

TR8-146-150

25. ARTESIAN WATER AT SPREYTON

During the 1920s a search for coal and petroleum in the lower Mersey Valley and surrounding districts was carried out by companies known as the Mersey Valley Oil Company, the Adelaide Oil Exploration Company and the Tasmanian Oil Company. A number of deep bores were drilled, some of which produced artesian water from a bed at the base of the Permian. One such bore was drilled on a property belonging to Mr. H. Smith just to the east of Spreyton Railway Station and about $\frac{1}{4}$ mile to the NNE of Mr G. P. Ayers's property. Water was tapped between 425 and 437 feet from the surface. A little to the west of Spreyton Station, when drilling at the bottom of a coal pit, artesian water was struck at 760 feet from the surface. About a mile to the south of Ayers's property, on the northern end of Bonneys Tier, artesian water was struck in a shaft at 128 feet below the surface. Artesian water was also obtained from the basal Permian bed on Native Plain, about $2\frac{1}{2}$ miles to the east of Railton, in one bore at a depth of 263 feet.

Only a few of the bores which penetrated the basal Permian produced pressure water. Three holes, $1\frac{1}{2}$ to 3 miles to the SE of Smith's bore, entered basement rocks without pressure water being recorded. It appears, therefore, that favourable conditions for artesian water in the area are localized.

Mr. Ayers, knowing of the success in the bore on Smith's property which has been rigged for use, and requiring water for orchard irrigation, requested advice on the possibility of obtaining artesian water on his property.

GEOLOGY

The Spreyton area is underlain by Permian sediments and some recent deposits which occur in a wide band along the Mersey River. Burns (1964) gave the following sequence for the Permian, from top to bottom:—

Kelcey Tier Beds.—This unit is 600 feet thick and consists of a sequence of mudstone and pebbly mudstone with bands of siltstone, sandstone and pebbly sandstone.

Mersey Coal Measures.—This is 62-95 feet thick and consists of an upper and a lower sandstone bed separated by a band of mudstone. Several coal bands occur but only one is persistent.

Spreyton Beds.—This unit is 159-578 feet or more thick and consists of mudstone with pebbly bands of mudstone and layers rich in fossils. To the south of Spreyton, the tasmanite oil shale bed occurs at varying heights above the base.

Basal Conglomerate.—The thickness of this unit ranges from 0 to more than 180 feet. It generally has a sand matrix which distinguishes it from the Spreyton Beds. It is from this basal bed that artesian water is obtained.

The Permian sediments have a regional dip to the north of about 10° and the intake area must be to the south, although the exact position is not known. The basal Permian beds are, however, exposed on the northern end of Bonneys Tier. A small fault was encountered in the drilling of Ayers's bore just above the coal seam.

The section below the coal seam appears to be unfaulted in Ayers's hole although there is a possible fault about 355 feet below the collar. Comparing the thickness of sediment between the coal seam and the aquifer in both Ayers's and Smith's bores, a thickening to the south is indicated. In Smith's bore, this thickness was 260 feet and in Ayers's bore it was 295 feet. Drilling of Ayers's bore also indicated a fairly constant slope for the aquifer from the shaft on the north end of Bonneys Tier to Smith's bore. This constancy in slope indicates that between these three points the pre-Permian surface is sloping fairly evenly.

It is not known for certain whether the basement rocks in the Spreyton district are Ordovician or Precambrian. The core logs from Smith's bore showed quartzite under the Permian which could be of either age. Bores to the SE entered limestone which is probably Ordovician, quartzite which again could be of either age, and schist which is undoubtedly Precambrian. Ayers's bore did not pass through the aquifer completely because of drilling difficulties.

DRILLING OF AYERS'S BORE

Date Commenced: 13.2.63.

Date Completed: 16.5.63.

Size of Hole: No. 3 to 61' 11".

NX from 61' 11"—395'.

Casing in Hole: 150' 9".

	<i>Ayers's Bore</i>	<i>Smith's Bore</i>
Depth to Aquifer	395 ft	425 ft
Altitude of Collar	c. 100 ft	40 ft
Output gal./hr.	2500	21,600 (1924) 730 (1963)
Temperature	65°F	69°F
Pressure at Surface lbs./in. ²	stated to be 35	72 (1924) 25 (1963)
Water Quality.	p.p.m.	p.p.m.
Total Dissolved Solids	304.1	312.4
Ca	69.8	65.5
Mg	14.0	13.8
Na	not determined	26.8
Cl	21.2	26.8
SO ₄	0.7	8.3
CO ₂	155.0	140.2

Analyses indicate very similar quality water with impurities occurring in roughly the same proportions.

BURNS, K. L., 1963—Deep Drilling near Latrobe. *Tech. Rep. Dep. Min. Tas.*, 7, 28-36.

BURNS, K. L., 1964—Devonport. *Explor. Rep. Geol. Surv. Tas.* 1-mile Map Ser. K/55/6.

REID, A. M., 1924—The Oil Shale Resources of Tasmania. *Miner. Resour. Geol. Surv. Tas.* 8 (vol. 1).

APPENDIX LOG OF AYERS'S BORE

by A. B. Gulline

From		To		Recovery		Rock Type
ft	in	ft	in	ft	in	
0	0	2	7	1	6	Decomposed rock and soil.
2	7	7	5	0	4	Quartz pebbles
7	5	10	0	0	10	Decomposed fine micaceous sandstone.
10	0	12	7	1	4	Sandstone ending in conglomerate.
12	7	14	0	0	5	Pebbly sandstone.
14	0	16	0	0	1	Clay
16	0	17	0	1	0	Shaly siltstone
17	0	17	9	0	5	Clay
17	9	20	0	1	3	Light grey shale
20	0	25	0	2	2	Friable grey shale
25	0	33	10	7	9	Grey shale
33	10	34	6	0	8	Very fine sandstone
34	6	39	1	3	3	Very fine sandstone becoming shaly and having calcite veins.
39	1	45	0	2	3	Shale.
45	0	55	0	9	8	1' shale then calcareous fossiliferous fine sandstone.
55	0	62	0	5	9	Fossiliferous shaly sandstone.
62	0	70	0	1	0	Calcite vein in fine sandy limestone.
70	0	75	0	2	4	Fine to medium sandstone.

<i>From</i>	<i>To</i>	<i>Recovery</i>	<i>Rock Type</i>
ft in	ft in	ft in	
75 0	79 0	4 0	Dark grey sandy shale.
79 0	84 0	0 5	Shale.
84 0	87 9	1 9	Fine sandstone.
87 9	92 6	1 10	Broken mixed sandstone and shale (fault zone).
92 6	100 0	2 3	Sandstone fine at top, coarse at bottom. Last 3" coal.
100 0	101 0	1 0	Coal.
101 0	125 0	16 5	Very fine to medium grained sandstone, dark bands with mica and organic remains.
125 0	126 0	1 0	Fine sandstone to siltstone.
126 0	135 0	7 1	Medium sandstone.
135 0	141 9	6 0	Very fine to fine sandstone with carbonaceous remains.
141 9	150 0	7 3	12" of carbonaceous shaly sandstone, then medium light grey sandstone with pyrite.
150 0	160 0	7 7	Silty very fine sandstone.
160 0	163 6	1 11	Medium to fine sandstone with small 2 mm pebbles.
163 6	168 8	5 2	Dark grey silty sandstone.
168 8	172 1	0 2	2" quartzite pebbles.
172 1	179 4	5 3	Dark grey silty fine sandstone.
179 4	184 0	3 2	Mainly dark grey siltstone.
184 0	194 6	8 9	Siltstone to very fine sandstone.
194 6	199 0	1 4	Limy very fine to medium sandstone.
199 0	201 4	0 5	Limy very fine sandstone.
201 4	203 4	6 8	Limy fine sandstone.
208 9	211 4	1 6	Shaly and fine dark grey sandstone.
211 4	220 0	5 5	Dark grey siltstone.
220 0	232 0	3 10	Dark grey siltstone to fine sandstone.
232 0	239 0	1 6	Siltstone with calcite and 2" pebbles.
239 0	241 9	2 6	Siltstone.
241 9	252 4	7 3	Siltstone and fine sandstone.
252 4	282 0	8 0	Pebbly mudstone.
282 0	290 0	7 0	Dark grey sandstone and siltstone with pebbles up to 1/2".
290 0	294 0	0 2	Dark grey siltstone, pebbles increasing to base.
294 0	303 5	2 0	Siltstone to fine sandstone with 2 mm pebbles.
303 5	313 0	0 9	Fine to medium conglomerate with a sandy matrix.
313 0	316 4	0 5 1/2	Fine sandstone with siltstone.
316 4	325 0	1 9	Fine pebbly sandstone with siltstone.
325 0	329 6	0 6	Sandy siltstone with 2" pebbles.
329 6	337 6	2 4	Siltstone to coarse pebbly sandstone.
337 6	340 0	0 5	Quartzite and jasper pebbles.

UNDERGROUND WATER

From ft in	To ft in	Recovery ft in	Rock Type
340 0	346 0	5 6	2' 9" mainly coarse pebbly sandstone with minor finer bands and fossils. 1' 10" siltstone, rare fossils. 3" coarse pebbly sandstone. 5" siltstone.
346 0	355 0	7 5	5" coarse sandstone with pebbles. 1' broken siltstone and coarse sandstone. 2' siltstone with pebbles. 1' coarse to fine sandstone with fossils. 2' 9" fine sandstone to siltstone with pebbles. Then coarse sandstone with pebbles, calcite veins and some siltstone. Possible fault at 355'.
355 0	356 5	0 4	Coarse to fine sandstone with pebbles.
356 6	361 0	1 8	Pebbly fossiliferous (<i>Strophalosia</i>) limestone.
361 0	369 0	1 7	Limestone.
369 0	380 0	0 8	Limestone with pebbles.
380 0	395 0	0 11	Pebbles of quartzite.

Percent Recovery 47.9.