brown medium to slightly coarse grained sand, compact and slightly friable.	14-15'	"	14

END OF HOLE 15'

WATER CUT -

WATER LEVEL -

F600
Serial No 811/61
D.M. 765/60

PERCUSSION DRILL LOG F600

PROJECT: Chowilla Damsite: River Murray Cnty. Hamley
LOCATION: Line "F" 800' Upstream from Dam Axis
Horizontal Distance East of Datum 600'
PURPOSE: Test of Subsurface Foundation Conditions
Geological Hole.
PLANT NO: 24
R.L. SURFACE 176.72
DATE COMMENCED: 7.2.61
BORE LOGGED: R.D. STEEL

DRILLER: W. Henderson
DEPTH: 20'
DATE COMPLETED 7.2.61
DATE 7.2.61

Depth			Description	Depth	Type of Sample.	Blows p/foot.
0	-	2'0"	Brownish grey fine grain sand, well rounded and unconsolidated	0-1'	open tube	-
				1-2'		1(
2'0"	-	5'0"	Light brownish-grey, greyish and brownish fine clayey sand, slightly limey in part and with scattered grit fragments.	2-3'	"	3(
				3'-4'	"	5(
				4'-5'	"	5(
5'0"	-	6'3"	Light grey-brown, light brown and orange-brown clayey sand. Slightly limey in part and with scattered grit fragments. Compact.	5'-6'	"	3(
6'3"	-	7'0"	Greyish-brown and greyish silty clay, with some pockets of brownish sand. Scattered grit fragments. Very stiff.	6'-7'	"	2(
7'0"	-	8'1"	Greyish to greenish-grey silty clay, with vague yellowish mottling. Somewhat sandy in small pockets and with scattered grit fragments.	7'-8'	"	2(
8'0"	-	10'0"	Greyish to greenish-grey silty clay, with prominent brown and yellow-brown mottling. Slightly micaceous and limey in part. Few grit fragments, organic blobs etc. Very stiff.	8'-9'	"	2(
				9'-10'	"	1(
10'0"	-	12'6"	Grey to light grey very silty clay, with prominent brown and yellow-brown mottling. Scattered grit fragments, iron oxide pockets. Very stiff.	10'-11'	"	1(
				11'-12"	"	1(
				12'-13'	"	1(
12'6"	-	14'0"	Light bluish-grey clayey silt, with prominent brown and yellow-brown mottling. Slightly micaceous, few grit, fragments. Stiff but somewhat friable.	13'-14'"		8

PERCUSSION DRILL LOG F600 Continued

Depth			Description	Depth	Type of Sample	Blow p.ft.
14'0"	-	15'0"	Light grey slightly clayey silt finely sandy in part. Prominent dark yellow-brown mottling. Slightly micaceous. Firm becoming friable.	14'-15'	open tube	10
15'0"	-	16'0"	Light grey to light bluish-grey slightly clayey to finely sandy silt, with some brown and yellowish mottling. Very moist.	15'-16'	"	12
16'0"	-	17'0"	Light grey to light bluish-grey finely sandy silt, with some brown and yellowish mottling. Very moist.	16'-17'	"	7
				17'-20'	"	not recorded.
17'0"	-	18'6"	Light grey to light bluish-grey clayey to finely sandy silt, with prominent yellowish mottling. Slightly micaceous. Soft and very moist.			
18'6"	-	20'0"	Grey to bluish-grey silty clay. Fairly soft and very moist. Slightly sandy in part.			

END OF HOLE 20'
WATER CUT Nil
STATIC LEVEL —.

F1000
Bore Serial No 849/61
D.M. 765/60

PERCUSSION DRILL LOG "F" 1000

PROJECT: CHOWILLA DAM SITE RIVER MURRAY County Hamley.
LOCATION: LINE "F" 800' upstream from Dam Site Axis.
Horizontal Distance East of Datum 1000'
PURPOSE: Test of Subsurface Foundation Conditions, Geological Hole

PLANT NO: 20
R.L. SURFACE: 172.20'
DATE COMMENCED: 1.3.61
BORE LOGGED: R.D. STEEL

BRILLER J. Doecke
DEPTH 20'
DATE COMPLETED 1.3.61
DATE 17/3/61

Depth			Description	Depth	Type of Sample	Blo p/f
0'0"	-	2'4"	Light grey, to light brown-grey fine sandy clay, becoming clayey fine sand in small pockets. Compact and somewhat friable. Few grit and plant fragments etc.	0'-1' 1'-2' 2'-3'	open tube " "	39 33 21
2'4"	-	4'0"	Pale greyish to pale brownish-grey fine clayey silt, with prominent light and dark yellow-brown mottling. Very compact and slightly friable. Few grit fragments and mica flecks, Some pockets selenite crystals from 3'-4'.	3'-4'	"	15
4'0"	-	7'0"	Pale greyish fine clayey silt, some yellow-brown mottling. Slightly micaceous. Very firm but slightly friable. Few gypsum crystals and iron oxide pockets.	4'-5' 5'-6' 6'-7'	" " "	11 7 7
7'0"	-	9'0"	Pale grey and yellow-brown mottled clayey silt. Stiff and slightly friable. Few grit fragments, mica flecks and small iron oxide pockets.	7'-8' 8'-9'	" "	6 11
9'0"	-	10'9"	Pale grey very fine clayey silt very silty clay, with prominent yellow brown mottling. Very firm, moist. Some small mica flecks and oxide stains.	9'-10' 10'-11'	"	6 7
10'9"	-	15'0"	Pale grey very fine clayey silt, with prominent yellow-brown mottling. Becoming soft and wet. Small mica flecks, iron oxide stains and pockets of greyish fine sand.	11'-15'	slush	-
15'0"	-	20'0"	Light greyish generally fine silty clay to clayey silt, maybe slightly sandy in part. Possibily laminated yellow-brown mottling. Soft and wet.	15'-20'	"	-

END OF HOLE 20'
WATER CUT -
WATER LEVEL BLANKET THICKNESS 20'+

F 1700
Serial No 863/61
D.M. 765/60

PERCUSSION DRILL LOG F. 1700

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY Cnty. Hamley
LOCATION: LINE "F" 800' upstream from Dam Site Axis
Horizontal Distance East of Datum: 1700'

PURPOSE: Test of subsurface Foundation Conditions: Geological Hole

R.L. SURFACE: 170.50' **DEPTH** 35'
PLANT NO 20 **DRILLER:** J. DOECKE
DATE COMMENCED 8.3.61 **DATE COMPLETED** 8.3.61
BORE LOGGED BY: R.D. STEEL **DATE:** 17.3.61

Depth			Description	Depth	Type of Sample	Blo p/ft
0	-	1'10"	Light greyish to light brownish-grey fine sandy clay, becoming clayey fine sand in pockets. Generally compact and somewhat friable. Few grit fragments. etc.	0'-1' 1'-2'	open tube	24 49
1'10"	-	3'0"	Light greyish to slight greenish grey silty clay, with vague brown and yellowish mottlung. Very stiff and compact. Few grit fragments etc.	2'-3'	"	15
3'0"	-	4'0"	Pale brown, light and dark yellow-brown mottled slightly clayey silt. Compact and somewhat friable. Slightly micaceous and with few organic pockets.	3'-4'	"	12
4'0"	-	6'0"	Dull grey to pale-brown fine silty sand, with prominent light and dark yellow brown mottling. Some pockets of dark grey ferruginous material. Compact and friable.	4'-5' 5'-6'	" "	18 13
6'0"	-	13'0"	Light brown to light yellow-brown, very fine silty sand to fine sandy silt. Slightly micaceous.	6'-13'	slush	-
13'	-	20'	Light to pale brown, slightly micaceous, fine silty sand.	13'-20'	"	-
20'	-	24'	Light to pale brown, slightly micaceous, fine grain samd.	20'-24'	"	-
24'	-	31'	Pale brown fairly fine grain sand, with scattered coarser grit fragments.	24'-31'	"	-
31'0"	-	25'	Pale brown fine to medium grain sand generally, but with abundant coarse sand and grit fragments.	31'-35'	"	-

END OF HOLE 35'
WATER CUT 18'
WATER LEVEL 10'
BLANKET THICKNESS 4'0".

F2500
Serial No 864/61
D.M. 765/60

PERCUSSION DRILL LOG F2500..

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY ; Cnty HAMLEY
LOCATION: LINE "F" 800' upstream from Dam Site Axis
Horizontal Distance East of Datum: 2500'
PURPOSE: Test of Subsurface Foundation Conditions,
Geological Hole.

PLANT NO 20
R.L. SURFACE 168.92
DATE COMMENCED: 9.3.61
BORE LOGGED: R.D. STEEL

DRILLER J. DOECKE
DEPTH 35'
DATE COMPLETED 9.3.61
DATE 17.3.61

Depth			Description	Depth	Type of Sample.	Blows p/ft
6"	-	2'0"	Light greyish fine sandy clay, becoming clayey fine sand in pockets. Very compact and slightly friable. Few grit fragments and plant remnants. etc.	0'-1' 1'-2'	open tube	3(2'
2'0"	-	3'0"	Slight greenish-grey very silty clay with vague yellowish mottling. Very stiff odd small gypsum pockets, laterite nodules etc.	2'-3'	"	1(
3'0"	-	3'9"	Light greenish-grey clayey silt, with light yellow-grey and yellowish mottling. Very compact to stiff, but slightly friable. Few mica flecks, gypsum pockets etc.	3'-4'	"	8
3'9"	-	8'0"	Light grey to light brown, light and dark yellow-brown mottled slightly clayey to finely sandy silt. Compact, fairly friable. Few mica flecks, organic pockets etc.	4'-5' 5'-6' 6'-7' 7'-8'	" " " "	19 12 12 14
8'0"	-	11'0"	Light greyish to light brown and yellowish-brown mottled fine sandy silt. Compact, friable and somewhat micaceous in part.	8'-9' 9'-10' 10'-11'	" "	8 8
11'	-	14'	Light grey to light brown, light and dark yellow-brown mottled, slightly clayey to finely sandy silt, Possibly containing pockets of blue-grey silty clay. Soft and wet.	11'-14'	slush	-
14'	-	20'	Light grey clayey to finely sandy silt or very fine sand, with yellow-brown lamination. Soft and wet.	14'-20'	"	-
20'	-	27'	Light grey to light yellow-grey fine grain sand, but with coarser sand and grit fragments irregularly abundant.	20'-27'	slush	-
27'	-	32'	Light brown generally fine grain sand, with some coarser sand and grit fragments.	27'-32'	"	-

Depth	Description	Depth Type of Sample.	Blow p.ft.
32' - 35'	Light to pale greyish-brown generally fairly fine grain sand, but with fairly numerous coarse grit fragments.	32'-35'	slush -

END OF BORE 35'
WATER CUT 18'
WATER LEVEL 10'
BLANKET THICKNESS 14'

F4210
Bore Serial No 885/61
DM 765/60

PERCUSSION DRILL LOG F4210

PROJECT CHOWILLA DAM SITE : RIVER MURRAY County Hamley
LOCATION: LINE "F" 800' upstream from Dam Site Axis
Horizontal Distance East of Datum 4210'
PURPOSE: Geological Hole for No2 . Two Well Velocity Test
PLANT NO 40 DRILLER W.F. FARROW
R.L. SURFACE 170.42' DEPTH 16'
DATE COMMENCED 17.3.61 DATE COMPLETED 21.3.61
BORE LOGGED R.D. STEEL DATE 23.3.61

Depth	Description	Depth	Type of Sample	B. p.f
0 - 1'4"	Greyish to slight brownish-grey fine silty to sandy clay, becoming clayey fine sand in pockets. Compact and fairly friable. Few grit fragments, plant remains, etc.	0-1'	open tube	35
1'4"- 2'0"	Greyish to slight brownish-grey and faint yellow-brown mottled very silty clay, maybe finely sandy in part. Very compact, slightly friable. Small grit fragments, minute plant remains, few laterite nodules etc.	1-2'	"	31
2'0"- 3'4"	Light grey-brown to yellow-brown very silty clay to clayey silt. Very stiff. Numerous white gypsum pockets and few dark iron oxide patches.	2-3'	"	28
3'4"-5'6"	Light brown to light grey-brown and yellow-brown mottled fine clayey silt. Stiff and compact. Few small gypsum crystals and some dark oxide patches.	3-4' 4-5'	" "	20 14
5'6"-6'6"	Light brown, light and dark yellow-brown mottled slightly clayey to finely sandy silt. Very compact, some-what friable. Few grit fragments, mica flecks etc.	5-6'	"	18
6'6"-8'0"	Light brown to light grey-brown and light yellowbrown fine silty sand, but with some pockets of clayey silt. Few grit fragments and mica flecks.	6-7' 7-8' 8-9'	" " "	16 18 22
8'0" - 12'0"	Light brown to yellow-brown mottled fine silty sand becoming light greyish slightly clayey to finely sandy silt in part.	9-10' 10-11' 11-12'	" " "	24 22 21
12'0" - 15'0"	Light brown to light and dark yellow-brown mottled fine silty sand, becoming somewhat coarser grained at depth. Few grit fragments, mica flecks etc.	12-13' 13-14' 14-15'	" " "	25 22 23

END OF HOLE 15'
WATER CUT 8'6"
WATER LEVEL 8'6"
BLANKET THICKNESS 6'6"

F55 00
Serial No 865/61
D.M. 765/60

PERCUSSION DRILL LOG F 5500

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY Cnty Hamley
LOCATION: LINE "F" 800' upstream from Dam Site Axis
Horizontal distance East of Datum 5500'
PURPOSE: Test of Subsurface Foundation Conditions;
Geological Hole.

PLANT NO: 20 — DRILLER: J. DOECKE
R.L. SURFACE 170.15' — DEPTH: 35 feet.
DATE COMMENCED: 9.3.61 — DATE COMPLETED 10.3.61
BORE LOGGED: R.D. STEEL — DATE 19.3.61

Depth	Description	Depth	Type of Sample.	Blows p/foot
0' - 2'0"	Light greyish to light brownish-grey fine sandy clay, becoming clayey fine sand in patches. Compact, but fairly friable. Few grit fragments, and plant remains.	0'-1' 1'-2'	open tube	17 19
2'0" - 3'6"	Greyish to slight brownish-grey and light greenish-grey very silty clay. Very compact and slightly friable. Scattered dark grit fragments, plant remnants etc.	2'-3'	"	13
3'6" - 8'0"	Greyish to slight greenish-grey silty to very silty clay, with pockets of gypsum and selenite crystals irregularly numerous. Some yellow-ish brown mottling appearing at depth.	3'-4' 4'-5' 5'-6' 6'-7' 7'-8'	" " " " "	7 6 9 8 8
8'0" - 10'	Light greyish to light greenish grey silty to very silty clay, with some yellowish brown mottling. Scattered gypsum pockets, selenite crystals and dark iron-oxide pockets.	8'-9' 9'-10' 10'-11'	" " "	9 6 not recorded
10' - 11'	Greenish-grey silty clay with yellowish-brown mottling. Very stiff Few small gypsum pockets.			
11' - 12'	Greenish-grey silty to very silty clay, with prominent brown and yellow-brown mottling. Very stiff.	11'-12'	"	-
12' - 14'	Pale grey to pale green-grey and yellow-grey clayey silt, with prominent dark yellow- brown mottling. Very compact, slightly friable.	12'-14'	"	-
14' - 18'	Bluish-grey silty clay, with pockets of light greyish fine silty sand. Soft and wet.	14'-18'	open tube	not recorded
18' - 24'	Light greyish-brown fine to medium grain sand, with fairly numerous coarse sand and grit fragments. Few mica flecks etc.	18'-24'	slush	-

F5500'

Depth			Description	Depth	Type of Sample	Blow p.ft.
24'	-	30'	Light greyish-brown fine to medium grain sand, with coarser sand and grit fragments irregularly abundant.	24'-30'	"	-
30'	-	35'	Mid-grey to dark grey fine grain sand, but with some coarse grit and ocasional gravel fragments. Some carbonaceous matter and few mica flecks.	30'-35'	"	-

END OF HOLE 35'
WATER CUT 18'
WATER LEVEL 10'
BLANKET THICKNESS 18'

DEPARTMENT OF MINES
SOUTH AUSTRALIA

F 7390
Bore Serial No.
890/61
D.M. 765/60

PERCUSSION DRILL LOG F 7390

PROJECT: CHOWILLA DAMSITE: RIVER MURRAY. County Hamley.
LOCATION: LINE "F" 800' upstream from Dam Site Axis.
HORIZONTAL DISTANCE EAST OF DATUM : 7390'
PURPOSE: GEOLOGICAL HOLE FOR No. 3. Two Well Velocity Test
PLANT NO: 20 DRILLER: J.DOECKE
R.L. SURFACE: 173.01 DEPTH: 18'
DATE COMMENCED: 23.3.61 DATE COMPLETED: 24.3.61
BORE LOGGED: R.D.STEEL DATE: 3.4.61

Depth	Description	Depth	Type of Sample.	Blows p/ft.
0 - 1'0"	Light grey to light grey-brown fine sandy to silty clay, becoming fine clayey sand in part. Compact and fairly friable. Few grit fragments etc.	0-1'	open tube	36
1'0" - 2'6"	Greyish to greyish-brown silty to very silty clay, becoming finely sandy in part. Very stiff and compact. Few grit fragments, etc.	1'-2'	"	34
2'6" - 3'0"	Light brown to grey-brown and yellow-brown very silty clay, with abundant pockets of gypsum crystals.	2'-3'	"	30
3'0" - 4'0"	Light brown to light and dark yellow-brown mottled fine clayey silt, becoming slightly sandy in part. Compact and somewhat friable. Few mica flecks etc.	3'-4'	"	19
4'0" - 9'0"	Light brown to yellow-brown fine sandy silt. Slightly clayey in part. Compact but friable. Few mica flecks etc.	4'-5' 5'-6' 6'-8'	" " "	12 16 20
9'0" - 18'0"	Light brown to yellowish-brown, generally very fine silty sand. Somewhat micaceous and friable.	8'-9' 9'-18'	" slush	20 -

END OF HOLE 18'

WATER CUT 11'

WATER LEVEL 10'6"

BLANKET THICKNESS 9'

F7625
Serial No. 835/61
D.M. 765/60

PERCUSSION DRILL LOG F7625

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, County Hamley.
LOCATION: LINE "F", 800' upstream from Dam Site Axis. Horizontal Distance East of Datum, 7625'.
PURPOSE: Observation Hole for No. 4 Field Permeability Test at F7725.

PLANT NO: 40
R.L. SURFACE: 173.16
DATE COMMENCED: 23/2/61
BORE LOGGED: R. D. Steel
DRILLER: W. F. Farrow
DEPTH: 30'
DATE COMPLETED: 23/2/61
DATE: 8/3/61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0" - 1'7"	Greyish to slight brownish-grey fine sandy clay, becoming clayey fine sand in part. Compact and somewhat friable.	0- 1' 1- 2'	Open tube	53 30
1'7" - 2'9"	Brownish-grey, very stiff silty clay, slightly sandy in part, with few grit fragments and plant remnants. Vague yellowish mottling.	2- 3'	"	16
2'9" - 3'0"	Greyish to greyish-brown and yellow-brown very silty clay. Very stiff. Slightly micaceous and with pockets of white selenite crystals.			
3'0" - 5'0"	Light grey, light and dark yellow-brown mottled clayey silt, with pockets of silty clay. Very compact, somewhat friable. Slightly micaceous and with patches of dark iron-oxide staining.	3- 4' 4- 5'	" "	12 16
5'0" - 8'2"	Light greyish to light and dark yellow-brown mottled slightly clayey to finely sandy silt. Compact and fairly friable. Slightly micaceous and with few dark organic pockets. Pockets of bluish-grey silty clay from 7'9"	5- 6' 6- 7' 7- 8'	" " "	12 13 9
8'2" - 10'0"	Light grey, light and dark yellow-brown mottled sandy silt. Fairly micaceous. Compact and friable.	8- 9' 9-10'	" "	15 20
10'0" - 12'0"	Light grey-brown, light and dark yellow-brown fine sandy silt, slightly clayey in part. Fairly micaceous. Compact, friable.	10-11' 11-12'	" "	21 -
12'0" - 22'0"	Brownish fine silty sand, slightly clayey and micaceous.	12-22'	Slush	-
22'0" - 30'	Brownish to yellowish-brown fine silty sand, slightly micaceous and with few grit fragments.	22-30'	"	-
	END OF HOLE 30'			
	WATER OUT 15'			

"F" 7675
Bore Serial No. 833/61
D.M. 765/60

PERCUSSION DRILL LOG F 7675

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, County Hamley.
LOCATION: LINE "F", 800' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 7675'
PURPOSE: Observation hole for Permeability Test at "F" 7725
Plant No: 40 Driller: W. Farrow
R.L. Surface: 173.10 Depth: 41'
Date Commenced: 21/2/61 Date Completed: 21/2/61
Bore Logged: R. D. Steel Date: 21/2/61

Depth	Description	Depth	Type of Sample	Blow p/f
0'0" - 1'0"	Brown-grey and light grey fine sandy clay, becoming clayey fine sand in pockets. Very compact. Friable.	0 - 1'	Open tube	43
1'0" - 3'0"	Brown-grey silty to very silty clay, finely sandy in pockets Very stiff and compact.	1 - 2' 2- 3'	" "	54 51
3'0" - 4'0"	Grey to brown-grey silty clay, with some brown and yellow-brown mottling. Numerous whitish gypsum pockets.	3- 4'	"	35
4'0" - 5'0"	Grey to grey-brown very silty clay, with some brown and dark yellow-brown mottling. Few gypsum pockets, abundant dark iron-oxide stains.	4- 5'	"	20
5'0" - 9'0"	Greyish very silty clay to clayey silt, with prominent brown and dark yellow-brown mottling. Becoming friable and finely sandy at depth. Some dark iron-oxide pockets.	5- 6' 6- 7' 7- 8' 8- 9'	" " " "	15 11 15 10
9'0" - 12'0"	Light bluish-grey, brown and dark yellow-brown mottled clayey to finely sandy silt. Slightly micaceous and fairly friable. Some dark iron-oxide pockets.	9-10' 10-11' 11-12'	" " "	10 13 24
12'0" - 14'0"	Light brown to light grey-brown and dark yellow-brown, coarsely mottled, fine silty sand, wet.	12-13' 13-14'	" "	24 32
14'0" - 24'	Brown and yellow-brown fine silty sand, perhaps somewhat clayey in part. Wet and unconsolidated.	14-24'	Slush	-
24' - 29'	Light brown to yellow-brown fine silty sand. Slightly micaceous. Wet and unconsolidated.	24-29'	"	-
29' - 41'	Light brown to light grey-brown fine to medium grain sand, with scattered mica flecks and grit fragments. Wet and unconsolidated.	29-41'	"	-

END OF HOLE	40'
WATER CUT	13'
WATER LEVEL	10.75'
THICKNESS OF BLANKET	9'0"

F7700
Serial No.832/61
DM 765/60

PERCUSSION DRILL LOG F 7700

PROJECT: CHOWILLA DAM SITE: MURRAY RIVER. County Hamley
LOCATION: Line "F" 800' upstream from Dam Site Axis (Line "D")
Horizontal distance East of datum 7700'
PURPOSE: Observation hole for Permeability test at F7700'
PLANT NO: 40 Driller: W. Farrow
R.L. Surface: 173.04' Depth: 40'
Date Commenced: 20.2.61 Date Completed: 20.2.61
Bore Logged: R.D. Steel Date: 21.2.61

DEPTH	DESCRIPTION	DEPTH	TYPE OF SAMPLE	BLOWS P/FT.
0 - 1'6"	Grey to brownish-grey fine sandy clay, becoming clayey fine sand in pockets. Compact fairly friable. Few grit fragments, plant remnants.	0-1'	open tube	38
		1'-2'		56
1'6" - 2'10"	Brownish-grey silty to very silty clay. Very stiff and compact. Slightly sandy in part. Few grit fragments.	2'-3'	"	38
2'10" - 4'0"	Grey-brown and dark yellow-brown mottled silty clay. Very stiff Abundant pockets of gypsum crystals.	3'-4'	"	17
4'0" - 9'0"	Grey to brown and dark yellow-brown mottled clayey silt. Slightly micaceous and friable. Dark iron oxide stains.	4'-5'	"	17
		5'-6'	"	13
		6'-7'	"	14
9'0" - 10'0"	Grey to blue-grey clayey silt, with some brown and dark yellow-brown mottling. Pockets of dark iron oxide staining. Slightly micaceous.	7'-8'	"	9
		8'-9'	"	8
		9'-10'"		10
10'0" - 11'0"	Light grey to light blue-grey fine sandy silt. Prominent light and dark yellow-brown mottling. Compact and friable; slightly micaceous.	10'-11'"		13
		11'-12'"		22
		12'-13'"		16
11'0" - 12'0"	As above only fine silty sand.			
12'0" - 13'0"	Light grey and dark yellow-brown mottled fine silty sand. Compact and friable.			
13'0" - 18'	Yellow-brown and light brown fine silty sand, with pockets of silty clay.	13'-18'	slush	not recorded
18' - 23'	Light grey to brownish-grey gravelly fine grained sand, somewhat clayey in part. Some yellow-brown mottling.	18'-23'	"	"
23'- 33'	Brown medium grained sand, with scattered coarse grit fragments. Few mica flecks.	23'-27'	"	"
33' - 40'	Light brown fine to medium sand. Slightly micaceous.	33'-40'	"	"

END OF HOLE 40'
Water Cut 12'
Water Level 10.69'
Blanket Thickness 11'0"

F7725
Serial No. 823/61
D.M. 765/60

PERCUSSION DRILL LOG "F" 7725

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, County Hamley.
LOCATION: Line "F", 800' upstream from Dam Site Axis.
Horizontal Distance East of datum: 7725'.
PURPOSE: Pump Hole for Permeability Test at F 7725'.
Plant No: 40 **Driller:** W. F. Farrow.
R.L. Surface: 173.09 **Depth:** 141'
Date Commenced: 13/2/61 **Date Completed:** 17/2/61
Bore Logged: R. D. Steel **Date:** 17/2/61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0" - 1'0"	Greyish-brown to greyish fine sandy clay, becoming clayey fine sand in pockets. Compact and friable. Few grit fragments.	0- 1'	Open tube	67
1'0" - 1'8"	Greyish-brown silty to finely sandy clay. Very stiff and compact. Few grit fragments.	1- 2'	"	62
1'8" - 2'0"	Greyish-brown, very stiff and compact silty clay, with abundant white gypsum crystals.			
2'0" - 3'0"	Grey-brown and dark brown mottled silty clay, with abundant white gypsum crystals in pockets. Black organic dendritic staining. Very stiff.	2- 3'	"	22
3'0" - 7'0"	Greyish to grey-brown very silty clay to clayey silt. Prominent brown and yellow-brown mottling. Some dark iron oxide stains. Very compact, somewhat friable.	3- 4' 4- 5' 5- 6' 6- 7'	" " " "	20 19 12 11
7'0" - 8'6"	Light greyish to light grey-brown slightly clayey silt, with prominent brown and yellow-brown mottling. Patches dark iron-oxide staining. Compact, fairly friable.	7- 8'	"	11
8'6" - 12'0"	Light grey, brown and dark yellow-brown mottled slightly clayey to finely sandy silt. Compact, slightly friable and moist. Some dark oxide staining.	8- 9' 9-10' 10-11' 11-12'	" " " "	14 10 11 10
12'0" - 14'0"	Light grey-brown, dark grey-brown and yellow-brown mottled, finely sandy silt, with pockets of iron oxide staining.	12-13' 13-14'	" "	24 23
14'0" - 15'0"	Light yellow-brown, dark yellow-brown, and dark yellow-grey, mottled, fine sandy silt to fine silty sand. Fairly friable. Wet.	14-15'	"	24

Depth	Description	Depth	Type of Sample	Blows p/ft.
15'0" - 25'0"	Light brown to light grey-brown fine to medium grain sand, with few coarse grit fragments. Slightly micaceous. Wet.	15- 25'	Slush	Not recorded.
25'0" - 30'	Light brown to light grey-brown fine to medium sand. Wet.	25- 30'	"	"
30' - 42'	Light brown to light yellow-brown generally medium grain sand. Wet and unconsolidated. Scattered mica flecks and coarse grit fragments.	30- 42'	"	"
42' - 50'	Grey to grey-brown and light yellow-brown medium grain sand, with scattered mica flecks and coarse grit fragments. Wet and unconsolidated.	42- 50'	"	"
50' - 55'	Light brown to light grey-brown fine to medium grain sand, with scattered mica flecks and grit fragments.	50- 55'	"	"
55' - 58'	Greyish to grey-brown generally medium to fairly coarse sand, with some hard cemented lumps, and some coarse grit fragments. Some pockets very silty clay at 57'-58'.	55- 58'	"	"
58' - 61'	Grey-brown coarse gritty sand, with abundant coarse rounded grit fragments and hard cemented lumps.	58- 61'	"	"
61' - 66'	Light greyish generally medium to somewhat coarse sand, with numerous milky quartz grit fragments.	61- 66'	"	"
66' - 70'	Light grey generally coarse grain sand, with some finer fraction and numerous rounded milky quartz grit fragments.	66- 70'	"	"
70' - 87'	Light grey medium to slightly coarse grain sand, with irregularly abundant coarse grit fragments. Wet and unconsolidated.	70- 87'	"	"
87' - 96'	Light grey to light brown-grey generally medium grain sand, with coarse rounded milky quartz grit fragments. Wet and unconsolidated.	87- 96'	"	"
96' - 112'	Grey to brownish-grey fine to medium grain sand, with some coarse grit fragments and some black organic specks. Slightly clayey in part. Wet. Unconsolidated.	96-112'	"	"
112 - 124'	Brownish-grey generally fine grain sand, with few grit frag-	112-124'	"	"

F 7725

Depth	Description	Depth	Type of Sample	Blows p/ft.
124' - 137'	Brownish-grey fine grain sand. Slightly micaceous. Scattered grit fragments. Wet and unconsolidated.	124-137'	Slush	Not recorded.
137' - 139'	Brownish-grey generally fine grain sand, slightly micaceous. Few pockets of blue-grey silty clay. Wet.	137-139'	"	"
139 - 141'	Bluish-grey silty clay, in discrete pockets with grey-brown fine grain sand. Wet.	139-141'	"	"

END OF HOLE	141'
WATER CUT	15'
WATER LEVEL	10.74'
BLANKET THICKNESS	9'0"

F+25, 7725
Serial No. 834/61
D.M. 765/60.

PERCUSSION DRILL LOG 7725, F+25

PROJECT: CHOWILLA DAMSITE: RIVER MURRAY, County Hamley.
LOCATION: 825' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 7725'
PURPOSE: Observation Hole for No. 4 Field Permeability Test at F7725.

PLANT NO: 24
R.L. SURFACE: 173.07'
DATE COMMENCED: 23/2/61
BORE LOGGED: R. D. Steel

DRILLER: W. Henderson
DEPTH: 30'
DATE COMPLETED: 24/2/61
DATE: 8/3/61

Depth	Description	Depth	Type of Sample	Blows p/ft
0'0" - 1'0"	Light brownish-grey to light grey fine sandy clay, becoming clayey fine sand in part. Compact and somewhat friable.	0- 1'	Open tube	50
1'0" - 2'0"	Light brown-grey very silty clay, finely sandy in parts and with few grit fragments. Very stiff and compact.	1- 2'	"	50
2'0" - 3'6"	Light brown, light grey-brown and yellowish very silty clay, becoming clayey silt from 3'0". Very compact. Few grit fragments, slightly micaceous.	2- 3'	"	50
3'6" - 4'0"	Light grey, light brown and darker brown very silty clay, with abundant pockets of white selenite crystals. Very compact.	3- 4'	"	20
4'0" - 8'0"	Light grey, light and dark yellow-brown mottled very silty clay. Some dark iron oxide pockets. Very compact. Becoming compact, friable, clayey silt from 7'0".	4- 5' 5- 6' 6- 7' 7- 8'	" " " "	15 11 10 8
8'0" - 10'0"	Pale grey, light and dark yellow-brown mottled fine sandy silt, with few grit fragments and mica flecks.	8- 9' 9-10'	" "	8 11
10'0" - 12'0"	Light grey to light grey-brown fine silty sand to sandy silt. Slightly micaceous. Compact and friable.	10-11' 11-12'	" "	11 10
12'0" - 20'	Pale grey to pale yellow-grey fine silty sand, becoming pale yellow-brown very fine silty sand in part. Slightly micaceous.	12-20'	Slush	-
20' - 30'	Light brownish to yellow-brown fine silty sand, with some light grey mottling. Slightly micaceous.	20-30'	"	-

END OF HOLE 30'
WATER CUT 16'
WATER LEVEL 10.75'
BLANKET THICKNESS 10'

7725, F+50
Serial No. 825/61
D.M. 765/60

PERCUSSION DRILL LOG 7725. F+50

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY, County Hamley.
LOCATION: 850' upstream from "F". Dam Site Axis.
Horizontal Distance East of datum 7725'.
PURPOSE: Observation bore for Field Permeability Test at F7725
Plant No: 20 **Driller:** J. Doecke
R.L. Surface: 173.18 **Depth:** 60'
Date Commenced: 15/2/61 **Date Completed:** 16/2/61
Bore Logged: R. D. Steel **Date:** 16/2/61.

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0" - 1'6"	Greyish to brownish-grey very silty clay, becoming finely sandy in part. Scattered grit fragments, plant remains. Very compact, slightly friable.	0- 1'	Open tube	26
1'6" - 2'9"	Brownish-grey very silty clay. Very stiff. Few grit fragments and plant remains.	1- 2'	"	41
2'9" - 4'6"	Grey, brown and dark yellow mottled very silty clay. Very stiff. Pockets of white gypsum crystals. Some dark dendritic staining.	2- 3' 3- 4'	" "	22 17
4'6" - 8'0"	Light grey silty clay, Stiff and moist. Prominent brownish mottling. Few small pockets of iron oxide. Becoming softer at depth.	4- 5' 5- 6' 6- 7' 7- 8'	" " " "	8 8 5 5
8'0" - 9'0"	Light grey to light bluish-grey clayey silt. Fairly firm, moist. Prominent brown to yellowish-brown mottling. Pockets of grey iron oxide staining. Slightly micaceous.	8- 9'	"	7
9'0" - 11'0"	Light blue-grey finely sandy silt, with prominent brown and dark yellow-brown mottling. Some dark iron oxide staining. Slightly micaceous. Moist, friable.	9-10' 10-11'	" "	10 9
11'0" - 20'	Light grey, brownish and yellow-brown, very silty clay. Finely sandy in part. Slightly micaceous.	11-20'	Slush	Not recorded.
20' - 25'	Light brown to light yellowish-brown fine grained sand, slightly micaceous.	20-25'	"	-
25' - 30'	Light brown medium grain sand, with few coarse grit fragments.	25-30'	"	-
30' - 35'	Light brown medium grained sand, with abundant coarse dark coloured grit fragments.	30-35'	"	-

F + 50, 7725

Depth	Description	Depth	Type of Sample	Blows p/ft.
35' - 45'	Light greyish to greyish-brown medium grained sand. Some hard cemented lumps and dark rounded gravel fragments.	35-45'	Slush	-
45' - 60'	Light grey to light grey-brown, generally coarse sand, with some fine interstitial fraction. Numerous coarse to very coarse grit fragments.	45-60'	"	-

END OF HOLE 60'
WATER CUT 15'
WATER LEVEL 10.81'
BLANKET THICKNESS (11'-20')

7725, F + 100
Serial No. 824/61
D.M. 765/60

PERCUSSION DRILL LOG 7725. F + 100

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, County Hamley.

LOCATION: 900' Upstream from Dam Site Axis
Horizontal Distance East of datum: 7725

PURPOSE: Observation Hole for Field Permeability test at F7725
DRILLER: J. DOECKE — PLANT NO: 20
R.L. SURFACE: 173.37' — DEPTH: 46'
DATE COMMENCED: 13.2.61 — DATE COMPLETED: 15.2.61
BORE LOGGED: R.D. STEEL — DATE: 15.2.61

DEPTH	DESCRIPTION	DEPTH	TYPE OF SAMPLE	BLOWS P/FT.
0 - 1'0"	Grey to grey-brown fine sandy clay, becoming fine clayey sand in pockets. Few grit fragments and plant remnants. Compact, somewhat friable.	0 - 1'	open tube	28
1'0" - 2'6"	Grey-brown very silty clay, with scattered grit fragments and plant remnants. Slightly gypseous in part. Very stiff and compact.	1' - 2'	"	30
		2' - 3'	"	19
2'6" - 3'6"	Brown to grey-brown very silty clay, with prominent yellow-brown mottling. Very stiff. Few grit fragments etc.			
3'6" - 5'0"	Grey to grey-brown, brown and yellow-brown mottled very silty clay, with numerous pockets of whitish gypsum crystals.	3' - 4'	"	11
		4' - 5'	"	8
5'0" - 7'0"	Grey to grey-brown very silty clay, with prominent brown and dark yellow-brown mottling. Stiff and moist. Pockets dark fe-oxide.	5' - 6'	"	7
		6' - 7'	"	5
7'0" - 9'0"	Greyish-brown, brown and dark yellow-brown clayey silt, with patches of dark grey fe-oxide. Slightly micaceous. Firm and fairly friable.	7' - 8'	"	6
		8' - 9'	"	6
9'0" - 10'0"	Light bluish-grey fine sandy silt, with some brown and dark yellow-brown mottling. Slightly micaceous and with patches of dark Fe-oxide, fairly friable.	9' - 10'	"	6
10'0" - 17'	Grey, brown-grey and yellow-brown mottled silty clay to clayey silt. Some Fe-oxide stains, slightly micaceous. Soft and very moist.	10'-17'	slush	-
17' - 22'	Brown to yellow-brown fine silty sand. Slightly micaceous. Unconsolidated.	17'-22'	"	-

7725 F + 100

DEPTH	DESCRIPTION	DEPTH	TYPE OF SAMPLE	BLOWS P/FT.
22' - 24'	Pale yellow to pale yellow-grey very fine silty sand. Slightly micaceous and with few grit fragments.	22'-24'	slush	-
24' - 30'	Brown to light yellow-brown fairly fine sand, with numerous very coarse rounded quartz grit fragments.	24'-30'	"	-
30' - 36'	Coarse rounded quartz grit, with fairly prominent yellowish fine interstitial sand fraction.	30'-34'	"	-
36' - 40'	Light yellow-grey to light yellow-brown generally medium grain sand, with numerous coarse grit fragments.	36'-40'	"	-
40' - 46'	Light grey generally medium grain sand, with fairly abundant rounded coarse grit fragments.	40'-46'	"	-
	End of Hole 46'			
	Water Cut 15'			
	Water Level 10.92'			
	Blanket Thickness (10'-17')			

F 7750
Serial No. 829/61
D.M. 765/60

PERCUSSION DRILL LOG F7750

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, County Hamley
LOCATION: Line "F" 800' Upstream from Damsite axis (Line "D")
Horizontal distance East of datum 7750'
PURPOSE: Observation Hole for Permeability Test at F 7750'
Plant No: 24 Driller: W. Henderson
R.L. Surface: 173.00 Depth: 40'
Date Commenced: 21.2.61 Date Completed: 21.2.61
Bore Logged: R.D. Steel Date 21.2.61

DEPTH	DESCRIPTION	DEPTH	TYPE OF SAMPLE.	BLOWS P/FT.
0'0" - 1'6"	Light grey and light grey-brown fine sandy clay, becoming clayey fine sand in pockets. Somewhat friable.	0'-1'	open tube	40
1'6" - 2'10"	Brownish-grey, very compact to stiff, silty to very silty clay, becoming finely sandy in small pockets. Few grit fragments, plant remnants etc.	1'-2'	"	32
2'10" - 3'1"	Light grey to light grey-brown and yellow-brown fine clayey silt. Slightly micaceous. Compact slightly friable.	2'-3'	"	26
3'1" - 4'0"	Brown and brownish-grey very silty clay, with prominent dark yellow-brown mottling. Stiff. Numerous pockets of gypsum crystals. Dark oxide stains.	3'-4'	"	13
4'0" - 5'0"	Light grey and light brown mottled clayey silt. Some light yellow-brown mottling. Numerous oxide pockets. Compact fairly friable.	4'-5'	"	11
5'0" - 7'0"	Light grey, very silty clay to clayey silt, with dark brown and yellow-brown mottling. Some dark oxide stains. Few grit fragments and mica flecks.	5'-6' 6'-7'	" "	9 8
7'0" - 9'0"	Light grey, slightly clayey to finely sandy silt, with prominent brown and dark yellow-brown mottling. Compact and friable. Pockets of dark oxide staining. Few mica flecks.	7'-8' 8'-9'	" "	8 9
9'0" - 19'0"	Light brown to yellow-brown fine silty sand. Slightly clayey and micaceous.	9'-19'	slush	not record-ed
19' - 21'	Light brown to yellow-brown, fine silty sand. Slightly micaceous. Small pockets of greyish silty clay.	19'-21'	"	"
21' - 40'	Light brown to greyish-brown medium to coarse sand. Scattered grit fragments and mica flecks.	21'-40'	"	"

END OF HOLE: 40'
WATER LEVEL: 10.19'
BLANKET THICKNESS: 9'0"
WATER CUT: 12'

F 7775
Serial No. 830/61
D.M. 765/60

PERCUSSION DRILL LOG F 7775

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY: County Hamley
LOCATION: Line "F", 800' Upstream from Dam Site Axis.
Horizontal distance East of Datum: 7,775'
PURPOSE: Observation Hole for Permeability test at "F" 7775
DRILL NO: 24 Driller: W. Henderson
R.L. Surface: 173.00' Depth: 30'
Date Commenced: 22.2.61 Date Completed: 22.2.61
Bore Logged: R.D. Steel Date: 23.2.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0 - 1'0"	Light grey to light grey-brown fine sandy clay, becoming clayey fine sand in pockets. Compact friable. Few grit fragments, plant remnants.	0 - 1'	Open Tube	38
1'0"- 1'9"	Grey-brown to greyish-brown silty clay, finely sandy in part. Very stiff and compact. Few grit fragments , plant remnants.	1'- 2'	"	48
1'9"- 2'3"	Greyish-brown, grey and brown, very silty clay, with some slight yellow-brown mottling. Slightly micaceous. Very stiff and compact.	2'- 3'	"	36
2'3"- 5'0"	Greyish-brown and grey-brown mottled, very silty clay. Very stiff. Pockets of gypsum crystals.	3'- 4' 4'- 5'	" "	26 17
5'0"- 7'0"	Light greenish-grey, brown and yellow-brown finely mottled silty clay. Stiff. Numerous dark iron oxide stains.	5'- 6' 6'- 7'	" "	11 10
7'0"- 8'0"	Light greenish-grey, brown and yellow-brown mottled silty clay. Firm and moist. Numerous iron-oxide stains.	7'- 8'	"	7
8'0"- 9'0"	Light greenish-grey, brown and yellow-brown mottled fine sandy silt. Compact, fairly friable. Numerous iron-oxide stains.	8'- 9'	"	6
9'0"-19'0"	Brown to yellow-brown very fine silty sand. Slightly micaceous. Slightly clayey, in part.	9'-19'	Slush	not recorded
19'0"-27'0"	Greyish-brown, somewhat silty fine sand. Slightly micaceous.	19'-27'	"	"
27'0"-30'0"	Brownish to light grey-brown, fine to medium grain sand. Slightly micaceous, scattered grit fragments.	27'-30'	"	"

END OF HOLE 30'
WATER CUT 15'
WATER LEVEL 10.62'
BLANKET THICKNESS 9'0".

F7825
Serial No. 831/61
D.M. 765/60

PERCUSSION DRILL LOG F7825

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, County Hamley
LOCATION: LINE "F", 800' upstream from Dam Site Axis.
Horizontal Distance East of datum: 7825'
PURPOSE: Observation Hole for Permeability Test at F 7725
R.L. SURFACE: 173.14 DEPTH: 30'
PLANT NO: 24 DRILLER: W. Henderson
DATE COMMENCED: 23/2/61 DATE COMPLETED: 23/2/61
BORE LOGGED: R. D. Steel DATE: 8/3/61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0" - 1'8"	Greyish to brownish-grey fine sandy clay, becoming clayey fine sand in part. Compact and fairly friable. Few grit fragments, plant remnants.	0- 1'	Open tube	27
1'8" - 2'8"	Brownish-grey to greyish-brown very silty clay, becoming pale grey and finely sandy in small pockets. Very stiff and compact.	1- 2'	"	27
2'8" - 3'0"	Light grey-brown and yellow-brown mottled, very silty clay. Very compact, somewhat friable. Numerous pockets of whitish selenite crystals.	2- 3'	"	21
3'0" - 4'0"	Light brown, light and dark yellow-brown very silty clay. Numerous pockets of white selenite crystals. Very compact, slightly friable. Slightly micaceous. Numerous dark iron oxide stains.	3- 4'	"	14
4'0" - 5'0"	Light grey to light brown-grey very silty clay. Some light and dark yellow-brown mottling. Slightly micaceous. Very compact, slightly friable.	4- 5'	"	11
5'0" - 7'0"	Light-grey-brown and dark yellow-brown mottled very silty clay. Very compact, stiff. Scattered dark iron oxide stains. Few mica flakes.	5- 6' 6- 7'	" "	10 8
7'0" - 8'10"	Light grey, light brown, light and dark yellow-brown mottled clayey silt becoming silty clay in pockets. Very compact, somewhat friable. Slightly micaceous Some dark grey iron oxide material.	7- 8' 8- 9' 9-10' 10-11' 11-12'	" " " " "	7 7 7 7 10
8'10"- 17'0"	Pale grey, light and dark yellow-brown mottled fine sandy silt. Compact, fairly friable. Dark grey iron oxide pockets. Slightly micaceous.	12-13' 13-14' 14-15' 15-16' 16-22'	" " " " Slush	30 24 15 20 Not recorded.

Depth	Description	Depth	Type of Sample	Blows p/ft.
17'0" - 22'0"	Light yellow-grey fine silty sand, slightly micaceous and with scattered grit fragments.			
22'0" - 26'	Light brownish-grey to light yellow-grey fine silty sand, slightly micaceous and with scattered grit fragments.	22-26'	Slush	Not recorded.
26' - 30'	Light brown to yellowish-brown fine silty sand. Slightly micaceous.	26-30'	"	"

END OF HOLE 30'
WATER CUT 15'
WATER LEVEL 10.80'
BLANKET THICKNESS 9'

F9850
Serial No 765/60
D.M. 765/60

PERCUSSION DRILL LOG F 9850

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY Cnty Hamley
LOCATION: LINE "F" 800' upstream from Dam Site Axis
Horizontal Distance East of Datum, 9850'
PURPOSE: Test of Subsurface Foundation Conditions
Geological Hole

PLANT NO 24
R.L. SURFACE 165.97'
DATE COMMENCED: 28.2.61
BORE LOGGED R.D. STEEL

DRILLER: W. HENDERSON
DEPTH 25'
DATE COMPLETED 28.2.61
DATE: 17.3.61

Depth			Description			
0	-	3'0"	Pale greyish fine clayey sand, with some yellow-brown ochreous mottling Generally very compact, but somewhat friable. Some plant root remnants near top, few pockets organic matter etc.	0'-1' 1'-2' 2'-3'	open tube	1 25 23
3'0"	-	6'0"	Pale greyish to pale greyish-brown very clayey silt to fine sand, with some dark yellow-brown mottling. Stiff and very compact. Pockets organic matter and some small sandy pockets at depth.	3'-4' 4'-5' 5'-6' 6'-7'	" " " "	35 22 16 13
6'0"	-	8'0"	Pale grey clayey silt to fine sand, with some yellow-brown and greenish mottling. Slightly micaceous and with few grit fragments.	7'-8'	"	7
8'0"	-	10'0"	Light grey slightly clayey fine sand with prominent yellow-brown and dark greenish-yellow mottling.	8'-9' 9'-10'	" "	7 6
10'	-	12'	Light greyish generally fine grain samd, with few grit fragments and pockets of dark yellow to dark greenish yellow very silty clay.	10'-11' 11'-12'	" "	7 7
12'	-	16'	Light greyish to light green-grey and vague yellowish-brown mottled slightly clayey fine sand. Slightly micaceous.	12'-16'	slush	
16'	-	20'	Light greyish fine to medium grain sand, with few grit fragments and mica flecks. Darker grey and somewhat clayey in part.	16'-20'	slush	
20'	-	25'	Light grey fine to medium grain sand, with vague darker grey and yellowish mottling. Becoming coarser grain at depth, with increasingly abundant grit fragments.	20'-25'	slush	

END OF HOLE 25'
WATER CUT 12'
WATER LEVEL 7'
BLANKET THICKNESS 10'

F10, 270
Serial No 855/61
D.M. 765/60

PERCUSSION DRILL LOG F10.270

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY; Cnty Hamley
LOCATION: LINE "F" 900' upstream from Dam Site Axis
Horizontal Distance East of Datum 10,270
PURPOSE: Test of Subsurface Foundation Conditions
Geological Hole.

PLANT NO: 24 — DRILLER W. HENDERSON
R.L. SURFACE: 165.85 — DEPTH 25'
DATE COMMENCED: 28.2.61 — DATE COMPLETED 1.3.61
BORE LOGGED R.D. STEEL — DATE 2.3.61

Depth			Description	Depth	Type of Sample	Blows p/foot
0	-	1'0"	Light brown fine grain sand, with some darker yellow-brown mottling. Few grit fragments and plant remnants. Fairly friable.	0-1'	open tube	25
1'0"	-	3'4"	Light greyish fine sandy clay, with prominent dark orange-brown mottling. Compact and slightly friable. Few mica flecks and grit fragments.	1-2' 2-3'	" "	25 20
3'4"	-	4'0"	Greyish silty to sandy clay, with prominent dark orange-brown mottling. Very compact and slightly friable. Few mica flecks and grit fragments.	3'-4'	"	14
4'0"	-	7'0"	Light brownish generally fairly fine grain sand, may be slightly clayey in part. Some grit fragments and mica flecks.	4-5' 5-6' 6-7'	" " "	20 15 20
7'0"	-	10'0"	Light brownish generally medium grain sand, with some coarse grit fragments. Unconsolidated.	7-8' 8-9' 9'-10'	" " "	20 20 ?
10'	-	12'	Light bluish-grey to greenish silty to finely sandy clay. Slightly micaceous and with some dark oxide pockets and organic matter. Fairly soft and moist.	10'-11' 11'-12'	" "	20 20
12'	-	16'	Light greyish to light brownish grey fine silty sand. Slightly micaceous. Soft and unconsolidated.	12'-16'	slush	-
16'	-	19'	Light grey to greyish fine grain sand, with some grit fragments and mica flecks. Unconsolidated and wet.	16'-19'	slush	-
19'	-	25'	Greyish to light brownish-grey generally medium grain sand with some darker grey mottling. Few grit fragments and plant remnants. Wet and unconsolidated	19'-25'	"	-

END OF HOLE 25'
WATER CUT 12'
WATER LEVEL 6'
BLANKET THICKNESS 7'

F,10,700
Serial No 856/61
D.M. 765/60

PERCUSSION DRILL LOG F 10,700

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, County Hamley
LOCATION LINE "F" 800' upstream from Dam Site Axis.
Horizontal Distance East of Datum 10,700'
PURPOSE Test of Subsurface Foundation Conditions.
Geological Hole

PLANT NO: 24
R.L. SURFACE 169.13
DATE COMMENCED 1.3.61
BORE LOGGED R.D. STEEL

DRILLER W. HENDERSON
DEPTH 25'
DATE COMPLETED 1.3.61
DATE 17/3/61

Depth	Description	Depth	Type of Sample	Blow p/ft
0'0" - 3'0"	Pale grey brown fine silty sand, with prominent dark yellow-brown ochreous mottling. Compact, but fairly friable. Few grit fragments root remnants, and slightly micaceous	0-1'	open	16
		1'-2'	tube	16
		2'-3'	"	17
3'0" - 6'0"	Pale greyish fine clayey sand, with slight dark yellow-brown mottling. Compact and slightly friable. Few grit fragments, mica flecks, charcoal pockets and plant root remnants.	3'-4'	"	17
		4'-5'	"	12
		5'-6'	"	8
6'0" - 8'0"	Pale brownish-grey clayey fine sand with some light and dark yellow-brown mottling. Very compact. Somewhat friable. Slightly micaceous and with few grit and plant remnants.	6-7'	"	8
		7'-8'"		17
8' 0" - 12'0"	Pale greyish slightly clayey fine sand, with some slight light yellow brown mottling. Few mica flecks and grit fragments. Generally soft and fairly friable.	8'-9'	"	19
		9-10'	"	34
		10-12'	slush	-
12' - 18'	Pale grey to pale brownish-grey generally fine grain sand, but with few sand and grit fragments scattered through.	12'-18'	"	-
18' - 24'	Pale grey to pale brownish-grey generally fine to medium grain sand, but with coarse sand and grit fragments increasingly abundant.	18'-24'	"	-
24' - 25'	Pale brown-grey medium grain sand slightly clayey. Fairly numerous coarse sand and grit fragments.	24'-25'	"	-

END OF HOLE 25'
WATER CUT 10'
WATER LEVEL 5'
BLANKET THICKNESS 8'

F11,900
Serial No 874/61
D.M. 765/60

PERCUSSION DRILL LOG F. 11,900

PROJECT: CHOWILLA DAM SITE RIVER MURRAY Cnty Hamley
LOCATION LINE "F" 800 upstream from Dam Site Axis
Horizontal Distance East of Datum: 11,900'
PURPOSE: Test of subsurface Foundation Conditions-
Geological Hole

PLANT NO 24
R.L. SURFACE 171.89'
DATE COMMENCED 14.3.61
BORE LOGGED R.D. STEEL

DRILLER W. HENDERSON
DEPTH 35'
DATE COMPLETED 14.3.61
DATE 20.3.61

Depth			Description	Depth	Type of Sample	Blow p.f
0'	-	2'0"	Greyish to brownish-grey fine sandy clay, becoming clayey fine sand in part. Compact and fairly friable. Few grit fragments and plant remains.	0'-1' 1'-2'	open tube	4 3
2'0"	-	3'0"	Greyish to slight brownish-grey very stiff silty clay, becoming fine sandy clay in part.	2'-3'	"	1
3'0"	-	3'9"	Greyish to greenish-grey stiff and moist silty clay, with numerous pockets of selenite crystals, few dark organic blobs etc.	3'-4'	"	6
3'9"	-	6'9"	Greyish to greenish-grey and slight yellow-grey silty clay, with odd small grit, plant and organic fragments and few iron oxide nodules.	4'-5' 5'-6' 6'-7'	" " "	6 6 6
6'9"	-	7'3"	Greenish-grey and slight yellow-grey mottled very silty clay. Stiff and moist. Few small organic blobs, iron oxide nodules etc.			
7'3"	-	8'0"	Greenish-grey to slight yellow-grey stiff and very silty clay, with prominent light and dark yellow-brown mottling. Numerous dark iron oxide patches and nodules and odd small gypsum pockets.	7'-8'	"	6
8'0"	-	10'9"	Light grey to light grey-brown and yellow-brown mottled clayey silt. Firm and fairly friable. Some dark iron oxide stains.	8'-9' 9'-10' 10'-11'	" " "	6 6 6
10'9"	-	12'	Light greyish to bluish-grey fine clayey sand. Fairly soft and friable. Few grit fragments and pockets of clayey silt as above.	11'-12	"	not corded
12'	-	15'	Light grey, light brown and yellowish-brown fine silty sand. Bluish-grey and slightly clayey in part. Few grit fragments, mica flecks etc.	12'-15'	"	"

F11,900' (continued)

Depth			Description		
15'0"	-	20'0"	Light grey, light brown-grey, light and dark yellow-brown mottled fine silty sand to fine sandy silt, Somewhat micaceous and clayey in part. Becoming brown-grey, grey-brown and yellow-brown mottled from 18'.	15'-20'	open tube
20'0"	-	23'0"	Mid-grey to light grey fine silty sand to sandy silt becoming slightly clayey in part. Slightly micaceous Prominent dark yellow-brown mottling.	20'-23'	"
23'0"	-	31'0"	Brown-grey to grey-brown and yellow-brown fine silty sand, becoming clayey to finely sandy silt in part. Somewhat micaceous. Soft and moist. Some small dark coloured biotite accumulations.	23'-31'	"
31'0"	-	34'0"	Greyish and light yellow-brown clayey fine sand to fine sandy silt, Numerous coarse grit fragments in part.	31'-34'	"
34'0"	-	35'0"	Becoming greyish-yellowbrown fine silty sand, slightly micaceous and slightly clayey in part.	34'-35'	"

END OF HOLE 35'
WATER CUT 12'
WATER LEVEL 6'
BLANKET THICKNESS 12'

F15,600
Bore Serial No 906/61
D.M. 765/60

PERCUSSION DRILL LOG F 15, 600

PROJECT: CHOWILLA DAM SITE RIVER MURRAY Hd. Murtho
LOCATION: LINE "F" 600' upstream from Dam Site Axis
Horizontal Distance East of Datum: 15,600'
PURPOSE: Test of Subsurface Foundation Conditions:
Geological Hole.

PLANT NO: 20
R.L. SURFACE 176.09
DATE COMMENCED 7.4.61
BORE LOGGED R.D. STEEL

DRILLER J. DOECKE
DEPTH 20'
DATE COMPLETED 7.4.61
DATE 19.4.61

Depth			Description	Depth of Sample	Type	Blow p. ft
0'	-	2'0"	Dark greyish-brown silty clay loam with few grit fragments, plant remnants etc. friable.	0'-1' 1'-2'	open tube	9 14
2'0"	-	3'0"	Light brown to greyish-brown silty to finely sandy clay, with numerous small mica flecks etc. Compact and slightly friable.	2'-3'	"	1[illegible]
3'0"	-	4'6"	Pale greyish-brown very fine silty sand, becoming somewhat clayey in part. Compact, friable to consolidated irregularly.	3'-4'	"	21
4'6"	-	5'0"	Greyish to light grey, light brown and vague yellowish-brown mottled silty to sandy clay. Firm. Few small pockets of fine grain sand, plant remnants, mica flecks etc.	4'-5'	"	1
5'0"	-	7'0"	Off-white to pale brown very compact and slightly friable, fine silty sand. Some mica flecks and grit fragments. Maybe some clay binding in part.	5'-6' 6'-7'	" "	21 3[illegible]
7'0"	-	8'0"	Light brown light orange-brown and light greyish fine grain sand, somewhat silty in part. Scattered mica flecks and wood fragments.	7'-8'	"	2[illegible]
8'0"	-	9'0"	Light brown to yellowish-brown generally medium grain sand. Few coarser grit fragments. etc.	8'-9'	"	22
9'0"	-	10'0"	Light brown to greyish-brown generally fairly fine grain sand, but with few coarser sand and grit fragments.	9'-10'	"	27
10'0"	-	11'0"	Yellow-brown generally medium grain sand, but with some finer fraction and few grit fragments.	10'-11'	slush	
11'	-	12'	Brownish medium grain sand, but with small pockets of light bluish-grey silty clay.	11'-12'	"	-

F 15,600' Continued

Depth			Description	Depth	Type of Sample	Blows p. ft.
12'	-	13'	Brownish to yellowish-brown generally medium grain sand. Slightly clayey in part.	12'-13'	"	
13'	-	20'	Light brownish to light yellowish brown generally fairly fine grain sand. Slightly clayey in pockets to 15'. Scattered grit fragments., mica flecks etc.	13'-20'	"	

END OF HOLE 20'
WATER CUT 11'
WATER LEVEL 7'
BLANKET THICKNESS 5'

F+10 16,230
Serial No 932/61
D.M. 765/60

PERCUSSION DRULL LOG F + 10. 16,230

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, HD. MURTHO

LOCATION: 810' downstream from Dam Site Axis.
Horizontal Distance East of Datum: 16,230'

PURPOSE: Observation hole for No 7 Field Permeability Test at F + 10, 16330

PLANT NO 20
R.L. SURFACE 175.32'
DATE COMMENCED 21.4.61
BORE LOGGED R.D. STEEL

DRILLER W. O'FARRELL
DEPTH: 20'
DATE COMPLETED: 21.4.61
DATE 23.4.61

Depth	Description	Depth	Type of Sample	Blows p/foot
0 - 1'0"	Greyish silty clay loam with few grit fragments, plant remains etc. Compact but friable.	0-1	open tube	15
1'0"- 2'0"	Grey to brownish-grey silty to sandy clay, with some light brown mottling. Very xompact, slightly friable. Few grit fragments, plant remains and small charcoal pockets.	1-2'	"	15
2'0"- 4'0"	Light brown to slight greenish-brown and yellow brown clayey to sandy silt. Compact, somewhat friable and slightly micaceous.	2-3' 3-4'	" "	16 20
4'0"- 5'0"	Pale grey-brown to yellow-grey fine silty sand. Slightly micaceous.	4-5'	slush	-
5'0"- 6'	Light grey to bluish-grey clayey silt to fine sand, with pockets of silty clay. Some greenish, light to dark brown and yellow mottling. Compact but fairly friable.	5-6'	"	-
6' - 9'	Pale brown to pale yellow-brown fine grained sand, slightly clayey in small pockets.	6-9	"	-
9' - 14'	Light brown to light yellow-brown medium grain sand, with few coarse grit fragments, mica flecks etc.	9-14'	"	-
14' - 20'	Light brown to light yellow-brown medium grain sand, with slight grey-brown mottling. Few odd small clay pockets, grit fragments and mica flecks.	14-20'	"	-
	END OF HOLE 20' WATER CUT 8'4" WATER LEVEL 6.48' BLANKET THICKNESS 4'			

F+10, 16280
Serial No 935/61
D.M. 765/60

PERCUSSION DRILL LOG F+10, 16280

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, Hd. Murtho
LOCATION: 810' upstream from Dam Site Axis.
Horizontal Distance East of Datum 16,280'
PURPOSE: Observation hole for No 7 Field Permeability Test at F+10, 16330

PLANT NO 20
R.L. SURFACE 174.63
DATE COMMENCED 17.4.61
BORE LOGGED R.D. STEEL

DRILLER W. O'FARRELL
DEPTH 20'
DATE COMPLETED 17.4.61
DATE 18.4.61

Depth	Description	Depth	Type of Sample	Blows p/foot
0'0" -1'0"	Greyish silty clay loam with few grit fragments and plant remains. Compact and friable.	0-1'	open tube	7
1'0" - 2'9"	Grey to brownish-grey silty to sandy clay, with some light brown mottling. Very compact, slightly friable. Few grit fragments, plant remains and charcoal pockets.	1-2' 2-3'	" "	15 18
2'9" - 4'0"	Light brown to slight greenish brown and yellow-brown mottled clayey to sandy silt. Slightly micaceous. Compact, but somewhat friable.	3-4'	"	18
4'0"-5'0"	Pale grey brown to yellow-grey fine silty sand. Slightly micaceous.	4-5'	"	18
5'0"-6'0"	Light grey and bluish-grey clayey silt to fine sand, with some greenish, light to dark brown and yellow-brown mottling. Compact, but fairly friable.	5-6'	"	16
6'0"-9'0"	Pale brown to pale yellow-brown fine sand, slightly clayey in small pockets.	6'-7' 7'-8' 8'-9'	" " "	16 15 15
9'0"-13'0"	Pale brown to light grey-brown slightly clayey fine sand. Slightly micaceous and containing few small clay pockets	9-10' 10-11' 11-12'	" " "	24 24 48?
13' -15'0"	Light brown to light yellow-brown medium grain sand, with some coarser grit fragments.	12-15'	slush	-
15' -16'	Light brown, light grey-brown and yellow-brown medium grain sand, with some pockets of slightly coarser sand.	15-16'	"	-
16' - 17'	Light brown to yellow-brown medium to coarser grain sand, with few mica flecks and grit fragments.	16'-17'	"	-

Depth	Description	Depth	Type of Sample	Blows p/foot
17' - 20'	Light brown to light grey-brown generally medium grain sand slightly clayey and micaceous in part.	17'-20'	slush	-

END OF HOLE 20'
WATER CUT 13'
WATER LEVEL 5.86
BLANKET THICKNESS 6'

F+10, 16305
Serial No. 936/61
D.M. 765/60

PERCUSSION DRILL LOG F+10, 16305

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY. Hd. Murtho
LOCATION: 810' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 16,305'
PURPOSE: Observation hole for No. 7 Field Permeability Test at F+10, 16305

PLANT NO.: 20
R.L. SURFACE: 174.35
DATE COMMENCED: 20/4/61
BORE LOGGED: R.D. Steel

DRILLER: W. O'Farrell
DEPTH: 20'
DATE COMPLETED: 20/4/61
DATE: 28/4/61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0" - 1'0"	Dark grey-brown and brownish silty to sandy clay, with grit fragments, plant remains, charcoal pockets and mica flecks. Compact, but fairly friable.	0-1'	Open Tube	16
1'0" - 4'0"	Grey to yellow-grey clayey to sandy silt, with some small patches of fine sand. Compact, fairly friable.	1'-2' 2'-3' 3'-4'	" " "	9 16 20
4'0" - 7'0"	Light grey to slight bluish-grey sandy clay, becoming clayey fine sand in part, with few grit fragments.	4'-7'	Slush	-
7'0" - 13'	Light brown to grey-brown clayey fine sand, becoming coarser grained in part. Few grit fragments etc.	7'-13'	"	-
13' - 15'	Light brown to light yellow-brown medium to slightly coarser grained sand, with numerous coarse grit fragments. Slightly micaceous.	13'-15'	"	-
15' - 20'	Light brown, light yellow-brown medium grain sand, with few mica flecks and coarse grit fragments.	15'-20'	"	-

END OF HOLE 20'
WATER CUT 8'2"
WATER LEVEL 5.57'
BLANKET THICKNESS 7'

F+10 16330
Serial No. 939/61
D.M. 765/60

PERCUSSION DRILL LOG F+10 16330

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY. Hd. Murtho
LOCATION: 810' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 16,330'
PURPOSE: Pump Hole for No. 7 Field Permeability Test.
PLANT NO.: 40 DRILLER: W.F. Farrow
R.L. SURFACE: 174.35' DEPTH: 135'
DATE COMMENCED: 20/4/61 DATE COMPLETED: 28/4/61
BORE LOGGED: R.D. Steel DATE: 30/4/61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0 - 1'3"	Greyish to greyish brown silty to finely sandy clay. Compact and somewhat friable in parts. Few grit fragments, mica flecks. Slightly limey in parts.	0-1'	Open Tube	15
1'3" - 2'0"	Greyish-brown fine sandy clay, with some small pockets of clayey fine sand. Compact, fairly friable. Few grit fragments etc.	1-2'	"	10
2'0" - 3'0"	Light greyish to light greenish-grey clayey silt, with some small pockets of silty clay. Compact, but somewhat friable. Few grit fragments, mica flecks and plant remains.	2'-3'	"	12
3'0" - 5'0"	Light greyish to light greyish-brown and vague yellow-brown clayey silt to clayey fine sand. Compact, slightly friable. Few grit fragments, mica flecks etc.	3'-4'	"	10
		4'-5'	"	11
5'0" - 6'10"	Light greyish to slight bluish-grey clayey to finely sandy silt, with prominent yellow and dark brown mottling. Vague greenish and bluish mottling in parts. Compact, somewhat friable. Few mica flecks, plant remains and small organic blobs.	5'-6'	"	11
		6'-7'	"	22
6'10" - 8'0"	Light brownish medium grained sand, with pockets of light greyish to light bluish-grey very silty clay	7'-8'	"	-
8'0" - 13'	Light brownish to slight greyish-brown fairly fine to medium grained sand, with few coarser sand and grit fragments, mica flecks etc. May be slightly clayey in parts	8'-13'	Slush	-
13' - 16'	Light brownish slightly clayey, fairly fine to medium grain sand, with few coarser sand fragments, mica flecks etc.	13'-16'	"	-
16' - 20'	Light brownish fairly fine sand, with few coarser sand and grit fragments, odd mica flecks etc.	16'-20'	"	-

Depth	Description	Depth	Type of Sample	Blows p/ft.
20' - 25'	Light to pale brown fine grain sand, but with odd coarse sand and grit fragments.	20'-25'	Slush	-
25' - 30'	Light greyish to pale brownish-grey fairly fine to medium grained sand, with few coarser sand and grit fragments, mica flecks etc.	25'-30'	"	-
30' - 33'	Light greyish, medium to slightly coarser grained sand, with some milky quartz grit fragments.	30'-33'	"	-
33' - 34'	Light greyish medium to fairly coarse sand, with few grit fragments and small lumps of decomposing wood matter.	33'-34'	"	-
34' - 37'	Greyish to light-greyish medium to somewhat coarse grained sand, with abundant dark fibrous wood matter.	34'-37'	"	-
37' - 41'	Greyish medium grain sand, with some coarser sand and grit fragments. Scattered fibrous wood fragments.	37'-41'	"	-
41' - 44'	Greyish medium to slightly coarser grain sand, with some milky quartz grit fragments and occasional dark wood fibres.	41'-44'	"	-
44' - 50'	Greyish generally medium to slightly coarser grain sand, with irregularly abundant dark fibrous wood matter. Few grit fragments etc.	44'-50'	"	-
50' - 53'	Greyish-brown to brownish-grey medium grained sand, with fairly numerous coarser sand fragments, some fibrous wood matter etc.	50'-53'	"	-
53' - 55'	Greyish-brown to brownish-grey medium grained sand, with few coarser sand and grit fragments and irregularly abundant fibrous wood matter. Few small pockets of greyish silty clay.	53'-55'	"	-
55' - 56'	Greyish to slight bluish-grey medium grained sand, with some coarser sand and grit fragments, few mica flecks etc. Somewhat clayey in parts.	55'-56'	"	-
56' - 58'	Greyish-brown to brownish-grey generally slightly clayey fine grained sand, but with some coarser sand and grit fragments, mica flecks etc.	56'-58'	"	-
58' - 65'	Light brownish generally medium grained sand, some finer fraction, but also with numerous coarse sand and grit fragments.	58'-65'	"	-
65' - 70'	Light brownish fine to medium sand generally, but with numerous coarser sand and rounded milky quartz grit fragments.	65'-70'	Slush	-

Depth	Description	Depth	Type of Sample	Blows p/ft.
70' - 75'	Light brownish fairly fine to medium grained sand, with few coarser grit fragments, mica flecks etc.	70'-75'	Slush	-
75' - 80'	Light brown fairly fine grained sand, with few coarser sand and grit fragments.	75'-80'	"	-
80' - 82'	Light brown medium grain sand, with fairly numerous coarser sand and grit fragments.	80'-82'	"	-
82' - 87'	Light brown medium grain sand, with numerous coarse to very coarse milky quartz grit fragments.	82'-87'	"	-
87' - 92'	Light brownish medium to slightly coarse grained sand generally, but with irregularly abundant milky quartz grit fragments.	87'-92'	"	-
92' - 94'	Light brownish medium to fairly coarse sand, with numerous quartz grit fragments.	92'-94'	"	-
94' - 101'	Light brown coarse gritty sand, abundant milky quartz grit fragments.	94'-101'	"	-
101' - 110'	Light brown coarse grain sand, with some small greyish clayey pockets	101'-110'	"	-
110' - 117'	Light brownish medium to coarse grained sand, becoming greyish and somewhat clayey in pockets. Fairly numerous milky quartz grit fragments.	110'-117'"		-
117' - 120'	Greyish to greyish-brown, slightly clayey, fine grain sand, with few grit fragments and mica flecks.	117'-120'"		-
120' - 124'	Light greyish-brown very fine grained sand, with few mica flecks etc.	120'-124'"		-
124' - 132'	Grey-brown to brown-grey clayey fine sand, with small pockets of bluish-grey silty clay.	124'-132'"		-
132' - 135'	Bluish-grey silty clay, in discrete pockets with greyish-brown fine grained sand.	132'-135'"		-

END OF HOLE 135'
WATER CUT 7'
WATER LEVEL 5.74'
BLANKET THICKNESS 6'10"

F+35, 16330
Serial No. 928/61
D.M. 765/60

PERCUSSION DRILL LOG F+35, 16330

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, Hd. Murtho
LOCATION: 035' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 16,330'.
PURPOSE: Observation hole for No. 7 Field Permeability Test at F+10, 16330.

Plant No: 20 — Driller: W. O'Farrell
R.L. Surface: 174.92' — Depth: 20'
Date Commenced: 19.4.61 — Date Completed: 19.4.61
Bore Logged: R.D. Steel — Date: 2.5.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0"- 1'2"	Dark brown to dark grey-brown fine sandy clay, maybe clayey fine sand in part. Compact, fairly friable. Few grit fragments etc.	0 - 1'	Open Tube	18
1'2"- 2'1"	Light grey to slight yellow-grey clayey silt, with some yellow-brown mottling. Slightly limey in part, with few grit fragments, organic pockets etc.	1'- 2'	"	22
2'1"- 3'10"	Light grey to slight bluish-grey clayey fine sand, with some darker yellow mottling. Slightly limey in part. Compact, fairly friable.	2'- 3'	"	19
3'10"- 6'0"	Pale greenish-brown generally fine silty sand. Slightly micaceous.	3'- 4' 4'- 5' 5'- 6'	" " "	24 15 27
6'0" -11'0"	Light to pale brown fairly fine grain sand, but with few greyish clayey pockets, mica flecks etc.	6'-11'	Slush	-
11'0"-20'0"	Light brownish fine to medium grain sand. Becoming bluish-grey to yellowish-brown and clayey in irregular patches.	11'-20'	"	-

END OF HOLE 20'

WATER CUT 8'

WATER LEVEL 6.16'

BLANKET THICKNESS 4'

F+60, 16,330
Serial No. 927/61
D.M. 765/60

PERCUSSION DRILL LOG F+60, 16,330

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY Hd. Murtho.
LOCATION: 860' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 16,330'
PURPOSE: Observation hole for No. 7 Field Permeability Test at F+60, 16330.

Plant No: 20 — Driller: W. O'Farrell
R.L. Surface: 175.22' — Depth: 20'
Date Commenced: 20.4.61 — Date Completed: 20.4.61
Bore Logged: R.D. Steel — Date: 2.5.61

Depth	Description	Depth	Type of Sample	Blows p/ft
0 - 1'2"	Mid-grey to dark brown-grey sandy clay. Compact, fairly friable. Large pockets of black organic matter.	0 - 1'	Open Tube	10
1'2"- 2'0"	Light greyish to slight yellowish-grey fine clayey silt to clayey fine sand. Compact, fairly friable. Slightly micaceous.	1'- 2'	"	14
2'0"- 3'6"	Light greyish to pale grey-brown fine silty sand, with slight yellow-brown mottling in part. Slightly micaceous and with few organic pockets.	2'- 3'	"	18
3'6"- 9'0"	Light brown to light grey-brown fairly fine grain sand, but becoming light greyish to light bluish-grey and clayey in pockets. Some grit fragments and mica flecks.	3'- 9'	slush	-
9'0"-17'0"	Light brown to light greyish-brown and some yellowish-brown mottled, fine to medium grain sand. Some small pockets of greyish to bluish-grey silty clay.	9'-17'	"	-
17'0"-20'0"	Light brown to light greyish-brown generally medium grain sand, but with small pockets of light greyish to light bluish-grey silty clay. Few grit fragments.	17'-20'	"	-
	END OF HOLE 20'			
	WATER CUT 7'9"			
	WATER LEVEL 6.37'			
	BLANKET THICKNESS 4'			

F+10, 16330
Serial No. 937/61
D.M. 765/60

PERCUSSION DRILL LOG F+10, 16330

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY, Hd. Murtho
LOCATION: 910' upstream from Dam Site Axis.
Horizontal Distance East of Datum 16,330'
PURPOSE: Observation Hole for No. 7 Field Permeability Test at F+10, 16330.

Plant No: 20 — Driller: W. O'Farrell
R.L. Surface: 175.68' — Depth: 20'
Date Commenced: 20.4.61 — Date Completed: 20.4.61
Bore Logged: R.D. Steel — Date: 2.5.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0"- 1'0"	Greyish-brown fine sandy clay loam. Friable. Few grit fragments, plant remains.	0 - 1'	Open Tube	12
1'0"- 2'2"	Light greyish-brown fine sandy clay loam, with some slight brownish mottling. Compact, fairly friable. Few plant remains etc.	1'- 2'	"	13
2'2"- 4'0"	Light greyish to slight brownish-grey fine clayey silt, with some yellowish mottling. Compact, slightly friable. Few grit fragments, plant remains etc. Becoming clayey sand from 3'1".	2'- 3' 3'- 4'	" "	9 7
4'0"- 5'6"	Pale greyish-brown fine silty sand, somewhat clayey and darker coloured in part.	4'- 5'	"	18
5'6"-16'0"	Light brown to slight yellow-brown generally medium grain sand, with bluish grey to yellowish brown clayey pockets. Few grit fragments, slightly micaceous.	5'-16'	Slush	-
16'0"-20'0"	Light brown to light yellow-brown and slight greyish-brown generally medium grain sand. Some coarser grit fragments, few small clayey pockets and mica flecks.	16'-20'	"	-

END OF HOLE 20'

WATER CUT 8'

WATER LEVEL 6.74'

BLANKET THICKNESS 4'6"

F+10, 16355
Serial No. 934/61
D.M. 765/60

PERCUSSION DRILL LOG F+10, 16355

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, Hd. Murtho.
LOCATION: 810' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 16,355'.
PURPOSE: Observation Hole for No. 7 Field Permeability Test at F+10, 16330.

Plant No: 20 — Driller: W. O'Farrell
R.L. Surface: 174.60' — Depth: 20'
Date Commenced: 17.4.61 — Date Completed: 17.4.61
Bore Logged: R.D. Steel. — Date: 2.5.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0"- 1'0"	Greyish to greyish-brown sandy clay, with few grit fragments and small pockets of fine grain sand. Compact, but friable.	0 - 1'	Open Tube	10
1'0"- 2'0"	Light greyish to light brownish clayey silt to clayey fine sand. Compact but friable. Slightly limey in part and with large pockets of charcoal and wood matter.	1'- 2'	"	6
2'0"- 4'0"	Light greyish to slight greenish-grey light yellow-grey and yellow mottled clayey silt, becoming clayey fine sand in part. Compact, but friable. Few small lime pockets, mica flecks etc.	2'- 3' 3'- 4'	" "	10 18
4'0"- 7'0"	Light grey to light yellow-grey clayey sand, but with some pockets of silty clay. Slightly micaceous. Compact, but fairly friable.	4'- 5' 5'- 6' 6'- 7'	" " "	15 12 12
7'0"- 8'0"	Light greyish to slight bluish-grey silty to very silty clay, with some prominent yellow mottling. Firm and moist. Few grit fragments and mica flecks.	7'- 8'	"	15
8'0"-11'0"	Pale grey to pale yellowish-grey and yellowish mottled clayey silt, becoming clayey fine sand in pockets. Compact, slightly friable and micaceous. Some pockets of medium grain sand from 10'3".	8'- 9' 9'-10' 10'-11'	" " "	31 - 25
11'0"-15'0"	Light brownish to yellowish-brown medium to slightly coarser grain sand, but becoming light bluish-grey fine silty sand in pockets.	11'-12' 12'-13' 13'-14' 14'-15'	" " " "	13 18 12 20
15'0"-20'0"	Light brown to yellowish brown generally fairly fine grain sand, becoming greyish-brown clayey to silty fine sand in part. Few grit fragments, mica flecks etc.	15'-20'	Slush	-

END OF HOLE 20'
WATER CUT 10'
WATER LEVEL 6.05'
BLANKET THICKNESS 4'6"

F+10, 16380
Serial No. 937/61
D.M. 765/60

PERCUSSION DRILL LOG F+10, 16380

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, Hd. Murtho.
LOCATION: 810' upstream from Dam Site Axis.
Horizontal Distance East of Datum: 16,380'
PURPOSE: Observation hole for No. 7 Field Permeability Test at F+10, 16330.

Plant No: 20 — Driller: W. O'Farrell
R.L. Surface: 174.90' — Depth: 20'
Date Commenced: 20.4.61 — Date Completed: 20.4.61
Bore Logged: R.D. Steel. — Date: 2.5.61

Depth	Description	Depth	Type of Sample	Blows p/ft.
0'0"- 1'0"	Dark grey to grey-brown and blue-grey silty to sandy clay, probably with some pockets of clayey fine sand. Compact, fairly friable. Few grit fragments etc.	0 - 1'	Open Tube	14
1'0"- 5'0"	Greyish to slight greenish-grey clayey silt to clayey fine sand, with some mid-grey and yellow mottling. Compact, but fairly friable. Slightly limey in part and with few grit fragments etc.	1'- 2' 2'- 3' 3'- 4' 4'-5'	" " " "	14 16 21 15
5'0"- 6'0"	Light greyish to slight bluish-grey silty to very silty clay, with yellow and yellowish-brown mottling. Firm and moist. Few organic blobs etc.	5'- 6'	"	18
6'0"- 9'0"	Light brown generally fairly fine grain sand, slightly clayey in part and with few grit fragments, mica flecks etc.	6'- 7' 7'- 8' 8'- 9'	" " "	25 60 43
9'0"-10'0"	Light grey-brown generally fairly fine grain sand, but with pockets of light bluish-grey, light brown and yellow mottled silty to very silty clay. Few grit fragments etc.	9'-10'	"	21
10'0"-11'0"	Light grey, light brown and light yellow-brown mottled, slightly clayey to finely sandy silt. Compact, but fairly friable. Few grit fragments, mica flecks.	10'-11'	"	16
11'0"-14'0"	Generally light brownish to light yellowish-brown fairly fine grain sand, with vague yellow-brown mottling in part. Slightly micaceous.	11'-12' 12'-13' 13'-14'	" " Slush	15 15 -
14'0"-20'0"	Light brownish generally medium to slightly coarser grain sand in part. Few coarse grit fragments etc.	14'-20'	"	-

END OF HOLE 20'
WATER CUT 12'
WATER LEVEL 6.19'
BLANKET THICKNESS 6'0"

F+10, 16430
Serial No. 931/61
D.M. 765/60

PERCUSSION DRILL LOG F+10, 16430

PROJECT: CHOWILLA DAMSITE, RIVER MURRAY, Hd. Murtho.
LOCATION: 810' upstream from Dam Site Axis.
Horizontal Distance East of datum: 16,430'.
PURPOSE: Observation hole for No. 7 Field Permeability Test at F+10, 16330.

Plant No: 20 **Driller:** W. O'Farrell
R. L. Surface: 174.90' **Depth:** 20'
Date Commenced: 18.4.61 **Date Completed:** 18.4.61
Bore Logged: R.D. Steel. **Date:** 2.5.61

Depth	Description	Depth	Type of Sample	Blows p/f
0'0"- 1'0"	Light grey to light grey-brown and vague yellow-grey mottled, clayey sand to sandy clay. Compact, but fairly friable. Few grit fragments, mica flecks etc.	0 - 1'	Open Tube	18
1'0"- 2'2"	Mid-grey to yellow-grey clayey fine sand to sandy clay. Compact, slightly friable. Scattered white lime pockets, few grit fragments.	1'- 2'	"	12
2'2"- 6'0"	Light greyish to slight greenish-grey clayey to silty fine sand, becoming silty clay in pockets. Yellow mott-ling prominent in part. Compact, fairly friable. Few grit fragments, mica flecks.	2'- 3' 3'- 4' 4'- 5' 5'- 6'	" " " "	9 8 9 9
6'0"- 8'0"	Light greyish to slight bluish-grey and yellow mottled clayey silt, with pockets of bluish-grey and greenish mottled very silty clay. Compact to firm, but somewhat friable.	6'- 7' 7'- 8'	" "	19 25
8'0"- 9'0"	Pale bluish-grey to pale brown and slight greenish mottled, slightly clayey silt to fine sand.	8'- 9'	"	22
9'0"-12'0"	Light brown slightly clayey fine sand, with some light and dark yel-low-brown mottling. Compact, fri-able and slightly micaceous. Pockets of light bluish-grey silty clay from 10'6".	9'-10' 10'-11' 11'-12'	" " "	25 23 15
12'0"-15'0"	Light brownish to light yellow-brown generally fairly fine grain sand. Slightly micaceous, with grit fragments. Becoming clayey in isolated small pockets.	12'-15'	Slush	-
15'0"-20'0"	Light brown to yellowish-brown fairly fine to medium grain sand. finely silty in part. Few grit fragments etc.	15'-20'	"	-

END OF HOLE 20'
WATER CUT 11'
WATER LEVEL 6.25'
BLANKET THICKNESS 8'

Pile Driver Hole No. 1
Serial No. 923/61
D.M. 765/60

PERCUSSION DRILL LOG (PILE DRIVER) NO. 1

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY. Hd. Murtho
LOCATION: Pile Driver
PURPOSE: Test of Subsurface Foundation conditions at River End of Pile Driving Test Area.

Plant No: 40 — Driller: W.F. Farrow
R.L. Surface: 174.86' — Depth: 100'
Date Commenced: 11.4.61 — Date Completed: 18.4.61
Bore Logged: R.D. Steel — Date: 25.4.61

Depth	Description	Depth	Type of Sample.	Blows p/ft.
0'0"- 3'0"	Pale greyish-brown clayey fine sand, becoming darker grey silty clay loam in parts. Few grit fragments, plant remains.	0 - 1' 1'- 2' 2'- 3'	Open Tube "	16 16 4
3'0"- 4'0"	Light-greyish brown and yellowish mottled very silty to sandy clay. Compact, somewhat friable. Few grit fragments, mica flecks, organic blobs etc.	3'- 4'	"	5
4'0"- 5'0"	Pale grey slightly clayey to finely sandy silt. Compact, somewhat friable. Few mica flecks, plant remains.	4'- 5'	"	4
5'0"- 6'0"	Light brown to brownish slightly clayey fine silty sand, with small pockets of clayey fine sand. Compact friable.	5'- 6'	"	-
6'0"- 7'0"	Pale brown to light-yellow brown fine silty sand to fine sandy silt.	6'- 7'	"	11
7'0"-10'0"	Light brown to pale greyish-brown very fine silty sand, becoming light greyish and clayey in pockets.	7'- 8' 8'- 9' 9'-10'	" " "	20 - -
10'0"-20'0"	Missing. Probably light brownish medium to slightly coarse sand, with few grit fragments etc.	10'-20'	slush	-
20'0"-25'0"	Light greyish-brown, generally medium grained sand, with some coarser sand and small grit fragments.	20'-25'	"	-
25'0"-30'0"	Light brownish-grey generally fairly fine to medium grained sand, with some coarser sand and small grit fragments.	25'-30'	"	
30'0"-35'0"	Light greyish-brown generally medium grained sand, with few coarser sand and milky quartz grit fragments.	30'-35'	"	-
35'0"-37'0"	Light brownish-grey medium to coarse sand, with fairly numerous milky quartz grit fragments.	35'-37'	"	-

PERCUSSION DRILL LOG (PILE DRIVER) NO. 1. (Continued)

Depth	Description	Depth	Type of Sample.	Blows p/ft
37'0"-44'0"	Light brownish to light greyish-brown, medium to fairly coarse sand, with fairly abundant coarse to very coarse milky quartz fragments.	37'-44'	slush	-
44'0"-47'0"	Light greyish generally medium grained sand, with some coarser sand and grit fragments. Few mica flecks, plant remains etc.	44'-47'	"	-
47'0"-48'0"	Light greyish-brown fairly fine to medium grained sands.	47'-48'	"	-
48'0"-50'0"	Light greyish-brown medium grained sand, with small pockets of greyish silty clay.	48'-50'	"	-
50'0"-52'0"	Light greyish-brown fairly fine to medium grained sand, with few fragments of dark wood matter.	50'-52'	"	-
52'0"-58'0"	Light greyish-brown, fairly coarse grain sand, with abundant coarse to very coarse grit fragments, some small wood matter etc.	52'-58'	"	-
58'0"-60'0"	Light brown fine to medium sand, with very abundant coarse rounded grit fragments.	58'-60'	"	-
60'0"-66'0"	Light brown medium to fairly coarse sand, with some coarse grit fragments.	60'-66'	"	-
66'0"-69'0"	Pale brown, generally medium grained sand, with numerous coarse sand and grit fragments.	66'-69'	"	-
69'0"-73'0"	Pale brown medium to fairly coarse sand, with numerous coarse to very coarse grit fragments.	69'-73'	"	-
73'0"-80'0"	Pale brown medium to somewhat coarse grained sand, with numerous coarse to very coarse grit fragments.	73'-80'	"	-
80'0"-86'0"	Pale brown fairly fine to medium sand, with few coarser sand and grit fragments.	80'-86'	"	-
86'0"-94'0"	Pale brown generally fairly coarse sand, some finer fraction, and numerous coarse to very coarse milky quartz grit fragments.	86'-94'	"	-

PERCUSSION DRILL LOG (PILE DRIVER) NO. 1. (Continued)

Depth	Description	Depth	Type of Sample.	Blow p/ft
94'0"-100'0"	Pale brown, fairly coarse gritty sand, with some finer sand fraction.	94'-100'	slush	-

END OF HOLE 100'

WATER CUT 7'2"

WATER LEVEL 6'2"

BLANKET THICKNESS 6'

Pile Driver Two Well Test
Serial No 919/61

PERCUSSION DRILL LOG (Two Well Pile Driver)

PROJECT: CHOWILLA DAM SITE RIVER MURRAY Hd. Murtho
LOCATION Vicinity Pile Driver
PURPOSE Pump Hole for No 4 Two Well Test
PLANT NO 20 DRILLER W.O'FARREL
R.L. SURFACE 175.82' DEPTH 18'
DATE COMMENCED 11.4.61 DATE COMPLETED 13.4.61
BORE LOGGED R.D. STEEL DATE 13.6.61

Depth	Description	Depth	Type of Sample	Blo p/
0 - 1'0"	Light greyish fine silty clay loam. Compact, fairly friable. Few grit fragments, plant remains etc.	0-1'	open tube	1(
1'0" - 3'1"	Greyish to light greyish and light greyish-brown clayey fine sand to fine sandy clay. Compact, somewhat friable. Few grit fragments, mica flecks, organic blobs etc.	1-2' 2-3	" "	9
3'1"- 5'0"	Pale grey to light yellow-grey and light yellow clayey silt to clayey fine sand. Compact, somewhat friable. Few grit fragments, mica flecks etc. Slightly limey in part.	3-4' 4-5'	" "	1(
5'0" - 8'0"	Light greyish-brown slightly clayey to silty fine sand. Few grit fragments, mica flecks. Compact becoming fairly friable. Some vague light yellow and brownish mottling,	5-6' 6-7' 7-8'	" " "	
8'0" - 9'6"	Pale greyish to light brown mottled slightly clayey to fine sandy silt. Slightly micaceous. Compact fairly friable.	8-9' 9-10'	" "	9
9'6"- 10'	Pale greyish fine sandy silt with pockets of pale brownish medium grained sand, Some grit fragments.			
10' - 12'	Pale brown to light yellowbrown fine silty sand, with few pockets of greyish silty clay.	10-12'	slush	
12- 14'	Light greyish-brown fine to medium grain sand, with some coarser sand and grit fragments. Few mica flecks etc.	12-14	"	
14' - 18'	Light greyish-brown generally fine to medium grain sand, but with fairly numerous coarser sand and small grit fragments.	14-18'	slush	

END OF HOEE 18'
WATER CUT 10'
WATER LEVEL 7'3"
BLANKET THICKNESS 10'

F 17, 480'
Serial No 956/61
D.M. 765/60

PERCUSSION DRILL LOG F 17.480'

PROJECT: CHOWILLA DAM SITE: RIVER MURRAY Hd. MURTHO
LOCATION: LINE "F" 800' upstream from Dam Site Axis
Horizontal Distance East of Datum : 17,480'
PURPOSE: Test of Subsurface foundation Conditions
Geological Hole

PLANT NO: 20 — DRILLER: W. O'FARRELL
R.L. SURFACE 175.56' — DEPTH 20'
DATE COMMENCED: 1.5.61 — DATE COMPLETED 1.5.61
BORE LOGGED R.D. STEEL — DATE 13.6.61

Depth			Description	Depth	Type pf Surface	Blow p. ft.
0'0"	-	2'0"	Greyish to greyish-brown silty to finely sandy clay. Fairly stiff and compact. Few grit fragments plant and wood remains, small charcoal pockets etc.	0'-1'	open tube	10
				1'-2'		12
2'0"	-	3'0"	Greyish to greyish-brown sandy clay, becoming light greyish clayey fine sand in pockets. Compact and generally slightly friable. Few grit fragments, small plant remains and numerous charcoal pockets.	2'-3'	"	10
3'0"	-	5'0"	Light greyish to light yellow - grey very silty clay to clayey silt, with some pockets of dark brown silty clay. Compact, slightly friable. Few grit fragments, lime blobs etc. and odd charcoal pockets.	3'-4'	"	13
				4'-5'	"	22
5 '0"	-	7'6"	Light greyish and yellowish mot tled silty to finely sandy clay. Fairly stiff and compact. Few grit fragments, mica flecks and small organic blobs,	5'-6'	"	17
				6'-7'	"	14
				7'-8'	"	10
7'6"	-	9'10"	Light greyish to pale grey and light grey-brown clayey silt, becoming clayey fine sand in part. Abundant dark grey and dark grey-brown organic stains. Numerous plant remains etc. odd grit fragments and mica flecks. Compact slightly friable.	8'-9'	"	14
				9'-10'	"	15
9'10"	-	12'0"	Light grey to slight greenish-grey silty to very silty clay. Stiff and compact. Some yellow and yellow-brown mottling. Few grit fragments, mica flecks and charcoal pockets.	10'-11'	"	18
				11'-12'	"	26
12'0"	-	14'6"	Pale grey to pale yellow-grey slightly clayey silt, becoming finely sandy in part. Some irregular yellowish mottling. Compact, fairly friable. Few small mica flecks and dark iron oxide stains.	12'-13'	open tube	24
				13'-14'		27

F17,480' Continued

Depth			Description	Depth Type of Sample	Blow p/foo
14'6"	-	17'	Pale greyish to pale yellowish-grey fairly fine to medium grain sand generally, but with some coarser sand and grit fragments,	14'-17'	sluah
17'	-	20'	Light greyish-brown generally medium to somewhat coarser grain sand, but with some finer fraction interstitially and coarse grit fragments.	17'-20'	"

END OF HOLE 20'
WATER CUT 13'
WATER LEVEL 7'1"
BLANKET THICKNESS 14'6"

F 17800
Serial No 955/61
D.M. 765/60

PERCUSSION DRILL LOG F 178C0

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY Hd. Murtho

LOCATION: LINE "F" 800' upstream from Dam Site Axis
Horizontal Distance East of Datum : 17,800'

PURPOSE: Test of subsurface Foundation Conditions, Geological Hole.

PLANT NO: 20
R.L. SURFACE 174.70
DATE COMMENCED 1.5.61
BORE LOGGED R.D. STEEL

DRILLER W. O'FARRELL
DEPTH 20'
DATE COMPLETED 1.5.61
DATE 13.6.61

Depth			Description	Depth	Type of Sample.	Blow
0'0"	-	2'0"	Greyish to greyish-brown sandy clay becoming clayey fine sand in small pockets. Compact, slightly friable. Few grit fragments, plant remains etc.	0'-1' 1'-2'	open tube	10 16
2'0"	-	3'0"	Mid-grey to grey-brown silty clay slightly sandy in part. Few grit fragments, mica flecks and small plant remains. Very compact.	2'-3'	"	17
3'0"	-	9'0"	Light grey to light brown and slight yellowish mottled, clayey silt to clayey fine sand, but with irregular pockets of greyish to bluish-grey silty clay. Stiff and compact slightly friable in part. Few grit fragments, mica flecks, organic blobs etc.	3'-4' 4'-5' 5'-6' 6'-7' 7'-8' 8'-9'	" " " " " "	16 15 12 13 12 12
9'0"	-	15'0"	Greyish to greyish-brown and lighter grey-brown mottled clayey fine sand generally, but becoming silty to fine ly sandy clay irregularly. Some vague yellow and yellow-brown mottling. Compact, somewhat friable in part Few grit fragments etc.	9'-10' 10'-11' 11'-12' 12'-13' 13'-14' 14'-15' 15'-16'	" " " " " " "	16 20 16 14 14 16 19
15'0"	-	20'0"	Light greyish-brown fine silty sand. Slightly micaceous and with odd small grit fragments.	16'-17' 17'-20'	slush "	- -

END OF HOLE 20'
WATER CUT 13'
WATER LEVEL 6'2"
BLANKET THICKNESS 9'

F 18,100
Serial No S 954/61
D.M. 765/60

PERCUSSION DRILL LOG F 18,100

PROJECT: CHOWILLA DAM SITE RIVER MURRAY Hd. Murtho
LOCATION: LINE "F" 800' upstream from Dam Site Axis
Horizontal Distance East of Datum 18,100'
PURPOSE: Test of subsurface Foundation Conditions
Geological Hole.

PLANT NO 20 — DRILLER W. O'FARRELL
R.L. SURFACE 176.89' — DEPTH 15'
DATE COMMENCED: 1.5.61 — DATE COMPLETED: 1.5.61
BORE LOGGED R.D. STEEL — DATE 13.6.61

Depth			Description	Depth	Type of Sample	Blo p. f
0'0"	-	4'0"	Reddish-brown fine sandy loam. Friable. Scattered small grit fragments, lime specks and small plant remains.	0'-1' 1'-2'	open tube	1
4'0"	-	5'10"	Generally greyish to slight brownish grey silty clay, with vague yellowish mottling in part. Very stiff and compact. Few grit fragments, small plant remains etc	2'-3' 3'-4' 4'-5' 5'-6' 6'-7'	" " " " "	1 8
5'10"	-	7'0"	Greyish to yellowish mottled clayey silt becoming clayey fine sand in part. Stiff and Compact. Few grit fragments etc.			
7'0"	-	11'0"	Greyish to light greyish very silty clay with pockets of clayey silt and clayey fine sand. Irregular reddish-brown, brown and yellowish mottling. Scattered mica flecks, grit fragments etc. Compact and fairly stiff.	7'-8' 8'-9' 9'-10' 10'-11'	" " " "	7 7
11'	-	15'0"	Light greyish to greyish-brown and dark brown mottled clayey silt to clayey fine sand. Very compact, fairly stiff. Few grit fragments, mica flecks etc. Some pockets of silty clay.	11'-12' 12'-13' 13'-14' 14'-15'	" " " "	1 1

END OF HOLE 15'
WATER CUT -
WATER LEVEL -

F 18250
Serial No 918/61
D.M. 765/60

PERCUSSION DRILL LOG F 18,250

PROJECT: CHOWILLA DAM SITE, RIVER MURRAY Hd. Murtho
LOCATION: LINE "F" 800' upstream from Dam Site Axis
Horizontal Distance East of datum 18,250
PURPOSE Test of Subsurface Foundation Conditions
Geological Hole.

PLANT NO 20
R.L. SURFACE 178.89
DATE COMMENCED 11.4.61
BORE LOGGED R.D. STEEL

DRILLER J. DOECKE
DEPTH 10'
DATE COMPLETED 11.4.61
DATE 21.4.61

Depth			Description	Depth	Type of Sample	Blows p/ft.
0'0"	-	4'10"	Brownish to slight reddish brown generally medium to slightly coarser grain subrounded sand, with some greyish mottling in part. Some fine clay or silt binding. Compact, but friable. Scattered grit fragments, plant root remnants.	0'-1' 1'-2' 2'-3' 3'-4'	open tube " "	10 11 20 25
4'10"	-	6'0"	Greyish to brownish-grey clayey sand, with some yellow mottling Some pockets of coarse sand, few lime specks etc. Compact, but somewhat friable.	4'-5' 5'-6'	" "	16 16
6'0"	-	7'0"	Greyish to light grey clayey sand with faint yellow mottling. Compact slightly friable. Becoming very sandy in part, with few lime pockets and grit fragments.	6'-7'	"	16
7'0"	-	10'0"	Light grey to light yellow-grey clayey silt to fine sand, with prominent yellow mottling. Pockets charcoal and wood fragments. Very compact but slightly friable and becoming increasingly sandy at depth.	7'-8' 8'-9' 9'-10'	" " "	15 13 16

END OF HOLE 10'
WATER CUT -
WATER LEVEL -

CHOWILLA DAM SITE - GEOLOGICAL INVESTIGATIONS

SUPPLEMENTARY REPORT
DAM SITE TESTING

APPENDIX II

PERMEABILITY TESTS - CALCULATION OF RESULTS

Results based on Thiem Formula (Wenzel 1942) United States Department of The Interior - Water Supply Paper 887.

Terms used in calculation.

$$Kp = \frac{Q \log e \frac{r_2}{r_1}}{\pi (h_2 + h_1)(s_1 - s_2)}$$

Kp = Coefficient of Permeability

Q = Discharge of pumped well - gallons per hour

r_2 = Radius of outer bore, from pump well

r_1 = Radius of inner bore, from pump well

s_1 = Drop in water level of inner bore

s_2 = Drop in water level of outer bore

h_1 = Depth of water in aquifer, - inner bore at equilibrium pumping.

h_2 = Depth of water in aquifer, - outer bore at equilibrium pumping.

$$\log e \, {}^{r_2}/_{r_1} = 2.30^3 \log \frac{r_2}{r_1}$$

The units of permeability quoted throughout this report are gallons per hour per square foot, per foot head of water per foot:-
which is defined as the number of gallons per hour passing through one square foot of aquifer under unit gradient. (One foot drop in head per linear foot). This is 1/24th of a Meinzer unit (Wenzel 1942) and approximately 2.436×10^{-3} darcy at 60°F.

It must be stressed that all figures quoted refer only to the mean permeability of the entire aquifer, which includes numerous strata of differing grain size, compaction and porosity. Values greater or less would be expected by channelling in the more permeable materials. The results are intended to assess the total water flow under the proposed dam.

1. SUMMARY OF RESULTS - for details see following calculations.

Sites 1, 2, 3 - See Preliminary Report - Crawford (1960)

SITE NO. 4 F 7725. Screened from 11'6" to 139'0"

Maximum:-	19.4	galls. per hour per square foot
Minimum:-	7.8	" " " " " "
Arithmetic Mean:-	13.3	" " " " " "
Graphic Mean:-	10.1	" " " " " "

SITE NO. 5 D 4300. Screened from 6'6" to 137'0"

Maximum:-	24.8	galls. per hour per square foot
Minimum:-	5.04	" " " " " "
Arithmetic Mean:-	13.7	" " " " " "
Graphic Mean:-	9.5	" " " " " "

SITE NO. 6 C+300. 14800 Screened from 6'6" to 130'0"

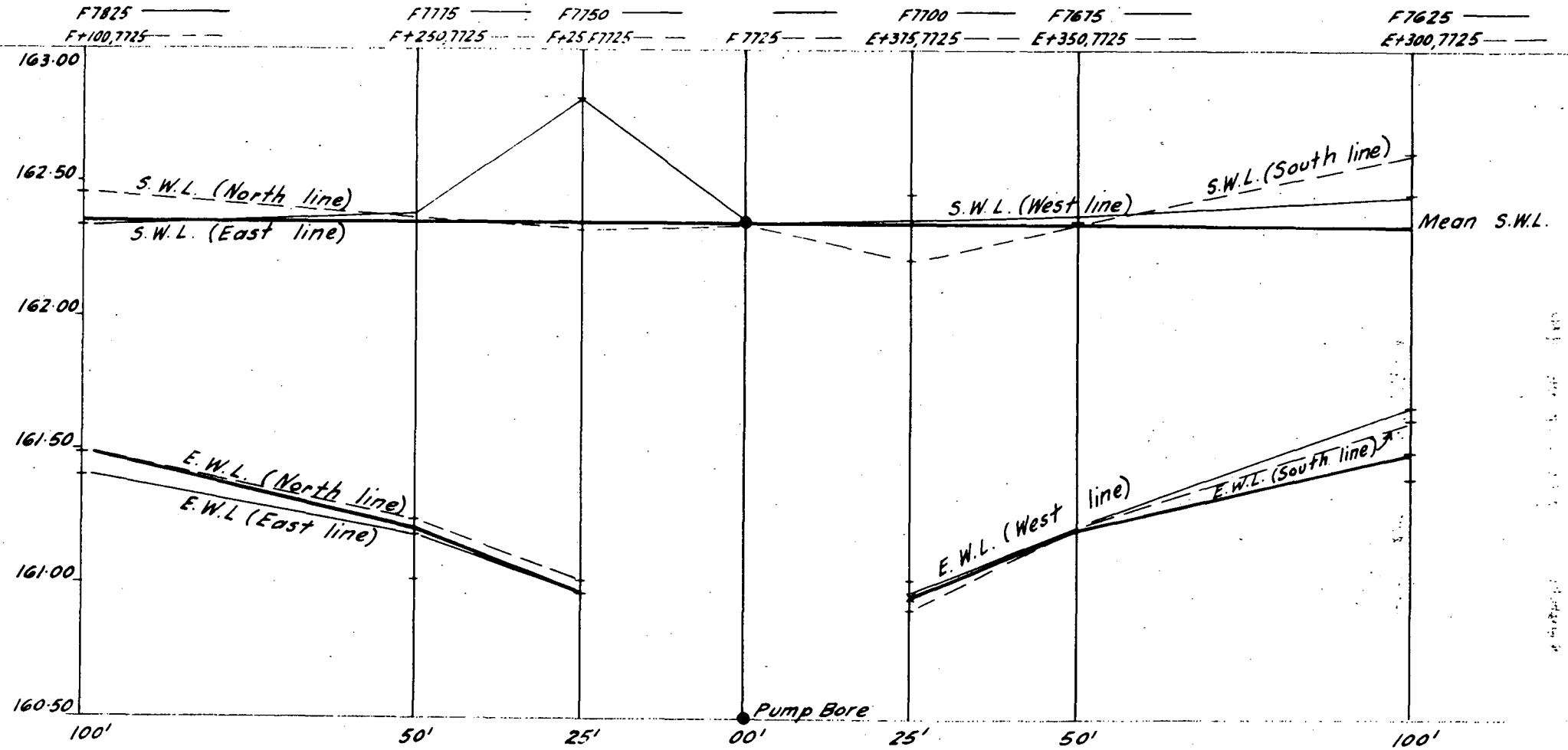
Maximum:-	30.6	galls. per hour per square foot - High due to experimental inconsistency of data.
Minimum:-	9.6	galls. per hour per square foot.
Arithmetic Mean:-	18.3	" " " " " " - Somewhat high as some very high figures used in result
Graphic Mean:-	16.5	" " " " " " "

SITE NO. 7 F+10, 16330 Screened from 5'6" to 132'0"

Maximum:-	30.3	galls. per hour per square foot - High; data doubtful.
Minimum:-	5.4	" " " " " " - Low, other evidence implies higher values than normal in this area.
Arithmetic Mean:-	17.3	" " " " " "

F 7725. R.L. Control. Peg. 173.05 R.L. Bottom aquifer. 34.09
Site Reading 4.83 Q = 3137 g.p.h.

Bore No.	Direction	R.L. Surface	R.L. Datum	S.W.L.	R.L. (S.W.L)	E.W.L.	R.L. (E.W.L.)	h.	s.
F 7725	Pump	173.09	174.13	11.79	162.34	-	-	-	-
F+25, 7725	1N	173.07	174.63	12.31	162.32	13.62	161.01	126.92	1.31
F+50, 7725	2N	173.18	173.91	11.54	162.37	12.67	161.24	127.15	1.1
F+100, 7725	3N	173.37	173.92	11.46	162.46	12.43	161.49	127.40	0.9
E+375, 7725	1S	172.97	174.72	12.51	162.21	13.82	160.90	126.81	1.3
E+350, 7725	2S	172.98	175.69	13.33	162.36	14.47	161.22	172.13	1.1
E+300, 7725	3S	172.98	176.12	13.50	162.62	14.50	161.62	127.53	1.0
F 7700	1W	173.04	173.50	11.14	162.36	12.54	160.96	126.87	1.4
F 7675	2W	173.10	173.79	11.44	162.35	12.58	161.21	127.12	1.14
F 7625	3W	173.15	173.88	11.42	162.46	12.21	161.67	127.58	.7
F 7750	1E	173.00	174.57	11.75	162.82	13.61	160.96	126.87	1.8
F 7775	2E	173.00	175.94	13.56	162.38	14.77	161.17	127.08	1.21
F 7825	3E	173.14	174.38	12.04	162.34	12.98	161.40	172.31	.9
GRAPHIC MEAN 25' radius	-	-	-	-	162.35	-	160.96	126.87	1.3
50' radius	-	-	-	-	162.35	-	161.21	127.12	1.14
100' radius	-	-	-	-	162.35	-	161.50	127.41	.8



To accompany report by R.D. Steel.

CHOWILLA DAM SITE INVESTIGATION
No.4 FIELD PERMEABILITY TEST
PUMP HOLE AT D4300'
GRAPHIC REPRESENTATION OF EXPERIMENTAL DATA

52864
GJ 3·8·61

A. DIRECT MEASUREMENT RESULTS

SITE NO. 4 Pump Hole at F 7725

R.L. Surface at F 7725 = 173.09'

R.L. Bottom aquifer at F 7725 = 34.09'

Average static water level R.L. 162.35'

Rate of Pumping Q = 3137 g.p.h.

North Line

(1N) F+25, 7725:- Level fell from R.L. 162.32 to R.L. 161.01
∴ s = 1.31. h = 126.92. r = 25'

(2N) F+50, 7725:- Level fell from R.L. 162.37 to R.L. 161.24
∴ s = 1.13. h = 127.15. r = 50'

(3N) F+100, 7725:- Level fell from R.L. 162.46 to 161.49'
∴ s = 0.97. h = 127.40. r = 100':-

S.W.L. about .1' high ∴ s may be actually less

Bores 3N-2N

$$Kp = \frac{Q \log_e \frac{r_2}{r_1}}{\pi (h_2+h_1)(s_1-s_2)}$$

$$\therefore Kp_{3N-2N} = \frac{3137 \times 2.303 \times .3010}{\pi (127.40+127.15)(1.13 - .97)}$$

$$= 17.0 \quad g.p.h.f^2$$

Bores 2N-1N

$$Kp_{2N-1N} = \frac{3137 \times 2.303 \times .3010}{\pi (127.15+126.92)(1.31-1.13)}$$

$$= 15.1 \quad g.p.h.f.^2$$

Bores 3N-1N

$$Kp_{3N-1N} = \frac{3137 \times 2.303 \times .6020}{\pi (127.40+126.92)(1.31-0.97)}$$

$$= 16.0 \quad g.p.h.f.^2$$

Kp = Coefficient of Permeabili
Q = rate discharge = 3137 g.p.
r_2 = radius outer bore
r_1 = radius inner bore
s_1 = Drop in water level inner bore
s_2 = Drop in water level outer bore
h_2 = Depth aquifer at equilibrium - inner bore
h_1 = Depth aquifer at equilibrium - outer bore.

$$\log_e \frac{r_2}{r_1} = 2.303 \log \frac{r_2}{r_1}$$

Note S.W.L. in 3N high
∴ s may be high
∴ s_1-s_2 low
∴ perm. values using 3N may be slightly high

NO. 4

SOUTH LINE

(1S) E+375. 7725:- Level fell from R.L. 162.21 to R.L. 160.90
∴ s = 1.31. h = 126.81. r = 25'

(2S) E+350. 7725:- Level fell from R.L. 162.36 to R.L. 161.22
∴ s = 1.14. h = 127.13. r = 50'

(3S) E+300. 7725:- Level fell from R.L. 162.62 to R.L. 161.62
∴ s = 1.00. h = 127.53. r = 100'

Direct measured values

Bores 3S-2S

$$Kp_{3S-2S} = \frac{3137 \times 2.303 \times .3010}{\pi(127.53+127.13)(1.14-1.00)}$$

$$= 19.4 \text{ g.p.h.f.}^2$$

$$= \frac{3137 \times 2.303 \times .3010}{\pi(127.41+127.13)(1.14-.92)}$$

$$12.4 = \text{g.p.h.f.}^2$$

- Bore 3S. S.W.L. .28 high.
∴ s value high
$s_1 - s_2$ low
∴ Perm. value high

- Values of 3S adjusted to Common S.W.L.

Bores 2S-1S

$$Kp_{2S-1S} = \frac{3137 \times 2.303 \times .3010}{\pi(127.13+126.81)(1.31-1.14)}$$

$$= 16.0 \text{ g.p.h.f.}^2$$

$$= \frac{3137 \times 2.303 \times .3010}{\pi(127.13+126.81)(1.46-1.17)}$$

$$= 9.49 \text{ g.p.h.f.}^2$$

S.W.L. 1S is .15 low
∴ s value low
$s_1 - s_2$ low
∴ Perm. value high

values h & s adjusted to Common S.W.L.

Bores 3S-1S

$$Kp_{3S-1S} = \frac{3137 \times 2.303 \times .6020}{\pi(127.53+126.81)(1.31-1.00)}$$

$$= 17.6 \text{ g.p.h.f.}^2$$

$$= \frac{3137 \times 2.303 \times .6020}{\pi(127.41+127.13)(1.46-.92)}$$

$$= 12.4 \text{ g.p.h.f.}^2$$

3S S.W.L. .28 high
1S S.W.L. .15 low
∴ $s_1 - s_2$ low
∴ Perm. value high

Values of s adjusted to Common S.W.L.

NO. 4

WEST LINE

(1W) F 7700:- Level fell from R.L. 162.36' to R.L. 160.96'
$\therefore$ s = 1.41. h = 126.87. r = 25'

(2W) F 7675:- Level fell from R.L. 162.35 to R.L. 161.21
$\therefore$ s = 1.14 h = 127.12. r = 50'

(3W) F 7625:- Level fell from R.L. 162.46 to R.L. 161.67
$\therefore$ s = .79 h = 127.58. r = 100'

S.W.L. value of 3W is .11 high $\therefore$ s high but E.W.L. also hig
$\therefore$ $s_1 - s_2$ values using 3W will be normal.

Bores 3W-2W using measured values Kp value may be slightly lo

$$Kp_{3W-1W} = \frac{3137 \times 2.303 \times .3010}{(127.58+127.12)(1.14-.79)}$$

$$= 7.8 \quad g.p.h.f.^2$$

Bores 2W-1W measured values normal or Kp value may be slightly l

$$Kp = \frac{3137 \times 2.303 \times .3010}{(127.12+126.87)(1.41-1.14)}$$

$$= 10.1 \quad g.p.h.f.^2$$

Bores 3W-1W measured values of s are relatively normal, but Kp value may be slightly low

$$Kp_{3W-1W} = \frac{3137 \times 2.303 \times .6020}{(127.58+126.87)(1.41-.79)}$$

$$= \underline{8.8 \quad g.p.h.f.^2}$$

NO. 4

EAST LINE

(1E) F 7750:- Level fell from R.L. 162.82 to R.L. 160.96'
S.W.L. 162.82 is about .47 greater than average, suggesting recorded S.W.L. not accurate $\therefore$ cannot use values using 1E. Level fell to approx. 162.36 in first ten minutes of pumping, hence may calculate using this figure.

$\therefore$ (1E) Assume level fell from R.L. 162.35' to R.L. 160.96'
$\therefore$ s = 1.39. h = 126.67. r = 25'.

(2E) F 7775:- Level fell from R.L. 162.38' to R.L. 161.17'
$\therefore$ s = 1.21 h = 127.08. r = 50'.

(3E) F 7825:- Level fell from R.L. 162.34' to R.L. 161.40'
$\therefore$ s = .94. h = 127.31. r = 100'

Using measured Values

Bores 3E-2E

$$Kp_{3E-2E} = \frac{3137 \times 2.303 \times .3010}{(127.31+127.08)(1.21-.94)}$$

$$= 10.1 \text{ g.p.h.f.}^2$$

Bores 2E-1E

$$Kp_{2E-1E} = \frac{3137 \times 2.303 \times .3010}{(127.08+126.87)(1.39-1.21)}$$

$$= 15.1 \text{ g.p.h.f.}^2$$

Bores 3E-1E

$$Kp_{3E-1E} = \frac{3137 \times 2.303 \times .6020}{(127.31+126.87)(1.39-.94)}$$

$$= 12.1 \text{ g.p.h.f.}^2$$

It is apparent by plotting static water levels and equilibrium water levels graphically, that the cone of depression caused by pumping is very similar in all directions tested and that deviations from such a theoretical cone are probably more a result of experimental errors in recording the true water levels, than significant fluctuations based on anomalous results.

Using such a theoretical cone:-

Points at 25' radius:- Water level falls from R.L. 162.35 to R.L. 160.96

$\therefore$ s = 1.39. h = 126.87. r = 25'.

Points at 50' radius:-

Water level fell from R.L. 162.35 to R.L. 161.17.

$\therefore$ = 1.14. h = 127.12. r = 50'.

Points at 100' radius:-

Water level fell from R.L. 162.34 to R.L. 161.40

$\therefore$ s = .85, h = 127.41 r = 100'

$\therefore$ Bores 100'-50' radius

$$Kp_{100-50} = \frac{3137 \times 2.303 \times .3010}{(127.41+127.12)(1.14-.85)}$$

$$= 9.4 \text{ g.p.h.f.}^2$$

Bores 50'-25' radius

$$Kp_{50-25'} = \frac{3137 \times 2.303 \times .3010}{(127.12+126.87)(1.34-1.14)}$$

$$= 10.9 \text{ g.p.h.f.}^2$$

Bores 100' to 25' radius

$$Kp_{100-25'} = \frac{3137 \times 2.303 \times .6020}{\pi(127.41+126.87)(1.39-.85)}$$

$$= 10.1 \text{ g.p.h.f.}^2$$

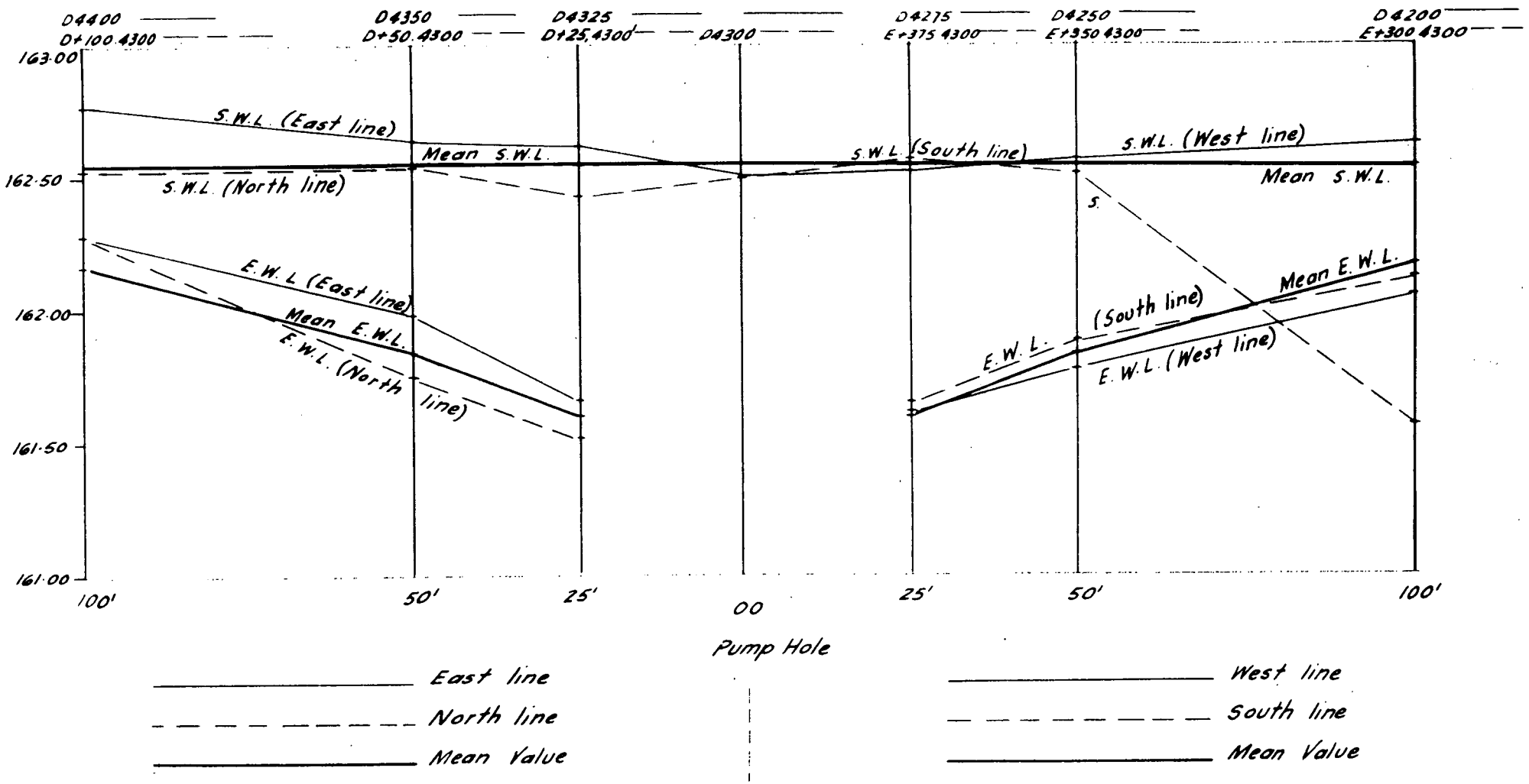
Minimum Value	7.8	g.p.h.f.^{2}
Maximum Value	19.4	g.p.h.f.^{2}
Arithmetic Mean Value	13.3	g.p.h.f.^{2}
Graphic Mean Value	10.1	g.p.h.f.^{2}

NO. 5

D 4300. R.L. Control Peg. 168.07 R.L. Bottom Aquifer 168.07 - 139.00 = 31.13

Q = 3228 g.p.h.

Bore No.	Direction	R.L. Surface	R.L. Datum	S.W.L.	R.L. (S.W.L)	E.W.L.	R.L. (E.W.L)	h.	s.
D 4300	Pump	168.13	168.94	6.45	162.49	-	-	-	-
D+25, 4300	1N	168.09	168.73	6.31	162.42	7.22	161.51	130.38	0.91
D+50, 4300	2N	168.47	169.34	6.81	162.53	7.59	161.75	130.62	0.78
D+100, 4300	3N	168.51	169.42	6.90	162.52	7.13	162.28	131.15	0.21
C+375, 4300	1S	168.31	169.14	6.58	162.56	7.49	161.65	130.52	0.91
C+350, 4300	2S	168.40	170.42	7.91	162.51	8.54	161.88	130.73	0.63
C+300, 4300	3S	168.36	169.05	7.49	161.56	6.93	162.12	130.99	-0.56
D 4275	1W	168.09	169.29	6.78	162.51	7.68	161.61	130.48	0.90
D 4250	2W	168.24	169.25	6.69	162.56	7.48	161.77	130.64	0.79
D 4200	3W	168.74	169.82	7.20	162.62	7.76	162.06	130.93	0.56
D 4325	1E	168.44	168.73	6.12	162.61	7.07	161.66	130.53	0.95
D 4350	2E	168.52	169.18	6.54	162.64	7.20	161.98	130.85	0.66
D 4400	3E	169.17	170.27	7.50	162.77	7.99	162.28	131.15	0.49
GRAPHIC MEAN									
25' radius	-	-	-	-	162.54	-	161.60	130.47	0.96
50' radius	-	-	-	-	162.54	-	161.84	130.71	0.70
100' radius	-	-	-	-	162.54	-	162.16	131.03	0.38



CHOWILLA DAM SITE INVESTIGATION
No 5 FIELD PERMEABILITY TEST
PUMP HOLE AT D4300'
GRAPHIC REPRESENTATION OF EXPERIMENTAL DATA

52863

SITE NO. 5 Pump Hole at D 4300

R.L. Surface at D 4300 = 168.13

Q = rate discharge = 3228 g.p.h.

R.L. Bottom aquifer at D 4300 = 168.13 - 137.00 = 31.13'

Average static water level 162.54'

Results using Direct Measurements.

1. North Line

(1N) D+25, 4300:- Level fell from R.L. 162.42 to R.L. 161.51
$\therefore$ s = 0.91 h = 130.38 r = 25'

(2N) D+50, 4300:- Level fell from R.L. 162.53 to R.L. 161.75
$\therefore$ s = 0.78 h = 130.62 r = 50'

(3N) D+100, 4300:- Level fell from R.L. 162.52 to R.L. 162.28
$\therefore$ s = 0.24 h = 131.15 r = 100'

S.W.L. Value of 1N is low $\therefore$ Perm. value may be low

Bores 3N-1N

$$Kp = \frac{Q \log_e \frac{r_2}{r_1}}{(h_2+h_1)(s_1-s_2)}$$

Q = rate discharge = 3228 g.p.h.

s_1-s_2 high
$\therefore$ Kp value low

$$= \frac{3228 \times 2.303 \times .3010}{(131.15+130.62)(0.78-0.24)}$$

$$= 5.04 \text{ g.p.h.f.}^2$$

Bores 2N-1N

$$Kp = \frac{3228 \times 2.303 \times .3010}{(130.62+130.38)(0.91-0.78)}$$

From graph
s_1-s_2 low
$\therefore$ Perm value high.

$$= 21.0 \text{ g.p.h.f.}^2$$

Bores 3N-1N

$$Kp = \frac{3228 \times 2.303 \times .6020}{(131.15+130.38)(0.91-0.24)}$$

$$= 9.0 \text{ g.p.h.f.}^2$$

2. South Line

(1S) C+375, 4300:- Level fell from R.L. 162.56 to R.L. 161.65
$\therefore$ s = 0.91 h = 130.48 r = 25'

(2S) C+350, 4300:- Level fell from R.L. 162.51 to R.L. 161.88
$\therefore$ s = 0.79 h = 130.73 r = 50'

(3S) C+300, 4300:- Level Rose from R.L. 161.56 to R.L. 162.12

The Static water level of 3S was obviously incorrect due to lack of hydraulic continuity inside and outside bore. Values of Kp determined on this basis are impossible.

If we assume equilibrium water level is correct and assume water level fall from graphic S.W.L., results are in good accordance with expectation
∴ working on this basis.

3S, Level theoretically fell from R.L. 162.54 to R.L. 162.12
∴ s = .42 h = 130.99 r = 100'

∴ Bores 3N-2N

$$Kp = \frac{3228 \times 2.303 \times .3010}{\pi (130.99+130.73)(.79-.42)}$$

$$= 7.4 \text{ g.p.h.f.}^2$$

Bores 2N-1N

$$Kp = \frac{3228 \times 2.303 \times .3010}{\pi (130.73+130.48)(0.91-0.78)}$$

$s_1 - s_2$ value low
∴ Kp high.

$$= 21.0 \text{ g.p.h.f.}^2$$

Bores 3N-1N

$$Kp = \frac{3228 \times 2.303 \times .6020}{\pi (130.99+130.48)(0.91-0.42)}$$

$$= 11.1 \text{ g.p.h.f.}^2$$

3. West Line

(1W) D 4275:- Level fell from R.L. 162.51 to R.L. 161.66
∴ s = 0.90 h = 130.48 r = 25'

(2W) D 4250:- Level fell from R.L. 162.56 to R.L. 161.77
∴ s = 0.79 h = 130.64 r = 50'

(3W) D 4200:- Level fell from R.L. 162.62 to R.L. 162.06
∴ s = 0.56 h = 130.93 r = 100'

Values do not significantly vary from ideal.

Bores 3W-1W

$$Kp = \frac{3228 \times 2.303 \times .3010}{\pi (130.43+130.64)(0.79-0.56)}$$

$$= 11.8 \text{ g.p.h.f.}^2$$

Bores 2W-1W

$$Kp = \frac{3228 \times 2.303 \times .3010}{\pi (130.64+130.48)(0.90-0.79)}$$

$s_1 - s_2$ value low
∴ Kp high

$$= 24.8 \text{ g.p.h.f.}^2$$

Bores 3W-1W

$$Kp = \frac{3228 \times 2.303 \times .6020}{(130.93+130.48)(0.90-0.56)}$$

$$= 16.0 = \text{g.p.h.f.}^2$$

4. East Line

(1E) D 4325:- Water level fell from R.L. 162.61 to R.L. 161.66
$\therefore$ s = 0.95 h = 130.53 r = 25'

(2E) D 4350:- Water level fell from R.L. 162.64 to R.L. 161.98
$\therefore$ s = 0.66 h = 130.85 r = 50'

(3E) D 4400:- Water level fell from R.L. 162.77 to R.L. 162.28
$\therefore$ s = 0.49 h = 131.15 r = 100'

S.W.L. Value of 3E is high (.13) $\therefore$ s value may be high
$\therefore$ s_2-s_1 may be low and Kp slightly high

Bores 3E-1E

$$Kp = \frac{3228 \times 2.303 \times .3010}{\pi(131.15+130.85)(0.66-0.49)}$$

$$= 16.0 \text{ g.p.h.f.}^2$$

Bores 2E-1E

$$Kp = \frac{3228 \times 2.303 \times .3010}{\pi 130.85+130.53)(0.95-0.66)}$$

$$= 9.4 \text{ g.p.h.f.}^2$$

Bores 3E-1E

$$Kp = \frac{3228 \times 2.303 \times .6020}{\pi(131.15+130.53)(0.95-0.49)}$$

$$= 11.8 \text{ g.p.h.f.}^2$$

It is apparent from plot that the cone of depression caused by pumping is similar in all directions, anomalies probably due to inadequate experimental data, rather than any real departure from the theoretical.

Values based on the average plotted theoretical values:-

Points at 25' Radius:-

Water level falls from R.L. 162.54 to R.L. 161.60
$\therefore$ s = 0.96 h = 130.47 r = 25'

Points at 50' Radius

Water level falls from R.L. 162.54 to R.L. 161.98
$\therefore$ s = 0.70 h = 130.71 r = 50'

Points at 100' Radius

Water level falls from R.L. 162.54 to R.L. 162.16
$\therefore$ s = 0.38 h = 131.03 r = 100'

$\therefore$ Bores at 100'-50' radii

$$Kp_{100-50'} = \frac{3228 \times 2.303 \times .3010}{\pi(131.03+130.71)(0.70-0.38)}$$

$$= 8.5 \text{ g.p.h.f.}^2$$

Bores at 50'-25' radii

$$Kp_{50-25'} = \frac{3228 \times 2.303 \times .3010}{(130.71+130.47)(0.96-0.70)}$$

$$= 10.5 \text{ g.p.h.f.}^2$$

Bores at 100'-25' radii

$$Kp_{100-25'} = \frac{3228 \times 2.303 \times .6020}{(131.03+130.47)(0.96-0.38)}$$

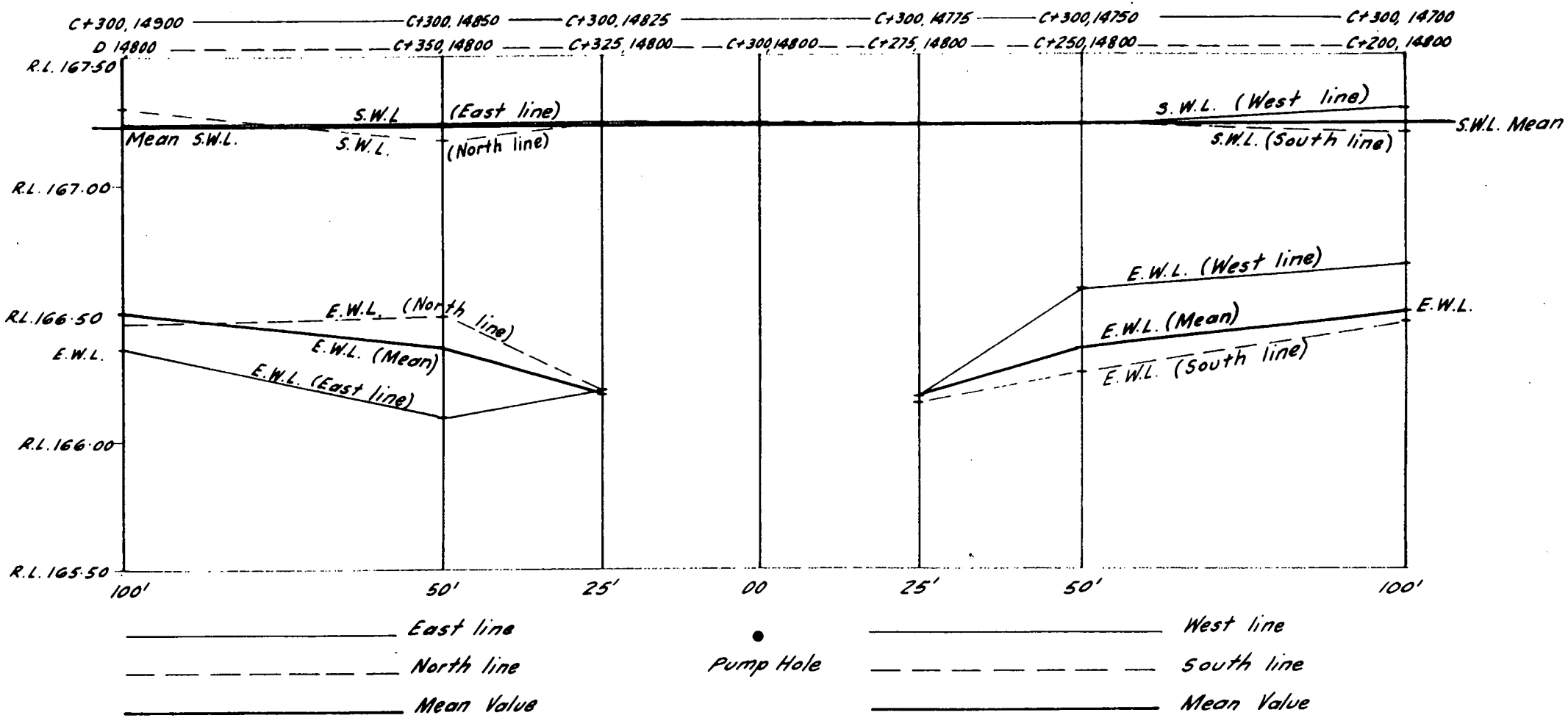
$$= 9.4 \text{ g.p.h.f.}^2$$

Maximum Value	24.8 g.p.h.f.^{2}	
Minimum Value	5.04 g.p.h.f.^{2}	Doubtful
Arithmetic Mean Value	13.7 g.p.h.f.^{2}	
Graphic Mean Value	9.5 g.p.h.f.^{2}	

NO. 6

C+300, 14800 R.L. Control Peg. 174.05' R.L. Bottom Aquifer 43.39'
Reading control Peg 4.80' Q = Rate discharge = 2900 g.p.

Bore No.	Direction	R.L. Surface	R.L. Datum	S.W.L.	R.L. (S.W.L)	E.W.L.	R.L. (E.W.L)	h.	s.
C+300, 14800	Pump	173.39	173.89	6.65	167.24	-	-	-	-
C+325,14800	1N	173.53	175.27	8.03	167.24	9.07	166.20	122.81	1.0
C+350,14800	2N	173.62	176.13	8.96	167.17	9.64	166.49	123.10	0.6
D 14800	3N	173.55	176.18	8.88	167.30	9.70	166.48	123.09	0.8
C+275,14800	1S	173.92	175.75	8.53	167.22	9.60	166.15	122.76	1.0
C+250,14800	2S	173.99	175.53	8.29	167.24	9.26	166.27	122.88	0.9
C+200,14800	3S	173.82	175.55	8.35	167.20	9.09	166.46	123.07	0.7
C+300,14775	1W	173.70	175.24	8.00	167.24	9.07	166.17	122.78	1.0
C+300,14750	2W	173.52	175.31	8.07	167.24	8.71	166.60	123.21	0.6
C+300,14700	3W	172.53	174.98	7.68	167.30	8.29	166.69	123.30	0.6
C+300,14825	1E	173.80	175.91	8.66	167.25	9.71	166.20	122.81	1.0
C+300,14850	2E	173.06	175.08	7.84	167.24	8.99	166.09	122.70	1.1
C+300,14900	3E	173.33	175.28	8.04	167.24	8.92	166.36	122.97	0.8
GRAPHIC MEAN									
25' Radius	-	-	-	-	167.24	-	166.18	122.79	1.0
50' Radius	-	-	-	-	167.24	-	166.36	122.97	0.8
100' Radius	-	-	-	-	167.24	-	166.50	123.11	0.7



CHOWILLA DAM SITE INVESTIGATION
No.6 FIELD PERMEABILITY TEST
PUMP HOLE AT C+300 14800
GRAPHIC REPRESENTATION OF EXPERIMENTAL DATA

FULL AQUIFER FIELD PERMEABILITY TEST NO. 6

Pump hole at C+300, 14800

R.L. Surface at Pump Hole = 173.39

R.L. Bottom aquifer at Pump hole = 173.39 - 130.00 = 43.39'

Average static water level = 167.24'

Pump Rate 2900 g.p.h.

1. North Line

(1N) C+325, 14800:- Water level fell from R.L. 167.24 to R.L. 166.2
$\therefore$ s = 1.04 h = 122.81 r = 25'

(2N) C+350, 14800:- Water level fell from R.L. 167.17 to R.L. 166.4

Neither S.W.L. or E.W.L. of this bore are probably correct. S.W.L. is .09 below mean value and E.W.L. is greater than for 3N, indicating a reverse cone of depression. It is assumed therefore that bore is not in true hydraulic contact with the aquifer and that true equilibrium had not been recorded. Calculations based on this bore would be inaccurate.

(3N) D 14800:- Water level fell from R.L. 167.30 to R.L. 166.4
$\therefore$ s = 0.82 h = 123.09 r = 100'

Again S.W.L. is above mean level, hence bore is not in free hydraulic contact with surroundings. Results may be calculated using 3N values but must be treated with reserve.

Bores 3N-1N

$$Kp = \frac{Q \log e \frac{r_2}{r_1}}{(h_2+h_1)(s_2-s_1)}$$

Q = 2900 g.p.h.

$\log e \frac{r_2}{r_1} = 2.303 \log \frac{r_2}{r_1}$

$$= \frac{2900 \times 2.303 \times .6010}{(122.09+122.81)(1.04-0.82)}$$

$s_1 - s_2$ value would be lower than true value

$\therefore$ Kp result high.

$$= 23.6 \text{ g.p.h.f.}^2$$

2. South Line

(1S) C+275, 14800:- Level fell from R.L. 167.24 to R.L. 166.15
$\therefore$ s = 1.07 h = 122.76 r = 25'

(2S) C+250, 14800:- Level fell from R.L. 167.24 to R.L. 166.27
$\therefore$ s = 0.97 h = 122.88 r = 50'

(3S) C+200, 14800:- Level fell from R.L. 167.20 to R.L. 166.46
$\therefore$ s = 0.74 h = 123.07 r = 100'

These values closely approximate the ideal curve of depression, therefore Kp values based on these figures would be reliable.

Bores 3S-2S

$$Kp = \frac{2900 \times 2.303 \times .3010}{(123.07+122.88)(0.97-0.74)}$$

$$= 11.3 \text{ g.p.h.f.}^2$$

Bores 2S-1S

$$Kp = \frac{2900 \times 2.303 \times .3010}{(122.88+122.76)(1.07-0.97)}$$ Value probably somewhat hig

$$= 26.0 \quad g.p.h.f.^2$$

Bores 3S-1S

$$Kp = \frac{2900 \times 2.303 \times .6020}{(123.07+122.76)(1.07-0.74)}$$

$$= 15.8 \quad g.p.h.f.^2$$

3. West Line

(1W) C+300, 14775:- Water level fell from R.L. 167.24 to R.L. 166.
$\therefore$ s = 1.07 h = 122.78 r = 25'

(2W) C+300, 14750:- Water level fell from R.L. 167.24 to R.L. 166.
$\therefore$ s = 0.64 h = 123.21 r = 50'

(3W) C+300, 14700:- Water level fell from R.L. 167.30 to R.L. 166.
$\therefore$ s = 0.61 h = 123.30 r = 100'

It is apparent that (2W) has not reached true equilibrium $\therefore$ values of Kp using (3W)-(2W) would be abnormally high and those using (2W)-(1W) would be abnormally low. Values using (3W) and (1W) would most closely approximate normality.

Bores 3W-1W

$$\therefore Kp = \frac{2.900 \times 2.303 \times .6020}{(123.30+122.78)(1.07-0.61)}$$

$$= 11.3 \ g.p.h.f.^2$$

4. East Line

(1E) C+300, 14825:- Water level fell from R.L. 167.25 to 166.20
$\therefore$ s = 1.05 h = 122.81 r = 25'

(2E) C+300, 14850:- Water level fell from R.L. 167.24 to R.L. 166.(
$\therefore$ s = 1.15 h = 122.70 r = 50'

(3E) C+300, 14900:- Water level fell from R.L. 167.24 to R.L. 166.
$\therefore$ s = 0.88 h = 122.97 r = 100'

E.W.L. of 2E is below E.W.L. of 1E, which is theoretically impossible. Bore 2E is thus unreliable. Kp values using 3E and 2E are possible, but must be treated with caution

Kp values using 3E and 1E are more likely to be correct.

Bores 3E to 2E

$$Kp = \frac{2900 \times 2.303 \times .3010}{(122.97+122.70)(1.15-0.88)}$$ Value probably low.

$$= 9.6 \quad g.p.h.f.^2$$

Bores 3E to 1E

$$Kp = \frac{2900 \times 2.303 \times .6020}{(122.97+122.81)(1.05-0.88)}$$ Value may be high

$$= \underline{30.6} \quad g.p.h.f.^2$$

Plotting values of S.W.L. and E.W.L. on graph, there does not appear to be any significant variation in the cone of depression caused by possible directional flow. Allowing for inconsistencies in experimental data, a theoretical cone of depression can be drawn representing a mean for all four directions tested. Graphic values of r, s and h are therefore

1. 25' Radius:- Water level falls from R.L. 167.24 to R.L. 166.18
$\therefore$ s = 1.06 h = 122.79 r = 25'

2. 50' Radius:- Level falls from R.L. 167.24 to R.L. 166.36.
$\therefore$ s = 0.88, h = 122.97 r = 50'

3. 100' Radius:- Level falls from R.L. 167.24 to R.L. 166.50
$\therefore$ s = 0.74 h = 123.11 r = 100'

Bores 100-50' Radii

$$Kp = \frac{2900 \times 2.303 \times .3010}{(123.11+122.97)(.88-.74)}$$

$$= \underline{18.6} \quad g.p.h.f.^2$$

Bores 50' to 25' Radii

$$Kp = \frac{2900 \times 2.303 \times .3010}{(122.97+122.79)(1.06-0.88)}$$

$$= \underline{14.5} \quad g.p.h.f.^2$$

Bores 100' to 25' Radii

$$Kp = \frac{2900 \times 2.303 \times .6020}{(123.11+122.79)(1.06-0.74)}$$

Maximum Value 30.6 $g.p.h.f^2$. but very high due to experimen inconsistency of data.

Minimum Value 9.6 $g.p.h.f^2$.

Experimental arithmetic mean Value = 18.3
May be slightly high as several abnormally high figures have been used in result.

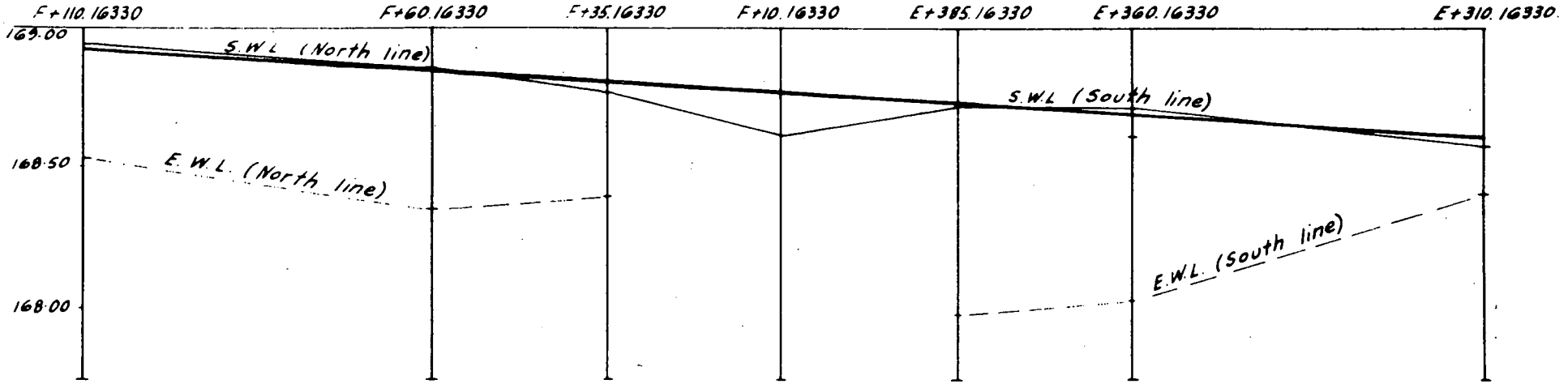
Graphic Mean Value = 16.5 $g.p.h.f^2$.
Probably nearest correct average value.

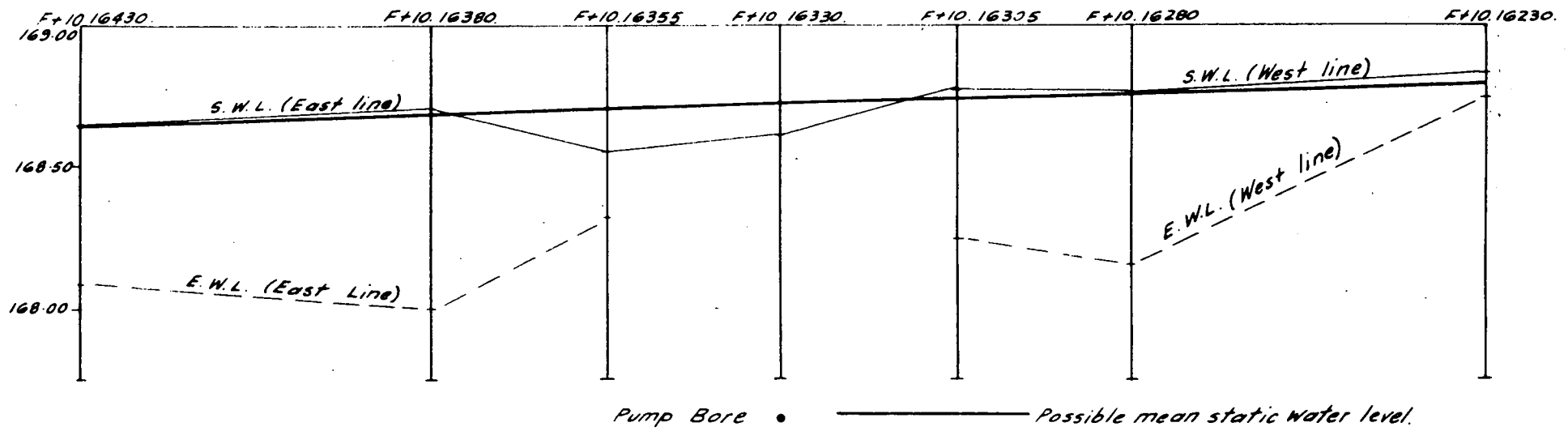
NO. 7 FIELD PERMEABILITY TEST

PUMP HOLE F+10, 16330

R.L. Control Peg 175.19 — R.L. Base aquifer, 42.35'
Level on " " 5.35 — Q = Rate discharge = 3110 g.p.h.

Bore No.	Direction	R.L. Surface	R.L. Datum	S.W.L.	R.L. (S.W.L)	E.W.L.	R.L. (E.W.L.)	h.	s.
F+10,16330	Pump	174.35	174.97	6.36	168.61	-	-	-	
F+65,16330	1N	174.92	176.23	7.47	168.76	7.83	168.40	126.15	0.
F+60,16330	2N	175.22	176.84	7.99	168.85	8.49	168.35	126.00	0.
F+110,16330	3N	175.68	177.10	8.16	168.94	8.57	168.53	126.18	0.
E+385,16330	1S	174.78	176.62	7.90	168.72	8.65	167.97	125.62	0.
E+360,16330	2S	174.95	176.73	8.02	168.71	8.68	168.05	125.70	0.
E+310,16330	3S	175.20	176.69	8.12	168.57	8.28	168.41	126.06	0.
F+10,16305	1W	174.38	176.71	7.93	168.78	8.46	168.25	125.90	0.
F+10, 16280	2W	174.63	177.09	8.32	168.77	8.93	168.16	125.81	0.
F+10,16230	3W	175.32	178.10	9.26	168.84	9.34	168.76	126.41	0.
F+10,16355	1E	174.60	176.34	7.79	168.55	7.97	168.32	125.97	0.
F+10,16380	2E	174.90	176.71	8.00	168.71	8.71	168.00	125.65	0.
F+10,16430	3E	174.90	176.93	8.28	168.65	8.85	168.08	125.73	0.





S.W.L..... Static Water Level
E.W.L..... Equilibrium Water Level

CHOWILLA DAM SITE INVESTIGATION
No.7 FIELD PERMEABILITY TEST
PUMP HOLE F+10. 16330'

52862
GJ

To accompany report by R.D. Steel

FULL AQUIFER FIELD PERMEABILITY TEST NO. 7

PUMP HOLE AT F+10, 16330

R.L. Surface at Pump hole = 174.35

R.L. Base of aquifer at Pump hole = 174.35 - 132.00 = 42.35'

Average static water leve. = 168.77

Pump rate 3110 gallons per hour.

The results of this permeability pattern will generally be unreliable. The area has been subject to severe vibration and constant flushing with fresh water during pile driving operations which have extended for several months prior to the test. Furthermore, its close proximity to the river, allows a completely variable supply of water to enter the pump hole from different directions, hence a true cone of depression would not be feasible. Marked variation in the static water level is evident in many bores, while it is also apparent that some holes have not reached equilibrium, despite 48 hours of continuous pumping.

Those holes having any significance are analysed hereunder:

1. North Line

(1N) F+35, 16330:- Water level fell from R.L. 168.76 to R.L. 168.40.

$\therefore$ s = 0.36 h = 126.15 r = 25'

The S.W.L. figure here is probably correct, but the Equilibrium water level is higher than for (2N) below. This is the reverse of the position expected. Obviously this bore has not reached equilibrium, or is not in true hydraulic contact with the aquifer, hence cannot be used in calculating Kp values.

(2N) F+60, 16330:- Water level fell from R.L. 168.85 to R.L. 168.35

$\therefore$ s = 0.50 h = 126.00 R = 50'

These values are probably reliable.

(3N) F+110, 16330:- Level fell from R.L. 168.94 to R.L. 168.53

$\therefore$ s = 0.41 h = 126.18 r = 100'

These values may be reliable, however the arc of depression in this direction is very flat and is an indication that the river water may be pouring through the more porous upper layers to counteract the theoretical drawdown.

Between Bores 3N and 2N

$$Kp = \frac{Q \log e \frac{r_2}{r_1}}{(h_2+h_1)(s_2-s_1)}$$

$$= \frac{3110 \times 2.303 \times .3010}{(126.18+126.00)(0.50-0.41)}$$

$$= 30.2 \text{ g.p.h.f.}^2$$

$$Q = 3110 \text{ g.p.h.f.}^2$$

$$\log e \frac{r_2}{r_1} = 2.303 \log \frac{r_2}{r_1}$$

This value if reliable, probably represents an optimum figure that might only apply adjacent to the river banks.

2. South Line

(1S) E+385, 16330:- Level fell from R.L. 168.72 to R.L. 167.97
$\therefore$ s = 0.75 h = 125.62 r = 25'

Values may be significant.

(2S) E+360, 16330:- Level fell from R.L. 168.71 to R.L. 168.05
$\therefore$ s = 0.66 h = 125.70 r = 50'

(3S) E+310, 16330:- Level fell from R.L. 168.57 to R.L. 168.41
$\therefore$ s = 0.16 h = 126.06 r = 100'

S.W.L. value of (3S) is low and it is fairly apparent that bore has not reached equilibrium or is not in true hydraulic contact with the aquifer.

s value will be low

$\therefore$ Kp values based on (3S) measurements will be low as $s_2 - s_1$ will be high.

Bores 3S-2S

$$Kp = \frac{3110 \times 2.303 \times .3010}{(126.06+125.70)(0.66-0.16)}$$

$$= 5.45 \text{ g.p.h.f.}^2$$

Bores 2S-1S

$$Kp = \frac{3110 \times 2.303 \times .3010}{(125.70+125.62)(0.75-0.66)}$$

$$= 30.3 \text{ g.p.h.f.}^2$$

Bores 3S-1S

$$Kp = \frac{3110 \times 2.303 \times .6020}{(126.06+125.62)(0.75-0.16)}$$

$$= 9.2 \text{ g.p.h.f.}^2$$

3. West Line

(1W) F+10, 16305:- Level fell from R.L. 168.78 to R.L. 168.25
$\therefore$ s = 0.53 h = 125.90 r = 25'

(2W) F+10, 16280:- Level fell from R.L. 168.77 to R.L. 168.16
$\therefore$ s = 0.61 h = 125.81 r = 50'

(3W) F+10, 16230:- Level fell from R.L. 168.84 to R.L. 168.76
$\therefore$ s = 0.08 h = 126.41 r = 100'

Readings here recorded are generally anomalous. S.W.L. measurements are in accord with a natural S.W.L. gradient and may be assumed reliable. However the E.W.L. of (1W) is above that of (2W) signifying a reverse cone of depression, which is theoretically impossible. It is further apparent that (3W) is not in hydraulic contact with the aquifer, as the level had fallen only 0.08". Other E.W.L. measurements signify relatively large water level differences in this direction. A value based on bores (3W) and (1W) may to a certain extent cancel out their relative deficiencies. The value would not be reliable.

Bores 3W-1W

$$Kp = \frac{3110 \times 2.303 \times .6020}{\pi (126.41+125.90)(0.53-0.08)}$$

$$= 9.0 \text{ g.p.h.f.}^2$$

4. East Line

(1E) F+10, 16355:- Level fell from R.L. 168.55 to R.L. 168.32
$\therefore$ s = 0.18 h = 125.97 r = 25'

(2E) F+10, 16380:- Level fell from R.L. 168.71 to R.L. 168.16
$\therefore$ s = 0.71 h = 125.65 r = 50'

(3E) F+10, 16430:- Level fell from R.L. 168.65 to R.L. 168.08
$\therefore$ s = 0.57 h = 125.73 r = 100'

Equilibrium water level of bore 1E is above that of 2E, thus giving again a reverse arc of depression. It is therefore assumed that either the bore is not in direct hydraulic contact with the aquifer or has not reached equilibrium. Values based on bore (2E) would be inaccurate.

Bores 3E-1E

$$Kp = \frac{3110 \times 2.303 \times .3010}{\pi (125.73+125.65)(0.71-0.57)}$$

$$= 19.5 \text{ g.p.h.f.}^2$$

In contrast to the other three patterns tested, the above does not show any uniformity in static water level or drawdown in any direction. The theoretical cone of depression used to calculate the mean values of permeability before cannot be used here, due to the number of external factors influencing the experimental data.

Maximum Value of Kp as calculated is 30.3 g.p.h.f.^{2}, a figure deemed to be abnormally high for an upper limit, as the data on which calculation is made must be treated with reserve.

Minimum Value of Kp = 5.4 g.p.h.f.^{2} Again this figure is considere too low to be confidently taken as a minimum. Other evidence implies higher permeability in this area than elsewhere on the site.

Arithmetic Mean Value:- 17.3 g.p.h.f.^{2}

Note: Drawdown measurements and pump rate figures have not been included in this report as they constitute unnecessary bulk. They are available at the Department of Mines for perusal if required.

CHOWILLA DAM SITE - GEOLOGICAL INVESTIGATIONS

SUPPLEMENTARY REPORT

APPENDIX III

TWO WELL VELOCITY TESTS - CALCULATION OF RESULTS

1. Introduction

Tests were conducted at five widely separated sites, and designed to test the permeability of the sandy materials immediately below the blanket cover. Results of a similar experiment carried out with Radioactive and chemical tracers in the preceding programme, indicated that this zone was in general more permeable than the great mass of sediments at lower depth.

Results have been calculated on the basis of a formula contained in volume 8, Number 1 (1957). Journal of Science "Permeability Measurements in the field as an assessment of Anisotrophy and Structure Development" by E. C. Childs, N. Collis-George and J. W. Holmes.

An explanation of the formula and terms used is given hereunder.

Terms Used in Calculation

K_H - Horizontal Permeability

$$K_H = \frac{\frac{dQ}{dt}}{(l + lf)\Delta\phi}$$

α - Geometrical Factor = $\frac{\text{Cosh}^{-1}}{\pi}\frac{(d/2r)}{}$

d = distance between well centres

r = radius each bore.

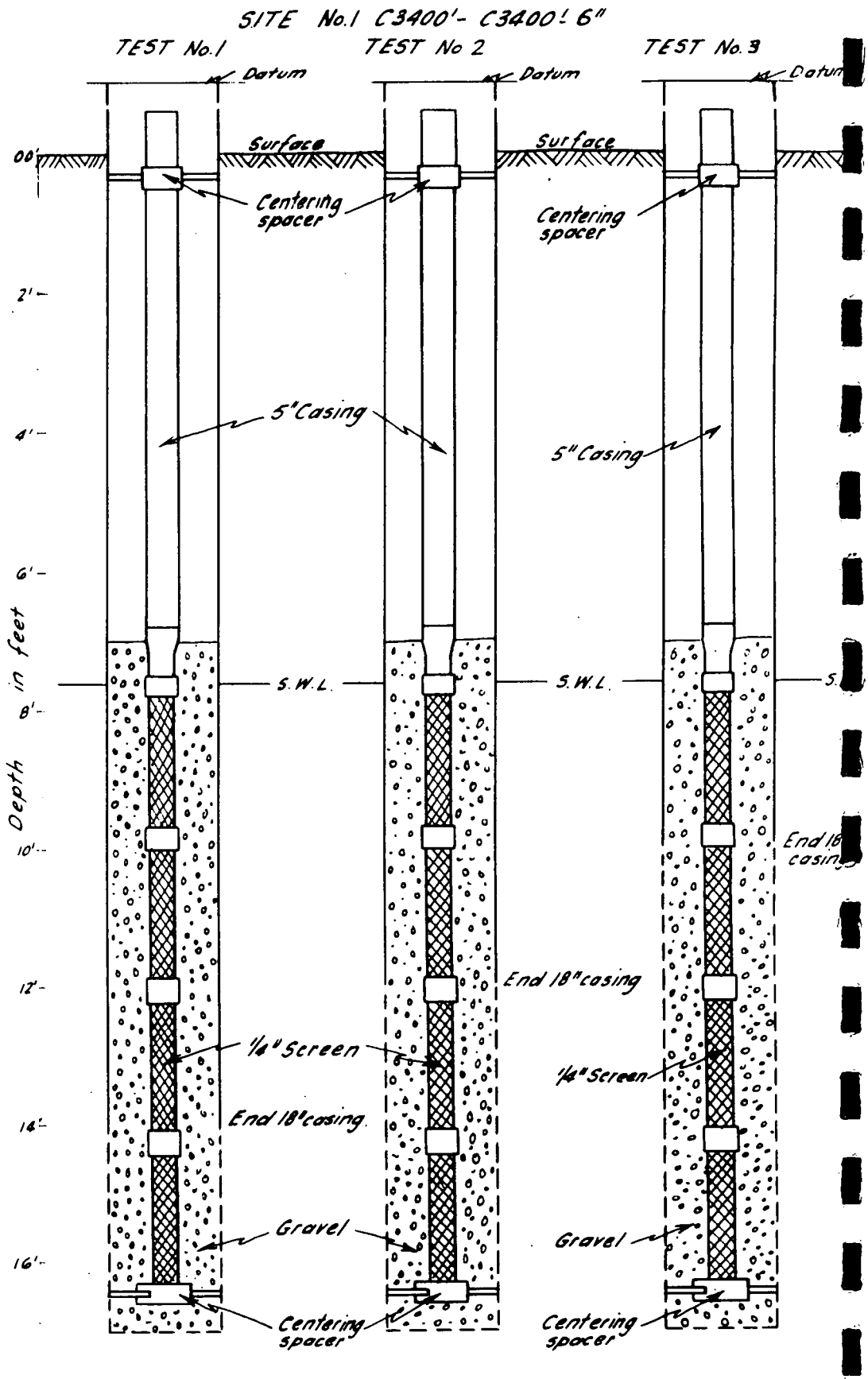
$\frac{dQ}{dt}$ = Rate of pumping. Gallons/min. Convert to ccs./sec.

l = length of well exposed.

lf = End correction: Assume = 0

$\therefore$ (l + lf) = Effective length of well.

$\Delta\phi$ = Potential head difference between wells at equilibrium and constant pump rate.



SITE No.1 TESTS Nos. 1, 2 & 3
(BOTH HOLES IDENTICAL IN EACH PATTERN)

To accompany report by R.D. Steel

S.A. DEPARTMENT OF MINES

Approved	Passed	Drn. R.D.S. Tcd. A.W. Ckd.	CHOWILLA DAM SITE – GEOLOGICAL INVESTIGATIONS DIAGRAMMATIC REPRESENTATION OF TWO WELL VELOCITY	D.M. Req.	Scale S2869 G+J

SITE No. 1 Test No. 1

Holes situated at C3400' and C3410'6"

(A) C3400 } S.W.L. approx. 7'7¼ below surface.
(B) C3410'6" }

Distance between centres - 10'6"

Diameter each well - 18"

Total depth of holes - 17'0"

Depth to which casing withdrawn 14'1"

∴ Effective depth of wells through which water can pass = 17'0"-12'1"

= 89 cms.

Static W.L. before Pumping

(A) C3400': 13'0" - 1'5¾" = 11'6¼" below datum.

(B) C3410'6": 13'0" - 1'10⅛"= 11'1⅞" below datum.

At Equilibrium pumping

(A) C3400' Pump Hole: 13'0"-1'1⅝" = 11'10⅜" below da

(B) C3410'6" Sink Hole: 13'0"-2'0¾" = 10'11¼" "

$\Delta\phi$ = (11'1⅞" - 10'11¼") + (11'10⅜"-11'6¼")

= 6¾"

= 17.15 cms.

$$K H = \frac{X \left(\frac{dQ}{dt}\right)}{(1+1f)(\Delta\phi)}$$

$X = \cos h^{-1} d/2r$

d = 10.5

2r = 18"

∴ X = 0.827

$\frac{dQ}{dt}$ = 23 gallons in 15 minut

$= \frac{23}{15} \times \frac{4.546}{60} \times 10^3$ ccs/se

$$\therefore = \frac{0.827 \times 23 \times 4.546 \times 10^3}{15 \times 60 \times 17.15 \times 89}$$

$= 6.3 \times 10^{-2}$ cms/sec.

Reverse Flow

A C3400 : Sink Hole X = 0.827

B C3410'6": Pump Hole 1+1f = 89 cms.

At Equilibrium

Water level A = 13'0"-1'10⅜" = 11'1⅜" below datum.

Water level B = 13'0"-1'3⅜" = 11'1⅞" below datum

∴$\Delta\phi$ = (11'6¼"-11'1⅜")+(11'8⅜"-11'1⅞")

= 4⅞" + 6¼"

= 28.89 cms.

$\frac{dQ}{dt}$ = 31 gallons in 13 mins.

$= \frac{31 \times 4.546 \times 10^3}{13 \times 60}$ ccs/sec.

$\therefore K_H = \frac{0.827 \times 31 \times 4.546 \times 10^3}{13 \times 60 \times 89 \times 28.89}$

$= \underline{5.81} \times 10^{-2}$ cms/sec.

Average Flow between wells in both directions.

6.05×10^{-2} cms/sec.

Test No. 2. Site No. 1

A C3400: Pump Hole

B C3410'6": Sink Hole

Depth of wells 17'0"

External casing raised to 11'11"

$\therefore$ Effective depth of well 1 = 17'0"-11'11" = 5'1"

(1 + 1f) = 155 cms.

$\Delta \phi = (8'10\frac{5}{8}"-8'5\frac{1}{4}") + (8'8\frac{7}{8}"-8'2\frac{5}{8}")$ New datum each test.

$\equiv 5\frac{3}{8}" + 6\frac{1}{4}"$

$= 11\frac{5}{8}"$

= 29.6 cms.

$\therefore K_H = \frac{\frac{dQ}{dt}}{(1+1f)\Delta\phi}$

$\frac{dQ}{dt}$ = 23 galls. in $8\frac{1}{2}$ minutes

$= \frac{23 \times 4.546 \times 10^3}{8.5 \times 60}$ ccs/sec.

$= \frac{.827 \times 4.546 \times 23 \times 10^3}{8.5 \times 60 \times 155 \times 29.6}$

χ = .827

$= 3.70 \times 10^{-2}$ cms/sec.

Reverse Flow

A C3400' Sink Hole

B C3410'6" Pump Hole

$\Delta \phi = (8'5\frac{1}{4}"-7'11\frac{7}{8}") + (9'3\frac{1}{8}"-8'8\frac{7}{8}")$

$= 5\frac{3}{8}" + 6\frac{1}{4}"$

$= 11\frac{5}{8}"$

= 29.6cms.

$\frac{dQ}{dt}$ = 17 galls. in 7 minu

$= \frac{17 \times 4.546 \times 10^3}{7 \times 60}$ ccs/

$K_H = \frac{.827 \times 4.546 \times 17 \times 10^3}{7 \times 60 \times 155 \times 29.6}$

χ = .827

(1+1f) = 155 cms.

$= \underline{3.32 \times 10^{-2}}$ cms/sec.

Average Reading for Both directions 3.51×10^{-2} cms/sec.

Test No. 3 Site No. 1

A C3400' Pump Hole

B C3410'6" Sink Hole

Depth of Wells 17'0"

External casing withdrawn to 10'0".

∴ Effective depth of well 17'0"-10'0"

= 7'0"

(1 + lf) = 214 cms.

$\Delta\phi$ = (2'8"-2'3⅜") + (2'9⅝"-2'4⅞") - Reading at bottom

4⅝" + 4¾" to fixed depth at datum.

≐ 9⅜"

= 23.8 cms.

$K_H = \frac{\frac{dQ}{dt}}{(1+lf)\Delta\phi}$

$= \frac{.827 \times 4.546 \times 31 \times 10^3}{11 \times 60 \times 214 \times 23.8}$

$= 3.47 \times 10^{-2}$ cms/sec.

χ = .827

$\frac{dQ}{dt}$ = 31 gallons in 11 minutes

$= \frac{31 \times 4.546 \times 10^3}{11 \quad 60}$ ccs/se

Reverse Flow

A C3400 Sink Hole

B C3410'6" Pump Hole

$\Delta\phi$ = (3'1"-2'8") + (2'4⅞"-1'11⅞")

= 10"

= 25.4 cms.

$\frac{dQ}{dt}$ = 23½ gallons in 8 minut

$\therefore K_H = \frac{.827 \times 4.546 \times 23.5 \times 10^3}{8 \times 60 \times 214 \times 25.4}$

$= \frac{23.5}{8} \times \frac{4.546}{60} \times 10^3$ ccs/

$= 3.43 \times 10^{-2}$ cms/sec.

Average Flow both directions 3.47×10^{-2} cms/sec.

Average Flow A-B - 4.49×10^{-2} cms/sec.

Average Flow B-A - 4.13×10^{-2} cms/sec.

Average Flow Both directions - 4.33×10^{-2} cms/sec.

SITE No. 2

Holes situated at F4200' and F4210'3"

(A) F4200' Pump Hole
(B) F4210'3" Sink Hole
} S.W.L. approx. 8'6" below surface.

Distance between centres 10'3"

Diameter each well 18"

Total depth of holes 15'0"

Depth to which casing withdrawn 9'0"

∴ Effective depth of wells l = 15'0"-9'0" = 6'0"

∴ l + lf = 183 cms lf = 0

Static Water Level before pumping

(A) F4200' = 13'0" - 2'3⅛" = 10'8⅞" below datum.

(B) F4210'3" = 13'0" - 2'6½" = 10'5½" below datum.

At Equilibrium after pumping

(A) F4200' = 13'0" - 1'8⅛" = 11'3⅞" below datum.

(B) F4210'3" = 13'0" - 2'10½"= 10'1½" below datum.

$\therefore \Delta\phi$ = (2'3⅛"-1'8⅛") + (2'10½"-2'6½")

= 11"

= 27.9 cms.

$$K_H = \frac{\chi \left(\frac{dQ}{dt}\right)}{(l+lf)\Delta\phi}$$

$$= \frac{.831 \times 4.546 \times 10^3 \times 16.3}{183 \times 6 \times 60 \times 27.9}$$

$$= 3.35 \times 10^{-2} \text{ cms/sec.}$$

$$\chi = \frac{\cos h^{-1}(d/2r)}{\pi}$$

d = 10.25'

2r = 1.5'

∴ χ = .831

$\frac{dQ}{dt}$ = 16.3 gallons in 6 minutes

$$= \frac{16.3 \times 4.546}{6 \times 60} \times 10^3 \text{ ccs/sec}$$

Reverse Flow

At Equilibrium

(A) F4200': Sink Hole - Water level 13'0"-2'10" below datum.

(B) F4210'3" Pump Hole: Water level 13'0"-2'2¾" below datum.

$\therefore \Delta\phi$ = (2'10"-2'3⅛") + (2'6½"-2'2¾")

= 10⅝"

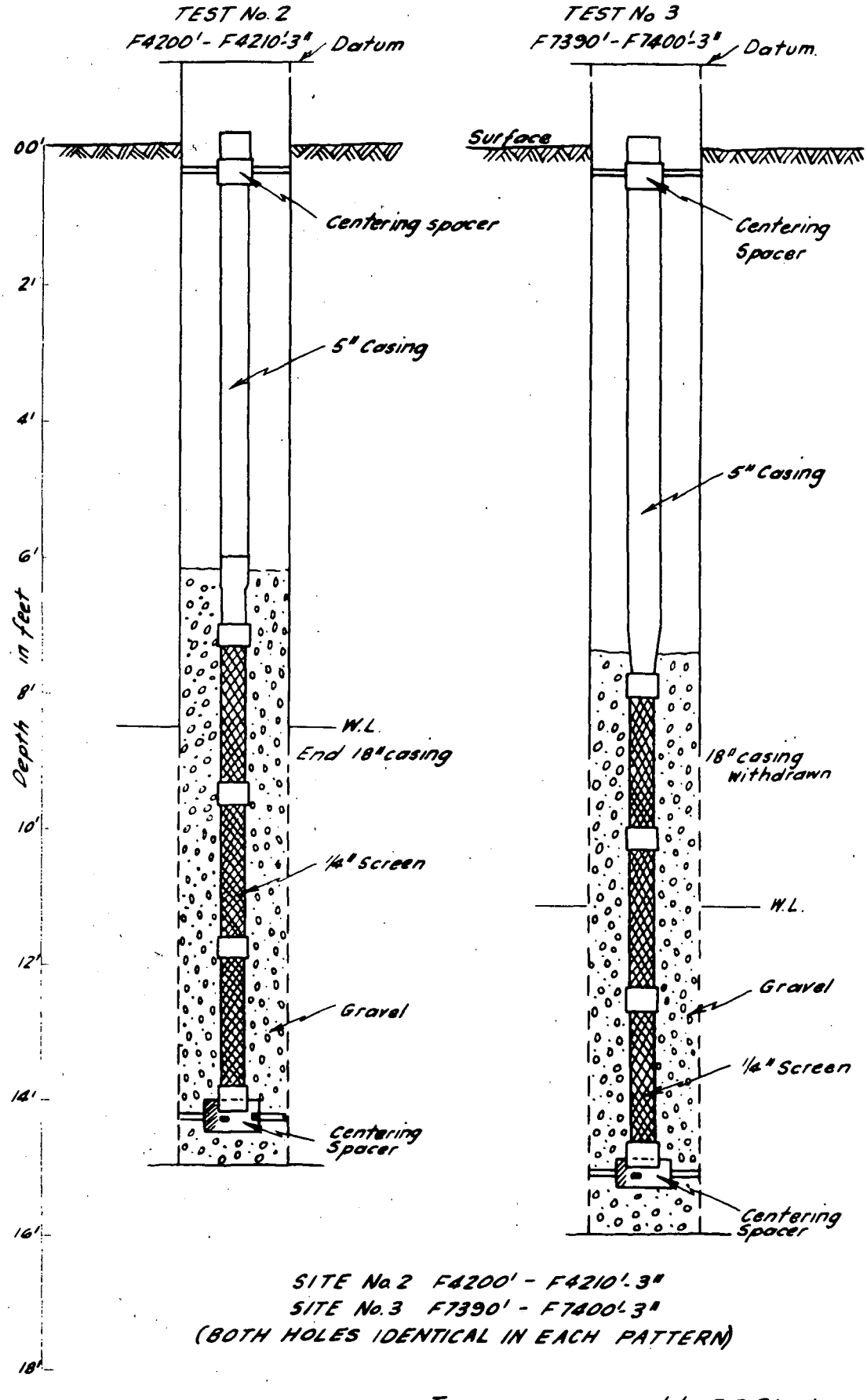
= 27.0 cms.

$$\therefore K_H = \frac{.831 \times 4.546 \times 10^3 \times 16.3}{183 \times 6 \times 60 \times 27}$$

$$= 3.46 \times 10^{-2} \text{ cms/sec.}$$

$\frac{dQ}{dt}$ = 16.3 galls in 6 minute

$$= \frac{16.3 \times 4.546}{6 \times 60} \times 10^3 \text{ ccs}$$



SITE No 2 F4200' - F4210'-3"
SITE No. 3 F7390' - F7400'-3"
(BOTH HOLES IDENTICAL IN EACH PATTERN)

To accompany report by R.D. Steel.

S.A. DEPARTMENT OF MINES

Approved Director	Passed	Drn. R.D.S. Tcd. A.W. Ckd. Exd.	CHOWILLA DAM SITE – GEOLOGICAL INVESTIGATIONS DIAGRAMMITIC REPRESENTATION OF TWO WELL VELOCITY TEST PATTERNS	D.M. Req.	Scale S2870 G+J Date 8-8-61

SITE NO. 3

Holes situated at F7390' and F7400'3".

(A) F7390'
(B) F7400'3"

S.W.L. approx. 11'2" below surface.

Distance between centres 10'3".

Diameter each well 18"

Total depth of holes 16'0"

Depth to which casing withdrawn 9'0"

∴ Effective depth of wells through which water moves

l = 16'0" − 11'2" = 4'10"

= 58"

= 147 cms.

Static water level before Pumping

(A) F7390: − 14'0" − 1'6⅝" = 12'5⅜" below datum.

(B) F7340'3": − 14'0" − 1'3⅛" = 12'8⅞" below datum.

At Equilibrium pumping

(A) F7390: − Sink Hole = 14'0" − 1'11⅜" = 12'0⅜" below datum.

(B) F7400'3": − Pump Hole = 14'0" − 1'1½" = 12'10½" below datum

∴ $\Delta\phi$ = (12'5⅜" − 12'0⅜") + (12'10½" − 12'8⅞")

= 6⅝"

= 16.8 cms.

∴ $K_H = \dfrac{\chi \frac{dQ}{dt}}{(1+1f)\Delta\phi}$ χ = .831

$\frac{dQ}{dt}$ = 9.5 galls. in 6 minutes

$= \dfrac{9.5 \times 4.546 \times 10^3}{6 \times 60 \quad 1}$ cc/sec

$= \dfrac{.831 \times 4.546 \times 10^3 \times 9.5}{147 \times 6 \times 60 \times 16.8}$

$= 4.04 \times 10^{-2}$ cms/sec.

Reverse Flow: at Equilibrium pumping

(A) F7390: Pump hole: 14'0" − 1'7⅞" = 12'4⅛"

(B) F7400'3": Sink hole: 14'0" − 1'9½" = 12'2½".

∴

ΔQ = (12'5⅜" − 12'4⅛") + (12'8⅞" − 12'2½")

= 7⅝"

= 19.4 cms.

$\frac{dQ}{dt}$ = 10.1 gallons in 6 minutes.

$= \dfrac{10.1 \times 4.546 \times 10^3}{6 \times 60}$

$K_H = \dfrac{.831 \times 4.546 \times 10^3 \times 10.1}{147 \times 6 \times 60 \times 19.4}$

$= 3.72 \times 10^{-2}$ cms/sec.

Average Flow over both directions

3.88×10^{-2} cms/sec.

SITE No. 4

Holes situated near pile Driver, Test perpendicular to River.

Hole A Nearest River)
Hole B 10'3" from A) S.W.L. approx. 7'3" below surface.

Distance between centres 9'6"

Diameter each well 18"

Total depth of wells 14'6"

Depth to which casing withdrawn 8'3"

Effective depth of wells through which water moves

l = 14'6" - 8'3" = 6.3" = 190 cms.

Static Water level before pumping

A. Pump Hole: = 9'0" - $10\frac{3}{4}$" = 8'$1\frac{1}{4}$" below datum

B. Sink Hole: = 9'0" - $11\frac{3}{8}$" = 8'$0\frac{5}{8}$" below datum.

At Equilibrium pumping

A. Pump - 9'0" - 10" = 8'2" below datum.

B. Sink - 9'0" - 1'$0\frac{3}{8}$" - 7'$11\frac{5}{8}$" below datum.

$\therefore$

$\Delta\phi$ = (8'$0\frac{5}{8}$" - 7'$11\frac{5}{8}$") + (8'2" - 8'$1\frac{1}{4}$")

= $1\frac{3}{4}$"

= 4.4 cms.

$K_H = \frac{\chi\left(\frac{dQ}{dt}\right)}{(1+lf)\Delta\phi}$

$= \frac{.831 \times 4.546 \times 10^3}{190 \times 40 \times 4.4}$

$= 11.2 \times 10^{-2}$ cms/sec.

$\chi = \cosh^{-1}$ (d/2

d = 1025'

2r = 1.5'

χ = .831

1+lf = 190 cms.

$\frac{dQ}{dt}$ = 8 galls. in 5 mins. 20 secs.

$= \frac{4.546}{40} \times 10^3$ ccs./sec.

Reverse Flow

At Equilibrium pumping

A. Sink Hole 9'0" - $11\frac{3}{4}$" = 8'$0\frac{1}{4}$"

B. Pump Hole 9'0" - $10\frac{3}{4}$" = 8'$1\frac{1}{4}$"

$\therefore \Delta\phi$ = (8'$1\frac{1}{4}$" - 8'$0\frac{1}{4}$") + (8'$1\frac{1}{4}$" - 8'$0\frac{5}{8}$")

= $1\frac{5}{8}$"

= 4.13 cms.

$K_H = \frac{.831 \times 4.546 \times 10^3}{34 \times 190 \times 4.13}$

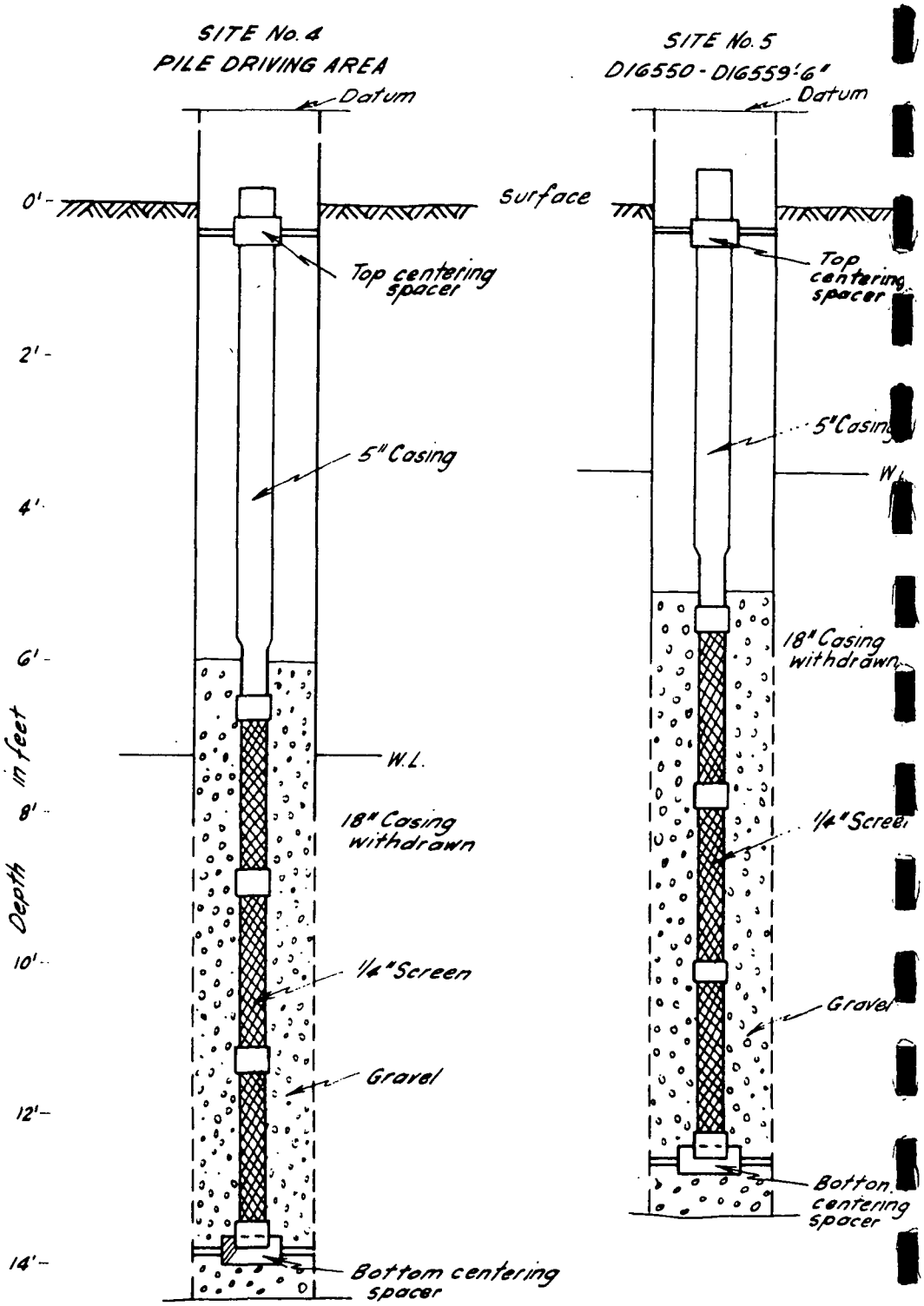
$= 14.2 \times 10^{-2}$ cms/sec.

$\frac{dQ}{dt}$ = 8 galls. in 4 mins. 32 sec.

$= \frac{1}{34} \times \frac{4.546}{} \times 10^3$ ccs/sec.

Average flow over both directions.

$= 12.7 \times 10^{-2}$ cms/sec.



SITE No. 4 PILE DRIVER AREA
SITE No. 5 D16550' - D16559'-6"
(BOTH HOLES IDENTICAL IN EACH PATTERN)

To accompany report by R.D. Steel.

S.A. DEPARTMENT OF MINES					
Approved Director	Passed	Drn. R.D.S. Tcd. A.W. Ckd. Exd.	CHOWILLA DAM SITE - GEOLOGICAL INVESTIGATIONS DIAGRAMMATIC REPRESENTATION OF TWO WELL VELOCITY TEST PATTERNS	D.M. Req.	Scale S2871 G+J Date 9-8-61

SITE No. 5

Holes situated at D16550 and D 16559'6"

D16550' } - } Static Water Level 3'2".
D16559.5' }

Distance between centres 9'6"

Diameter each well 1.5'

Total depth of bores 13'4".

Depth to which casing withdrawn 6'0"

∴ Effective depth of well l = 13'4" - 6'0" = 88"

= 224 cms.

Static Water Level before pumping

(A) D16550 6'0" - 1'6½" = 4'5½"

(B) D16559.5' 7'0" - 1'7½" = 5'4½"

At equilibrium with pumping

(A) D16550 Sink Hole: 6'0" - 1'11" = 4'1"

(B) D16559.5 Pump Hole: 7'0" - 6⅝" = 6'5⅜"

$\therefore \Delta\phi$ = (4'5½"-4'1") + (6'5⅜" - 5'4½")

= 1'5⅞"

= 45.4 cms.

$$K_H = \frac{\chi \frac{dQ}{dt}}{(1+lf)\Delta\phi}$$

$$= \frac{.806 \times 10.7 \times 4.546 \times 10^3}{224 \times 6 \times 60 \times 45.4}$$

$$= \underline{1.07 \times 10^{-2} \text{ cms/sec.}}$$

$\chi = \cos h^{-1} d/2r$

d = 9.5'

2r = 1.5'

$\therefore \chi = .806$

$\frac{dQ}{dt}$ = 10.7 gallons in 6 minutes

$= \frac{10.7}{6} \times \frac{4.546}{60} \times 10^3$ ccs/sec

1 + lf = 224 cms.

Reverse Flow:

At Equilibrium Pumping

(A) D16550 Pump Hole 7'0" - 2'1¾" = 4'10¼"

(B) D16559.6 Sink Hole 7'0" - 2'8" = 4'4"

$\therefore \Delta\phi$ = (4'10¼" - 4'5½") + (5'4½" - 4'4")

= 1'5¼"

= 43.8 cms.

$$K_H = \frac{.806 \times 11 \times 4.546 \times 10^3}{6 \times 60 \times 224 \times 43.8}$$

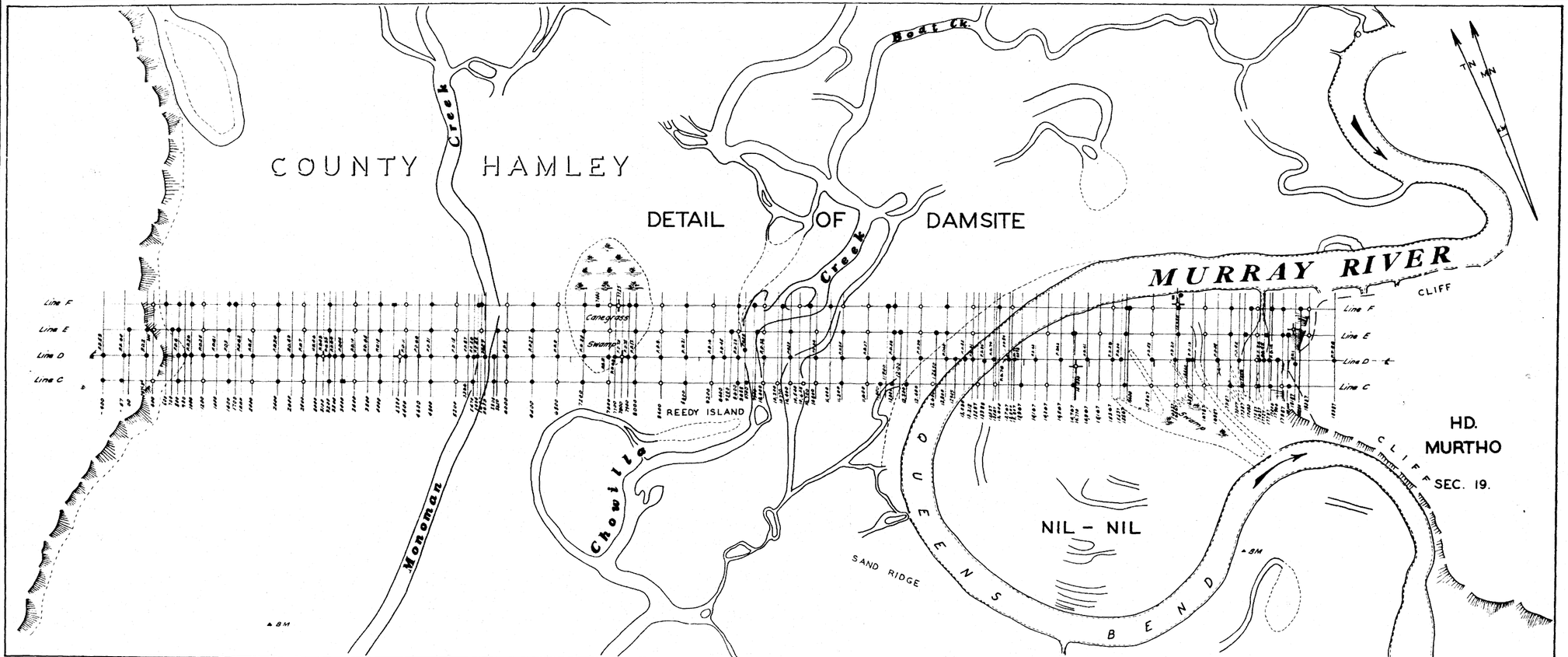
$$= \underline{1.14 \times 10^{-2} \text{ cms/sec.}}$$

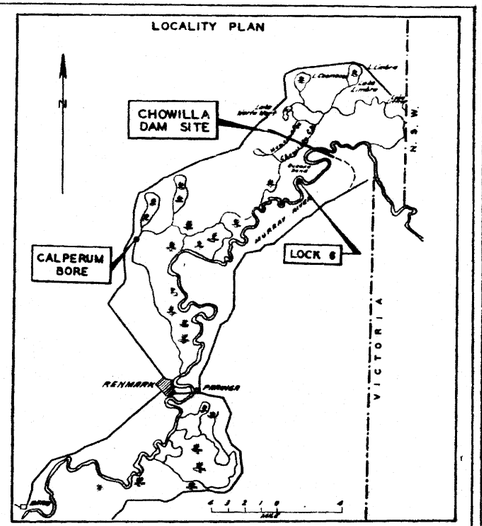
$\frac{dQ}{dt}$ = 11 gallons in 6 minutes

$= \frac{11}{6} \times \frac{4.546}{60} \times 10^3$ ccs/sec.

Average for both directions 1.10×10^{-2} cms/sec.

R. D. Steel,





LEGEND

Percussion drill hole ..... ●

Power auger drill hole ..... o

Pumped hole in test patterns ..... ✛

Sealed Tube Sample Hole ..... ●

Two Well Velocity Test Pattern ..... ▬

BOREHOLE LOCATION PLAN CHOWILLA DAM SITE

SCALE

800 400 0 800 1600 2400 3200

FEET

To accompany report by W. Johnson, K. Hern and R.D. Steel.

GO-G05 B' G+J

E R N R I V E R F L A T S

LINE F

EAST

15,587' 2'-3"(B.Th) No water
15,600' 5'-0"(B.Th) 11'-0"(W.C) 7'-0"(W.L)
15,987' From 4'-6"(B.Th) 7'-5"(W.C) 7'-5"(W.L)
16,367' 5'-0"+(B.Th) No water
16,787' 6'-0"(B.Th) 6'-0"(W.C) 4'-10"(W.L)
Cream fine to medium grained sand
17,187' 11'-0"(B.Th) 10'-0"(W.C) 7'-0"(W.L)
17,480' 14'-6"(B.Th) 13'-0"(W.C) 7'-0"(W.L)
17,587' 18'-0"(B.Th) 12'-0"(W.C) 6'-4"(W.L)
17,800' 9'-0"(B.Th) 13'-0"(W.C) 6'-2"(W.L)
17,987' 14'-0"(B.Th) 13'-9"(W.C) 7'-0"(W.L)
18,100' 15'+(B.Th) – (W.C) – (W.L)
18,250' –(B.Th) –(W.C) –(W.L)
18,387' No water

R.L. 200'
R.L. 180'
R.L. 160'

R I V E R F L A T S

LINE E

15,567' 8'-0"(B.Th) 8'-0"(W.C) 4'-0"(W.L)
15,967' 2'To 4'(B.Th) 3'-3"(W.C) 3'-3"(W.L)
16,367' 6'-0"(B.Th) 5'-0"(W.C) 4'-0"(W.L)
16,787' 8'-0"(B.Th) 8'-0"(W.C) 5'-6"(W.L)
17,187' 10'-0"(B.Th) 10'-0"(W.C) 7'-0"(W.L)
17,400' 16'-0"(B.Th) 17'-0"(W.C) 8'-6"(W.L)
17,587' 20'-0"(B.Th) 19'To 20'(W.C) 14'-9"(W.L)
17,987' 0'To4'?(B.Th) No water
18,100' No water
18,387' No water
Grey-brown fine to med. sand with occasional clay pellets

R.L. 220'
R.L. 200'
R.L. 180'
R.L. 160'

N R I V E R F L A T S

15,967' P.D.53 2'-0"+(B.Th) 3'-0" (W.C) 3'-0" (W.L)
16,327' P.D.20 7'-0"+(B.Th) 7'-0" (W.C) 2'-6" (W.L)
16,550' P.D. – 6'-0"(B.Th) 7'-0"(W.C) 3'-6"(W.L)
16,560' P.D. – 6'-0"(B.Th) 7'-0"(W.C) 3'-6"(W.L)
16,587' P.D.19 6'-0"+(B.Th) 5'-0" (W.C) 3'-6" (W.L)
16,987' P.D.16 7'-0"+(B.Th) ? (W.C) ? (W.L)
17,307' P.D.52 9'-0"+(B.Th) 7'-0" (W.C) 6'-0" (W.L)
PRO.
17,627' P.D.56 15'-0"(B.Th) 11'-0"(W.C) – (W.L)
17,727' P.D.55 25'-0"(B.Th) – (W.C) – (W.L)
17,787' P.D.12 18'To 25'(B.Th) 27'-0" (W.C) 12'-0" (W.L)
17,900' No water
18,187' P.D.1 90'-0"approx. (W.C) – (W.L)
18,987' P.D.86 98'-0" (W.C) 35'-0" (W.L)

LINE D

R.L. 260'
R.L. 240'
R.L. 220'
R.L. 200'
R.L. 180'
R.L. 160'
R.L. 140'
R.L. 120'
R.L. 100'
R.L. 80'
R.L. 60'
R.L. 40'
R.L. 20'
R.L. 00'

F L A T S

15,567' 4'-0"(B.Th.) 4'-0"(W.C.) 4'-0"(W.L.)
15,987' 8'-10"(B.Th.) 1'-10"(W.C.) 1'-10"(W.L.)
16,367' 4'-0"(B.Th.) 5'-0"(W.C.) 2'-1"(W.L.)
16,787' 14'-0"(B.Th.) 10'-0"(W.C.) 4'-1"(W.L.)
17,187' 6'-6"(B.Th.) 6'-0"(W.C.) 3'-6"(W.L.)
17,350' 6'-0"(B.Th.) 5'-0"(W.C.) 4'-0"(W.L.)
17,587' 6'-0"(B.Th.) 8'-0"(W.C.) 2'-2"(W.L.)
17,600' 11'-0"(B.Th.) 10'-0"(W.C.) 2'-1"(W.L.)
17,800' No water
17,987' No water
18,100' No water

LINE C

R.L. 220'
R.L. 200'
R.L. 180'
R.L. 160'

BORE REFERENCE

14,967' Chainage
P.D. 41 Percussion Drill No.
6'-0"(B.Th.) Blanket thickness
6'-0"(W.C.) Water cut
5'-0"(W.L.) Water level

LEGEND

QUATERNARY

TERRESTRIAL DEPOSITS
- Sandy clay Talus.
- Reddish-brown sandy loam to sandy clay loam with irregularly abundant grit fragments.

FLOOD PLAIN & NEWER VALLEY DEPOSITS
- Light to medium grey or brown silt, to very fine and fine silty sand. Mid to dark brown and grey-brown clay and silty clay.
- As above with white lime pockets and nodules.
- Light grey-brown, yellow-brown, mottled fine sandy-silty clay, grading in depth to clayey-silty, very fine to fine sand.
- Blue-grey, greenish and light brown, irregularly mottled, fine sandy to silty clay.
- Light grey to light brown and yellow-brown mottled slightly silty to silty clay.
- Blue grey and greenish clay and silty clay.

Disconformity-(erosional break)

OLDER VALLEY DEPOSITS
- Generally bluish-grey silty clay, with some sand and grit pockets.
- Fine grain sand: Light yellow-brown, light brown, light grey and light grey-brown.
- Fine to medium grain sand: Light yellow-brown, light brown, light grey and light grey-brown.
- Medium grain sand: Light yellow-brown to light brown, light grey and light grey-brown.
- Medium to coarse grain sand: Generally light grey to light grey-brown.
- Coarse grain sand: Generally with some fine interstitial fraction. Light grey-brown and light to pale greyish.
- Coarse rounded milky quartz grit fragments

Disconformity-(erosional break)

TERTIARY

LACUSTRINE DEPOSITS
- Light grey, light brown, yellow-brown and reddish-brown mottled clayey sand, generally with numerous coarse grit fragments. Becoming coarse gritty sand at depth.
- Brick-red fine to medium grain sand, somewhat silty in part, and with numerous course grit fragments
- Light yellowish-brown medium grain sand, with abundant coarse grit fragments.

Possible disconformity

ESTUARINE DEPOSITS

Pliocene to Upper Miocene — Loxton Sands Equivalents
- Possibly light yellowish medium to coarse grain sand may be with some fine fraction.
- Light grey to grey-brown generally fine grain sand somewhat clayey and micaceous in part.
- Bluish-grey silty clay in discrete small pockets with fine grain sand Some carbonaceous and pyritic material in part.

MARINE DEPOSITS

Upper Miocene — Bookpurnong Equivalents
- Mid-grey to greenish-grey glauconitic silty to sandy clay, siltstone or silty sand. Somewhat pyritic and with irregularly abundant shell fragments.

Middle Miocene — Pata Limestone Equivalents
- Greyish to greenish-grey glauconitic siltstone, silty clay marl, with irregularly abundant fossil fragments.

HORIZONTAL SCALE
100 0 100 200 300 400 500 600
FEET

SCALE IN FEET
100 0 100 200 300 400 500
SCALE IN METRES
50 0 50 100 150

(8)

S.A. DEPARTMENT OF MINES

CHOWILLA DAM SITE GEOLOGICAL INVESTIGATIONS

GEOLOGICAL CROSS SECTIONS ALONG LINES C,D,E & F

EASTERN RIVER FLATS

(MURRAY RIVER – EASTERN BANK
CHAINAGE 12,600' TO CHAINAGE 18,987')

To accompany report by W.Johnson, N.Hiern & R.Steel

Note
Levels based on Murray River datum.
To reduce to M.S.L. deduct approx. 105ft.

L60-142C
G+J
B.T.

F 1

WEST

EASTERN RIVER FLATS

LINE F

13,800'

R.L.180'
R.L.160'
R.L.140'

MURRAY RIVER

W.L.(169·33)on 5-8-60

For details see Drg.No. L60-1428

15,367' 0" (B.Th.) 5'-6" (W.C) 5'-5" (W.L)

15,567' 2'-3" (B.Th.) No water

15,800' 5'-0"(B.Th.) 11'-0"(W.C.) 7'-0" (W.L.)

15,967' From 4'-6"(B.Th.) 7'-5" (W.C.) 7'-5" (W.L.)

16,367' 5'-0"+(B.Th.) No water

16,787' 6'-0" (B.Th.) 6'-0" (W.C.) 4'-10" (W.L.)

Cream fine to medium grained sand

EASTERN RIVER FLATS

LINE E

13,200'

R.L.180'
R.L.160'
R.L.140'

MURRAY RIVER

W.L.(169·17) on 4-8-60

For details see Drg.No. L60-1428

14,367' 12'1 to 14'(B.Th.) 10'1o 12' (W.C) 4'-0" (W.L.)

14,767' 3'-0" + No water

14,770' 14'-0"(B.Th.) – (W.C.) – (W.L.)

15,167' 10'-0"?(B.Th.) 6'-8" (W.C.) 6'-8" (W.L.)

15,567' 8'-0" (B.Th.) 8'-0" (W.C.) 4'-0" (W.L.)

15,967' 2'-to-4'(B.Th.) 3'-3" (W.C.) 3'-3" (W.L.)

16,367' 6'-0"(B.Th.) 5'-0"(W.C.) 4'-0" (W.L.)

16,787' 8'-0"(B.Th.) 8'-0" (W.C.) 5'-6" (W.L.)

EASTERN RIVER FLATS

LINE D

R.L.180'
R.L.160'
R.L.140'
R.L.120'
R.L.100'
R.L.80'
R.L.60'
R.L.40'
R.L.20'
R.L.00'

MURRAY RIVER

W.L.(169·24)on 4-8-60

12,945' 11'-0"(B.Th.) 11'-0" (W.C.) 5'-0" (W.L.)

13,091' P.D.82

13,212' P.D.81

13,388' P.D.80

13,537' P.D.79

13,742' P.D. 76 8'-0" (B.Th.) 8'-0"(W.C.) 4'-0" (W.L.)

13,767' P.D. 54 8'-0"(B.Th.) 8'-0"(W.C.) 5'-0"(W.L.)

13,807' P.D.77 8'-0"(B.Th.) 6'-0"(W.C.) 4'-0"(W.L.)

13,817' P.D.78 8'-0"(B.Th.) 6'-0"(W.C.) 3'-0"(W.L.)

14,167' P.D.43 8'-0"+(B.Th.) 8'-0" (W.C.) 4'-0" (W.L.)

14,567' P.D.42 8'-0"+(B.Th.) 7'-0" (W.C.) 5'-0" (W.L.)

14,800' P.D.– 3'-6"(B.Th.) 10'-0"(W.C.) 8'-2"(W.L.)

14,967' P.D.41 8'-0"(B.Th.) 6'-0"(W.C.) 5'-0"(W.L.)

15,367' P.D. 29 4'-0"+ (B.Th.) 4'-0" (W.C.) 3'-6"(W.L.)

15,537' P.D. 30 6'-0"+ (B.Th.) 5'-0" (W.C.) 4'-0" (W.L.)

15,967' P.D. 53 2'-0"+ (B.Th.) 3'-0" (W.C.) 3'-0" (W.L.)

16,327' P.D. 20 7'-0"+ (B.Th.) 7'-0" (W.C.) 2'-6" (W.L.)

16,550' P.D.– 6'-0"(B.Th.) 7'-0"(W.C.) 3'-6"(W.L.)

16,560' P.D.– 6'-0"(B.Th.) 7'-0"(W.C.) 3'-6" (W.L.)

16,587' P.D.19 6'-0"+(B.Th.) 6'-0" (W.C.) 3'-6" (W.L.)

16,987' P.D.16 7'-0"+ (B.Th.) ? (W.C.) ? (W.L.)

LINE C

R.L.200'
R.L.180'
R.L.160'

MURRAY RIVER

W.L.(169·24)on 4-8-60

For details see Drg. No. L60-1428

12600

13287' 16'-0"(B.Th.) 5'-6" (W.C.) 2'-6" (W.L.)

13567' 20'-0"(B.Th.) 10'-0" (W.C.) 6'-0" (W.L.)

13967' 7'-0" (B.Th.) 7'-0" (W.C.) 5'-0"(W.L.)

14,367' 8'-0"(B.Th.) 8'-0"(W.C.) 6'-0" (W.L.)

14,767' 5'-0" + (B.Th.) No water

15,167' 4'-6" (B.Th.) 4'-6" (W.C.) 3'-3" (W.L.)

15,567' 4'-0" (B.Th.) 4'-0" (W.C.) 4'-0" (W.L.)

15,967' 8'-10" (B.Th.) 1'-10" (W.C.) 1'-10" (W.L.)

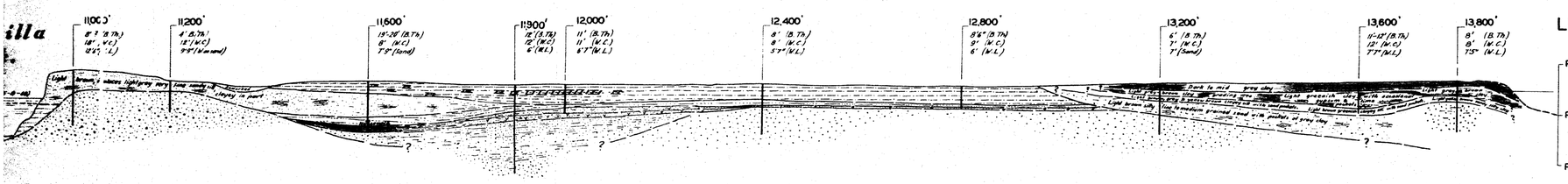
16,367' 4'-0" (B.Th.) 5'-0" (W.C.) 2'-1" (W.L.)

16,787' 14'-0" (B.Th.) 10'-0" (W.C.) 4'-1" (W.L.)

F 2

SCALE IN FEET
100 0 100 200 300 400
50 0

CHOWILLA ISLAND



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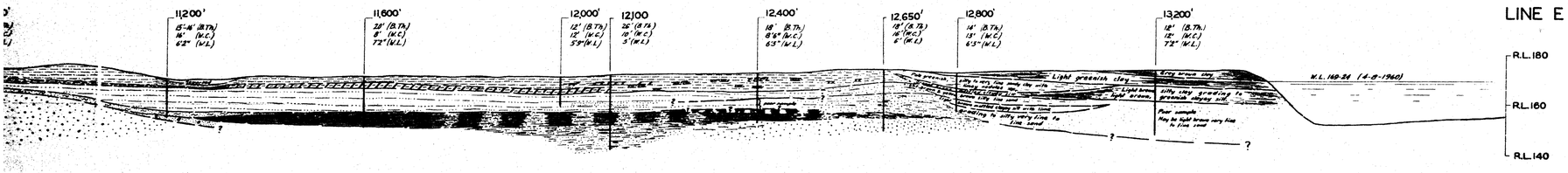
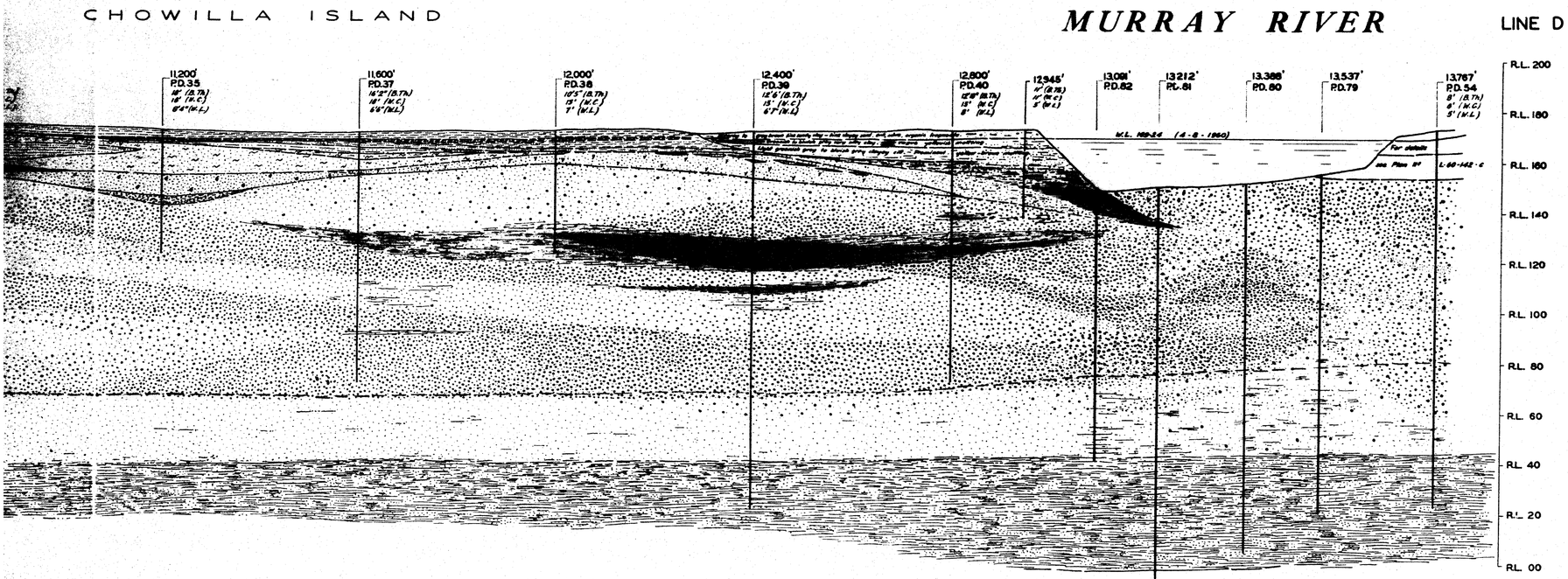
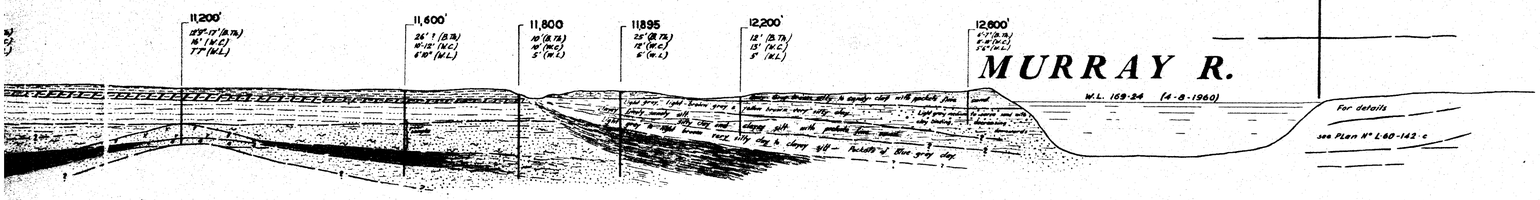


CHOWILLA ISLAND

MURRAY RIVER



CHOWILLA ISLAND



SCALE IN FEET
SCALE IN METRES

LEGEND

EAST

QUATERNARY

TERRESTRIAL DEPOSITS

Do not occur in this section

FLOOD PLAIN & NEWER VALLEY DEPOSITS

Reworked floodplain material: assorted sandy to silty clay & clayey silt

Group I — Greyish, grey-brown, bluish-grey or greenish clay, silty to sandy in part, with sand pockets of fine clayey sand.
Group IA — As for group I, but with granular disseminated and crystalline gypsum.
Group IIA — As for group II, but with granular disseminated and crystalline gypsum.
Group II — Light grey, light brown and yellow to orange-brown mottled, silty clay to clayey silt.
Group III — Light grey, light brown and yellow to orange-brown, slightly clayey to finely sandy silt. Few small sand pockets.
Group IIIA — Light grey to light brown and yellow brown, laminated clayey silt to silty clay.
Group IIIB — Light grey, light brown and yellow-brown mottled, silty fine sand.

Group IV — Bluish-grey clay to silty clay, with rare brownish mottling. Microscopic in part.
Group IVA — Light grey microscopic silty clay and clayey silt, with thin lenses of fine sand.

Group V — Mid-grey to brownish-grey silty fine to very fine sand. Somewhat micaceous in part.
Group VA — Light grey to bluish-grey essentially fine clayey to fine sandy silt.

Disconformity - (erosional break)

OLDER VALLEY DEPOSITS

Generally bluish-grey silty clay, with some sand and grit pockets.

Fine grain sand: Light yellow-brown, light brown, light grey and grey-brown.

Fine to medium grain sand: Light yellow-brown to light brown, light grey and light grey-brown.

Medium grain sand: Light yellow-brown to light brown, light grey and light grey-brown.

Medium to coarse grain sand: Generally light grey to light grey-brown.

Coarse grain sand: Generally with some fine interstitial fraction. Light grey - brown and light to pale greyish.

Coarse rounded milky quartz grit fragments.

Disconformity - (erosional break)

LACUSTRINE DEPOSITS

Do not occur in this section.

Possible disconformity

ESTUARINE DEPOSITS

TERTIARY

Pliocene to Upper Miocene — Lacton Sands Equivalents

Possibly light yellowish medium to coarse grain sand; may be with some fine fraction.
Light grey to grey - brown generally fine grain sand, somewhat clayey and micaceous in part.
Bluish - grey silty clay in discrete small pockets with fine grain sand. Some carbonaceous and pyritic material in part.

MARINE DEPOSITS

Upper Miocene — Bookpurnong Equivalents: Pale grey to greenish grey glauconitic silty to sandy clay, siltstone, or silty sand. Somewhat pyritic and with irregularly disseminated shell fragments.

Middle Miocene — Pata Limestone Equivalents: Greyish to greenish - grey glauconitic siltstone, silty clay and marl, with irregularly disseminated shell fragments.

BORE REFERENCE

13767' Chainage.
PD 54 Percussion Drill N°.
8' (B.Th.) Blanket Thickness.
8' (W.C.) Water cut.
5' (W.L.) Water level.

NOTE: Levels based on Murray River datum, to reduce to M.S.L. deduct 105'.

S.A. DEPARTMENT OF MINES

CHOWILLA DAM SITE

GEOLOGICAL INVESTIGATIONS

GEOLOGICAL CROSS SECTIONS ALONG LINES C D E & F

CHOWILLA ISLAND

(CHOWILLA CREEK - MURRAY RIVER
CHAINAGE 9600' TO CHAINAGE 13800')

HORIZONTAL SCALE

100 00 100 200 300 400 500 600

FEET

To accompany report by W. Johnson, N. Warn, R. Steel.

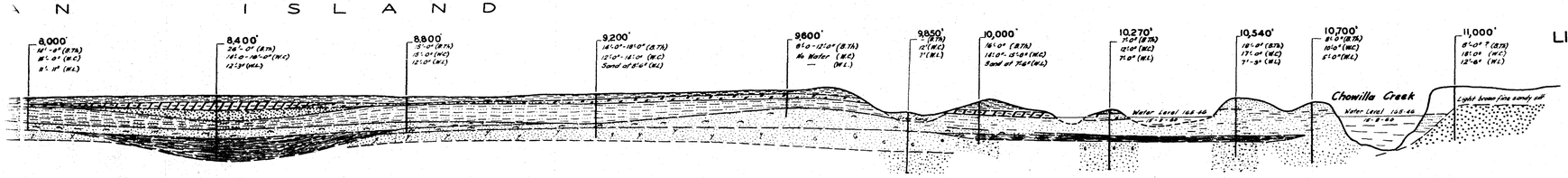
L·60-142·B
G+J

F 1


WEST
CHOWILLA ISLAND
LINE F
Chowilla Ck.
LINE E
Chowilla Ck.
LINE D
Chowilla Ck.
MURRAY RIVER
LINE C
Chowilla Ck.
MURRAY R.
R.L. 200
R.L. 180
R.L. 160
R.L. 140
R.L. 120
R.L. 100
R.L. 80
R.L. 60
R.L. 40
R.L. 20
R.L. 00
SCALE IN FEET
SCALE IN METRES

F 2

N I S L A N D



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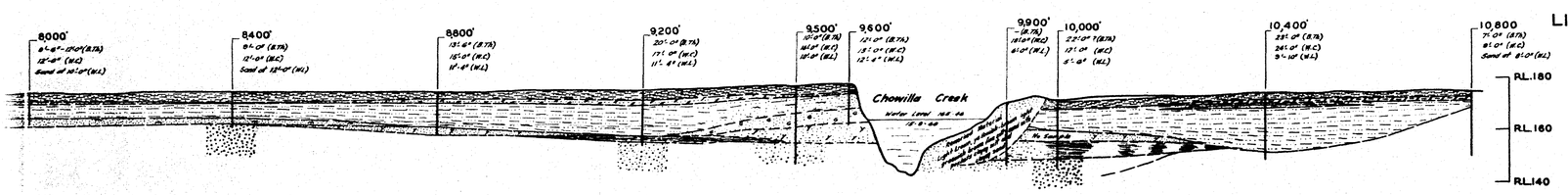
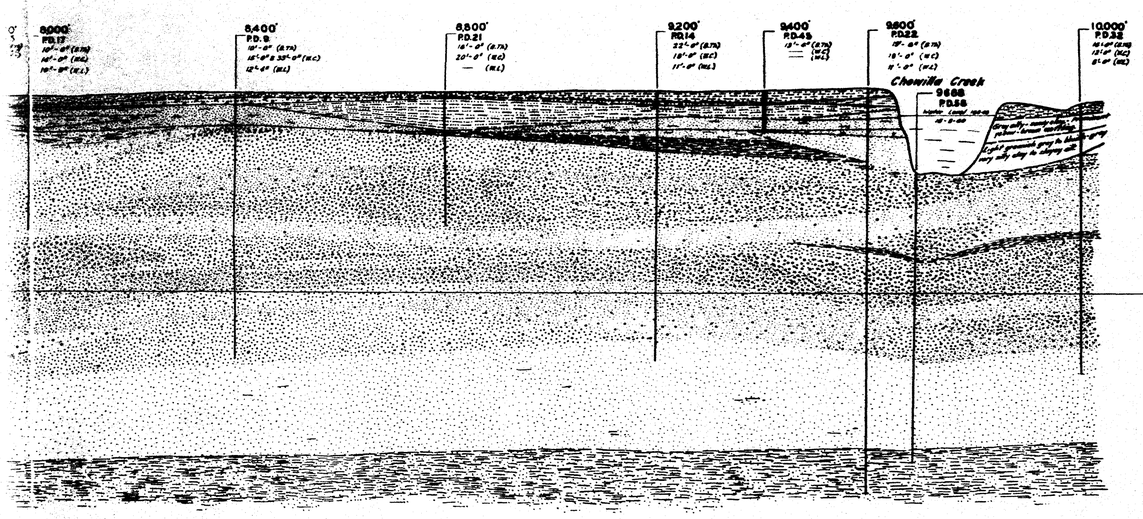
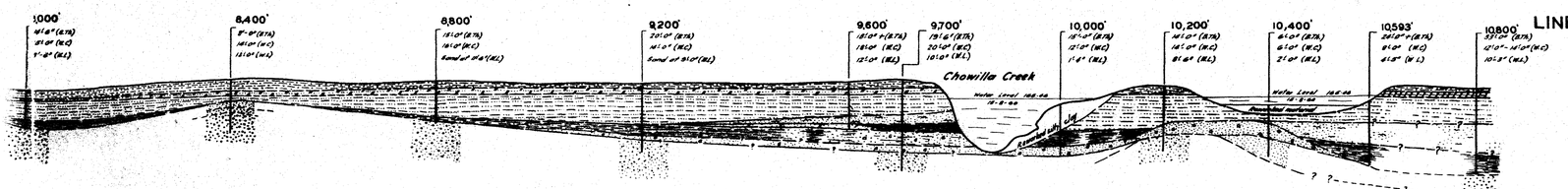


S L A N D



N I S L A N D



S.A. DEPARTMENT OF MINES

CHOWILLA DAM SITE GEOLOGICAL INVESTIGATIONS

GEOLOGICAL CROSS SECTIONS ALONG LINES C, D, E & F

MONOMAN ISLAND

(MONOMAN CREEK — CHOWILLA CREEK
CHAINAGE 5394' — CHAINAGE 10,000')

HORIZONTAL SCALE

100 0 100 200 300 400 500 600 700 800

FEET

EAST

LEGEND

QUATERNARY

TERRESTRIAL DEPOSITS

Reddish brown sandy loam to sandy clay loam, with irregularly abundant grit fragments.

Reddish brown to light reddish-brown fine sandy clay to clayey sand, with white lime patches and nodules irregularly abundant.

Reddish-brown clayey sand to sandy clay, with coarse grit fragments generally abundant.

FLOOD PLAIN AND NEWER VALLEY DEPOSITS

Reworked floodplain material: assorted sandy to silty clay and clayey silt.

Groups

I — Greyish grey-brown, bluish-grey or greenish clay, silty to sandy in part, with sand pockets of fine clayey sand.

IA — As for group I, but with granular disseminated and crystalline gypsum.

IIA — As for group II but with granular disseminated and crystalline gypsum.

II — Light grey, light brown and yellow to orange-brown mottled silty clay to clayey silt.

III — Light grey, light brown and yellow to orange-brown slightly clayey to clayey sandy silt with rare small sand pockets.

IIIA — Light grey to light brown and yellow-brown laminated clayey silt to silty clay.

IIIB — Light grey, light brown and yellow-brown mottled silty fine sand.

IV — Bluish-grey clay to silty clay, with vague brownish mottling. Micaceous in part.

IVA — Light grey micaceous silty clay and clayey silt, with thin lenses of fine sand.

V — Mid-grey to brownish-grey silty fine to very fine sand. Sometimes micaceous in part.

VA — Light grey to bluish-grey essentially fine, clayey to fine sandy silt.

Disconformity (erosional break)

OLDER VALLEY DEPOSITS

Generally, bluish-grey silty clay, with some sand and grit pockets.

Fine grain sand. Light yellow-brown, light brown, light grey and light grey brown.

Fine to medium grain sand. Light yellow-brown to light brown, light grey and light grey-brown.

Medium grain sand. Light yellow-brown to light brown, light grey and light grey-brown.

Medium to coarse grain sand. Generally light grey to light grey-brown.

Coarse grain sand - Generally with some fine interstitial fraction. Light grey-brown and light to pale greyish.

Coarse rounded milky quartz grit fragments.

Disconformity (erosional break)

LACUSTRINE DEPOSITS

Light grey, light brown, yellow-brown and reddish brown mottled clayey sand generally with numerous coarse grit fragments. Becoming coarse gritty sand at depth.

Brick-red fine to medium grain sand, somewhat silty in part, and with numerous coarse grit fragments.

Light yellowish-brown medium grain sand, with abundant coarse grit fragments.

Possible disconformity

TERTIARY

ESTUARINE DEPOSITS

Pliocene to Upper Miocene — Loxton Sands Equivalents

Possibly light yellowish medium to coarse grained sand, may be with some fine fraction.

Light grey to grey-brown generally fine grain sand, somewhat clayey and micaceous in part.

Bluish-grey silty clay, in discrete small pockets with fine grain sand. Some carbonaceous and pyritic material in part.

MARINE DEPOSITS

Upper Miocene — Bookpurnong Equivalents

Mid grey to greenish grey glauconitic silty to sandy clay, siltstone or silty sand. Somewhat pyritic and with irregularly abundant shell fragments.

Middle Miocene — Tata Limestone Equivalents

Greyish - to greenish-grey, glauconitic siltstone, silty clay and marl, with irregularly abundant fossil fragments.

NOTE:-
Levels based on River Murray Datum.
To reduce to MSL datum approx 105'

BORE REFERENCE

9600 Chainage.
PD.45 Percussion drill number.
51.0' Alluvial thickness.
51.0' Water cut.
21.0' Water level.

Sealed Tube Samples

Screen for Permeability Tests.

F 1

L60-142A
G+J

To accompany report by W. Johnson, N. Hiern and R.D. Steel

A.D.W.

WEST

MONOMAN ISLAND

LINE "F"

RL.180
RL.160
RL.140

5,500
5,600'
6,000'
6,400'
6,800'
7,200'
7,390'
7,400'
7,600'
7,625'
7,675'
7,700'
7,725'
7,750'
7,775'
7,525'
8,000'
8,400'
8,800'
9,200'
9,600'

Monoman Creek

MONOMAN ISLAND

LINE "E"

RL.180
RL.160
RL.140

5,600'
5,850'
6,000'
6,400'
6,800'
7,200'
7,600'
8,000'
8,400'
8,800'
9,200'
9,500'
9,600'

Monoman Creek
Chowilla Creek

MONOMAN ISLAND

LINE "D"

RL.180
RL.160
RL.140
RL.120
RL.100
RL. 80
RL. 60
RL. 40
RL. 20

5,639'
5,800'
6,000'
6,400'
6,800'
7,200'
7,600'
7,700'
7,750'
7,775'
7,800'
7,825'
7,850'
7,900'
8,000'
8,400'
8,800'
9,200'
9,400'
9,600'

Monoman Creek
Chowilla Creek
TEST 3
TEST 2
TEST 1

MONOMAN ISLAND

LINE "C"

RL.180
RL.160
RL.140

5,475'
5,800'
6,000'
6,400'
6,800'
7,200'
7,600'
8,000'
8,400'
8,800'
9,200'
9,600'
9,700'

Monoman Creek
Chowi

SCALE IN FEET
SCALE IN METRES

F 2