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DEPARTMENT OF MINES.

SOUTH AUSTRALIA.

HYDROLOGY OF THE BAROSSA VALLEY.

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I. ABSTRACT.

The fertile Barossa Valley comprises about 72 square miles in portions of the Hundreds of Moorooroo, Belvidere, Nuriootpa and Barossa in the North Para Catchment Area and includes the centres of Nuriootpa, Tanunda, Lyndoch and Rowlands Flat. It is noted for its wine production and is important as a fruit and vegetable producer as well as its canning, quarrying and chemical industries.

A Mediterranean type climate of dry hot summers and moderately wet winters provides a reliable rainfall of about 22 inches a year, an average yearly total of about 55×10^9 gallons for the Catchment Area which is drained by the North Para River and its tributaries. The River flows out of the Valley through a gauging station which has had an average measured yearly flow of 3.6×10^9 gallons since 1939.

The Valley is a basin in Torrensian Series and Kanmantoo rocks of the Adelaide System and has formed by a probable late Tertiary or Quaternary westerly dipping fault resulting in a steep escarpment to the east and gentle rises to the west. The basin has been partly filled with Quaternary and Tertiary lacustrine and fluviatile sediments varying from clays to coarse gravels. The Tertiary basin deposits are frequently lignitic and may be contemporaneous (with different facies) with the lateritized and ferruginous capping of Tertiary sands, clays and gravels found on the western slopes of the basin.

The basin sediments are somewhat lenticular and, therefore, together with the varying topography drainage and form of the basin, present a complex hydrological system. The sediments are generally well charged with water along the main drainages but are not uniformly so in either plan or depth. Near the main drainages, bores have produced good supplies of good quality water where favorable aquifers have been penetrated - particularly in the Nuriootpa - Lights Pass area. At other points less permeable beds yield poor supplies.

Bores and wells in Tertiary outcrops on the western margins of the Valley have produced small supplies of high salinity water. Areas of shallow alluvium and Adelaide system rocks vary in their

capacities to produce underground water, depending upon the local conditions of drainage amd permeability.

Surface runoff waters entering the Valley are thought to suffer relatively little loss through lateral percolation into the tight Adelaide System Rocks, and that part which does not flow out of the Valley is largely lost through evaporation and transpiration.

To preserve the present storage of underground water and salinity conditions, increased utilization must be accompanied by increased recharging of the aquifers. The amount of water available for this purpose is of the order of that measured by the flow of the River through the gauging station. Only a portion of this amount will enter the underground storage depending upon the favorability of recharge conditions.

Although the area is largely served by reticulated reservoir water, such water is insufficient for irrigation and industrial requirements, and increased demand for underground supplies may be expected.

II. INTRODUCTION.

The Barossa Valley, noted for its vineyards and wine industries, is also important as a fruit, vegetable, and grain producer. Chemical and quarrying industries are of note in the Angaston area as is canning at Nuriootpa.

The Valley itself comprises portions of the Hundreds of Belvidere, Nuriootpa, Moorooroo and Barossa in the more highly developed part of the North Para River Catchment Area. For this report it is considered as extending in length from just north of Williamstown northward through Lyndoch and then north-easterly with the North Para River past Rowlands Flat, Tanunda and Nuriootpa to the Dimchurch area. In breadth it extends about ten miles over the flat Nuriootpa - Tanunda plain from low-lying hills on the west to the higher Angaston Hills to the east. To the south it becomes more irregular and narrower in width as it joins and includes the north draining Lyndoch Valley.

The towns of Angaston, Lyndoch, Rowlands Flat, Tanunda, Nuriootpa and Stockwell are served by rail, road and reservoir water.

Considerable water sampling was done by A. Mason in 1950-51 when a hydrological survey was initiated. With the departure of Mason the survey was dormant until resumed and re-examined by Chugg at the end of 1953 and carried on into February, 1954.

Maps in this report are based on the one inch to two mile Hundred plans with reference to the recently completed Gawler One Mile Sheet. The Military one mile sheets of Gawler, Kapunda and Cambrai provide fifty foot contour intervals. The Truro Sheet, and hence contours for the area north-east of Dorrien are not available, and the aneroid barometer was used to establish elevations in this and other areas of the survey, the values being used on the accompanying sections.

III. ACKNOWLEDGMENTS.

Acknowledgment must be given to Mr. A. Mason's initial field work and compilation of records which provided a most useful start for the Survey. Helpful assistance was given by Mr. R. Foster. Co-operation by both the Engineering and Water Supply Department and the Meteorological Branch, Commonwealth of Australia, in providing records necessary to the report are appreciated. Mr. E. P. O'Driscoll, Senior Hydrologist, was most helpful with his advice during the preparation and revision of the text.

IV. CLIMATE.

The Barossa Valley is favoured by a Mediterranean type climate of mild winters, warm to hot summers, and a reliable rainfall of about 22 inches a year. Trumble (1948) has prepared tables showing rainfall, evaporation and drought frequency from which applicable abstractions are made (Table No. 1). Williamstown lies out of the Valley and its higher rainfall may be attributed to its hilly environment, characteristic only of the southern marginal portion of the Valley. The annual rainfall increased from Nuriootpa south through Tanunda, Lyndoch and Williamstown, while Angaston is anomalously high being probably characteristic of the foothills of the eastern ranges.

TABLE NO. 1.

MEAN MONTHLY RAINFALL AND EVAPORATION (INCHES)

CENTRE	Years Rainfall Recorded		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Mean Annual Rainfall
Angaston	62	R	0.90	0.77	0.94	1.73	2.39	3.03	2.68	2.99	2.57	1.89	1.30	1.08	22.27
		E	8.7	7.1	6.0	3.7	2.0	1.5	1.4	2.0	3.0	4.8	6.8	8.3	
Lyndoch	56	R	0.86	0.71	0.83	1.76	2.42	3.36	2.93	3.16	2.78	2.04	1.22	1.03	23.10
		E	8.9	6.8	5.5	3.5	2.0	1.3	1.4	2.0	3.1	4.4	6.6	8.6	
Nuriootpa	60	R	0.90	0.71	0.90	1.62	2.17	2.83	2.46	2.76	2.37	1.79	1.19	1.12	20.82
		E	9.1	7.5	6.1	3.7	2.1	1.3	1.4	2.0	3.0	5.1	7.5	8.8	
Tanunda	75	R	0.91	0.67	1.00	1.75	2.39	3.08	2.61	2.85	2.50	1.89	1.22	1.00	21.87
		E	8.9	7.2	5.9	3.5	2.0	1.3	1.4	2.0	3.0	4.6	6.6	8.5	
Williamstown	62	R	1.01	0.75	0.97	2.14	3.04	4.40	3.61	3.80	2.96	2.24	1.40	1.08	27.40
		E	8.5	6.9	4.8	3.2	2.0	1.3	1.3	1.9	3.0	4.5	6.0	1.1	

Abstracted from "Rainfall, Evaporation and Drought Frequency in South Australia," H. C. Trumble, Jour. of Agriculture, Sept., 1948.

Station	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Annual Total
Angaston	4	4	5	8	12	13	15	15	12	9	6	5	108
Lyndoch	3	3	3	7	10	13	13	14	11	9	6	4	96
Nuriootpa	4	4	4	8	11	14	15	15	11	9	6	5	106
Stockwell	4	4	4	7	11	13	15	15	19	9	7	5	106
Tanunda	4	3	4	7	11	12	13	14	11	9	6	4	98
Williamstown	3	3	3	7	10	12	13	13	10	8	5	4	91

CLIMATE (Contd.)

The Commonwealth of Australia, Book of Normals, No. 1 "Rainfall" has rainfall figures for a standard period of 30 years from 1911 to 1940, the figures being somewhat lower than Trumble (loc. cit). In addition, the Book of Normals shows the number of days of rainfall per month of 0.01 inches or more.

The significance of the last table is the low number of wet days even for the months of highest rainfall.

Table No. 3, a further excerpt from Trumble, shows the mean extent of the rainfall season in months, the percentage probability of effective rain for each month, the percentage drought year frequency (i.e. the percentage probability of 5 month of effective rain for the year) and the mean air temperature for the month of July. Additional rainfall figures are presented in Table No. 4 for yearly rainfall from 1939 to 1953.

It may be said that the Valley has an average rainfall slightly in excess of 21 inches per year, most heavily distributed over the winter months. The effective rain occurs in less than 1/3 of the days of the year and in the summer months is generally precipitated as showers of short duration. The yearly rainfall is dependable, with a drought year (less than 5 months of useful rain) about one year in seven.

IV. TOPOGRAPHY.

The dominant topographical features of the area are the generally flat plains, bounded by a steep gradient to the east with hills rising over 2000 feet, and to the west by gentler slopes and elevations less than 1000 feet. Longitudinally the valley divides itself into three distinct sections, as enumerated below -

1. The northern section comprises the broad flat Tanunda - Nuriootpa plains bounded on the west by the Greenoch Hills, to the east by the Angaston Hills and by a poorly defined water shed in the Dimchurch area to the north. The southern boundary may, for convenience, be taken as the Tanunda Creek.

2. South from the Tanunda Creek through Rowlands Flat to Altona the valley is not so flat, and has a steeper gradient toward the

TABLE NO. 3.

CENTRE	Mean Rainfall Season (months)	PERCENTAGE SEASONS WITH RAINFALL EFFECTIVE FOR - Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Percentage Drought year Frequency	Mean Air Temperature (of July)
Angaston	7.6	4	14	19	64	92	98	100	97	91	60	21	12	13	47
Lyndoch	7.7	7	13	18	65	92	99	100	97	91	67	26	13	12	48
Nuriootpa	7.2	3	11	18	53	89	96	98	94	89	50	20	8	22	48
Tanunda	7.6	5	11	18	62	62	99	99	97	87	60	25	10	13	48
Williamstown	8.3	12	13	23	76	95	98	100	97	93	75	34	14	6	47

Abstracted from "Rainfall, Evaporation and Drought Frequency in South Australia," H. C. Trumble, Journal of Agriculture, Sept., 1948.

North Para River. Near Rowlands Flat the River bends sharply to the north-west where it has cut a gorge of about 200 feet in depth.

3. A water shed near Altona is the beginning of westerly drainage toward Lyndoch where the valley again widens to join Tweedies Gully and the adjacent Hoffnungs Lagoon as well as the gullies from the west.

The form of the valleys as well as the lacustrine nature of the deeper sediments, described under Tertiary Geology, suggests a former system of lakes variously bounded, drained, and connected by successive phases of Tertiary and Quarternary orogeny.

V. DRAINAGE.

Plan A shows boundaries of the water shed for the North Para River, an area of approximately 172 square miles. The river commences in Flaxmans Valley, flows north to Duck Pond Creek, south of Stockwell, and then southwesterly to Nuriootpa, Tanunda and Rowlands Flat near where it bends sharply to the northwest. At Tanunda and just north of Rowlands Flat, respectively, it is joined by the northwest flowing tributaries, Tanunda Creek and Jacobs Creek. A northerly draining watercourse develops along Lyndoch Valley, and joins the North Para River just upstream from the River gauging station at Sections 546 and 547, Hundred of Barossa.

Mature drainage is developed along a north westerly direction representing the older established drainage while drainage of a more youthful character is seen in the westerly flowing streams which have developed as a consequence of late Tertiary and Quaternary uplift (Hossfeld 1949).

The gradient of the North Para River along the Valley is gentle, descending about 275 feet in ten river miles (approx. 1/190) from Nuriootpa to Rowlands Flat, as compared with its westerly course 3¾ miles distant from Rowlands Flat in which it descends 195 feet (i.e. about 1/95).

The Dimchurch area constitutes a flat poorly drained plain receiving overflow from the Stockwell Creek, and is partly outside the North Para Catchment. The eventual drainage is to the north-west where surface waters join the Saint Kitts Creek.

DRAINAGE (Contd.)

Other poorly drained areas occur locally in minor depressions in the Nuriootpa Tanunda Flats and at Hoffnungs Lagoon, Section 567 Hundred of Barossa, where a small lake occasionally forms after rains.

VI. SOILS.

As suits the complex environment of varying topography, drainage, and rock formations, the soil types are diverse and localized. Northcote ("Soils and Land Use in the Barossa District South Australia" in press) has for the northern portion of the Valley used 60 soil series, 1 soil family, 7 soil complexes, and 11 soil groups as mapping units. His major soil groupings include red brown earths, brown earths, transitional red brown earth solonized soils, solodized-solonetz soils, solod soils, calcareous pallid zone soils, podsolized lateritic soils, sandy podsol, Rendzina, black earths brown soils of heavy texture and a number of others listed under soil complexes and alluvial soils.

From his descriptions, most of the soils can be considered to have good vertical drainage, significant exceptions being the Kalimna, Langmeil and Dimchurch series of the red brown earths, solodized-solonetz, solod soils and podsolized lateritic soils.

VII. VEGETATION.

A. NATURAL VEGETATION:

The present Valley floor as well as much of the slopes are now almost devoid of their original cover. A few scattered eucalypts are all that remain of what was once Savanna woodland country in the Lights Pass area (Northcote, Russel and Wells, in press). Some areas relatively inconvenient for use contain remnants of sclerophyllous scrub including blue gum and native pine and some good sized Peppermint Gums are seen along the larger stream courses.

B. CULTIVATED VEGETATION:

The area is now largely under cultivation and includes vineyards which are the dominant crop; fruit orchards, particularly

VEGETATION (Contd.)

apricots, pears, plums and peaches; vegetables, mainly carrots, onions and tomatoes; cereal crops of wheat and oats; and fodders, including lucerne and maize. Pasture land in the north of the Valley is largely unsown and consists mainly of weeds, sour sobs etc., and some grasses.

A detailed discussion of the present land use in the northern portion of the Barossa Valley is given by Northcote, Russel and Wells "Soils and Land Use in the Barossa District, South Australia", Zone I, Part B (in press).

VIII. GEOLOGY.

A. PRE-CAMBRIAN:

South of Bethaney, basin and alluvial sediments fill low lying areas of Torrensian rocks of the Adelaide System. Although masked by Alluvium, the Kitchner Fault can be interpolated from the Gawler Geological Sheet as extending north from the Williamstown area through a point just east of Lyndoch. The fault marks the division in the series of the sometimes calcareous phyllitic slates and schists found on the western side, from the more highly metamorphosed rocks of the eastern side outcropping as schists with local albitization and talcose lenses, quartzites, marbles, epidote quartzites and diopside actinolite rocks, as well as some basic and pegmatitic outcrops, (Gawler 1 mile Geological Sheet).

B. EARLY PALAEOZOIC (?):

East of the Kitchner Fault the Torrensian Series is faulted against the later rocks of the Kanmantoo group which out-crop marginally to the eastern edge of the basin from Tanunda Creek north. These metamorphosed sediments of schists and quartzites locally include the Angaston Marble, epidote quartzites and calcareous-magnesiam silicate rocks. The recrystallization of the fault zone and the absence of a notable fault scarp suggest an early Palaeozoic age of the movement.

C. TERTIARY:

On the western margins of the Valley, Tertiary sands, clays,

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quartz gravels and grits, frequently ferruginous, occur as an unconformable capping on the Pre-Cambrian. These leached sediments are highly siliceous and indicate a lateritic development. They have long been considered of Tertiary age (Brown 1889) but efforts at correlating the various inland expressions of Tertiary deposition have not been satisfactorily resolved (Glaessner 1953).

These arenaceous to fine grained siliceous deposits, however, appear by their contact on supposedly peneplained Adelaide System rocks, to represent sedimentation resulting from some stage of rejuvenation. Their later history of lateritization indicates another period of quiescence before subsequent renewed rejuvenation commenced a new erosion cycle removing much of the material. Further Palaeontological study may date them with the Maslin sands but there is no evidence of overlying marine sedimentation.

D. BASIN SEDIMENTS - TERTIARY AND QUATERNARY:

Below Quaternary Alluvium the depth of Post-Adelaide System deposits, between Dimchurch and Rowlands Flat indicates Tertiary sedimentation. From bore log information, a basin of fluviatile and lacustrine sedimentation extending to a depth of 350 feet from the present surface at Bore No. 52 Hd. of Moorooroo can be concluded as underlying the Nuriootpa-Tanunda Plain. In east-west section it is asymmetrical with its deeper portion in closer proximity to the eastern scarp. Although previously it may have extended farther south the present north south limits of the basin sedimentation as distinguished from recent shallow alluvial fill may be considered as commencing just north of Dimchurch and deepening to the south under the Nuriootpa Tanunda Plains before terminating on rising bedrock near Rowlands Flat. South of bore No. 4, Hd. of Barossa, there is no indication of the lignitic material characteristic of the deeper portion of the basin.

Attempted correlation of sediments within the basin from bore log information failed to provide a consistent stratigraphic section but shows instead the lenticular nature of the beds. Reference to the Bore Summary Sheets may be made for detailed logs and description of the sediments. A generalized picture of the

basin stratigraphic column of the deeper portion of the basin would show in descending order -

Soil and subsoil
Clays with lenses of gravel and sand
Sands frequently very fine and micaceous or sandy clay
Clay with sand and gravel
Brown sand and clays with lignitic facies.

Brown sand and dark clays with carbonaceous material variously described as lignite, brown coal and woody material have been penetrated in the deeper portion of the basin, 100-300 feet from the surface. A sample from Bore No. 76, Sect. 131, Hd. of Moorooroo taken from 186 to 255 feet was analysed as follows (assay 124/44) --

Moisture	8.65%
Volatile matter	20.86%
Fixed carbon	13.2%
Ash	57.37%

Hossfeld (1949) has had fossil fruit taken from Bore No. 145, Hundred of Moorooroo identified as follows:-

Phymalocaryon mackayi
Concotheca turgida
Pleioclinis couchmanii
Penteune trachyclinis
Rhytidotheca Lunchii
Spondylastrobus Smythii

He concludes that the fruits are of Pliocene Age.

It is considered that the Tertiary deposits of the basin may be correlated with the outcropping Tertiary sands, gravels and clays described above. The abundance of carbonaceous material preserved as fossil wood and lignite suggests a basin formation with swampy conditions at the time of depositions which may not represent a uniform environment for Tertiary sedimentation. River erosion may have carried away some of this material, particularly on the Western margins, and the action of the overlying sediments would have inhibited the lateritic development.

Above basement rock, mention is made in bore logs of clays and soft rock which may be decomposed Adelaide System slates and schists.

D. QUATERNARY:

Mixed gravels, sands and clay piedmonts extend westerly into the Valley from the eastern ranges. These deposits with alluvium found in gullies and areas of gentle slope as well as

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the upper portion of the basin sediments, can be considered as denudation products from Tertiary, early Palaeozoic (?) and Pre-Cambrian outcrops, and are presumably of Quaternary age.

East-west trending sand ridges found on the western margins of the valley are probably wind deposits of Pleistocene age.

E. ADDITIONAL FAULT (?):

Although masked by basin sediments and alluvium, a fault branching north-easterly parallel to the ranges forming the eastern boundary of the Valley is suggested by the topography. Such a fault has been proposed on the tectonic sketch of the Gawler 1 Mile Geological Sheet. The elevation changes from over 2000 ft. in the range on the east, down to 700 to 800 feet, on the flat Valley plains, and then rising only about 200 feet in the hills forming the western boundary. The height of the eastern scarp is accentuated, as seen in the east-west sections across the valley, by the asymmetrical form of the basin. The deeper portion of the basin is much closer to the eastern margins than to the west. Such a structure could be explained by Tertiary faulting perhaps along line of earlier Tertiary or Palaeozoic movement which had initially given a land surface suitable for lignitic deposition. Tertiary cappings found west of the Valley are not repeated to the east, where they may have been removed by accelerated erosion due to their high elevation.

IX. HYDROLOGY.

A. GENERAL:

1. Rainfall

The average rainfall for the catchment area, approximately 172 square miles, may be taken at 22 inches a year or a total average annual quantity of about 55×10^9 gallons.

2. Reticulated Supplies

Reference to consumption figures of the Engineering and Water Supply for reticulated waters introduced to the area are on the order of 0.5×10^9 gallons annually for

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recent years. Some of this water is at present being used for industrial and irrigation purposes, particularly spraying of carrots as well as for stock and domestic uses.

It is considered that the amount of reticulated water available for recharging of the underground aquifers after use and consequent evaporation and transpiration is negligible.

3. Withdrawal from Surface Drainage

Some water is pumped directly from water holes in the North Para River and from a few small dams in gully drainages The yearly pumping is, however, not large and is not thought to exceed 0.5×10^9 galls. as a maximum.

4. Withdrawal from Underground Supplies

Yearly pumping from bores is of the order of from one to three thousand million gallons, much of which is used as irrigation water and, therefore, largely lost through evaporation and transpiration.

5. Evaporation

Determination of the average yearly evaporation for the Catchment Area is complicated by the varying physiography, vegetation and soil cover and irrigation use. The centres of Angaston, Lyndoch, Nuriootpa, Tanunda, and Williamstown may be taken as collectively representative of the area in terms of rainfall and evaporimeter values.

The areas of steep topography would cause increased run off and less evaporation attending the decreased saturation value of the surface material.

Each month must be considered separately for its state of soil saturation, quantity and period of precipitation, likely run off, vertical drainage and evaporimeter value, the mean rainfall season varying from 7.2 months at Nuriootpa to 8.3 at Williamstown. Through the greater portion of this period the ground surface can be considered as close to saturation and, subject to the local topography and vegetation, to have an evaporation value from the top 4 inches of soil comprising about one half of that given by

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the standard Australian Evaporimeter (Trumble, 1948). In the period of low rainfall, usually of short duration, the upper 4 inches tend to lose water at the rate of two-fifths of that of the evaporimeter provided there is sufficient rainfall and upward capillary action to keep the surface moist.

Study of the above points and tables 1, 2 and 3 suggest an estimate of 25 x 10^9 gallons as evaporation of rain water precipitated on the catchment area but irrigation processes, particularly spraying, would increase this value.

6. Run Off and Underflow.

The surface drainage from the catchment area, is channelled in the North Para River through the gauging station at the corners of Sections 546 and 547 Hundred of Barossa. The yearly gaugings as supplied by the Engineering and Water Supply Department at this station are compared with rainfall figures of the Meteorological Branch, Commonwealth of Australia for the equivalent fifteen year period from 1939 through 1953 in Table No. 4. An average yearly run off through the gauging station of 3.6 x 10^9 gallons is indicated.

Waters entering the Valley from the Catchment Area are contained by a basin formation of Adelaide System rock of low porosity, and lateral losses by outward percolation through these older metamorphosed sediments would be relatively small. Jointing and brecciation do in some cases provide openings through which water can move, but this effect decreases with depth and is further inhibited by rocks whose decomposition products tend to seal these openings (e.g. schists breaking down to clays). Topographical considerations suggest that underflow is induced by the surrounding basement rock to conform in a general manner with the surface drainage and to seek the low elevation of the North Para River Course as a means of exit from the Valley. The unfavourable nature of the basement rock as an aquifer capable of permitting underflow over an extended distance in the region of the North West flow of the River from Rowlands Flat suggests, that underflow is very limited and that the River gauging as shown (Table No. 4) represents the bulk of

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the water draining away from the Valley. A similar argument holds for the north draining Lyndoch Valley waters which join the River above the Gauging Station.

7. Transpiration

The large acreage of vines and other crops would cause high transpiration values for the Valley portion of the Catchment Area.

It is, therefore, considered that evaporation and transpiration together constitute the great bulk of waters lost to the catchment area and to the Valley in particular, while surface runoff accounts for most of the remainder of the rainfall, very little being lost by river underflow or lateral and vertical seepage into the underlying rocks.

B. AQUIFERS:

Discussion of the underground waters may best be treated by reference to their aquifers as listed below:

1. Basin sediments -
   - (a) Gravels, grits and coarser sands.
   - (b) Fine sands
   - (c) Clays
   - (d) Deeper gravels, sands and clays often associated with lignitic or woody material.
2. Shallow alluvium overlying Adelaide System rocks.
3. Quartz rich Tertiary (?) cappings of gravels, grits, sands and clays with lateritic development.
4. Adelaide System - schists, slates, phyllites, quartzites, marbles and quartz veins.

C. CHARGING OF THE AQUIFERS:

The porosity of surface sediments allowing intake to underground storage in favorable aquifers is variable.

1. Basin Sediment Aquifers:

The soils and subsoils of that part of the Valley north of Tanunda generally allow vertical drainage as seen (Northcote, in press), but a notable exception is the Dimchurch area which supports a suspended water table often expressed by swampy conditions. South of Tanunda the soils have yet to be studied in detail, but here as for the northern area, drainages frequently

TABLE NO. 4.

COMPARISON RAINFALL WITH NORTH PARA RIVER GAUGINGS.

YEAR	RAINFALL IN INCHES ANGASTON	LYNDOCH	NURIOOTPA	TANUNDA	STOCKWELL	RIVER GAUGINGS. MILLIONS OF GALLONS.
1939	25.90	24.78	23.82	24.05	20.41	3,903
1940	16.79	16.92	15.11	14.80	13.76	211
1941	23.94	25.73	23.46	23.65	22.40	1,890
1942	28.01	28.56	25.12	27.21	23.82	8,179
1943	19.34	19.94	17.19	18.43	18.36	1,742
1944	14.69	14.92	13.21	14.71	13.21	185
1945	18.94	18.68	18.24	19.72	18.37	351
1946	24.12	25.08	22.47	27.00	23.68	2,378
1947	27.91	25.59	25.28	25.11	23.74	3,404
1948	21.66	25.33	20.70	22.48	19.09	3,387
1949	17.76	17.81	15.91	19.10	15.47	703
1950	19.38	15.72	15.71	17.77	17.29	995
1951	28.51	23.53	27.59	31.27	26.37	13,760
1952	27.46	25.80	27.13	26.06	24.87	7,616
1953	20.92	17.85	18.57	21.92	16.31	5,499
TOTALS FOR 15 yrs.	335.33	326.24	309.51	333.28	297.15	54,203
Av. for 15 yrs.	22.35	21.80	20.60	22.20	19.80	3,620

Rainfall gaugings from Meteorological Branch, Commonwealth of Australia. River Gaugings from Engineering and Water Supply Dept.

intersect the sediments, exposing shallow gravels and sands which should act as permeable media for the intake of surface waters.

Clay strata, however, occur at various depths and would act as barriers for the effective movement of sub-surface waters, giving rise to perched water tables where the unrestricted water level is at greater depth. Aquifers below clay horizons can only be considered as charged from lateral or underlying permeable beds while a lenticular aquifer bounded on all sides by clay would not be readily re-charged and is subject to exhaustion by pumping.

The upper aquifers of the basin may then, with local exceptions, be considered as well charged during times of surface drainage, but for deeper aquifers recharge is often limited.

Some of the logs of bores penetrating the deeper and lignitic aquifers make no mention of water being cut in this lower zone, which may be sealed against downward re-charging by the presence of clay strata and from below by Adelaide System residual clay products.

2. Other Aquifers.

In the gullies marginal to the southern portion of the Valley the charging of the shallow fluviatile sands and gravels is a local problem related to nearby water courses and the permeability of overlying beds.

The Tertiary cappings of sand, gravels and clays in the Hundreds of Nuriootpa and Barossa are too elevated to be charged by the main drainage system and receive only localized intake.

Because of the inclined attitude of their beds and relatively low porosity the Adelaide System rocks present a different problem in charging but one still related to the passage of surface flow over the more permeable or, in this case, the better jointed members. In outcrop areas individual study of each problem is required to assess the amount of recharge to be expected.

Bores penetrating Adelaide System rocks underlying the basin sediments have struck a zone of clays and soft material above the unweathered older rock. This zone is probably a poorly permeable residual decomposition product of the underlying slates and schists etc. and hence a barrier to the entry of water into the latter. That the older rock is in cases locally charged, however, is proved by

bores deriving their supplies from slates, quartzites and marble below the more recent sediments.

D. SUPPLY FROM THE AQUIFERS:

1. Basin Sediments:

Water supplies which will be obtained by the drilling of bores varies between wide limits, even over small areas, because of the very variable lithological characteristics of the basin sediments. Larger supplies are usually obtained in the more coarse-grained facies, but at depth there is frequently a blanketing effect from overlying and less permeable beds, which may severely restrict downward percolation and consequent recharge.

Sections showing the generalized basin horizons indicate some continuity of facies and consistency between neighbouring bores, but the beds must be considered as somewhat lenticular and not subject to being interpolated between distant bores with assurance. Such a pattern of deposition may be considered as resulting from lacustrine and fluviatile depositional environments occurring at different stages of orogeny through Tertiary and Quaternary times.

(a) Gravels grits and course sands.

Clean gravels are the best aquifers, however, in stream cuttings both clean gravels and gravel dispersed in tight clays have been observed, the latter condition being not very suitable for development.

The same is true of grits and coarse sands which when clean are capable of producing large supplies, under suitable recharge conditions, which do exist in places.

(b) Fine sand.

Fine to very fine sands, frequently micaceous, are commonly struck at depths of 50 to 100 feet in the Nuriootpa-Lights Pass Plain but lens out north of Tanunda and are the source of some large supplies. The successful extraction of water from these fine sands is sometimes rendered difficult or even

impossible because of the tendencies of the sands to collapse under the influence of prolonged pumping. Because of their small grain size, these sands sometimes initially yield only a small supply and are difficult to develop by the use of screens. Development of irrigation bores in such aquifers, calls, therefore, for specialized drilling techniques and is often found to be not possible, even for skilled drilling operators, so that the satisfactory construction of bores depends somewhat on fortuitous and quite unpredictable occurrence of sands of coarser than normal grain size.

(c) Clays.

The clays, by reason of their poor permeability, are of no use as aquifers, and their widespread occurrence at varying depths often severely restricts the recharge of deeper potential aquifers.

(d) Deeper basin sediments.

The deeper, often lignitic, sands, gravels and clays have been penetrated by a number of bores with some success, although unfortunately, bore log information is often vague as to what part of the total supply is derived from these lower members. (Table No. 5)

Except for bores Nos. 45 and 82 these lower beds do not seem productive of large supplies and more precise information is required before any reliable predictions can be made as to their ground water potential. Drilling into these beds is frequently a "hit or miss affair" as regards supplies, which are frequently in stock quantity only.

2. Alluvium.

Shallower alluvium found in the Valley from Rowlands Flat south and from gullies marginally entering the Valley contain various sand and gravel aquifers and clays. Supplies proved are not large, being less than 2000 g.p.h., and as usual vary with the rock character and with the recharge potential.

TABLE NO. 5.

SUMMARY OF INFORMATION OF BORES PENETRATION DEEPER BASIN SEDIMENTS.

Bore No.	Hundred	Nature of Aquifer	Depth of aquifer infeet	Salinity Grains/Gall.	Supply in g.p.h.
4A	Moorooroo	Brown sand	150-154	?	2000
14	"	Brown sedments and seams of brn. sand	135-220	?	?
25	"	Brown silt, sandy gravel and lignite	108-146	39.7	?
42	"	Sand	171-188	?	?
45	"	Sand and gravel	150-154	240 approx.	7000
50	"	Grey sand with wood	185	?	Small ?
52	"	Sands and lignite	150-337	?	?
59	"	Brown and white sands	165-185	?	?
82	"	Grey sands and gravel	180	120-34	5000
99	"	Course gravel, brown clay and gravel	254 299	330-46 Incl. other water?	2700 incl. Upper water
82A	"	Brown coal and sand	175-200	81 Incl. upper water	2000 incl. Upper water
111A	"	Coarse gravel Brown clay and gravel	254 299	?	1500 incl. Upper water
4	Barossa		56-93	53 Incl. other water	2800

3. Tertiary Sands, Gravels and Clays.

Lateritic and ferruginous Tertiary sands, clays and gravels outcropping on the western margins of the Valley in the Hundreds of Nuriootpa and Barossa have little water producing potential, being generally too elevated to be charged by the main drainage system. Because of high salinity and the introduction of reticulated water supplies, many wells have long been abandoned and information is thus dated and obscure. Reports for these wells indicate that their yields are small, and some have become dry over a period of the last ten years.

4. Adelaide System Aquifers.

Supplies up to 4000 and 5000 g.p.h. have been proved in the basement aquifers including schists, slates, quartzites, phyllites, marble and quartz veins. Bore log information is often vague as to the exact nature of the rock penetrated, (the following Table (No. 6) summarises waters from these aquifers), and it has not been possible to determine whether there is any marked variations in the salinities of waters from different rock types. Experience elsewhere, however, makes it seem probably that such variations do occur, even in areas of high rainfall and recharge.

E. SALINITY:

In Plan C analysed waters between 0 and 100 feet are coloured according to a salinity scale. Isohalsines are drawn where a sufficiently high density of water points occur. The complex nature of the salinity pattern is apparent and will be discussed for each rock group.

1. The Basin Aquifers.

The basin waters are subject to variation both in plan and in depth, the most noticeable feature of the salinity pattern being the freshening effect along the surface drainages, particularly the North Para River, Jacobs Creek and Tanunda Creek.

This is further evidence that the shallow waters are being charged locally. The waters down to one hundred feet in depth, although in different aquifers, vary from low salinity values, suitable for all agricultural purposes in the vicinity of

TABLE NO. 6.

SUMMARY OF WATERS FROM BASEMENT AQUIFERS.

Bore No.	Nature of Aquifer	Depth of Aquifer	Supply in G.P.H.	Salinity grains/ galls.
HUNDRED OF BAROSSA				
1	Grey blue slate Very hard grey rock	228 414-534	2800 to 4000	68-89
2	Micaceous rock (Schist?)	181-	1200-2000	51-53
11	Mica Schist	160-170	5000	102
21	Cherty quartzite Quartz biotite gneiss Soft sandy micac. gneiss	89-189 216 252	800	20
22	Schists	?	?	48
22B	Mica Schist	100	?	?
23	Hard mica schist	154	1500	?
24	Schist?	107	400 (now dry)	?
33	Slate		800	?
33A	Slate	50-80	1000	?
37A	Hard blue rock	80-300	4000	?
38A	White marble	175	800	?
53	Phyllitic slate	0-105	400	?
56	Rock and quartz		3000	153
56A	Slate	48	2500	160
57B	Sandy slate		2000?	79
58A	Slate and quartzite	40	2000	?

Bore No.	Nature of Aquifer	Depth of Aquifer	Supply in G.P.H.	Salinity grains/ galls.
HUNDRED OF MOOROOROO				
2	Slate and schist		Small	?
14	Light and dark grey rock	500	Small	?
52	Grey schist and rock		No water listed	
70	Quartzite	205	No record	?
104	Sandy slate		" "	?
122A	Blue rock		Small	?
123	Grey rock Brown Micaceous Rock	360 417	2-300 including upper water	?
122B	Blue rock	81	Small	?
122E	Quartzite	50 and 131	?	?
131	Blue micaceous sandstone	180-206	3500 incl. upper water	
147	Soft grey slate Grey brown slate	141) 471)	1000-1500	.34
HUNDRED OF BELVIDERE.				
31	Quartzite?	226	2800	?
HUNDRED OF NURIOOTPA				
2	Hard rock	251	3000 incl. Upper water	?
10A	Schists	No. information		
23	Grey micac. rock Blue slatey rock with micaceous seams	152 257	1000	

the main drainages, laterally to those fit only for stock.

That the waters do vary with depth is proved by a few bores which have penetrated different waters with different salinities, although there are too few analyses of deeper waters to warrant plotting their values in plan. Information showing varying salinity with depth in the same bore is summarised below:-

TABLE NO. 7.

BORES SHOWING VARIATION OF SALINITY WITH DEPTH IN BASIN SEDIMENTS.

Bore No.	Nature of Aquifer	Depth in feet	Salinity in grains per gallon
55	Clay and boulders?	25	Brackish
	" "	45?	66.83
80	?	32	78.80
	Gravel	53	?
	Gravel	64	?
		Combined waters	92.71
104	(from well)	32	151.86
	Sand and gravel?	0-145	159.68
4C	?	48-50	401.36
	?	147-151	959.07
	Black smelly material containing fossil bark and leaves	187-188	184.55
		188-195	194.28
111B	?	61	388.82
	?	110	74.85
	?	144	66.89
25	Brown clay and sand		
	Lignitic	30	91.8
	Sands and gravels	Sampled From 252	39.7

Although the evidence is not conclusive, the deeper waters appear less saline. Generally higher salinity is noted in the Dimchurch area where salt incrustations are seen along the shallow drainages after surface flow has ceased. It is thought that the higher salinity of the shallow wells of this poorly drained area is at least partly due to concentration of salts in static waters by evaporation. That flooding and deposition of transported material is active in this area is shown by the thickness of recent deposition (Northcote, in press).

The salinity of basin waters may be influenced by connate salts from old lacustrine evaporation surfaces. Tepper (1888)

examined in the banks of the River near Tanunda layers of impure salt in "a white and blue very adhesive clay" which he found to lie normally below 20 to 40 feet of "Yellowish, sandy and gravelly clay" which occasionally outcropped. These salt layers were not observed by the writer. If such salt remnants exist to any extent, Tepper rightly suggests that they may be the cause of saline springs along the river, and could well account for anomalously high salinity at various points and for the markedly fresher waters near likely intakes where any salt seams may have been washed away.

2. Alluvial Waters.

Water points in the shallow alluvial areas outside of the basin sediments in the adjoining gullies and south in the Rowlands Flat and Lyndoch Valley areas are included on the salinity plan with waters in the basin sediments (below 100 feet from the surface). These waters are usually low in salts as the pockets of alluvium are generally along low areas of surface drainage and hence intake.

3. Exposed Tertiary Sediments

Generally higher salinity waters are found on the western margins of the Valley where cappings of Tertiary sands, grits, gravels and clays have been described. A number of old abandoned wells not listed in this report have been mentioned in vague terms by land owners as having been abandoned because of high salinity and some obtained no water at all. These old wells, of which there is now little evidence, were apparently located on the north western portion of the Hundred of Nuriootpa. The saline nature of the water is confirmed by samples analysed. It would seem that these higher levels, with little opportunity for surface intake, provide waters too saline for agricultural and in some cases for stock use. Bore No. 10B, Hundred of Nuriootpa located on a sandy ridge is a notable exception, being probably affected by extremely localized intake conditions.

4. Adelaide System Waters.

From available information (Table No. 6) waters from the older rocks are of relatively low salinity, but in many of the deeper bores there is no evidence as to whether the salinity varies with depth.

5. Movement of Underground Water.

The direction of movement of underground water appears to conform generally with that of the surface drainage, but is subject to local variations due to the different permeability of the sediments. Lateral recharge of the lower aquifers around the margins of the basin must, however, occur during periods of surface flow.

Waters in inclined aquifers below relatively impermeable horizons develop a head and occur as subartesian when they are tapped through the confining bed at points below their hydraulic gradient.

A barrier to the flow of the deeper waters in the basin occurs in the vicinity of Jacobs Creek, north of which to the Moorooroo-Belvidere boundary basin sediments, often arenaceous and lignitic, are as much as 50 feet below the outlet level of the North Para River as it changes direction and flows North West. If the basin sediments were removed a shallow, more or less continuous lake, would be formed in this area. However, the "dammed" portion of the basin is not a proven source of good supplies even for potentially good aquifers, as intake to the lower beds appears to be restricted at least in some areas by the occurrence of overlying impermeable strata.

X. UTILIZATION OF UNDERGROUND WATER.

A. PRESENT USAGE:

Although most of the Valley is supplied from surface reservoirs, such water is used primarily for stock and domestic purposes and the amount available for irrigation or industrial use is limited. With an increasing population somewhat less of the reservoir water now used for irrigation may be available. Many of those wishing to supplement the rainfall by irrigation of vineyards, orchards and vegetable plots or for industrial supplies have made use of small dams, river water and underground water. Following is a table (No. 8) of present underground water usage as indicated from the survey.

TABLE NO. 8.

PRESENT UNDERGROUND WATER USAGE.

USE	NO. OF WATER POINTS.
Garden and domestic	33
Stock	75
Lucerne and fodders	31
Vegetables	61
Fruit trees	48
Vineyards	22
Wine Industry	13
Swimming Pool	2
Drainage	6

Garden and domestic includes some commercial vegetable and fruit tree consumption.

The irrigation of vines is a controversial point among the growers questioned. Some would irrigate their vineyards if supplied with suitable water, but others feel that there is a loss of grape quality by irrigation methods which offsets possibilities of larger yields.

Rainfall is insufficient for vegetable production and overhead sprinkling is generally used. Vegetable plots are on small holdings frequently without individual water supplies and are thus dependent upon reservoir water which is not always available for this purpose.

A number of fruit orchards receive supplementary waterings in the dryer times of the year while others receive only rain precipitation. Northcote, Russel and Wells (in press) have said, "All tree-fruits benefit from supplementary waterings in the dry summer months and none more so than peaches".

B. FUTURE EXPLOITATION OF UNDERGROUND SUPPLIES:

Since an increased demand for undergroundsupplies is indicated a discussion of future possible supplies is in order. The variety of underground water environments suggests seven areas to be considered.

1. Portion of Hundred of Belvidere and Stockwell Area.

Frequently highly saline upper waters found in wells

have discouraged deeper boring in this area, and the wells have proved limited supplies only. Large supplies are not to be expected here where surface drainage from the Stockwell Creek is inhibited by impervious surface clays from recharging the underground supplies. Small supplies of stock water and, in proximity to intake, some domestic garden water may be obtainable in the future.

2. Western Portion of the Hundred of Nuriootpa.

Except for low areas in close proximity to the river, which may be considered with area No. 4 below, this elevated undulating country cannot be expected to provide, significant supplies in the future. The upper waters in the ferruginous and lateritic sediments are generally saline, but deeper waters in the basement rocks at points below the North Para River may provide less saline waters, of which, however, there is only one recorded occurrence, being from bore No. 23 which from 252 feet has pumped a useful supply of low salinity water.

3. Eastern Edge of the Valley.

Selection of bore sites along the eastern edge of the valley near the ranges is a problem for individual attention, as supplies are controlled by local drainage from the hills, and the nature and structure of the deposits. Favourable basement aquifers charged from gully drainage may provide moderate supplies of good water as would gravels and sands accumulated in deeper portions of the gullies.

The thick piedmont sediments from the ranges are not a good boring risk unless good recharge conditions are indicated.

4. Nuriootpa - Lights Pass Plains Area.

This area may be defined as that portion of the plain from the Moorooroo - Belvidere Hundred boundary south to a point two miles north of Tanunda and extending east from the low hills near the River to the edge of the steeper eastern ranges.

This plain through which the North Para River flows diagonally past Lights Pass and Nuriootpa is the most heavily exploited for underground water. A fine sand aquifer is generally to be found from 30 to 100 feet below the surface and is readily

charged, particularly in the vicinity of the river.

No indication of a general lowering of the water level in this area was found, and, in fact, the standing water levels in a number of cases were slightly higher than in 1950-51, apparently due to the somewhat higher rainfall in the last few years. However, over an extended period of time this area cannot be expected to produce greatly increased supplies and still recover by recharging in the wet months.

Recharging from the River can be considered most effective when the surrounding water table is at its lowest and least effective when the water table approximates that of the river level. Significant River flow is limited to about 5 months of the year, and is at a minimum during the dry period, when irrigation is practised and replenishment would be most needed.

Increased pumping for summer and autumn irrigation, therefore, occurs at a period of lowering water table and minimum replenishment, and seasonal exhaustion of supplies, with possible increasing salinities caused by lateral percolation from the more salty marginal and bedrock waters is a definite possibility if the rate of ground water usage is significantly increased. Recharge of those basin sediments must depend largely (considering an extended period of time) on the flow and underflow of the North Para River and tributaries. The value of the surface flow in this area is not known, but may be estimated liberally at two thirds, that is, (2.4×10^9 gallons yearly) of that at the gauging station down stream, where it has the advantage of receiving additional water from Jacobs and Tanunda Creek as well as Lyndoch Valley and smaller drainages. Because of the relatively low permeability of the aquifer, it would not seem likely that more than 10% of this flow, or say 0.24×10^9 gallons a year, would actually act as additional replenishment of the groundwater and an increased rate of withdrawal over this figure for a prolonged period of time can be expected to result in a net yearly impoverishment of the underground supplies with lowering of the water table and attending increased salinity.

Since the nature of the beds is somewhat lenticular the effective recharging would not be uniform, although it would be at a maximum in close proximity to the river, so that bores in that area would be, in general, more satisfactory than elsewhere.

5. Basin Sediments from Tanunda South.

The remainder of the basin sediments extending South to Jacobs Creek is not as extensively drilled, nor does it have as high an individual production from each bore. In this region recharging is less effective because of the shallowness of basin sediments over which the river passes and the lensing out of some of the sands found at shallow depth in the Nuriootpa Lights Pass area. Although receiving intake from Jacobs and Tanunda Creek this portion of the basin, by reason of the more predominant clay facies in its upper region, can be considered to contain less water than that to the north.

At present, if there is a balance between withdrawal and recharge on the upstream Lights Pass - Nuriootpa area, all the present runoff is available for recharge in the Tanunda - Rowlands Flat area. Since this latter receive additional runoff from surface streams, possibly 5/6 of the water at present flowing past the Gauging Station would be available for recharge if required. This is estimated at 3×10^9 gallons. However the generally lower permeability of the sediments and the fact that in this area much of the River course is over basement rock suggest a reduced additional groundwater intake percentage of say 5 per cent or about 0.15×10^9 gallons. This is a suggested maximum withdrawal for this area, from localities readily charged, but over pumping could occur locally even with less withdrawal. It also may be assumed that increased pumping in the Tanunda Area or South to Rowlands Flat will have a similar increase in the Nuriootpa-Lights Pass are a in which case the total additional volume of water which could safely be withdrawn from the groundwater in the two areas would be limited to $(0.24 + 0.15) \times 10^9$ gallons, or say 0.4×10^9 gallons yearly, which is all that the rocks could reasonably be expected to absorb in the way of annual recharge.

Even this volume could not be utilized except under ideal conditions of spacing of the bore sites.

6. Lyndoch Valley Area.

Withdrawal of waters from this lower basin because of the basement rock barrier to southern moving waters is largely independent of the main portion of the Valley discussed. Large permanent supplies are not to be expected but favourable beds well charged may give useful irrigation waters for individual small areas. Because of its limited watershed, water available for additional recharging is only of the order of about 5×10^8 gallons of which perhaps 10% or 5×10^7 gallons is likely to be added to the underground storage annually.

The waters are obtained both from shallow alluvium along stream courses and from jointing in underlying basement rock. In this area local conditions must control the location of sites, but additional withdrawal up to fifty million gallons annually is feasible if pumping is from favourably disbursed sites.

XI. CONCLUSIONS.

It has been indicated that an increasing demand for bore water in the Valley is to be expected, and only part of this likely demand can be met without withdrawing water at a faster rate than the aquifers are charged. Those bores nearest the sources of intake will be the least affected, while local points may suffer differentially from a resultant depletion of underground storage because of the discontinuous nature of some of the aquifers.

The possibilities of obtaining additional supplies from the areas considered is summarized as follows:

1. PORTION OF HUNDRED OF BELVIDERE AND STOCKWELL AREA.

Only wells and bores of limited supply and questionable salinity are to be expected from this area and hence overpumping depleting the underground storage of the area generally is not anticipated.

2. WESTERN PORTION OF THE HUNDRED OF NURIOOTPA.

Future withdrawal of underground water is not expected to

be in sufficient quantity or of suitable quality to be of significant irrigation use in this area.

3. EASTERN EDGE OF THE VALLEY.

A few additional, carefully selected bore sites can be expected to provide useful irrigation waters either in gully alluvium or favourable basement rock strata associated with good recharge conditions. Close proximity of bores in the same hydrological unit is to be avoided.

4. NURIOOTPA-LIGHTS PASS AREA.

Conditions for recharge indicate that an increased volume of underground water can be safely pumped up to about two hundred million gallons a year over the present withdrawal provided that the bores are located and dispersed so as not to impoverish portions of the area.

5. BASIN SEDIMENTS FROM TANUNDA SOUTH.

Because of the less favourable general permeability the recharging potential than for the Nuriootpa-Lights Pass area and a safe maximum for additional withdrawal would be of the order of one hundred fifty million gallons annually. To realize this maximum, however, bores must be adequately spaced.

6. LYNDOCH VALLEY AREA.

A smaller volume of water is available for recharge in this area, and an increase in present yearly withdrawal is limited to approximately fifty million gallons.

Since data leading to the conclusions in this report are to some extent based on incomplete bore log records and involve considerations of structures not completely revealed by inspection, a periodic check of the standing water levels, supplies and salinities of a few representative bores in the Valley at say three year intervals is suggested. Such a check would serve to indicate any tendency toward depletion of underground supplies or increased salinity and would be of use in advising for future supplies.

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DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A.

Hundred: MOORooROO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
1	Pt.209	95	-	-	Small								Dry Well. in ironstone and sand	J.G. Wilksch
1A	208	Now 60		60+	Was good	Not	Sampled	Steam boilers			level		Well Fallen in to 60 ft.	A.E. Bair Ltd.
1B	219				Now dry	Not	Sampled	was used			level		Well Bricked	Hotel Stockwell
1C	208	100			Now Dry	Not	Sampled			Was used	level		Old Well	
2	219	15 (Drive in bottom)	15	10	1500	1534/51	65.95	Yes	-	Yes	Gully		Slates & schists	A.M. Kruschel (Well & drive)
3	193	104 (was 126)	-	-	1500	-	-	-	-	Potatoes	-		Alternating clays & gravel beds. Gravel bed 2 feet @ 104'. At 126 feet 8' - 10' plastic clay.	Bert Boehm. (Bore)
3A	193	36		24	Now small	W33/54	83	Not used			level		Poor water at bottom sealed off. Good water supply also affected	B.Boehm
3B	193	60-70			Poor	Not	Sampled	Abandoned Quality poor			level		Brown clay with lignite bands	B.Boehm
4	193	29-30	-	28	Small	1533/51	171.43	-	Yes	-	level		Main supply from gravel overlain by quicksand	Bert Boehm (House Well)
4A	186	175	30-32 59-64 80-100 150-154	- - - -	100 2000 2000 2000	-	-	Abandoned					0-6' drift sand; 6-20' red clay; 20-30' red sandy clay; 30-32' clay & gravel; 32-57' stiff pink clay; 57-59' sandy gravel; 59-64' gravel; 64-80' stiff pink clay; 80-112' sandy clay; 112-116' pink clay; 116-125' sandy clay; 125-132' red clay; 132'-138' sandy clay; 138'-150' brownclay with wood and sand; 150-154' brown sand; 154-175' white sand with wood.	H.E. Polst (Orchard bore)
4B	193	60-70			Poor	Not	Sampled	Not used Quality Poor			level		Brown clay with bands of lighter clays.	B.Boehm

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 4 : Hundred : MOORCORCO

Underground Water Survey of County LIGHT

2m—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
4C	193	204	(I) 48–50 (II) 147–151 (III) 187–188 (IV) 188–195		(I) 12.12.38 (II) 12.12.38 (III) 9.12.38 (IV) 9.12.38		401.36 959.07 184.55 194.28	Not used Became more brackish			level		150–155 ft. Black smelly material containing fossil bark & leaves 204 ft. stoney	B. Boehm
4D	157	90		16		W28/54	81	Not now used			gully		Schists	Sporn Bros.
4E	137	28		20		1935	633.41				level		Old Bore	J. Thomas
5	189	78	35) 50) 77)	40	2000+	1531/51	141.54	–	–	Vineyard	level		Alternating clay & gravel. Main aquifer in clean gravel.	J.Hahn (House Bore)
5A	184	27		24		W31/54	138				level		Well	P. Spanagel
5B	183	77	(I) 18 (II) 77		(I) Small (II) ?	(I) Salty (II) Salty		Abandoned			level		Red clay, bluish grey clay Water in sand & gravel	A.H. Hahn
5C	183	70	(I) 26 (II) 68		(I) 2–300 (II) 2–3000	(II) 285					level		Reddish clay with yellow bands. Waters in gravel beds	A. H. Hahn
5D	183	40 apx				Not sampled		Was used for garden now as septic tank			level		Well	
5E	182	84½		40	1500+	W27/54	160			Garden	level		0–25' Red clay, 25–30' Red clay with gravel, 30–36' yellow clay, 36–39' yellow clay with sand, 39–43' Yellow sand and gravel, 43–53' Stiff yellow clay, 53–58' clay & sand, 58–73' yellow clay & gravel, 73–83½' sand & gravel, 83½–84½' white sandy clay.	Sporn Bros.
			Pump Tests		(1) 1500 gph (2) 2500 gph			5" pump at 66ft., pumping level 40' 5" pump at 56ft., for 15 min.						
6	180				Now dry			Abandoned						E.D. Roesler
7	181	68	–	41	5000+	1529/51	138.97	–	–	Orchard			0–36' well; 36–41' coarse gravel; 41–56' clay; 56–62' coarse gravel	P. Spanagel (River bore)
8	181	72	–	38	1500–2000	1530/51	90.62	–	–	Vegetables			At approx. 60' = fine sand. At 72' gravel.	P. Spanagel (House Bore)
9	180	71	28) 40) 70)	45	5000–6000	1528/51	102.58	–	–	Vines (10 years)	level		Alternating clay & gravel beds, main supply in clean gravel.	J. Hahn (River bore)

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 12

Hundred: MOORCORCO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
10	174	90-100	-	20' approx.		Approx	200	Abandoned					0-25' red clay & trav; 25-30' quicksand; 30-40' Yellow clay; 40-90' alternating clay and gravel. White pipeclay below gravel.	P.A. Scholz
11	138	183	-	16	10000	1518/51	138.04	-	-	Vines. Ground showed salt accumulation	level		Abandoned	H.E. Bahnisch (Bore)
12	138	27	-	21	50	1519/51	203	Yes	-	-	level			H.E. Bahnisch
12A	174	22		20		(1935)	113.11	Was used			level		Abandoned Old Well	
13	175	90	-	20	8-10,000	1514/51	198.83	-	-	Vines - unsuccessful	level			P.A. Scholz (House Bore
13A	175	25½		15½(1935)		(1935)	204.63				level		Old Well Abandoned	P.A. Scholz
14	175	597	35) 78) 500)	25-28	1,000	No Sample		Abandoned			level		0-8' brown clay; 8-30' brown mottled clay; 30-35' sand & gravel; 35-75' Brown sandy clay; 75-78' Coarse gravel & red sand; 78-120' yellow clay; 120-135' Grey sandy clay; 135-220' brown segment with seams of brown sand; 220-232' brown coal and wood; 232-333' white limestone; 333-336' white quartz; 336-355' Hard quartz; 355-370' Micaceous grey rock, 370-484' hard grey rock; 484-500' Blue micaceous sandstone 500-597' light & dark grey rock.	P.A. Scholz (Deep bore)
14A	175	23		14		(1935)	171.81				level		Old well Abandoned	J.F. Scholz
15	176	73			4-5000	No Sample		-	-	Orchard	level		-	P.A. Scholz (River Bore)
15A	176	84	74 apx.	19	10,000 estim.	W26/54	160		Yes	Garden				H.B. Scholz
16	177	63	-	34	6000	No Sample		-	-	Orchard	level		25-30' fine sand; 30-60' clay with gravel stones; 60-63' Gravel (wash).	L.S. Plush (Conc. shaft bore)
16A	177	35		26	2-400	W25/54	101		Yes	Vegetables	level		House Well	A.H. Hahn

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 42

Hundred: MOCKOROO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
17	178	42	-	33	7000	1527/51	93.07	-	-	Fruit trees (occasionally)	level		0-6' black soil;6-8' sand 8-42' alluvium containing clay; @ 42' sand(quicksand).	L.S. Plush (Shaft & bore
						35/54	75							
17A	178	50	-	30	2-3000	-	Good	-	-	Vegs including french beans			Pear roots down almost to S.W.L.	L.S. Plush (Abandoned well)
17B	178	40		20	4-5000	W51/54	98		Yes	Vegetables	level		0-27' clay,27-35'sand, 35-40sand & gravel, 40 gravel	S.W. Mader
18	Pt.173	90-92	20 90	20	5000	1532/51	239.11	-	-	Fruit trees & Vines (3 years, ~~no discontinued~~) Vine 90 years old Vine roots almost down to S.W.L.	level		0-7'red clay & lime;7-40' red & grey clay; 40-40½' sand and gravel; 40½-49' red & grey clay; 49-51' fine drift sand; 51-62' Yellow & grey clay; 62-65' Gravelly clay; 65-68' Gravel; 68-76' Fine drift sand; 76-87' Fine silty sand.	L.C. Warnecke (Disused bore)
19	172	Twin bores 84 & 79		31	5000	1513/51	119.14 Possibly improves with pumping	-	-	Fruit trees and vines (15 years) Couch grass tennis court.	level		20-40' quicksand main supply in gravel. Down to 120' pipeclay on bottom	H.R. Sage (House bore)
20	172	75	-	26	10-12,000	Old analysis	66 approx.	-	-	Fruit trees & Vines.	level		Water in large gravel	H.R. Sage (River bore)
21	Pt.171	100 120	98	29	-	1510/51	64	-	-	Vegs.& fruit trees	level		0-98' clay; 98-120'fine sand	K. Ellis
22	Pt.171	52	52	19	7000	1511/51	97.91	-	-	Vegs.& fruit trees	level		0-50' blue clay; 50-52' coarse gravel	K. Ellis (House bore)
23	Pt.171	71	42 69	26	6-7000	1512/51	133.51	-	-	Fruit trees & vines since 1936.	level		0-18' well. At 42' gravel containing good supply (7½-8000g.p.h.). 42-59' clay 59-61' sand; 61-69' gravel; 69-71' clay.	D.R. Tamke
24	Pt.170	72	-	24	-	1509/51	99	Unused			level		"	H.E. Waechter
25	169	286	30 60 108 146	25-30	1000	At 30' At252'	91.8 39.7	Abandoned 10" bore			level		0-30' brown clay & sand 30-33' coarse sandy gravel; 43-45' coarse gravel;45-60' clay (brown & grey) 60-63' Yellow gravel & sand; 63-66' brown sand; 66-69' grey & yellow sand; 69-79' coarse gravel; 79-82' brown clay; 82-85' clay, sand & gravel; 85-128' brown silt; 128-145' grey silt & lignite; 145-153' clay sandy gravel & lignite; 153-156' clay & lignite; 156-216' brown & greyy drift sand; 216-218' dark brown clay and drift sand;218-245'V.F. drift sand;245-248'fine & coarse sand & drift; 248-258' Dark coarse sand & grits with lignite;258-286' lignitic sand.	E. & W.S.

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A 2

Hundred: KOOROCOO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
26	Pt.169	40†	-	25	-	1524/51	39	Disused			level			Bert Boehm
28	Pt.169	65	-	34	-	1523/51	86	Yes			level		Well & Bore Fine sand chocked bore	Mrs.Mader (Well)
28A	168	79		10 apx.	large	Not Sampled			Yes		level		Water in sand	A.E. John
29	170	40+	-	29	Good	1520/51	84.79	-	-	Vegs. & fruit	level			P.E. Hausler
30	Pt.169	98	76	37	-	1525/51	132.49 Standing idle 2 years	Not Equipped			level		Sand, red clay, limestone, and clay rubble, 76-96' gravel (wash)	H.E. Polst (New bore near house)
31	173	50-60	-	16-20 approx.	5000	deteriorated with use	180 approx.	-		Fruit & vines (2 years only)	level		-	A.R. Milway
32	173	130	51		1000	-	-	Not Used			level			A.R. Milway
32A	160	81½ (1st water) Main supply? casing slotted @ 76'	18-28	19	5000	1505/51	126.91	-	-	Vegs. i.e. beetroot & carrots	level		0-18' yellow clay; 18-28' sandy clay; 28-37' variegated clay; 37-42' sandy clay; 42-60' stiff yellow clay 60-62' sandy clay; 62-66' yellow clay; 66-68' red sand; 68-75' yellow clay 75-81½' coarse gravel.	A.B. Hoffman
33	Pt.162	74	-	26	2-3000+	1506/51	83.39	-	-	Vegs. including beans & cucumbers	level		-	J. Boehm
34	Pt.163	52	-	36	Good	1521/51	124.34	-	-	Vegs. & fruit trees	level			H. Grope
35	Pt.164	115	Casing slotted @ 98'	36	3500-8000	1522/51	160 (may improve on pumping)	-	-	Fruit trees & vines occasionally	level		0-14' soil and red clay; 14-36' red sandy clay; 36-47' red clay; 47-52' sand & gravel; 52-71' variegated clay; 71-82' sandy clay; 82-89' red sand; 89-111' coarse sand & gravel	H.E. Polst (Home well & bore)
36	162	148	-	21	-	1508/51	83.45	-	-	French beans & cucumbers	level		Gravel beds & quicksand; @ 80' boulders; 80-120' blue pipeclay.	P.F. Schmidt
37	162	30	-	25	500+	1507/51	83.31	-	-	Vegs. including beans and cucumbers	level		Clay rubble	C.A. Schmidt
38	163	60+	-	35	2000	Disused		-	Yes	Vegs.	level			V.L. Schiller

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A.2

Hundred: MOOROOROO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
39	Oval	60	25	21	6000	1491/51	88	-	-	Watering sports oval	level			Centennial Park Committee (Abandoned bo
40	Oval	?	-	18	3000	1492/51	84.81	-	-	Watering sports oval	level			Centennial Park (New bo
41	Pt.155	?	-	15	Good	1517/51	75	-	-	Swimming	level			Swimming Pool Nuriootpa
42	153	188	38 132-140	40	1400	Approx	200	Abandoned			level		0-18' soil & red clay; 18-25' brown clay; 25-91' light brown sandy clay; 91-102' clay & gravel; 102-127' sandy clay; 127-132' White quarts gravel; 132-140 clay & gravel; 140-143 sandy clay; 143-153' decomp.wood; 153-171' Wood and sandy clay; 171-188'sand	G.R. Raethal (No.1 bore
43	153	170	36	30	3-4000	Approx	200	Abandoned			level		1-25' Soil & brown clay; 25-65' brown sandy clay; 65-68' brown sand; 68-79' sandy clay; 79-94' gravel; 94-97' sandy clay; 97-108' fine gravel; 108-137' Yellow sandy clay; 137-168' grey sandy clay; 168-170' grey sand.	G.R. Raethal (No.2 Bore
44	153	94	80	20	10-12000	Approx	80	-	-	Fruit trees	level		0-21' old bore; 21-41' sandy clay; 60-68' pink sandy clay; 68-70' yellow sandy clay; 70-74' gravel; 74-80½sandy clay; 80-94' gravel.	G.R. Raethal (No.3 bore
45	153	154	38 Casing slotted @ 107' 150-154 (main cut)	30 (approx)	7000		175 increased to 240	-	Abandoned	Fruit trees	level		0-4' soil & clay; 4-9' sandy clay; 9-24' red clay; 24-86' sandy clay; 86-91' clay & gravel; 91-101 gravel; 101-106' stiff clay; 106-117' sand & gravel; 117-122' clay & gravel; 122-129'white sandy clay; 129-138' yellow sandy clay; 138-148' brown clay & wood; 148-152' sand & gravel; 152-154' coarse gravel.	G.R. Raethal (House bore
46	142	62½	6-35' 39-61'	9	1-2000	Possibly	90	Abandoned			level		0-6' soil and yellow clay; 6-35' sandy clay; 35-37' yellow clay; 37-39' sand; 39-61' gravel & sand; 61-62½ clay.	S. Tolley (Near bridge)

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 4A

Hundred: MOOROOROO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
47	142	87	56 77½	15½	Poor (sanded up)	-	-	Abandoned			level		0-13' soil & clay; 13-17' sandy clay; 17-45' clay; 45-55' sandy clay; 55-56' sand; 56-57' gravel; 57-64½' sandy clay; 64½-66½' sand; 66½-75' gravel; 75-78' sandy gravel; 78-79' clay; 79-82' sand; 82-87' gravel.	S. Tolley (near vineyard well)
48	142	86	84-86	20 (measured)	10000	No Sample		-	-	Vines	level		Main supply in gravel wash @ 84-86'	S.E. Tolley (vineyard well & bore)
49	143	86	-	26	12-15000	1499/51	90.16	-	-	Vines (occasionally)	level		main supply in gravel bed at 86'.	S. E. Tolley (House well)
50	145	210	35) 73) 185) Casing pulled back to 69'		500								0-33' red clay; 33-40' sandy clay; 40-50' red clay; 50-70' clay with grit; 70-73' sandy clay; 73-95' yellow clay; 95-118' sandy clay; 118-139' white sandy clay 139-141' brown clay; 141-158' white sandy clay; 158-200' grey sand with wood; 200-210' white sandy clay Tested ½ hour @ 60' for 2500 gph. - sand choked bore.	P.C. Hahn (Vineyard bore
51	145	80	38 80 (main)	40	2000	1504/51	59.04	-	Yes	Yes	level		0-33' red clay; 33-38' sandy clay; 38-60' red clay; 60-71' soft yellow clay; 71-74' sandy clay; 74-79' sand & gravel; 79-80' red sandy clay.	P.C. Hahn (Garden bore near tanks
52	145	391	70-75?							Yes	level		0-45' Soil and brown sandy clay; 45-50' grey variegated clay; 50-70' brown clay; 70-75' soft brown sandstone; 75-80' grey clay; 80-95' variegated clay; 95-115' grey sandy clay; 115-120' grey clay; 120-130' fine white sand; 130-145' white sandy clay; 145-150' brown lignite clay; 150-200' brown sand with seams of decayed wood; 200-230' white clay; 230-337' brown sand with seams of decayed wood; 337-340' grey clay; 340-350' grey schist 350-391' grey rock.	P.C. Hahn (Roadside bore
52A	146	118	110-114	50	1200?	W32/54	43				level		New bore 0-114' apx.-clay with some ironstone at base, 116-118' fine sand.	A.A. Briar
52B	147	120				Dry		Was used for vegetables now dry			level		Well Bricked	C. Hahn

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A2

Hundred : MCCOROCROO

Underground Water Survey of County LIGHT

2a—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
53	1739	95	40	20	Small	1535/51	46.81			Vegs.(including beans & cucumbers) & fruit trees	Gully		Alluvium, aquifer decomposed bedrock, bedrock at 95'	B.B. Schiller (Well & Bore).
54	142	39		15	500	1502/51	90		Yes	Vegs.	level		Mostly sand & gravel	G.A. Mader
55	142	69	1st water @ 25' brackish	20	20000	1500/51	66.83			Vegs. & fruit trees	level		Clay & boulders. Running sand around 45'	A.B. Hoffman
56	142	78'9	78					Abandoned			level		1-36' blue-grey clay; 36-54' blue clay; 54-58' brown clay; 58-64' sandy clay; 64-71' tough blue clay; 71-77' brown drift sand; 77-78'9 gravel	W. Appelt (Bore No.2)
57	142	75	75	30	2000+	1501/51	108.28			Ice making	level			W. Appelt (Ice plant bo
58	142	90			15000 before sanding 3000 after			Abandoned (due sanding, winery purposes)						Seppelts (Nuriootpa Winery)
59	142	265	45 110		Small 2-3000 Tested for drainage @ 3000			Abandoned		Drainage bore	level		0-100' brown clay; 100-110' grey clay; 110-125' brown sandy clay; 125-165' brown lignite with bars sand; 165-175' brown sand; 175-185' white sand; 185-200' grey clay; 200-265' green clay & rock.	Seppelts (Nuriootpa Winery)
60	143	130	37-46 67-70 main @ 96'	29	5000+	1503/51	159.58			Vegs. (no beans or citrus) Fruit light watering when ripening			0-32' rubble & red clay; 32-37' sandy clay; 37-46' sand 46-60' sandy clay; 60-67' yellow clay; 67-70' sand & gravel; 70-78' clay; 78-87' sandy clay; 87-94' gravel; 94-110' sandy clay; 110-123' brown clay; 123-130' sandy clay & gravel.	
61	136	60-66		25		1057/51	95.71			Condensing	level			Tolley, Scott & Tolley (West well bore)
62	135	80		22	3000	1060/51	78.85			Condensing	level			Tolley, Scott & Tolley (East side works)
63	134	98		40 (approx)	2000	1497/51	150.09		Yes	Fruit trees	level		Clay & sand, last 6-8' gravel (wash)	Erhard Keisler
64	134	110		40	Good	1498/51	156.01		Yes	Vegs. & fruit	level			E.V. Atze

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A.5

Hundred : MOORCOROO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
65	133	155½	154	52	2000+	W1496/51	65.49		Yes	Vegetables	level		90-138' Yellow to blue hard clay; 138-154' grey sand, 154-155½ gravel.	C.G. Atze
66	133	108		48 (approx)	1000+	1495/51	31.18			Vegs (including french beans & cucumbers)	level			E. Lowke
67	113	113		Dry	moderate at one time		Abandoned			Veg. & fruit (bad effect citrus & cucumbers)	High		Stratified clay, sand and gravel (bricked to bottom)	E.E. Baum
68	136	85	(1) 30 main 70-73'	25	14,000	1055/51	86.49			Distillery	level		0-25' vari sandy clay; 25-27' rubble; 30-45' sticky clay; 45-70' red sandy clay; 70-73' coarse gravel; 73-83' yellow sandstone; 83-85' rubble (wash?)	Penfolds (Nuriootpa No.3 well & bore)
69	136	47	40	24	3000		Approx 105 (several years ago)			Winery purposes	level		0-47' soft clay & sand mixed with gravel. No definite gravel bed.	Penfolds (Nuriootpa No.2 well)
70	136	390					Abandoned				level		0-40' red & brown sandy clay; 40-47' light sandy clay; 47-60' dark clay; 60-65' fine yellow sand; 65-70' c. rubble & clay; 70-100 Yellow sandstone; 100-103' coarse gravel; 103-106' white sandy clay; 106-115' alternating hard conglom. & sand 115-120' white pipeclay; 120-130' alternating hard conglom. & sand. 130-180' yellow sandstone 180-205' blue clay; 205-208' dark quartz rock; 208-260' grey sandy clay; 260-287' grey quartzite; 287-292' grey sandy silt; 292-300' soft grey silt; 300-310' grey cemented sand; 310-320' grey quartzite; 320-325' soft quartz; 325-330' light grey cemented sand; 330-370' grey quartzite; 370-380' brown & white sand; 380-390' grey sandy clay; (? bedrock @ 205') A.A.C.M.	Penfolds (Nuriootpa deep bore)
71	136		See Sketch Bore Details Record				(Supply deteriorated)							Penfolds (No.1 well 1912)
72	136	90	(1) 20'		6000	1056/51	91.91			Condensing	level		0-37' clay; 37-40' gravel & grey clay; 40-63' yellow clay; 63-90' white pipeclay.	Tarac Ltd. (No.2 bore)
73	136	60		14	6000	1061/51	84.95			Condensing	level		0-27' limestone rubble; 27-60' clay & limestone	Tarac Ltd. (No. 1 bore).

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 4

Hundred: HOOROOROO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
73A	136	300' approx			A b a n d o n e d									Tarac Ltd. (Deep bore)
74	136	i) 27 ii) 80	80	15	13000	1052/51	85.44			Distillery	level		0-27' clay; 27-35' sand & clay; 35-37' sand; 37-40' gravel; 40-65' clay; 65-75' sand & clay (silt) 75-80' gravel (wash) (Approx. log from Borer)	S.A. Grape Growers Assn.
75	135	34'4		26	8000 (?)	1058/51	94.13			Vegs. carrots & cucumbers	level			G.A.C. Hage
76	131	330		85	1500+		126 (?) old analysis			Vegs. & vines	level		0-3' sand; 3-128' brown sandy clay; 128-150' yellow sandy clay; 150-155' red sandy clay; 155-186' white sand; 186-196' brown clay; 196-255' brown coal 255-290' grey clay; 290-330' blue clay.	E.C. Hage
77	130	400 (approx)		110	1200		Old analysis (50(?)			Vines (4 years)	level			W.G. Hahn
78	678	70 (drives in bottom)		60	Good	1516/51	154.05			Cooling	Hilly		Drives in sandstone	W. Salter & Sons
79	121	63	i) 28	12	5-6000	1515/51	102.47			Vegs, fruit & vines	level		0-28' silt & clay; @ 28' sand (coarse) 6" layer on clay; 28-51' coarse gravel (wash); 51-61' blue & red mottled clays; @ 61' about 9" V. coarse gravel & river wash; 61-61'9 clay; 61'9-63' gravel bed similar above.	A.A. Falkenberg (River bore)
80	121	64	i) 32 ii) 53 iii) 64 Combined	- - - 12	- 5000 - 6000	- - - 1583/51	78.80 - - 92.71			Fruit & vines	level		@ 53' gravel; 53-64' clays; 64' gravel. White pipeclay 64' gravel bed consists fine white sand and coarse brown gravel with waterworn wash stones up to 1½".	A.A. Falkenberg (Garden bore)
81	122	30		29	Small	1054/51	283.87	Yes	Yes	No good	level		Bricked well. (probably alluvium)	E.G. Obst

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A2

Hundred: BOOROOROO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
92	121	24		23	W'mill	1044/51	113.67				level		Bricked well. Probably alluvium.	C.A. Schuls (Disused well)
93	122	80	i) 30 ii) 80	25 (approx)	1000-1200	1053/51	183.28			Vegs. & fruit			0-2' sand 2-80' clay etc.	E. Keisler
94	73	66		24	4000	1077/51	167.72		Yes	Some Vegs. (Beans, cucumbers & tomatoes no good) Maize. Fruit 4 times in 12 years	level		From bottom of well through wash gravel & pipeclay. Bottomed on gravel.	H.T. Hage
95	64	120	100	33	3250	1493/51	102.03	Yes	Yes	Vegs. & fruit. Beans started on reservoir water & finished on bore water.	level		0-112' clay & limestone 112-120' coarse creek sand finished in gravel.	M.E. Hahn
95A	85	12		6		W2518/53	22	Was Used			level		Partly fallen in not used	A.G. Zimmerman
96	92	109				1071/51	106.39	Yes	Yes	Vegs. including carrots, potatoes and melons.				C.L. Burgomeister
96A	67	90	Now Dry			-	-	Was Used		Vegetables	level		Old Well	
96B	67					Was good water					level		Old well fallen in	
96C	66	20								Garden, washing, drinking	level		Abandoned Well	
97	73	17		12	?	1075/51	142.85						Gravel	H. Pfeiffer (P.H. Bore)
98	61	41		28	2000	Year 1943	219.12			Winery	level			B. Seppelt & Sons (Dorien Winery)
99	57	299	52 95 254 299	52 47	Good (Sanded up) 2700+	7.5.38 14.3.39	250.37 330.46			Vegs. & fruit	level		0-7' soil & yellow clay; 7-110' variegated clay with streaks gravel; 110-123' grey sand; 123-127' grey clay; 127-135' white sand & seams blue clay; 135-136' white quartz & gravel; 136-145' fine sand & grey clay; 145-182' brown lignite clay & sand; 182-233' seams brown & grey clay & f. sand. 233-234' coarse gravel; 234-254' fine sand; 254-262' coarse gravel. 262-272' fine gravel; 272-282' hard cemented gravel; 282-292' gravel & brown clay; 292-295' loose gravel; 295-299' brown clay with gravel.	C. Schmidt (Abandoned bore)

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A2

Hundred : MOOROOROO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
82	125	190	180 (approx)	80' measured (53)	5000	1494/51	180.34	Yes	Yes	Vegs. & fruit (very sandy soil)	Level		0-2' red clay; 2-12' red clay and gravel; 12-20' red clay; 20-40' variegated clay; 40-46' red clay & rubble; 46-50' sandy clay; 50-57' red and white sand; 57-59' red sand & gravel; 59-74' variegated clay; 74-78' gravel; 78-84' white sandy clay; 84-92' sandy clay; 92-98' vari-clay & gravel; 98-110' vari-clay; 110-125' yellow clay and sand; 125-130' white sandy clay; 130-160' white sand; 160-175' grey sand & wood; 175-178' grey sand & gravel;	C.G. Atze (No.2)
82A	91	200	130-144 175-200	82	2000	W29/54	81			carrots	level		0-4' white sand, 4-28' Brown clay, 28-53' red clay; 53-80' red, yellow and blue clay, 80-120' red and blue gravelly clay, 120-130' yellow gravelly clay, 130-144' fine sand and gravel, 144-160' red gravelly clay, 160-170' yellow sand & clay, 170-175' yellow clay 175-200' brown coal and sand.	R.P. Schmidt
83	126	205			5000		(?) old anlaysis 95		Yes	Vegs. occasionally Citrus	level		0-110' brown sandy clay; 110-140' light brown clay; 140-165' fine white sand; 165-180' sticky grey clay; 180-190' brown clay; 190-205' Coarse sand & quarts gravel.	C.A.C. Hage (House bore)
84	127	92		91	500 g.p.d.	1584/51	84.80			Vegs.			Bottom of well said to be in old river wash.	P. Hanckel
84A	127	507									level		Abandoned Bore	H.R.H. Schultz
85	120	14		7		1051/51	111.21				level			E.B. Liebig (well beside river)
86	120	67		16	3000	1049/51	96.83			Vegs (including beans & cucumbers)			0-67' sand & gravel; 67-100' pipeclay.	H. Liebig (House well)
87	120	23		19		1050/51	167.29			Vegs.	level			E.B. Liebig (Disused house well)
88	120	48	47	10	3500	1052/51	83.56			Apricots & vines (7 years)	level		0-7' surface soil & sand; 7-40' sand; 40-48' sand & gravel.	H. Liebig (Vineyard bore)
89	120			11							level			E.B. Liebig (Garden well)
90	71	68	68	21		1048/51	80.90				level		From bottom of well sand & gravel.. Cut water 68' in clean gravelly wash.	J.W. Hahn

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 42

Hundred: MOCROORCO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
99A	55	S P R I N G			Perm-anent	1045/51	167.09	Yes		Not tried	level		Issuing from sandy schist.	B.W. Pech (Spring)
99B	83	45		21					Yes	Vegs. & fruit	level			B.W. Pech (Disused well)
99C	339	45		35	Small	1535/51	34			Vegs. & fruit			Timbered well probably alluvium.	C.W. Chinner.
99D	426	265	70		300	1941	85.2							H.F. Lock
99E	426	108			12-1500 g.p.day	1941	90.62							H.F. Lock
101	73	11		6		1046/51	203.62							D.A. Tolley Pty.Ltd. (well)
102	61	136	i)28') ii)79') iii)120')		3800	1066/51 1067/51	91.39 91.64			Vines	level		0-6' clay & rubble; 6-15' red clay; 15-22' yellow clay; 22-28' yellow sandstone 28-38' clay & gravel; 38-72' yellow clay; & sand; 72-79' clay & gravel; 79-120' soft blue micaceous rock; 120-129' hard blue rock; 129-136' white quartzite.	D.A. Tolley Pty.Ltd. (Vineyard bore)
103	47	252	Sample from - - - - when backfilled to - - - - - -	9	6000 252' 60'	1068/51	504.72 151.86 137.88		Yes	Vegs. except french beans. Fruit trees occasionally	River flat		0-26' existing well; 26-136' old hand bore; 136-178' grey blue rock; 178-202' grey rock with hard seams; 202-238' grey-green rock; 238-252' hard green rock; Bore backfilled with concrete to 60'. Existing supply coming from alluvial above that depth.	G.E. Jantke (No.2 or river bore)
104	47	145	Analysis of well	25	2500 5000	1042/51 3735	159.68 151.86		Yes	Vegs., tomatoes but not french beans. Fruit trees	Terrace		0-32' existing well; 32-38' variegated clay; 38-40' fine sand; 40-46' grey sand & gravel; 46-48' sand & gravel; 48-55' variegated clay; 55-60' sand & gravel; 60-65' clay; 65-80' pipeclay; 80-85' soft pink slate; 85-109' soft yellow slate; 109-112' yellow slate; 112-145' sandy slate;	G.E. Jantke (No.1 or House bore)
105	48	30		17		1047/51	162.88				level			
105A	49	30			2000+ g.p.day	Fit for stock only		Yes			level		Old well Clays with gravel	Tintara Vine Vale
106	47 & 48	85			nil		A B A N D O N E D						In gravel @ 85'	H.A. Hoffman
107	"	91			nil		A b a n d o n e d							H.A. Hoffman

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A 2

Hundred : MOORCROO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
108	47 & 48	28		21		1074/51	159.32	Yes		Vegs. except beans.				H.A. Hoffman (house well)
109	49	160	i) 35 ii) 80-100'	30	6000		Said to be 200	Abandoned					Sandy alluvium possibly decomp. slate in bottom.	J.B. Traeger
110	51	60					Said to be 250	Abandoned						F.P. Munsberg
111	51	83	i) 42 ii) 68 iii) 83				Said to be 60	Abandoned					0-106' "quicksand"	F.P. Munsberg
111A	57	299	52,95, 254,299	47	Was 1500				Was used		level		Bore sanded up - abandoned 0-110' Variegated clay, streaks of sand and gravel, 110-123' grey sand, 123-127 grey clay, 127-135' White sand with seams of blue clay, 135-136' white quarts and gravel, 136-145' fine sand and grey clay, 145-182 brown lignite clay and sand, 182-233' brown and grey clay and fine sand 233-234 coarse gravel, 234-254' fine sand, 254-262' coarse gravel, 262-272' fine gravel, 272-282' hard cemented gravel, 282-292' gravel and brown clay, 292-295' loose gravel, 295-299 brown clay and gravel.	Kramer
111B	57		i) 61 ii) 110 iii) 144	i) 52 iii) 52	i) 500 iii) ?	i) 1940 ii) 1940 iii) 1940	388.82 74.85 66.84				level		Kramer	Kramer
112	120	100			500		Good	Disused					Clay & sand, on bottom very fine red sand.	P.I. Girletz
112A	29	50		40	fair	W2519/53	116	Was used			gully		Well	A. Steinert
112B	52	97				Dry		Abandoned			level			
113	35	22		11	Small	1064/51	155.46			Vegs. but not beans			Probably alluvium	H.W. Hoffman
114	34	305	i) 60	31	900	794/51	103.73	Disused		Considered unsuitable for irrigating vines.	level		Sand, about 150' grey schist?	J.C. Traeger

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No.....

Hundred : MCOROORGO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
115		104	i) 50	36	1400	1072/51	134.51				level		0-3' sandy soil; 3-14' brown clay & streaks of gravel; 14-28' brown clay; 28-45' grey gravelly clay; 45-50' grey yellow clay; 50-80' fine sand 80-97' coarse white sand; 97-104' coarse & fine white sand.	H.E. Helling
116	32	47		46		1069/51	130.56	Disused					Probably alluvium	C. W. Nitschke
116A	74	100	60		Poor	Not Sampled				Was used	level		Well and bore with drives 18-25' sand 25-100' clay	
116B	25	83		78		W2524/53	396	Was used			level			D.L. & M.E. Garrett
116C	24	12		9		W2522/53	10			Domestic	level		Well	V.K. Kraft
116D	25	60								Was used	level		Abandoned Well	
117	36	12	?	7		1073/51	154.71	Yes	Yes				Probably alluvium	
118	36	60 approx.				Brackish		Abandoned						C.F. Braunack
119	36	18		16		1078/51	193.60		Yes				Probably alluvium	R. Braunecke
119A	37	14		8		W2705/53	248.56				level		Old well - abandoned	Schubert
120	Oval	318		54	1500-2000	1070/51	153.30	Swimming Pool					Mr. Roehr Boring Contractor, Dutton.	Council Bore (Tanunda Oval)
120A	39	23		20	fair	W2456/53	120	Yes	Yes	Not successful in garden	gully		Well	A.G. Kalleske
120B	21	220ap.	i) 50	32½	1300	(1939)	219.27			Not successful on fruit trees			Abandoned	R. Ellis
			ii) 165	24	600									
			iii) 208	24	3600		127.35							
120C	39	28		22		W2406/53	220			Was used for tanning	gully		Well	W.A. Juttner
120D	38	74	52	52			330-95				level		Old well 0-2' soil and sand, 2-4' red clay, pipeclay, boulders, 52-74' greyish micaceousand and water	F. Wallent
120E	13	30		27½	1000?	(1935)	267.07				level		Old well	Linder
121	26	50		29		801/51	58.26			Vegs. & fruit	Gully			E. Hueppauff (Garden well)
121A	26	122	90		very small			Abandoned			level			E. Hueppauff

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No.....

Hundred : MOOROOROO

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
121B	26	300	100	100	300		220				level		clay brown coal shale	E. Hueppauff
121C	26	-	-			W2405/53	62			Garden	level		Dam Spring fed	E. Hueppauff
122	26	52	- 55			W803/51	239.31	Not in use					House well	E. Hueppauff
122A	676	145	125		350			Not in use		lathers	gully		0-2' soil,2-25' yellow sandstone,25-46' white sandstone and quarts 46-60'yellow sandstone,60-76' marble, 76-79' blue rock,79-92' grey sandstone & Quarts,92-109 Blue rock,109-115' blue micaceous sandstone,115-117' blue rock,117-118'quartzite 118-126'blue rock,126-127 Quartzite,127-131'blue sandstone, 131-135'Quartzite,135-138'Blue sandstone,138-146'Quartzite.	Schulz
122B	676	165	46,81		250	Not Sampled		Not in use		lathers well	gully		0-2'soil,2-18'brown clay, 18-28'grey rock,28-74'grey sandstone,74-82'blue rock, 82-93'greyrock,93-99 blue rock 99-103'grey rock,103-113'blue rock,113-122'grey rock,122-128' quartsite,128-142'blue rock, 142-150'quartzite,150-163 granite,163-167'grey rock.	Schulz
122C	676	115			150	Not Sampled		Not in use		lathers well	gully		Well and bore 6" of gravel at 30'	Schulz.
122D	676	41		25ap	1000	W2458/53	56	Yes		Vegetables and fruit trees	gully		Timbered to 32ft. 9 feet of gravel	Schulz.
122E	87	131	50,131			Not Sampled		Not in use			gully		0-1 surface soil,1-14' yellow micaceous clay and grit,14-22' brown micaceous sand,22-24' yellow micaceous rock,24-36' brown micaceous rock,36-49' brown and grey seams of hard micaceous rock,49-53'very hard grey quartzite,53-77' hard grey micaceous rock, 77-100'hard grey quartzite with very hard underlying seams, 100-103'blue micaceous rock, 103-112' hard grey quartzite, 112-122'hard grey micaceous rock 122-125'hard grey quartzite.	
122F	769	6		Surface		W2521/53	18			Vegetables & fruit trees	gully		Water in sand above clay	R.A. Heidenreich
122G	769	20		Surface 0		Not Sampled				" " "	gully		Water in sand above clay	R.A. Heidenreich

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A 2

Hundred: MOCKROO

Underground Water Survey of County LIGHT

2x—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
122H	769	8		6		W2520/53	19				gully		Water in sand above clay	R.A. Heidenreich
123A	39	85	60		small			Drainage Bore		unsuccessful	level		micaceous clay & pipeclay from 50-85 ft. no gravels.	W.S. Ahrns
123	12	430	i) 80 ii) 360 iii) 417	157	2000-3000	800/51	119.13			Winery			0-2' red sand; 2-10' brown clay; 10-40' white clay; 40-65' sand & gravel; 65-80' white sand & quartz gravel; 80-200' grey mica schist 200-220' soft grey rock; 220-230' hard grey quartz, 230-255' grey micaceous slate; 255-290' grey rock; 290-296' hard grey rock; 296-400' grey rock; 400-414' hard brown rock; 414-417' brown micaceous rock;	B. Seppelt & Sons (Chateau Tanunda)
123B	39	80		4 variable				Drainage Well		unsuccessful	level			Tanunda Hotel
123C	39	20		variable				Drainage Well		unsuccessful	Hillside			Savings Bank
123D	12	80		variable				Drainage Well			level		Since collapse to 50ft. Unsuccessful for drainage	Tanunda Club
124	81	S p r i n g				802/51	45.72			Good	Gully		Issuing from schist rock	P. Stiller
125	41	17		10		790/51	141.59		Continued top watering does affect lucerne				Alluvium	C.G. Tscharke (Disused creek well)
126	41	22		13		784/51	377.05		"		level		Alluvium	C.G. Tscharke (House well)
127	41	40		37		811/51	157.85				Hill		Alluvium	J.H. Rosensweig
128	1	23		22		806/51	451.06	D i s u s e d			Gully		Alluvium	W. Schuls (House well)
129	1	231	i) 17 main 180-190'	16	3000	807/51	88.52			Trees & vines	Gully		0-3' brown sand; 3-17' brown sandy clay & gravel; 17-30' yellow sandy clay; 30-90' grey mica schists; 90-150' soft grey slate; 150-190' hard grey rock; 190-231' grey micaceous sandstone.	W. Schuls (Equipped bore)
130	1	20		18		813/51	378.05		Not suitable		Gully		Probably alluvium.	B.E. Mickan (Disused well)

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A.2 Hundred: MOOROOROO

Underground Water Survey of County LIGHT

2x—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
131	1	206	i) 31 ii) 180–206	18	3500		Good	Not Equipped			Gully		0-2' red sand; 2-10' red sandstone; 10-30' yellow clay; 30-35' brown sand & gravel; 35-60' brown sandy clay; 60-145' grey mica schist; 145-160' hard grey rock; 160-180' blue grey rock; 180-206' blue micaceous sandstone.	B.E. Mickan (Bore)
132	2	31		26		814/51	134.80	Disused			Gully			H.J. Bosinberg
133	3	20		17		810/51	80.29			Vegs. & fruit including beans	Gully			M.C. Lindner
134	4	40		34		805/51	154.66	Yes	No	No	Gully			J.A. Kube
135	5	46		41		792/51	65.52	Yes			Gully			C.L. Sonntag (Disused well)
136	5	68		64		791/51	137.64			Vegs. & fruit. No good for beans and some flowers	Gully			D. Hage (well)
137	82	38		35		793/51	76.06	Yes	No	Good (?)			Schist bedrock on road cutting nearby.	P. Stiller (Abandoned well)
138	665	86'				799/51	146.08	Yes			level			Mr. Herman
138A	663	Surface seakage (Spring)				789/51	768.03				Gully			N. Dier
138B	664	N. Para River (underflow pools)				781/51	264.63							N. Para River
139	645	14		12		786/51	191.70							O.J. Crocke
140	738	33		29		809/51	25.53							
140A	744	Spring			900	796/51	46.04			Vegs. including beans & cucumbers			Spring in schist rock	L.V. Schrapel (Spring)
142	646	23		16		785/51	151.29						Red gravelly loam, sandy loam, black clay and gravel wash, black clay. (may be decomp. bedrock).	(New house well)
143	644	19		14		787/51	28.63			Vegs. fruit. (including beans and cucumbers)			Black sand & little gravel.	A.G. Nitschke
144	647	23		20		788/51	152.59		Yes	Vegs. & fruit no beans or cucumbers			Through gravels & wash. Water may be lying on bedrock	H.B. Lindner

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 42

Hundred: MOCKOROO

Underground Water Survey of County LIGHT

2K—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
144A	647	17		12		W34/54	270	Not in use			Gully			C.W. Linder
145	651	302		150' (?)		21/6/55	56.98	Abandoned (sanded up)					0-130' Sandy clay; 130-131'?, 131-250' brownish clay, 250-255' fine black sand with lignite (large fragments of limbs of trees) and coarse grit, 255-302' very coarse ferruginous grit, sand and gravel. Samples of fossil fruit recovered.	R.A. Lindener (Abandoned bore) B. Milich, Driller Tarnnda.
145A	649	95		92		W30/54	198	Was used			level		Well, bricked	E.A. Grocke
146	634	12		9		795/51	52.91	Yes		Yes	Gully			Mr. Lindener
147	643	560	i) 114 ii) 471	90	1000-1500	765/51	33.75			Winery	Hill		0-25' soil and cemented gravel; 25-32' red gravel & clay; 32-42' hard cemented gravel; 42-60' red gravel clay; 60-114' grey gravel clay; 114-154' soft grey slate; 154-160' soft blue slate; 160-182' grey slate; 182-242' grey-brown slate; 242-361' grey slate; 361-505' grey-brown slate; 505-560' hard grey slate.	P.T. Falkenberg Glen View Winery.
148	630	38		35		804/51	140.43			Vegs. & fruit (no good for beans or cucumbers)	Gully			J.C. Modistich
149	626	9		4		798/51	265.84				Gully			Disused well near Jacob's Ck.
150	637	42		33		W24/54	82	Not used			Gully		Well - bricked	F.B. Mietschke

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A3 — Hundred: NURIOOTPA

Underground Water Survey of County

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
1	48	29 approx.	Abandoned			Very brackish			Wont grow					F. Liebich
1A	218	60-70				Salty		Abandoned			gully		Well	
1B	755				very small	Salty		Abandoned					Old bore	
1C	754	70		Was 65	poor	Salty		Abandoned - now dry			level		Old well — Red and white clay to 15 ft.	
1D	212	19		14	small		756				level		Well	E.G. Lehman
1E	48	20		14			1009	Abandoned			level			E.G. Lehman
1F	48	23		18		Salty		Abandoned			level			E.G. Lehman
1G	48	16		13			158	Was used			level			E.G. Lehman
2	159	251	i) 30 ii) 70 iii) 251		3000 draw-down	Brackish Fair Good				Vineyard 2 years			0-25' clay & limestone rubble; 25-100' clay & gravels lignitised wood @ 100' pyritised, cemented quarts conglom. then gravel bed. @ 150' Hard rock more than 20' @250' Tools dropped 2'0" (Mr. Krieg's description)	E.J. Krieg (North bore)
3	159	40	i) 40 ii) 60	12	8000 (?)	1543/51	86.39		Yes	Yes			Clay & limestone rubble and then mainly fine sand.	E.J. Krieg (South bore)
4	156	40		10		Brackish			Deteriorates					C.D. Herman
4A	156	63	16		Small				Drainage Bore		level		0-36' clay; 36-45' sand, 45-50 clay, 50-51' sand, 51-53½' gravel, 53½-63' gravel	Annella
5	138	26		17		1586/51	14 (may be contaminated with rain)			Yes			Probably alluvium	A.B. Rohrlach
6	156	19		17		1541/51	178			Vegs. except beans, cucumbers and tomatoes				P.J. Schols
7	141		Disused		Well									C.B. Robin
7A	176				poor	Salty			Now dry		level		Old Well	
7B	176	93		65	poor		736		Abandoned		level		pipeclay	W. Zimmerman

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 83 — Hundred: NURIOOTPA

Underground Water Survey of County LIGHT

2m—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
7C	176	65		54	small			poor was used originally	Has gone dry		level		Kaolin? 45-53 ft. pipeclay at 63 ft.	W. Zimmerman
8	141	90	i) 20 ii) 40 iii) 60 iv) 90	11 apx drawdown	At 60' 5000 (includes 2000 from shallow supply 10-11 IV estim. 3000	At 65' 75 At 40 1585/51 65 (Mixture of waters) 83.90				Fruit trees			Alternating beds of clay sand and gravel At 20') sand horizon At 40') At 60') fine gravel horizon	C.B. Robin (Well & bore)
9	137	31		17		1587/51	156.01						Concrete lined well. (Bore log E. Lange possibly refers this hole) 0-11' soil& limestone. 11-15' sand; 15-27' sandy clay; 27-35' clay; 35-50' sandy clay; 50-59' sand & gravel; 59-66' gravel.	H.D. Lange.
10A	119	148	i) 10	7		(approx. (hydrometer)	968						Approx. log. 30-40'white and red mottled clay; 40-50' clay with quartz drift; 50-55' decomp.schist; 60-148' solid schist.	C.G. Liebig
10B	197	10	soak	2	Small permanent	1588/51 2514/53	46.17 12			Vines			Sand & clay. Water held up on impervious clay. When well was 30' deep it let water down into underlying dry horizon.	Seppelts Winery (Soak well)
11	78	66				400 ap	$\frac{7-1}{8-8}$ os.	Abandoned			level			W.E. Liebig
12	78	108				437 ap	1 os.ap	Abandoned						W.E. Liebig
13	78	185				1311 ap	3 os.ap	Abandoned					Quicksand at 126'	W.E. Liebig
14	78	85	i) 35 ii) 40 iii) 60 IV) 85	31		(1) 3.03 os. 1300 ap							0-1'8" sub soil, 1'8" -15' white pipeclay, 15-35' siliceous fine grained sand-iron stained,35-50' Pure fine white silicious sand with large water worn quartz pebbles, 50-70' light grey sand clay silt, 70-85' grey blue silty clay.	W.E. Liebig
15	Pt.124					very salty		Abandoned			level		Old well	
16	75	30ap				very salty		Abandoned			level		Old well	
17	82	33		19		2516/53	445	Yes						E.T. Linke

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 83

Hundred : NURICOOPA

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
18	82	23		13	3-400	2517/53	207			Garden	Gully		Old house well 18-23' solid blue rock	E.T. Linke
19	241	35		21		Salty			Not used		level		Well	N.O. Schuls
20	638	54		48	good	2455/53	190	Yes			Gully		Near ferruginous sand stone	P.J. Offe
21	651	13		9		2457/33	310	Yes			Gully		Well Near ferruginous sand-stone	J.G. Falkenberg
22	801	140		100?		Not Sampled		Yes	Not now used	Yes	level		Well - into bedrock	E. Schuls
23	801	300	i) 152 ii) 257	120-130	i) poor ii) - Total 1000	1946 494/54	30 49	Yes	Yes	Garden	Hill		0-1' white sand, 1-3' yellow clay, 3-19' white pipeclay with seams of soft white rock, 19-58' Soft variegated sand rock, 58-77' variegated micaceous clay, 77-79' seams of quarts, 79-99' soft variegated mic-clay, 99-112' grey mic. rock with seams of quartz, 112-249' grey mic. rock, 249-257' blue slatey rock, 257-269' blue slatey rock with mic. seams, 269-291' blue slatey rock with thin seams of quarts, 291-300' blue slatey rock with micaceous seams.	E. Schuls

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A1

Hundred: BAROSSA

Underground Water Survey of County ADELAIDE

2m—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
1	2706	543	15) 228) 414) 439) 472) 534)	Flows + 2" (Flowed)	2,800-4,000 Drawdown 20'	6.11. 39 808/51	89.1 65.68			Vines, fruit & vegs.	Gully		0-2' soil; 2-4' coarse gravel; 4-9' cemented gravel; 9-15' sandy clay 15-20' yellow clay (caving); 20-23' yellow clay; 23-70' soft grey slate; 70-146' soft grey-brown slate; 146-155' harder grey slate; 155-228' grey-brown slate (water rose to 6' below surface); 228-250' grey blue slate; 250-318' Ditto with bands grey-green calc slate; 353-362' harder grey-blue slate; 362-516' very hard grey rock; at 414' - SWL 3' 439' - " Surface 472' - " + 2" 516-526' light grey and brown rock; 526-534' hard brown rock; 534-536' hard grey quartz. WC at 534' 536-540' brown rock; 540-543' hard - ditto -	R.P.B. Koch (Bore)
2	2707	26		Dry Well							Level		-	R.P.B. Koch (Dry well)
4	2708	360	19 56 main supply below 181'	10'))))30-40))	1200-2000	28.8. 39 770/51	51.1 53.42			Vines, fruit (including citrus) and vegs.	Hill		0-25' brown and yellow clay and grit; 25-26' sand and gravel; 26-33' soft yellow sand rock; 33-34' fine gravel; 34-36' brown clay; 36-37' white pipeclay; 37-45' brown clay; 45-56' white pipeclay; 56-93' fine white sand; W.C. 2,800 g.p.h. (also fossil fruit) 93-101' stiff brown clay; 101-123' fine dirty sand; 123-136' sand and pyrites; 136-149' white micaceous clay; 149-169' grey mica clay; 169-175' soft grey mica clay; 175-243' grey and brown micaceous rock; 243-246' grey mica rock; 246-264' hard brown ditto. 264-268' hard grey rock; 268-354' hard brown mica rock; 354-360' hard grey quartzite.	F.E. Geue (Bore)
5	2703	21		17		Disused					Level		Probably alluvium	-

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A4

Hundred: BAROSSA

Underground Water Survey of County ADELAIDE

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
6	2703	20		14	Small	764/51	100.49			Fruit trees and vegs. (including beans).			Alluvium	A.A. Altmann (House well)
7	2703	36		33		761/51	96.78			Fruit trees and veg. (including beans).	Level		Alluvium	A.A. Altmann
8	2716	47	Dry Well											
9	2702	40		37		768/51	65.45			Vegs. and Fruit (incl. beans)	"		Gravel	F.W. Hoffman (Well)
10	2702	22		19		762/51	152.07			Vineyard (?)	"		Alluvium	Opposite Gramps Orlando Winery.
11	2716	200 (approx.)	160-170 Appr.	80 (approx)	5,000	769/51	101.69			Vegs. (including beans), fruit trees and winery-distillery.			Sunk by Johnson Bros. 1931 Approx. log (see also log No. 6, folder No. 2 Hd. Barossa). 1-100' sand and gravels; 100-200' mica schist. When first pump tested, water charged with mica flakes.	Gramps Orlando Winery.
12	2711	26		25		766/51	137.62						Bricked well.	W. Obst
13	2702	25		23	Small	771/51	121.99			Fruit trees and vegs (including french beans)			Loam and gravel	J.A. Koch
14	2716	29		25		772/51	118.80						Alluvium	B. Liebich
15	2702	23		18		773/51	89.47						Alluvium. White sand and gravel recently cleaned from bottom.	Mr. Jeike
16	2702	27	20	24		775/51	70.68			Fruit and vegs.			0-1'6" soil; 1'6"-20' loamy sand; 20-27' gravel with large boulders.	F.R. Koch
16A	2721	32		31	Small	777/51	91.89			Fruit and vegs.			Bricked well said to be rock on bottom. ? schist or cemented gravel.	-
17	2717	71		66'6"	Fair	774/51	229.76			Fruit and vegs. (French beans?)			0-40' sand; 40-70' gravel and boulders pipe-clay at bottom (?schist)	A.A. Schulz

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A9 — Hundred: BAROSSA

Underground Water Survey of County ADELAIDE

2x—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output; Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
18	2720		Spring			763/51	39.56			Yes	Gully		Issuing from schist outcrop.	Hoffman
19	3069	35		33	Poor	725/51	75.51			Yes	"		-	Springwood Bros.
19A	546	Creek under flow				783/51	226.22	Yes	Pool		"		-	Creek Pool
19B	3072	20		Became dry in recent years						Was used on garden			Ferruginous sandstone nearby	
20	3069	35		33		731/51	45.07	Disused			"		-	-
21	3070	300	(1) 89 (11) 216 (111) 252	(1) 100 (11) (111) 80 now stands 47	Tested 1,440 now 800	5478 709 751	17.22 20.12	Yes		Yes	Hill		0-30' Coarse red-yellow sand; 30-40' Fine dark yellow sand; 40-65' Micaceous clay; 65-76' Quartz vein in mica schists; 76-86' Decomposed mica schists and clay; 86-87' Gravel wash; 87-96' Cherty quartzite and micaceous schists; 96-98' Micaceous quartzite; 98-104' Whitish weathered mica schists; 104-180' Green to grey chloritic mica schist; 180-200' Quartz mica schist with abundant pyrite; 200-215' Kaolinised pyritic mica schist; 215-240' Dense hard fine-grained quartz biotite gneiss; 240-258' Soft sandy micaceous gneiss; 258-262' Vein quartz in dense sandy biotite gneiss with pyrite; 262-300' Hard dense fine grained pyritised biotite-quartzite.	J.G. Mahlo
22	581	74		62		710/51	48.87	Yes	Yes	Yes (including french beans)			Bricked well Mica schist (Mr. Mahlo's description).	J.G. Mahlo (House well)

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A4

Hundred: Barossa

Underground Water Survey of County ADELAIDE

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
22A	581	155½	46	25	150	5083 ~~146~~	37.94	Bore abandoned - falling in			Hill		0-30' Clay, sandy clay; 30-46' Gravel, clay; 46-52' Gravel, pipeclay; 52-64' Pipeclay, mica schist; 64-100' Mica schist; 100-114' Grey slate (sandy mica schist?); 114-130' Quarts and black stone (schist?); 130-135' Blue sand - mica schist; 135-156' Black mica schist.	J.G. Mahlo
22B	581	124	100?	?	?	Not sampled		Bore abandoned			Hill		0-48' Yellow clay and some gravel; 48-58' Pipe clay and gravel; 58-78' Pipe clay and gravel; 78-83' "Slatey clay" (mica schist); 83-120' Mica schist and slate; 120-124' "Drift sand"	J.G. Mahlo
22C	581	135	50 100	40	Not tested			Abandoned			Hill		0-30' Red clay, grit and decomposed sandstone; 30-70' Yellow decomposed micaceous sandstone; 70-135' Micaceous schist with a few quarts veinlets	J.G. Mahlo
23	564	184	i) 110-120 main supply 154'	90	1,500	17.7.46	59.90						Drilled by Horwood, Bagshaw	M.C. Koch
						1040/51	61.60	Yes	Yes	Yes	Hill		Described by Mr. Koch. 0-2' Soil; 2-25' Red clay; 25-35' Pipeclay; 35-90' Gritty sand and fine sand (very loose) then pipeclay 90-120' Mica schist (soft) (1st water); 120-154' Mica schist (hard) main supply around 154'; 154-185' Mica schist (hard); At 185' struck sand difficult to make further headway. (Probably sandy schist. (A.A.C.M.	
24	564	42	Abandoned			3.3.44	150.38	Yes					Gravel at 42'.	MC. Koch (Abandoned partly filled well)
25	2725	24		6	Fair (can be faulked)	779/51	85.24	Yes		Yes (not French beans)	Gully		Schist	W.J. Thomas (Disused house well)

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A4

Hundred: BAROSSA

Underground Water Survey of County ADELAIDE

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
26	2726	Spring				778/51	64.92	Yes	Yes	Yes			Schist	W.J. Thomas (Spring)
27	2725	Spring			Good	776/51	65.94	Yes		Yes (including beans)			Black soil In 1900. Slum from cleaning contained lot of sulphur.	J.K. Barritt
28	1967	43		31		782/51	32.58	Yes			Gully			
28A	1968	20		10		780/51	64.55	Yes		Yes (not beans)	Gully		Soil Permanent springs in gully nearby.	G. Parbs (House well)
29	3068	19		18		730/51	132.90	Yes			"		Alluvium	- (Disused well)
30	567	177	107	98	400	Dry 1951		Yes			Hill		Horwood, Badshaw. 0-7' red clay; 7-17' very hard micaceous rock; 17-29' red clay; 29-37' very hard; micaceous rock; 37-44' gravel; 44-53' soft mica rock; 53-71' clay and black gravel; 71-87' broken mica rock; 87-96' clay and gravel; 96-99' quartzite; 99-104' brown rock; 104-130' micaceous 130-137' sandstone; 137-148' quartzite; 148-153' clear quartz; 153-177' broken quartz in slate;	Mr. A.B. Zerk (Dry Bore)
31	567	52		46		713/51	72.97	Yes					Soil and clayey gravel in bottom	A.B. Zerk (No. 1 well)
32	536	19		16		718/51	89.19	Yes			Level		Alluvium	Mrs. Gogell (Disused well)
32A	282	39		22	11/54	219		Not used			Gully		Well- bricked	
33	537	(Well 22) (Bore 97) 119	i. 27 ii.118	i. 27 ii. 20	i. 3-400 ii. 2400 now only 800	1515/51	217			Required for fruit trees but too salty	Level		Slate	P.H. Burge

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 44

Hundred: BAROSSA

Underground Water Survey of County ADELAIDE

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
33A	537	109	50 - 80	50	1,000	1940	257.06	Abandoned					0-50' Clay; 50-80' Clay and slate; 80- Hard rock;	P.N. Burge
33B	537	95	93	50	2,500	31.1.41	296.99	Abandoned			Gully			"
33C	541	30			Small			Was used		Too salty	Hill side		House well	
33D	541	60			Very small		Very salty	Abandoned					Old well; Clay at top	
34	501	Underflow		10		719/51	89.83	Yes			Level		Alluvium	B.A. Gogell (Creek underflow pool).
34A	501	11		5						Has been used on garden	Gully		Well	
35	562	132	60	?	Faulks with windmill	714/51	149.33	Yes			Hill		Hard rock from 18'	F. Zerk
36	567	28		25		712/51	58.96	Yes			Gully		Alluvium	A.B. Zerk (No. 2 well)
37	3159	49		38	Windmill	715/51	515.63				Hill			Mr. Krieg (Disused well)
37A	3250	303	80,300	60	4,000	Not sampled			Yes	Some vegetables	Hill		0-70' Pipe clay etc. 70- Hard blue rock	R.A. Kreig
37B	79	100				Fit for stock only		Was used		Abandoned	Level		Old well - clay	
37C	534	60+		20		12/54	103		Yes	Has been used	Gully		Well to 50 ft. Bore to ?	Mrs. H.M. Down
37D	3250A	34		24		10/54	205			Has been used for short periods	Hillside			A.G. Engel
38	502	Underflow Pool (creek)		10	Permanent	720/51	98.11	Yes		Yes (not french beans)	-		Alluvium	J. Semmler (Creek underflow pool)
38A	534	331	i) 25 ii) 175	Total	i) 1000 1800	68/54	112			Cooling wine leeching grape skins general cleaning	Level		0-2' Black soil; 2-26' Brown clay; 26-35' Brown sandstone; 35-90' Variegated clays; 90-106' Ironstone conglom.; 106-120' Grey rock; 120-220' White marble; 220-331' Brown rock	B. Seppelts & Sons Lyndoch.
39	759	19	Dry well											
40	532	22	" "			721/51	198.31	Yes		Yes				L.M. Semmler

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 44 — Hundred: BAROSSA

Underground Water Survey of County ADELAIDE

2x—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
41	503	16		10		727/51	85.52	Yes		Garden & citrus (not french beans)	Level		Bricked well (Alluvium?)	
42	486	37		35		728/51	488.82	Yes			Gully		Well.	
43	~~1753~~ 1735 (?)	29		27		729/51	255.29		Yes (flooding)		"			
44	504	17'6		12'6	Faulks at 2000	723/51	83.72	Yes		Including french beans and septic tank.	Level		Alluvium with layers of rubbly lime.	G. Gramp & Sons (Winery well)
44A	504	12		6		67/54	96	Not	used		Level		Well	Gramps Winery
45	505	14		12		724/51	65.17	Yes		Yes	Level			G. Gramp & Sons (Disused well)
45A	505	18		9		66/54	124				"		Well	Gramps Winery
45B	3148/759		Surface		Variable	60/54	126				Hill		Spring	Mrs. J.G. Krieg
46	568	150		47-50	1,800	726/51	51.25	Yes		Yes (including citrus)			As described by Mr. Kies. 0-10' Wash gravel; 10-20' Stones; 30' Boulders; 40' Clay; 50' Soft rock; 60' Soft damp, little gravel and clay; W.C. 60-62' rose 6'; 60-68' Green clay, much rubble and fine grit, few stones; 68-69' Struck hard rock; 90' Softer rock; 105' Bluer to 112'; 112-122' Brittle & porous 127-128' Little porous 137' Hard dark blue rock; 150' Completed in blue rock.	R.F. Kies (No. 1 Bore)
47	568	120 In progress			In	progress								R.F. Kies (No. 2 Bore)
48	1733	17		15		717/51	34.17	Yes		Yes (no beans)			Slate bedrock	Krieg Brothers
48A	286	27		18		490/54	11	Was used		Not suitable	Level		Well - bricked	R.M. Willson
49	530	17		15		711/51	66.17	Yes		Yes (including french beans)				F. Mahle

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A-1

Hundred: BAROSSA

Underground Water Survey of County ADELAIDE

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
49A	530	27		12		65/54	46			Not now used	Hillside		Well	Gramps Winery
50	506	18		Dry										
50A	506	41	7	8	2,000 Variable	61/54	59			Maize	Level		Well and bore 0-8' Black soil and sub-soil 8-15' Red clay with white stoney fine sand at bottom of hole	Semmner Bros.
50B	506	25	18		?	62/54	68			Not used	"		House bore Penetrated gravel.	Semmner Bros.
51	508	70			Good	716/51	60.44	Yes		Yes			Refer DM 25/41, Bores 1 and 2 may apply	A.D. Krieg
51A	3149	48		20 ap	1,000 decreasing	63/54	69	Yes			Gully		Clays and subsoil 41-48' Slate	Semmner Bros.
51B	568	110	37	44	2,500			Yes			"		0-45' "Rubble"; "Quicksand at 110'	N.V. Kies
52	523 (522?)	23		21		722/54	132.25	Yes		Yes	"		Slate on spoil heap.	G. Gramp (Well)
52A	3162	?				492/54	298			Garden	Hill		Bore	Mrs. M.D. Teusner
52B	3163	61		43		491/54	334		Poor	Fowls foods	"		Well-boarded alluvium?	A. Wilksch
53	3160	105		59	Faulks at 400	706/51	175.57	Yes					All-rock (phyllitic slate)	T.E. Tuesner (No. 2 Bore)
54	521	30 (approx)		28		707/51	244.31	Yes	Yes		Gully		Alluvium and slate on dump.	Tuesner (Well)
55	521	92				705/51	362.40	Yes						P.H. Lerke
56	520	142		40 (Approx.)	3,000	708/51	152.93			Yes (not cucumbers or beans)			In rock with quarts below 40'.	T.E. Tuesner
56A	519	166	48	48	2,500+	493/54	160			Tomatoes, commercially	Gully		0-2' Black soil; 2-15' Yellow clay; 15-98' Yellow slate; 98-166' Hard grey-blue slate	A. Minge and Sons
57	513	200		Below 63'	Small									T.B. Tante
57A	511	41		33½	200 apx.	59/54	123	Yes			Gully			A.C. Hausler
57B	980	100		40 ap	2,000+?	64/54	79			Garden	"		Well 40') Bore 60') In sandy slates	J.W. Mattner

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A-1

Hundred: BAROSSA

Underground Water Survey of County ADELAIDE

2m—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR			SURFACE ELEVATION		Remarks and Strata	Occupier's Name
								Stock	Lucerne	Garden and Domestic	Form	Height above Sea Level		
58	514	31		25	Small	1063/51	79.64			Yes			Alluvium	G.H. Koch
58A	514	88	1) 40' main 60'	30	2,000	No sample				Yes			0-7' Red clay; 7-15' Yellow clay; 15-38' Yellow slatey rock; 38-52' Blue slatey rock; 52-59' Quartzite; 59-68' Blue slatey rock; 68-74' Yellow slatey rock; 74-88' Blue slatey rock.	G.H. Koch (Bore)
59	515	63		21 (Flowed 15 years ago i.e. 1936)	1,200-1,400	1041/51	86.20		Yes	Yes (not beans) Irrigated vines 15 years - noticeable effect only 1951.			0-17' Surface 17-63' Probably clay and gravel.	C.G. Fromm
60	3053	39		38	Small	1059/51	53.30			Yes			Bricked well (probably alluvium)	J.H. Krieg

Table No. B1

DEPARTMENT OF MINES—ADELAIDE

Hd. BELVIDERE

DETAILED ANALYSES OF UNDERGROUND WATERS IN PORTION OF CO. LIGHT

5m—2.49 225

Serial No.	Section No.	Chlorine, Cl.	Sulphuric Acid radicle, SO_4	Carbonic Acid radicle, CO_3	Nitric Acid radicle, NO_3	Sodium, Na	Potassium, K	Calcium, Ca	Magnesium, Mg	Iron, Fe	Silica, SiO_2	Total Saline Matter Grains/Gall.	Total Saline Matter Ounces/Gall.	Assumed Composition of Salts: Calcium carbonate	Calcium sulphate	Calcium chloride	Magnesium carbonate	Magnesium sulphate	Magnesium chloride	Sodium carbonate	Sodium sulphate	Sodium chloride		Sodium nitrate	Potassium chloride	Silica	Hardness (degrees English): Total	Temporary	Permanent	Due to calcium	Due to magnesium	Analysis No.
2	354	89.43	14.57	14.10	trace	56.76		5.72	6.60			187.18	0.43	14.28			7.79	18.26	2.58			144.27		trace			41.44	23.54	17.90	14.28	27.16	W1600/51
3	344	60.06	10.58	8.40	Nil	38.95		4.64	3.27			125.90	0.29	11.59			2.04	13.26				99.01		Nil			25.05	14.02	11.03	11.59	13.46	W1598/51
4	281	109.73	21.38	16.20	present	67.68		4.51	8.17			233.18	0.53	23.75			2.75	27.43	7.21			172.04		present			57.36	27.00	30.36	23.75	33.61	W1596/51
5	342	65.11	9.84	12.00	present	40.02		5.07	5.44			137.48	0.31	12.67			6.18	12.33	4.58			101.72		present			35.06	20.01	15.05	12.67	22.39	W1597/51
8	3003	93.80	19.34	10.05	trace	60.97		4.64	6.08			194.88	0.45	11.59			4.36	23.86			0.44	154.63		trace			36.61	16.78	19.83	11.59	25.02	W1609/51
9	3006	88.74	19.17	10.50	present	61.46		2.72	5.40			187.99	0.43	6.79			9.04	13.81			12.05	146.30		present			29.00	17.53	11.47	6.79	22.21	W1613/51
13	3005	27.16	7.69	20.25	present	33.33		1.07	1.20			90.70	0.21	2.67			4.16			27.72	11.37	44.78		present			7.61	7.61	Nil	2.67	4.94	W1612/51
14	375	178.15	26.34	28.35	present	111.28		9.79	14.46			368.37	0.84	24.45			19.24	33.01	8.77			282.90		present			83.95	47.29	36.66	24.45	59.50	W1601/51
15	3000	221.21	22.26	41.85	trace	162.66		4.00	10.03			462.01	1.06	9.99			34.77			19.64	32.92	364.69		trace			51.25	51.25	trace	9.99	41.26	W1607/51
16	3004	49.42	7.45	15.15	present	38.76		2.64	2.88			116.30	0.27	6.59			9.98			7.24	11.02	81.47		present			18.44	18.44	Nil	6.59	11.85	W1610/51
17	2998	76.47	8.81	18.15	present	47.33		6.07	7.10			163.93	0.38	15.16			12.73	11.04	4.70			120.30		present			42.00	27.89	14.11	15.16	26.84	W1605/51
18	2999	169.40	31.60	23.70	present	107.91		10.50	12.26			355.37	0.81	26.22			11.21	39.60	4.03			274.31		present			76.70	39.53	37.17	26.22	50.48	W1606/51
19	3000	460.25	14.73	15.75	trace	166.65		54.02	47.07			758.47	1.73	26.27	20.88	103.42			184.33			423.57		trace			328.55	26.27	302.28	134.88	193.67	W1608/51
21	210	85.58	0.66	29.55	trace	61.70		5.07	5.79			188.35	0.43	12.66			20.07			13.57	0.98	141.07		trace			36.48	36.48	Nil	12.66	23.82	W1595/51
22	55	121.45	1.98	18.75	trace	66.20		8.58	9.55			266.51	0.52	21.42			8.31	2.48	26.04			168.26		trace			60.70	31.28	29.42	21.42	39.28	W1589/51
24	204	74.90	10.37	15.60	present	42.92		7.58	7.34			158.71	0.36	18.93			5.97	13.00	11.71			109.10		present			49.13	26.01	23.12	18.93	30.20	W1594/51
25	2993	98.00	19.75	25.80	present	73.35		4.72	7.41			229.03	0.52	11.79			25.64			0.79	29.21	161.55		present			42.28	42.28	Nil	11.79	30.49	W1603/51
27	197	185.50	17.90	22.05	trace	88.18		17.51	19.84			350.98	0.80	36.78	9.44			14.09	66.53			224.14		trace			125.34	36.78	88.56	43.72	81.62	W1591/51
30	74	178.50	1.28	21.66	trace	99.99		6.57	13.44			321.38	0.74	16.41	[illegible]		16.53	1.60	32.70			254.14		trace			71.71	36.02	35.69	16.41	55.30	W1590/51
32	199	172.20	20.16	21.45	trace	86.79		14.87	17.94			333.41	0.76	35.78	1.83			23.65	51.53			220.62		trace			110.93	35.78	75.15	37.12	73.81	W1592/51

DETAILED ANALYSES OF UNDERGROUND WATERS IN PORTION OF CO. LIGHT

Serial No.	Boeing No.	Chlorine, Cl	Sulphuric Acid radicle, SO_4	Carbonic Acid radicle, CO_3	Nitric Acid radicle, NO_3	Sodium, Na	Potassium, K	Calcium, Ca	Magnesium, Mg	Iron, Fe	Silica, SiO_2	Total Saline Matter Grains/Gall.	Total Saline Matter Ounces/Gall.	Assumed Composition of Salts: Calcium carbonate	Calcium sulphate	Calcium chloride	Magnesium carbonate	Magnesium sulphate	Magnesium chloride	Sodium carbonate	Sodium sulphate	Sodium chloride	Sodium nitrate	Potassium chloride	Silica	Hardness (degrees English): Total	Temporary	Permanent	Due to calcium	Due to magnesium	Analysis No.
2	219	25.13	3.29	12.90	present	16.99		4.93	2.71			65.95	0.15	12.31			7.76	2.33			2.12	41.43	present			23.45	21.52	1.93	12.31	11.14	W1534/51
4	193	74.56	10.57	24.15	present	45.07		7.29	9.79			171.43	0.39	18.20			18.61	13.25	6.81			114.56	present			58.46	40.28	18.18	18.20	40.26	W1533/51
40	193	183.69	42.55	30.00	trace	118.12		9.00	18.00			401.36	0.92	22.50			23.19	53.38	2.11			NaClAKCl 438.66				183.04	44.00	139.04	53.25	129.79	21.8.35
40	193	488.45	113.08	16.05	Nil	274.38		24.30	42.81			959.07	2.19	26.75	46.20			100.96	87.89			697.42	Nil			236.91	26.75	210.16	60.75	176.16	3077
40	193	88.19	18.52	12.90	Nil	43.35		11.08	10.51			184.55	0.42	21.50	8.42			15.77	28.67			110.19				70.95	21.50	49.45	27.70	43.25	3878
40	193	91.50	20.53	13.80	Nil	46.67		10.93	10.85			194.28	0.44	23.00	5.80			20.53	26.24			118.63				71.96	23.00	48.96	27.32	44.60	3079
48	137	316.70	64.89	26.40		172.58		21.30	31.54			633.41	1.45	44.00	12.57			70.20	67.98			NaClAKCl 438.66				183.04	44.00	139.04	53.25	129.79	21.8.35
5	189	52.92	12.88	23.10	present	42.29		4.93	5.42			141.54	0.32	12.31			18.79			4.15	19.05	87.24	present			34.61	34.61	Nil	12.31	22.30	W1531/51
7	181	58.52	13.79	15.90	present	38.31		6.86	5.59			138.97	0.32	17.13			7.91	16.38			1.07	96.48	present			40.14	26.52	13.62	17.13	23.01	W1529/51
8	181	46.34	0.66	9.90	Nil	27.45		1.79	4.48			90.62	0.21	4.46			10.16	0.83	5.40			69.77	Nil			22.89	16.52	6.37	4.46	18.43	W1530/51
9	180	45.22	7.45	13.05	trace	24.58		6.58	5.70			102.58	0.23	16.43			4.50	9.34	9.83			62.48	trace			39.89	21.78	18.11	16.43	23.46	W1528/51
11	138	66.08	2.67	16.95	present	44.68		2.72	4.94			138.04	0.32	6.79			17.12			1.24	3.95	108.94 NaClKCl	present			27.11	27.11	Nil	6.79	20.32	W1518/51
12A	174	45.11	9.34	17.25	trace	31.35		4.64	5.44			113.11	0.26	11.60			14.46	6.29			6.39	74.37	trace			33.99	28.76	5.23	11.60	22.39	20.8.35
13	175	90.67	17.86	19.35	present	48.57		11.72	10.66			198.83	0.45	29.27			2.53	22.38	21.19			123.46 NaClAKCl	present			73.13	32.27	40.86	29.27	43.86	W1574/51
13A	175	97.37	18.56	16.80		46.70		13.93	12.27			204.63	0.47	28.00	9.27			15.06	36.14			116.16 NaClAKCl				85.32	28.00	57.32	34.83	50.49	22.8.35
14A	175	76.58	16.58	19.05	trace	37.59		9.43	12.58			171.81	0.39	23.58			6.89	20.78	25.02			95.54	trace			75.35	31.77	43.58	23.58	51.77	21.8.35
17	178	36.61	8.85	14.25	trace	21.96		6.22	5.18			93.07	0.21	15.53			6.94	11.09	3.68			55.83	trace			36.85	23.76	13.09	15.53	21.32	W1527/51
18	173	119.70	0.58	28.50	Nil	78.45		1.57	10.31			239.11	0.55	3.92			35.75			1.25	0.86	197.33	Nil			46.36	46.36	Nil	3.92	42.44	W1532/51
19	172	49.71	11.73	14.70	trace	29.98		7.36	5.66			119.14	0.27	18.38			5.17	14.70	4.70			76.19	trace			41.68	24.52	17.16	18.38	23.30	W1513/51
22	171	39.48	10.70	12.45	trace	24.20		6.07	4.81			97.71	0.22	15.17			4.71	13.41	2.90			61.52	trace			34.96	20.76	14.20	15.17	19.79	W1511/51
23	171	56.42	14.44	14.70	trace	33.32		8.36	6.27			133.51	0.31	20.88			3.06	16.10	6.77			84.70	trace			46.68	24.52	22.16	20.88	25.80	W1512/51
29	163	35.77	6.91	11.40	trace	21.08		5.43	4.20			84.79	0.19	13.56			4.60	8.66	4.39			53.58	trace			30.82	19.01	11.81	13.56	17.26	W1520/51
30	169	81.06	0.54	3.15	present	36.44		3.43	7.87			132.49	0.30	5.25	0.77	3.05			30.80			92.62	present			40.93	5.25	35.68	8.57	32.36	W1525/51
32A	160	56.15	11.89	13.50	present	29.97		8.93	6.47			126.91	0.29	22.30			0.18	14.90	13.35			76/18	present			48.92	22.51	26.41	22.30	26.62	W1505/51
33	162	34.65	8.02	10.80	trace	19.90		5.72	4.30			83.39	0.19	14.28			3.15	10.05	5.33			50.58	trace			31.97	18.02	13.95	14.28	17.69	W1506/51
34	163	60.48	4.86	12.90	Nil	36.89		3.86	5.35			124.34	0.28	9.64			10.01	6.09	4.82			93.78	Nil			31.63	21.51	10.12	9.64	21.99	W1521/51
36	162	32.48	8.11	12.90	present	20.38		4.93	4.65			83.45	0.19	12.31			7.76	10.16	1.41			51.81	present			31.44	21.52	9.92	12.31	17.13	W1508/51
37	162	30.16	8.02	14.70	present	21.85		4.79	3.85			83.31	0.19	11.96			10.58	3.96		7.19		49.62	present			27.80	24.51	3.29	11.96	15.84	W1507/51
40	Oval	35.21	8.68	10.65	trace	20.00		5.72	4.55			84.81	0.19	14.28			2.94	10.88	5.87			50.84	trace			33.00	17.78	15.22	14.28	18.72	W1492/51
49	142	35.06	8.43	13.80	Nil	23.60		5.29	4.04			90.16	0.21	13.21			8.26	8.22		2.77		51.70	Nil			29.83	23.00	6.83	13.21	16.62	W1499/51
51	145	30.00	3.99	4.20	trace	11.05		6.72	3.08			59.04	0.13	7.01	5.65	6.23			12.06			28.09	trace			29.44	7.01	22.43	16.77	12.67	W1504/51
53	1739	15.05	2.35	12.00	present	7.68		8.07	1.66			46.81	0.11	20.01	0.20			2.77	4.31			19.52	present			26.99	20.01	6.98	20.16	6.83	W1536/51
55	142	25.13	6.17	11.10	present	17.59		3.72	3.12			66.83	0.15	9.29			7.77	4.36		3.98		41.43	present			22.13	18.51	3.62	9.29	12.84	W1500/51
57	142	47.60	8.48	13.20	Nil	25.36		8.22	5.42			108.28	0.25	20.52			1.26	10.63	11.40			64.47	Nil			42.82	22.00	20.82	20.52	22.30	W1501/51
60	143	78.12	9.51	15.00	trace	34.05		14.29	8.61			159.58	0.36	25.02	13.48	0.83			13.71			86.54	trace			71.11	25.02	46.09	35.68	35.43	W1503/51
61	136	35.98	8.68	16.20	present	24.29		5.86	4.70			95.71	0.22	14.63			10.44	8.36		2.97		59.31	present			33.97	27.02	6.95	14.63	19.34	W1057/51
62	135	31.06	7.32	11.85	trace	19.77		5.22	3.67			78.83	0.18	13.03			5.68	8.17	0.70			50.25	trace			28.13	19.78	8.35	13.03	15.10	W1060/51
63	134	79.80	7.98	9.30	Nil	34.61		9.00	9.40			150.09	0.34	15.51	9.48			1.62	35.51			87.97	Nil			61.14	15.51	45.63	22.48	38.66	W1491/51
64	134	74.73	13.04	13.20	trace	31.00		15.65	8.39			156.01	0.36	22.02	18.48	3.85			32.86			78.80	trace			73.60	22.02	51.58	59.07	34.53	W1498/51
65	133	21.84	8.76	11.25	Nil	15.54		5.22	2.88			65.49	0.15	13.03			4.83	7.37		4.26		36.00	Nil			24.90	18.77	6.13	13.03	11.87	W1496/51
66	133	14.77	1.73	3.30	Nil	8.01		1.83	1.44			31.18	0.07	4.82			0.58	2.11	3.25			30.36	Nil			10.72	5.50	5.22	4.82	5.90	W1495/51

DETAILED ANALYSES OF UNDERGROUND WATERS IN PORTION OF CO. LIGHT

6m—2.49 255

Serial No.	Section No.	Chlorine, Cl.	Sulphuric Acid radicle, SO_4	Carbonic Acid radicle, CO_3	Nitric Acid radicle, NO_3	Sodium, Na	Potassium, K	Calcium, Ca	Magnesium, Mg	Iron, Fe	Silica, SiO_2	Total Saline Matter Grains/Gall.	Total Saline Matter Ounces/Gall.	Assumed Composition of Salts: Calcium carbonate	Calcium sulphate	Calcium chloride	Magnesium carbonate	Magnesium sulphate	Magnesium chloride	Sodium carbonate	Sodium sulphate	Sodium chloride	Sodium nitrate	Potassium chloride	Silica	Hardness (degrees English): Total	Temporary	Permanent	Due to calcium	Due to magnesium	Analysis No.
68	136	32.97	7.74	14.40	trace	21.40		5.51	4.41			86.49	0.20	13.91			8.52	9.65			0.06	54.35	trace			32.05	24.03	8.02	13.91	18.14	W1055/51
72	136	35.71	7.86	15.15	trace	21.89		6.36	4.94			91.91	0.21	15.88			7.91	9.85	2.62			35.65	trace			36.20	25.26	10.94	15.88	20.32	W1056/51
73	136	33.53	7.78	12.90	trace	20.78		5.72	4.24			84.95	0.19	14.28			6.10	9.75	2.00			52.82	trace			31.72	21.52	10.20	14.28	17.44	W1061/51
74	136	34.58	7.86	12.15	trace	20.73		5.86	4.26			85.44	0.20	14.63			4.75	9.85	3.52			52.69	trace			32.16	20.27	11.89	14.63	17.53	W1062/51
75	135	40.82	7.24	12.00	trace	23.39		6.00	4.68			94.13	0.22	14.98			4.24	9.07	6.38			59.46	trace			34.24	20.00	14.24	14.98	19.26	W1058/51
78	678	64.83	13.00	19.95	present	38.42		11.58	6.27			154.05	0.35	28.92			3.67	16.29	7.52			97.65	present			54.72	33.28	21.44	28.92	25.80	W1516/51
80	121	37.94	6.25	14.70	Nil	23.17		6.00	4.65			92.71	0.21	14.99			8.02	7.83	2.98			58.89	Nil			34.16	24.51	9.65	14.99	19.17	W1583/51
81	122	140.35	18.51	22.05	present	74.72		15.22	13.02			283.87	0.65	36.78	1.66			21.73	33.79			189.91	present			91.57	36.78	54.79	38.00	53.57	W1054/51
82	125	100.12	11.15	6.30	trace	36.83		14.51	11.43			180.34	0.41	10.51	15.30	15.64			44.76			93.63	trace			83.27	10.51	72.76	36.23	47.04	W1494/51
84	127	32.06	11.36	11.40	present	17.35		8.43	4.20			84.80	0.19	19.01	2.79			11.77	7.13			44.10	present			38.33	19.01	19.32	21.06	17.27	W1584/51
85	121	49.29	10.00	12.30	present	26.29		7.15	6.18			111.21	0.25	17.85			8.25	12.53	11.75			66.83	present			43.27	20.52	22.75	17.85	25.42	W1051/51
86	120	42.07	8.68	11.55	trace	22.56		6.57	5.40			96.83	0.22	16.40			2.42	10.88	9.79			57.34	trace			38.62	19.28	19.34	16.40	22.22	W1049/51
87	121	71.54	14.56	21.45	present	40.80		9.15	9.79			167.29	0.38	22.85			10.89	18.25	11.59			103.71	present			63.14	35.77	27.37	22.25	40.29	W1050/51
88	136	57.66	5.10	10.50	Nil	20.47		5.57	4.26			83.56	0.19	13.91			3.04	6.39	8.18			52.04	Nil			31.44	17.53	13.91	13.91	17.53	W1052/51
90	71	37.73	8.64	4.95	trace	24.56		2.22	2.80			80.90	0.18	5.54			2.29	10.59			0.28	62.20	trace			17.07	8.26	8.81	5.54	11.53	W1048/51
92	121	49.50	9.63	13.05	present	32.10		4.22	5.17			113.67	0.26	10.54			9.46	12.07				81.60	present			31.81	21.77	10.04	10.54	21.27	W1044/51
93	122	88.78	14.40	15.30	Nil	39.84		14.58	10.38			183.28	0.42	25.52	14.81			4.95	36.73			101.27	Nil			79.12	25.52	53.60	36.41	42.71	W1053/51
94	73	79.52	11.52	16.50	present	42.88		7.86	9.44			167.72	0.38	19.63			6.68	14.44	18.61			108.99	present			58.47	27.53	30.94	19.63	38.84	W1077/51
95	64	45.13	9.79	12.45	Nil	24.66		6.93	5.07			102.03	0.23	17.30			2.92	12.27	6.85			62.69	Nil			38.16	20.76	17.40	17.30	20.86	W1493/51
96	92	45.22	7.90	15.15	Nil	22.08		10.36	5.68			106.39	0.24	25.27	0.82			9.17	15.00			56.13	Nil			49.24	25.27	23.97	25.87	23.37	W1071/51
97	73	68.33	8.72	14.85	trace	31.87		10.86	8.22			142.85	0.33	24.77	3.19			8.11	25.77			81.01	trace			60.94	24.77	36.17	27.12	33.82	W1075/51
98	61	23.85	5.35	5.70	Nil	11.57		4.15	3.21			53.83	0.12	9.51	1.16			5.68	8.07			29.41	Nil			23.57	9.51	14.06	10.36	13.27	W1076/51
99	57	137.46	7.20	17.25	Nil	48.97		24.01	15.48			250.37	0.57	28.75	10.20	26.33			60.62			124.47				123.73	28.75	94.98	60.02	63.71	2709
99	57	185.27	8.89	19.35	Nil	66.25		30.80	19.96			330.46	0.76	32.25	12.60	39.29			77.93			168.39	Nil			158.89	32.25	126.64	77.00	81.89	14.3.39
99A	55	87.23	6.71	12.45	Nil	46.14		7.36	7.80			167.69	0.38	18.38			2.01	8.41	21.62			117.27	Nil			50.48	20.77	29.71	18.38	32.10	W1045/51
99B	83	7.21	1.15	7.95	Nil	6.39		2.72	0.96			26.38	0.06	6.79			3.33			2.67	1.70	11.89	Nil			10.75	10.75	Nil	6.79	3.96	W1065/51
101	73	96.77	15.76	18.75	trace	46.40		14.51	11.43			203.62	0.47	31.27	6.76			13.77	33.88			117.94	trace			83.27	31.27	52.00	36.24	47.03	W1046/51
102	61	36.27	8.64	12.75	Nil	27.66		2.93	3.39			91.64	0.21	7.52			11.75				12.78	59.79	Nil			21.27	21.27	Nil	7.32	13.95	W1067/51
103	47	65.67	10.58	12.60	Nil	31.98		9.29	7.76			137.88	0.32	21.02	2.96			10.64	21.97			81.29	Nil			55.13	21.02	34.11	23.19	31.94	W1068/51
104	47	75.19	12.72	14.40	present	41.83		7.15	8.39			159.68	0.37	17.85			15.29	15.94	14.37			106.32	present			52.37	24.02	25.55	17.85	34.52	W1042/51
105	48	72.38	16.21	16.65	trace	31.66		17.94	8.04			162.88	0.37	27.77	22.97	0.17			31.49			80.48	trace			77.88	27.77	50.11	44.80	33.08	W1047/51
108	47 A48	93.26	15.64	19.20	present	48.04		12.36	10.82			199.32	0.46	30.86			0.98	19.60	25.77			122.11	present			75.39	32.01	43.38	30.86	44.53	W1074/51
111B	57	217.35	11.11	22.05	Nil	83.18		32.66	22.47			388.82	0.89	36.75	15.74	36.91			87.99			211.43				174.11	36.75	137.36	81.65	92.46	28.240
111B	57	28.98	1.73	16.26	Nil	18.53		5.57	3.78			74.85	0.17	13.93			11.10	2.17	0.55			47.10	Nil			29.49	27.10	2.39	13.93	15.56	28.2.40
111	57	24.92	1.40	14.78	Nil	19.05		3.86	2.88			66.89	0.15	8.65			9.98			5.11	2.07	41.08	Nil			20.50	20.50	Nil	8.65	11.85	28.2.40
113	35	70.42	11.65	18.00	Nil	35.72		10.58	9.09			155.46	0.36	26.41			3.05	14.60	20.60			90.80	Nil			63.81	30.03	33.78	26.41	37.40	W1064/51
114	34	45.64	6.83	12.90	Nil	30.88		3.07	4.41			103.73	0.74	7.67			11.66	5.20			3.96	75.24	Nil			25.81	21.49	4.32	7.67	18.14	W794/51
115	33	65.25	4.65	15.45	Nil	34.96		7.29	6.91			134.51	0.31	18.20			6.38	5.83	15.23			88.87	Nil			46.63	25.77	20.86	18.20	28.43	W1072/51
116	32	61.04	4.61	16.80	trace	34.95		6.93	6.23			130.56	0.30	17.30			9.04	5.78	9.59			88.85	trace			42.94	28.04	14.90	17.30	25.64	W1069/51
117	36	68.95	13.78	17.25	present	34.47		11.08	9.18			154.71	0.35	27.67			0.93	17.27	21.22			87.62	present			65.44	28.78	36.66	27.67	37.77	W1073/51
119	36	88.03	18.23	18.90	trace	44.03		13.29	11.12			193.60	0.44	31.52	2.28			20.83	27.06			111.91	trace			78.95	31.52	47.43	33.19	45.76	W1078/51

DETAILED ANALYSES OF UNDERGROUND WATERS IN PORTION OF CO. LIGHT

Serial No.	Boston No.	Chlorine, Cl.	Sulphuric Acid radicle, SO_4	Carbonic Acid radicle, CO_3	Nitric Acid radicle, NO_3	Sodium, Na	Potassium, K	Calcium, Ca	Magnesium, Mg	Iron, Fe	Silica, SiO_2	Total Saline Matter Grains/Gall.	Total Saline Matter Ounces/Gall.	Assumed Composition of Salts: Calcium carbonate	Calcium sulphate	Calcium chloride	Magnesium carbonate	Magnesium sulphate	Magnesium chloride	Sodium carbonate	Sodium sulphate	Sodium chloride	Sodium nitrate	Potassium chloride	Silica	Hardness (degrees English): Total	Temporary	Permanent	Due to calcium	Due to magnesium	Analysis No.
1194	37	115.97	13.83	20.55	9.98	61.69		14.29	12.25			248.56	0.57	34.25	2.06			15.56	35.67			NaCl 147.40 KCl	13.68			86.14	34.25	51.89	35.73	50.41	2705/35
120	Oval	75.33	4.61	17.10	Nil	40.41		8.36	7.49			153.30	0.35	20.87			6.45	5.78	17.47			102.73	Nil			51.68	28.52	23.16	20.87	30.81	W1070/51
120B	21	111.50	11.65	17.40	Nil	53.20		14.79	11.73			219.27	0.50	29.00	7.44			8.02	39.59			135.22	Nil			82.75	29.00	53.75	34.48	38.27	3085
120C	21	66.56	8.52	14.25	Nil	14.15		4.50	3.37			127.35	0.29	11.25	10.54			1.63			10.68	93.25				25.12	23.76	1.36	11.25	13.87	3086
120D	13	142.51	11.28	16.80	trace	65.22		18.37	12.89			267.07	0.61	28.00	15.98	6.84			50.48			NaCl 165.77 KCl	trace			98.97	28.00	70.97	45.93	53.04	13.6.35
121	26	26.65	4.53	5.40	present	18.18		1.64	1.86			58.26	0.13	4.10			4.13	3.32			2.78	43.93	present			11.76	9.00	2.76	4.10	7.66	W801/51
122	26	113.05	12.67	10.50	21.89	57.11		9.58	14.51			239.31	0.55	17.51	8.73			8.16	50.36			124.55	30.00			83.64	17.51	66.13	23.93	59.71	W803/51
123	12	55.72	7.24	12.00	Nil	34.87		4.93	4.37			119.13	0.27	12.31			6.49	9.07	2.62			88.64	Nil			30.29	20.00	10.29	12.31	17.98	W800/51
124	81	17.90	4.07	7.05	Nil	12.18		2.36	2.16			45.72	0.10	5.89			4.95	3.61			1.76	23.51	Nil			14.77	11.77	3.00	5.89	8.88	W802/51
125	41	66.22	8.93	14.70	trace	37.97		7.43	6.34			141.59	0.32	18.55			5.03	11.19	10.30			96.52	trace			44.64	24.52	20.12	18.55	26.09	W790/51
126	41	167.65	27.12	19.20	33.60	86.31		25.65	17.52			377.05	0.86	32.02	38.43	4.21			68.62			187.71	46.06			136.16	32.03	104.14	64.06	72.10	W784/51
127	41	74.49	9.71	15.75	present	42.85		8.43	6.62			157.85	0.36	21.05			4.40	12.17	11.32			108.91	present			48.29	26.28	22.01	27.05	27.24	W811/51
128	1	240.80	0.82	43.80	present	120.25		21.44	23.95			451.06	1.03	53.53			16.46	1.03	74.36			305.68	present			152.09	13.08	79.01	53.53	98.56	W806/51
129	1	52.78	0.25	1.50	Nil	30.75		1.86	1.38			88.52	0.20	2.50	0.35	2.10			5.40			78.17	Nil			10.33	2.50	7.83	4.65	5.68	W807/51
130	1	200.20	17.49	24.15	trace	97.02		19.37	19.82			378.05	0.86	40.28	11.01			12.18	67.98			246.60	trace			129.93	40.28	89.65	48.37	81.56	W813/51
132	2	57.40	7.20	16.05	5.85	33.84		8.15	6.31			134.80	0.31	20.35			5.41	9.02	11.48			80.54	8.00			46.31	26.77	19.54	20.35	25.96	W814/51
133	3	33.81	3.70	8.10	5.84	22.52		3.22	3.10			80.29	0.18	8.04			4.61	4.64	3.25			51.75	8.00			20.79	13.51	7.28	8.04	12.75	W810/51
134	4	67.55	9.51	12.30	10.94	38.99		8.36	7.01			154.66	0.35	20.52	0.48			11.49	18.37			88.80	15.00			49.71	20.52	29.19	20.87	28.84	W805/51
135	5	29.10	2.84	9.75	present	15.00		5.36	3.47			65.52	0.15	13.38			2.43	3.56	8.03			38.12	present			27.66	16.26	11.40	13.38	14.28	W792/51
136	5	64.69	5.27	11.85	7.42	31.92		9.15	7.34			137.64	0.31	19.76	4.21			2.88	26.47			74.15	10.17			53.06	19.76	33.30	22.86	30.20	W791/51
137	82	24.55	1.85	20.55	present	23.39		2.22	3.50			76.06	0.17	5.54			12.14			15.17	2.74	40.47	present			19.94	19.94	Nil	5.54	14.40	W793/51
138	665	67.34	7.82	16.65	Nil	42.75		5.88	5.66			146.08	0.33	14.63			11.07	9.80	1.92			108.66	Nil			37.92	27.76	10.16	14.63	23.29	W799/51
138A	663	80.51	14.44	12.45	present	44.23		8.86	7.54			768.03	0.38	20.76	1.87			16.44	16.53			112.43	present			53.15	20.76	32.39	22.13	31.02	W789/51
138B	664	130.06	17.08	22.05	Nil	70.30		11.29	13.85			264.63	0.61	28.19			7.24	21.41	29.10			178.69	Nil			85.18	36.79	48.39	28.19	56.99	W781/51
139	663	91.14	15.26	15.60	Nil	52.77		8.65	8.28			191.70	0.44	21.60			3.72	19.12	13.12			134.14	Nil			55.66	26.00	29.66	21.60	34.66	W786/51
140	738	6.97	2.18	6.90	present	6.69		1.50	1.29			25.53	0.06	3.75			4.47			2.60	3.22	11.49	present			9.06	9.06	Nil	3.75	5.31	W809/51
140A	744	17.50	3.21	8.55	Nil	10.29		4.22	2.27			46.04	0.11	10.54			3.13	4.02	2.19			26.16	Nil			19.88	14.24	5.64	10.54	9.34	W796/51
142	646	73.08	13.13	10.50	present	39.46		8.50	6.62			151.29	0.35	17.51	5.06			11.98	16.45			100.29	present			48.47	17.51	30.96	21.23	27.24	W785/51
143	644	7.80	1.93	8.70	present	4.34		3.72	2.14			28.63	0.07	9.29			4.40	2.42	1.49			11.03	present			18.10	14.52	3.58	9.29	8.81	W787/51
144	647	73.08	10.57	13.05	present	42.78		6.86	6.25			152.59	0.35	17.13			3.91	13.25	9.56			108.74	present			42.85	21.78	21.07	17.13	25.72	W788/51
145	651	20.96	3.54	11.85	trace	12.80		4.36	3.47			56.98	0.13	10.90			7.46	4.44	1.64			NaCl 32.54 KCl				25.18	19.75	5.43	10.90	14.28	21.6.35
146	634	18.20	4.73	11.10	Nil	12.03		3.22	3.63			52.91	0.12	8.04			8.81	5.35			0.68	30.01	Nil			22.97	18.53	4.44	8.04	14.93	W795/51
147	643	8.65	2.35	10.50	trace	6.60		3.36	2.29			33.75	0.08	8.39			7.69	0.35			3.06	14.26	trace			17.81	17.52	0.29	8.39	9.42	W765/81
148	630	69.57	9.63	10.95	present	34.75		8.08	7.45			140.43	0.32	18.26	2.62			9.75	21.46			88.34	present			50.83	18.26	32.57	20.18	30.65	W804/51
149	626	136.85	18.76	15.00	Nil	66.71		15.37	13.15			265.84	0.61	25.02	18.17			7.44	45.63			169.58	Nil			92.49	25.02	67.47	38.38	54.11	W798/51

able No. B3

DEPARTMENT OF MINES—ADELAIDE

Hd. MURROOTPA

DETAILED ANALYSES OF UNDERGROUND WATERS IN PORTION OF CO. LIGHT

58—2.49 255

Serial No.	Section No.	Chlorine, Cl.	Sulphuric Acid radicle, SO_4	Carbonic Acid radicle, CO_3	Nitric Acid radicle, NO_3	Sodium, Na	Potassium, K	Calcium, Ca	Magnesium, Mg	Iron, Fe	Silica, SiO_2	Total Saline Matter Grains/Gall.	Total Saline Matter Ounces/Gall.	Assumed Composition of Salts: Calcium carbonate	Calcium sulphate	Calcium chloride	Magnesium carbonate	Magnesium sulphate	Magnesium chloride	Sodium carbonate	Sodium sulphate	Sodium chloride	Sodium nitrate	Potassium chloride	Silica	Hardness (degrees English): Total	Temporary	Permanent	Due to calcium	Due to magnesium	Analysis No.
3	159	31.15	8.02	15.60	present	19.26		8.93	3.43			96.39	0.20	22.30			3.13	10.05	1.96			48.95	present			36.44	26.02	10.42	22.30	14.14	W1543/51
8	141	32.75	7.90	12.90	trace	20.29		5.93	4.13			83.90	0.19	14.81			5.65	9.90	1.96			51.58	trace			31.81	21.52	10.29	14.81	17.00	W1585/51
9	137	71.27	13.66	15.60	present	38.31		8.15	9.02			156.01	0.36	20.35			4.78	17.12	16.37			97.39	present			57.47	26.03	31.44	20.35	37.12	W1587/51
CB	197	6.15	5.56	7.88	11.49	10.50		3.00	1.59			46.17	0.11	7.49			4.76	1.09			6.94	10.14	15.75			14.05	13.14	0.91	7.49	6.56	W1588/51

DETAILED ANALYSES OF UNDERGROUND WATERS IN PORTION OF CO.

Serial No.	Section No.	Chlorine, Cl.	Sulphuric Acid radicle, SO_4	Carbonic Acid radicle, CO_3	Nitric Acid radicle, NO_3	Sodium, Na	Potassium, K	Calcium, Ca	Magnesium, Mg	Iron, Fe	Silica, SiO_2	Total Saline Matter Grains/Gall.	Total Saline Matter Ounces/Gall.	Assumed Composition of Salts: Calcium carbonate	Calcium sulphate	Calcium chloride	Magnesium carbonate	Magnesium sulphate	Magnesium chloride	Sodium carbonate	Sodium sulphate	Sodium chloride	Sodium nitrate	Potassium chloride	Silica	Hardness (degrees English): Total	Temporary	Permanent	Due to calcium	Due to magnesium	Analysis No.
1	2706	29.90	3.50	9.15	trace	13.28		5.15	4.70			65.68	0.15	12.86			2.02	4.39	12.65			33.76	trace			~~32.20~~	~~15.25~~	~~16.95~~	~~12.86~~	~~19.34~~	W808/51
4	2708	16.50	5.68	11.40	Nil	15.24		2.36	2.23			53.41	0.12	5.89			7.73			4.19	8.40	27.20	Nil			15.07	15.07	Nil	5.89	9.18	W770/51
5	2703	59.15	9.71	19.80	trace	35.17		9.80	6.23			139.86	0.32	24.47			7.21	12.17	6.62			89.39	trace			55.30	34.76	20.54	24.47	30.83	W767/51
6	2703	41.09	8.27	14.55	trace	26.88		4.65	5.05			100.49	0.24	11.61			10.67	9.75			0.72	67.74	trace			32.39	24.28	8.11	11.61	20.78	W764/51
7	2703	38.92	8.23	14.25	trace	26.80		3.93	4.65			96.78	0.22	9.81			11.76	6.24			4.81	64.16	trace			28.94	23.76	5.18	9.81	19.13	W761/51
9	2702	24.15	5.23	12.75	trace	12.73		6.50	4.09			65.45	0.15	16.23			4.24	6.55	6.07			32.36	trace			36.47	22.27	14.20	16.23	20.24	W768/51
10	2702	52.36	11.56	33.60	trace	33.60		10.72	10.23			152.07	0.35	26.77			24.66	14.49	0.74			85.41	trace			68.86	56.02	12.84	26.77	42.09	W762/51
11	2716	37.17	17.16	12.00	Nil	21.10		8.80	5.46			101.69	0.23	20.01	2.67			19.15	6.23			53.63	Nil			49.00	20.01	28.99	21.98	27.02	W769/51
12	2711	42.91	2.53	43.20	present	22.09		14.50	12.39			137.62	0.31	36.20			38.21	3.17	11.90			56.14	present			97.52	79.31	18.21	36.20	61.32	W766/51
13	2702	54.75	8.93	14.85	Nil	29.03		6.93	7.50			121.99	0.28	17.31			6.28	11.19	13.43			73.78	Nil			48.17	24.76	23.41	17.31	30.86	W771/51
14	2716	53.20	8.31	15.00	present	27.64		7.22	7.43			118.80	0.27	18.03			5.89	10.41	14.21			70.26	trace			48.60	25.02	23.58	18.03	30.57	W772/51
15	2702	37.52	6.50	13.35	trace	21.13		5.64	5.33			89.47	0.20	14.88			6.90	8.15	6.62			53.72	trace			36.01	22.27	13.74	14.08	21.93	W773/51
16	2702	27.50	6.21	11.70	trace	15.91		5.14	4.22			70.68	0.16	12.83			5.64	7.78	3.99			40.44	trace			30.20	19.54	10.66	12.83	17.37	W775/51
16A	2721	38.36	6.62	14.07	trace	20.09		7.22	5.53			91.89	0.21	18.03			4.58	8.30	9.91			51.07	trace			40.78	23.46	17.32	18.03	22.75	W777/51
17	2717	114.10	14.90	18.90	trace	56.41		12.01	13.44			229.76	0.53	29.99			1.29	18.67	36.42			143.39	trace			85.29	31.51	53.78	29.99	55.30	W774/51
18	2720	12.00	3.66	9.75	Nil	8.61		2.79	2.75			39.56	0.09	6.97			7.83	2.42			2.56	19.78	Nil			18.29	16.27	2.02	6.97	11.32	W763/51
19	3069	27.25	5.27	15.00	present	19.19		5.57	3.23			75.51	0.17	13.91			9.36	2.62			4.70	44.92	present			27.20	25.02	2.18	13.91	13.29	W725/51
19A	546	106.96	21.97	19.95	Nil	51.63		9.00	17.41			226.22	0.52	22.47			9.11	26.66	36.77			131.21	Nil			94.11	33.29	60.82	22.47	71.69	W783/51
20	3069	16.00	2.76	9.30	trace	11.98		3.57	1.46			45.07	0.10	8.91			5.06			0.64	4.08	26.38	trace			14.92	14.92	Nil	8.91	6.01	W731/51
21	3070	7.49	0.68	4.20	Nil	6.74		0.32	0.69			20.12	0.05	0.80			2.39			3.57	1.01	12.35	Nil			3.64	3.64	Nil	0.80	2.84	W709/51
22	581	14.03	3.81	12.90	trace	12.58		3.04	2.51			48.87	0.11	7.59			8.70			3.82	5.63	23.13	trace			17.92	17.92	Nil	7.59	10.33	W710/51
22A	581	11.57	2.74	9.45	present	7.96		5.00	1.24			37.94	0.09	12.49			2.75	2.23			1.39	19.08	present			17.59	15.74	1.85	12.49	5.10	5083
23	564	19.05	3.33	15.90	Nil	17.77		2.86	2.69			61.60	0.14	7.14			9.33			8.80	4.92	31.41	Nil			18.21	18.21	Nil	7.14	11.07	W1040/51
24	564	64.38	9.26	22.54	present	35.73		9.65	8.82			150.38	0.34	24.10			11.37	11.61	12.49			90.81	present			60.40	37.60	22.80	24.10	36.30	3.3.44
25	2725	35.07	10.70	9.00	Nil	21.95		4.43	4.09			85.24	0.19	11.06			3.33	13.41	1.64			55.80	Nil			27.89	15.01	12.88	11.06	16.83	W779/51
26	2725	28.35	0.16	12.00	Nil	17.85		3.50	3.06			64.92	0.15	8.14			9.50	0.20	1.10			45.38	Nil			21.33	20.01	1.32	8.74	12.59	W778/51
27	2725	30.03	5.39	7.20	Nil	15.51		3.64	4.17			65.94	0.51	9.09			2.48	6.75	8.22			39.42	Nil			26.25	12.01	14.24	9.09	17.16	W776/51
28	1967	9.25	4.98	6.30	trace	9.50		1.50	1.05			32.58	0.08	3.75			3.64			2.58	7.36	15.25	trace			8.07	8.07	Nil	3.75	4.32	W782/51
28A	1968	26.85	3.83	10.95	Nil	12.73		5.86	4.33			64.55	0.15	14.63			3.06	4.80	9.71			32.35	Nil			32.45	18.25	14.20	14.63	17.82	W780/51
29	3068	47.74	5.55	30.15	trace	33.37		9.51	6.58			132.90	0.30	23.74			22.37	0.64			7.45	78.70	trace			50.82	50.28	0.54	23.74	27.08	W730/51
31	567	25.75	4.73	15.60	present	17.71		5.57	3.61			72.97	0.17	13.91			10.20	3.33			3.08	42.46	present			28.77	26.01	2.76	13.91	14.86	W715/51
32	536	41.30	6.25	9.45	Nil	21.71		6.07	4.41			89.19	0.20	15.16			0.51	7.83	10.50			55.19	Nil			33.39	15.78	17.61	15.16	18.23	W718/51
33A	537	126.00	13.62	24.11	Nil	70.03		9.93	13.37			257.06	0.59	24.81			12.97	17.07	24.20			178.01	Nil			19.83	40.20	39.63	24.81	55.02	7.11.40
33B	537	151.06	16.05	24.80	Nil	71.34		13.79	19.85			296.89	0.68	34.47			5.93	20.11	55.14			181.34	Nil			116.16	41.51	74.65	34.47	81.69	31.1.41
34	501	33.81	7.20	16.65	Nil	21.55		4.72	5.90			89.85	0.21	11.79			13.46	9.02	0.78			54.78	Nil			36.06	27.75	8.31	11.79	24.27	W719/51
35	562	61.61	11.69	20.85	present	44.35		4.43	6.40			149.35	0.34	11.86			19.98	3.17			13.55	101/51	present			37.39	34.76	2.63	11.06	26.33	W714/51
36	567	21.40	4.28	11.85	present	12.95		5.36	3.12			58.96	0.13	13.38			5.38	5.36	1.92			32.92	present			26.22	19.76	6.46	13.38	12.84	W712/51
37	3159	245.35	27.57	54.90	trace	142.68		18.30	26.85			515.63	1.18	45.70			38.65	34.55	34.07			362.66	trace			156.10	91.58	64.52	45.70	110.40	W715/5
38	502	38.08	6.13	19.80	Nil	18.36		7.15	8.59			98.11	0.22	17.85			12.79	7.68	13.12			46.67	Nil			53.19	33.03	20.16	17.85	35.34	W720/51
40	532	93.11	11.81	22.95	trace	47.71		9.51	13.22			198.31	0.45	23.74			12.25	14.80	26.24			121.28	trace			78.13	38.26	39.87	23.74	54.39	W721/51
41	503	32.54	5.27	17.70	present	15.45		7.79	6.77			85.52	0.20	19.45			8.49	6.60	11.71			39.27	present			97.31	29.53	17.78	19.45	27.86	W727/51

Table No. 84

DEPARTMENT OF MINES—ADELAIDE

Hd. BAROSSA

DETAILED ANALYSES OF UNDERGROUND WATERS IN PORTION OF CO. ADELAIDE

5m—2.49 265

Serial No.	Section No.	Chlorine, Cl.	Sulphuric Acid radicle, SO_4	Carbonic Acid radicle, CO_3	Nitric Acid radicle, NO_3	Sodium, Na	Potassium, K	Calcium, Ca	Magnesium, Mg	Iron, Fe	Silica, SiO_2	Total Saline Matter Grains/Gall.	Total Saline Matter Ounces/Gall.	Assumed Composition of Salts: Calcium carbonate	Calcium sulphate	Calcium chloride	Magnesium carbonate	Magnesium sulphate	Magnesium chloride	Sodium carbonate	Sodium sulphate	Sodium chloride		Sodium nitrate	Potassium chloride	Silica	Hardness (degrees English): Total	Temporary	Permanent	Due to calcium	Due to magnesium	Analysis No.
42	486	256.90	30.41	26.25	present	133.63		14.86	26.77			488.82	1.12	37.11			5.62	38.11	68.33			339.65		present			147.28	43.78	103.50	37.11	110.17	W728/51
43	1753	126.35	13.78	25.05	trace	60.42		11.86	17.83			755.29	0.58	29.61			10.26	17.27	44.56			153.59		trace			102.97	41.79	61.18	29.61	73.36	W729/51
44	504	28.14	5.64	20.10	trace	16.27		7.50	6.07			83.72	0.19	18.73			12.46	7.07	4.11			41.35		trace			43.70	33.50	10.20	18.73	24.97	W723/51
45	505	18.80	2.88	19.65	trace	12.21		7.50	4.13			65.17	0.15	18.73			11.83	3.56			0.06	30.99		trace			35.72	32.76	2.96	18.73	16.99	W724/51
46	568	21.70	4.65	6.75	present	11.43		3.57	3.15			51.25	0.12	8.91			1.98	5.83	5.48			29.05		present			21.88	11.26	10.62	8.91	12.97	W726/51
48	1733	7.85	1.48	12.00	Nil	8.33		2.50	2.01			34.17	0.08	6.24			6.97			5.83	2.19	12.94		Nil			14.51	14.51	Nil	6.24	8.27	W717/51
49	530	21.35	3.83	17.40	present	11.18		7.58	4.83			66.17	0.15	18.93			8.50	4.80	5.52			28.42		present			38.80	29.01	9.79	18.93	19.87	W711/51
51	508	18.90	4.28	15.45	trace	10.80		7.36	3.65			60.44	0.14	18.37			6.24	5.36	3.02			27.45		trace			33.39	25.78	7.61	18.37	15.02	W716/51
52	523	58.53	6.54	20.40	trace	24.99		12.72	9.07			132.25	0.30	31.76			1.91	8.20	26.86			63.52		trace			69.07	34.02	35.05	31.76	37.31	W722/51
53	3160	34.28	8.64	20.55	present	41.80		7.58	12.72			175.57	0.40	18.93			12.93	10.83	26.63			106.25		present			77.26	34.28	36.98	18.93	52.33	W706/51
54	521	123.90	11.11	22.65	trace	52.02		19.44	15.19			244.31	0.56	37.78	14.64			0.98	58.70			132.21		trace			111.05	37.78	73.27	43.54	62.51	W707/51
55	521	189.70	18.23	25.65	trace	86.43		20.37	22.02			362.40	0.83	42.79	10.97			13.15	75.82			219.67		trace			141.47	42.79	98.68	50.85	90.62	W705/51
56	520	70.14	7.00	22.20	trace	30.53		11.15	11.91			152.93	0.35	27.84			7.74	8.77	30.98			77.60		trace			76.85	37.02	39.83	27.84	49.01	W708/51
58	514	24.15	5.51	22.05	Nil	12.73		8.43	6.77			79.64	0.18	21.06			13.24	6.91	6.07			32.36		Nil			48.89	36.77	12.12	21.06	27.83	W1063/51
59	515	33.75	4.69	17.85	present	12.74		9.94	7.23			86.20	0.20	24.82			4.17	5.88	18.95			32.38		present			54.57	29.76	24.81	24.82	29.75	W1041/51
60	3053	12.40	2.39	19.65	trace	8.29		5.43	5.14			53.30	0.12	13.56			16.19	2.33			0.78	20.44		trace			34.70	32.77	1.93	13.56	21.14	W1059/51

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. 11 — Hundred: BELVIDERE

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
1	343			Dry Well										
1A	341	18		15		488/54	124	Yes			Level		Well - bricked	G.S.H. Mattschoss
2	354	44		41	200-300	1500/51	187.18	Yes			"		Probably alluvium	H.S. Mickan (Well)
3	344	71		53	Small	1598/51	125.90	Yes			"		Timbered well, probably alluvium.	-
4	313	84		80	Small	1596/51	233.18	Yes			"		Ditto	P.A. Braunack
5	342	14		11		1597/51	137.48			Fruit and vege. (Beans and citrus not well)	"		Bricked well, probably alluvium	J.H. Schmitke
5A	354	12		11		487/54	316	Was Used			"		House well 0-1' Hard soil 1- Red loose clay	G.S.H. Mattschoss
5B	354	5		4		489/54	1550				"		Cellar of house Hard sub-soil overlying limestone (?)	"
5C	354	18		Was 15	Small	Not sampled		Was used		Well - Fallen in	"		0-2' Sub-soil; 2-18' Loose clay, with lumps of limestone 18' Hard white limestone	"
6	352	79		67		1540/51	240	Yes			"		Drilled by B. Milich, Tamunda 1/3/40	-
7	350	64		57	Small	1599/51	122	Yes			"		Bricked well. Probably alluvium.	E.B. Kleinig (North Well)
7A	354	96	40	25	400	2512/53	545	Yes			"		Well to 20 ft. Clay at top. Gravel at 90 ft.	A.B. Roehr
7B	354	30						Too salty for stock			"		Old well abandoned	"
8	3003	50		45	"	1609/51	194.88	Yes			"		Bricked well. Probably alluvium.	A.E.A. Mickan
9	3006	54		51	"	1613/51	187.99	Yes		Vege. occasionally (not good)	"		Bricked well. Probably alluvium.	E.B. Kleinig (House well)
10	213	86		84	200-300 gpd.	1539/51	360	Yes			Gully		Hard rock from surface (Indurated sediments)	A.B. John
11	3005	44		40		1611/51	283	Yes			Level		Probably alluvium	North of T.W. Roehr
13	3005	49+		35		1612/51	90.70	Yes			"		Recently cleaned out. Clay and gravel on dump. Some lateritic material.	T.W. Roehr

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

Table No. A.1 Hundred: BELVIDERE

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity; Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
14	375	11		5	Small	1601/51	368.37	Yes	Yes		Gully		Alluvium	H.J. Meldrum
15	3000	14		9		1607/51	462.01	Yes			Level		Alluvium	R.H. Ludewig (Disused House well)
16	3004	27		23		1610/51	116.30	Yes			"		Bricked well, probably alluvium.	M. Dallwitz
17	2998	30		26	2,000 gpd.	1605/51	163.93	Yes		Vegs. but not cucumbers or beans.	"		Water occurring in gravel bed.	W.M. Schols
18	2999	51		50	Small	1606/51	355.37	Yes			"		Alluvium	A. Mickan
19	3000	8		6		1608/51	758.47				Floodway for Stockwell Creek.		Alluvium.	R.H. Ludewig (Disused paddock well)
20	2997	17		11		1604/51	185	Yes			Level		Probably alluvium	-
21	210	51		50	Small	1595/51	188.85	Disused			"		Ditto	Nat. Mickan
22	55	36		33		1589/51	226.51	Yes			Level		Probably alluvium	R.J. Gallasch
23	2993	14		12		1602/51	312	Yes	Yes		"		Ditto	Alf. Maynald
24	204	17		14		1594/51	158.71	Yes		Vegs. (beans no good)	"		Ditto	J.A. Tscharke
25	2993	25		17		1603/51	229.03	Yes	Yes	Vegs. no good	"		Ditto	P. Lewke
26	61		Dry to 24		24'	Disused				Vegs. no good	"		Ditto	G.E. Mibus
27	197	40		23		1591/51	350.98	Yes	Disused		"		Ditto	A.A. Becker
28	95	45		31	Small	1542/51	110	Yes						R. & P. Dittrich (Disused stock well)
29	95	22		20	Small	1537/51	41			Vegs. yes	Level		Alluvium	R. & P. Dittrich (Garden well)
30	74	36		32		1590/51	321.38	Yes					Alluvium	G.E. Mibus

DEPARTMENT OF MINES, ADELAIDE

SUMMARY OF BORE RECORDS

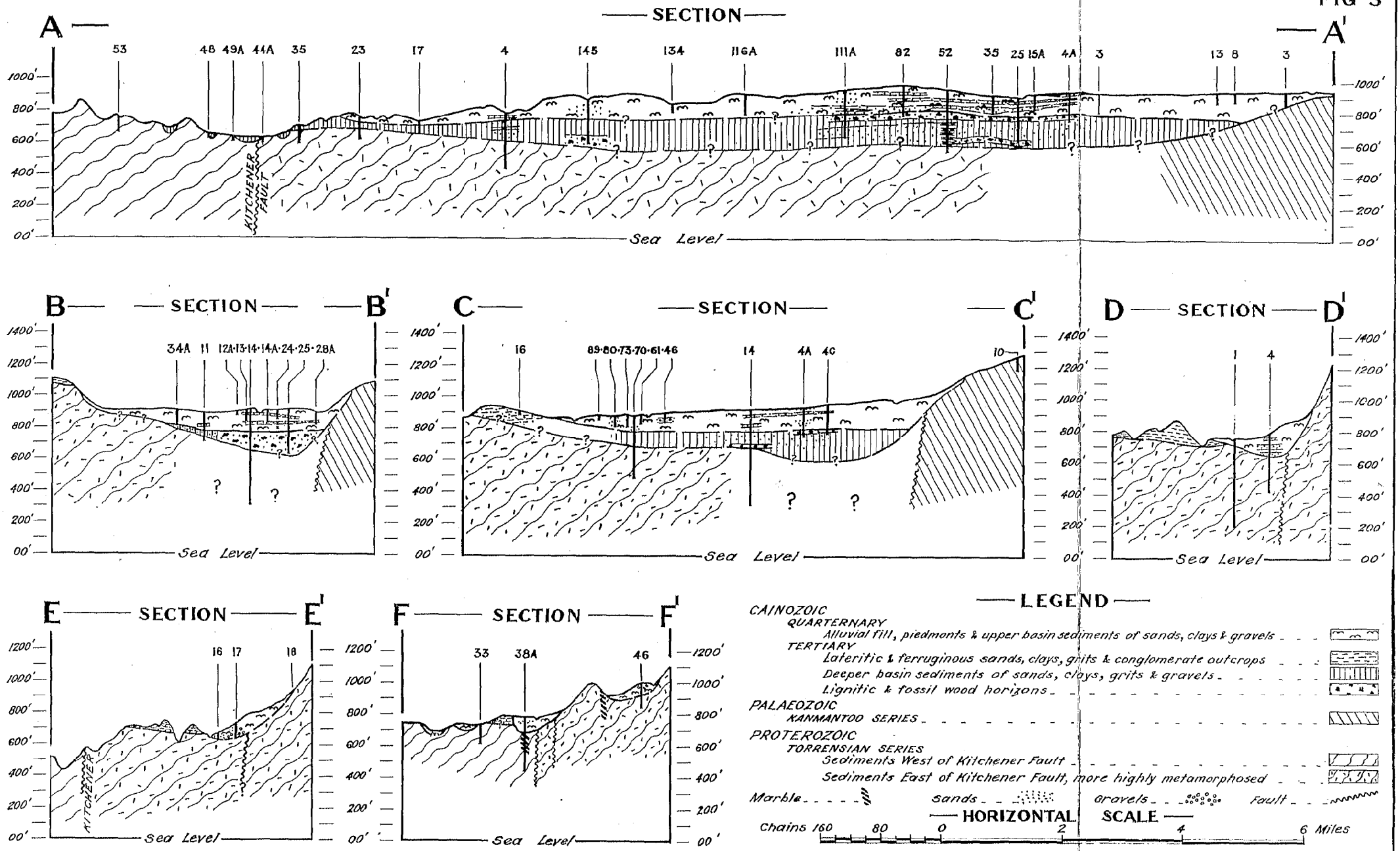
Table No. 21 — Hundred: BELVIDERE

Underground Water Survey of County LIGHT

2M—3.53 1033

Serial No.	Section No.	Total Depth Ft.	Depth at which Water Cut, Ft. below Surface	Static Level, Ft. Below Surface	Tested Output, Gall. per Hour	Analysis No.	Total Salinity, Grains per Gall.	NOTES ON USAGE FOR: Stock	Lucerne	Garden and Domestic	SURFACE ELEVATION: Form	Height above Sea Level	Remarks and Strata	Occupier's Name
31	79	250	At 226' 237' 250'	- - -	2,880 - -	- -	- 1.62 ozs. 1.25 ozs. (Hydrometer)	Abandoned			Level		0-140' Shaft 140-163' Decomposed rock; 163-179' Blue grey rock; 179-192' Grey rock; 192-200' Hard grey rock with seams of pyrite. 220-228' Very hard grey rock; 228-236' Grey blue rock; 236-250' Ditto with lot pyrites. (Horwood, Bagshaw 1937)	Schiller (Abandoned bore)
31A	76	35		30	Poor	2513/53	22	Not used			"		Well Water in sand	E. Schiller
31B	76							Grew vegetables for a while but said to have ruined soil.			"		Well by house	"
32	199	24		23		1592/51	333.41	Disused			"		Alluvium	H.M. Tscharke
33	199	37		23		1593/51	425	Abandoned			"		Alluvium	-
34	200	20		18		1538/51	115	Newly Dug			"		Carbonate clay with concentrations of travertine limestone	E.R. Schulz
34A	78	103	40, 60; 80, 103.		All waters said to be salt.								Bottom in gravel	E.G. Lehman

FIG 3



54·131/4

BAROSSA VALLEY
GEOLOGICAL SECTIONS

S. A. DEPT. OF MINES.

FIG. 1

N

BELVIDERE

NURIOOTPA

DUCK POND SCK.

FLAXMANS VALLEY

NURIOOTPA

ANGASTON

TANUNDA

PARATANUNDA CREEK

NORTH PARA

JACOBS CREEK

MOOROROO

LYNDOCH

BAROSSA

WILLIAMSTOWN

SCALE

Miles 2 1 0 2 4 6 Miles

NORTH PARA CATCHMENT AREA .....

AREA OF SURVEY .....

51·277

S. A. DEPT. OF MINES.

LEGEND

0 - 110 grains per gallon	
110 - 150 " " "	
150 - 220 " " "	
220 - 330 " " "	
330 - 440 " " "	
440 - 550 " " "	
550 - 600 " " "	
660 - 880 " " "	
Over 880 " " "	
Bore	63 = serial No. 160 = salinity
Well	45
Spring	18
Boundary of survey	

STAEDTLER MARS 561 70-13 Made in England

S.A. DEPT. OF MINES

UNDERGROUND WATER SURVEY
BAROSSA VALLEY
BORE LOCATION & SALINITY PLAN

Approved	Passed	
		Drn
		Ted
Director of Mines		Ckd
		Exd

Scale 40 CHNS. TO 1 INCH

L 51-55
GH

Date

KOONUNGA

BELVIDERE

TO TRURO

DIMCHURCH

STOCKWELL R.S.

NUROOTPA

GREENOCK

ANGASTON

TANUNDA

BETHANY

GOMERSAL

B

B'

D