

PRELIMINARY REPORT ON THE UNDERGROUND WATER SUPPLY
PROSPECTS ON THE LAWRENNY ESTATE.

Lawrenny Estate is not favourably situated for underground water supplies, at least not in those runs where it is most needed. The greater part of the estate is underlain by dolerite which is not promising as an aquifer, although it makes a good catchment rock for surface dams. Areas containing favourable prospects of underground water do occur but these are mostly in parts already well supplied with surface water.

It is perhaps best to consider briefly in turn the prospects in each of the existing runs, commencing from the Clyde and working towards the Ouse.

This discussion is entirely of a general character and is intended merely to convey the broad picture of the water supply prospects in the area, and serve as a basis on which officers of the Department of Agriculture may determine their detailed requirements. Actual well sites should be selected in collaboration with that department according to the specific needs to be satisfied.

Green Valley Run

Underground water is not promising but permanent surface water of good quality is available from the Clyde River and from Green Valley Creek. The surface rocks are mainly dolerite. However, some fracture zones and small lenses of felspathic sandstone occur, and limited supplies of water could probably be obtainable from these, but there is a considerable element of chance about their discovery. Water from the fracture zones would probably be hard with carbonates of lime and magnesia dominant but would be suitable for stock. Water from the sandstone lenses should be of rather better quality. Run off conditions are good so surface dams should be efficient provided they were located away from fracture zones.

Officer's Bottom Run

Officer's Bottom is almost entirely dolerite and has little prospects of underground water. However, it has a broad frontage to the Clyde River containing permanent water, and also to the creek along its southern boundary. The latter also contains permanent water but it is very brackish apparently because it is fed by brackish springs issuing from a large fault which runs down this valley. Some lenses of felspathic sandstone are intercolated in the dolerite on the south-east side of the small tributary valley immediately north of the rabbiters hut, and these may yield limited amounts of water but the location of them would be very chancy. Patches of alluvium along the Clyde would yield water but these are not required because the Clyde itself is permanent.

River Ellengowan Run is composed entirely of dolerite with a plateau capping of Tertiary basalt in the south-west part. The dolerite is unfavourable for underground water and the basalt is a possible source, but not very promising in this run (see Middle Ellengowan). Permanent water is available in the Clyde and conditions for surface dams are good.

Langloch offers good prospects of water supply. The run consists of dolerite along the Clyde and extending back half a mile to a mile from the river, a basalt plateau jutting in from the north

and an area of felspathic sandstones and Langloh coal measures in the south-west quadrant. ~~Permanent~~ water is available in the Clyde, and also in the creek running south off Ellengowan Plateau. This creek is fed by springs at the base of the basalt flows. The position of these springs is indicated by a group of willows at the head of the gully. Reliable underground water of good quality could be obtained from the Triassic sandstones and the coal measures of this run. Supplies could probably also be obtained from bores to the base of the basalts on the plateau.

River Kimbolton Run has permanent water along its frontage with the Clyde but is not very favourably situated away from the river. Its hills are of dolerite with satisfactory surface damsites. Flanking the Clyde near Hamilton are quartz sandstones of the Knocklofty stage. These probably contain water, probably with a high but tolerable NaCl content, but in any case water is not wanted here. Over the ridge, towards the Langloh road, the dolerite gives place to Triassic sandstones and shales - quartz sandstones towards the south-western corner and felspathic sandstones at the north-western corner. These sediments are water bearing with a good floor of impervious dolerite below, but the dip is away towards the north-west so no great storage can be expected in the rocks on this run although limited supplies could be obtained by drilling.

Clyde Run

This run is mostly Lower Triassic sandstone overlain by Triassic shales and dolerite at the eastern corner along the Clyde. Permanent water is available along the Derwent and Clyde frontages so that no part of the run is more than a third of a mile from running water. Underground water should be obtainable almost anywhere on the run from bores less than 500 feet in depth but the NaCl content is likely to be high although probably within the tolerance for sheep.

Back Bone Run

Back Bone Run is not favourably situated for ground water. The area is almost entirely composed of dolerite, but some lenses of sandstone are included in the dolerite. Limited supplies of water may possibly be obtained from wells sunk in these lenses or on jointed zones in the dolerites. Permanent water is obtainable from a small creek in the south-west corner, which is fed by small springs issuing from a fault zone through the dolerite. This water is brackish but is within the tolerance of stock. The yield from this source could probably be improved and made more certain by a properly placed well. Conditions for surface dams are good provided the fracture zones are avoided.

Middle Ellengowan

This run is mostly on top of the basalt plateau but falls away along the northern boundary to the creek separating it from Back Bone. This valley is in dolerite and between the dolerite and the basalt is a layer of felspathic sandstone which cuts out towards the east. Permanent water of poor quality but suitable for sheep is present in the creek along the northern boundary. This water is partly of underground origin. The basalt plateau will probably yield water to bores of moderate depth - less than 500 feet. This water would probably be hard but should be suitable for all stock purposes though too hard for domestic purposes. The sandstone area may also yield water to shallow bores - say not more than 200 feet.

Front Ellengowan

This run is almost entirely on the basalt plateau and the remarks concerning probable bore water obtainable there from on the Middle Ellengowan Run also apply here. There is a small area of dolerite along the northern boundary and the small creek flowing along this boundary is stated to be permanent. This water is probably largely of sub-basaltic origin.

Napier's Run

Consists of part of the basalt plateau in the northern half and Triassic felspathic sandstone in the south-east, with small dolerite intrusions. Bore water could probably be obtained from both the basalt area and the sandstone area at depths of not more than 500 feet. Both waters should be suitable for all stock purposes, with that from the sandstone probably the better of the two. The only permanent water at present available is that in a creek crossing the extreme north-west corner of the run. This creek is fed by springs issuing from the basalts.

Kimbolton Run

Consists largely of Triassic shales with some felspathic sandstones in the north-east and quartz sandstones in the south. There are also patches of basalt and broad dyke of dolerite. There is no permanent water on the run. A large dam in the shale area has been considered permanent but dried out for the first time on record in the 1945 drought. Underground water can probably be obtained at many places on this run, but it may be necessary to drill to several hundred feet for permanent supplies. Water quality should be satisfactory for stock and in general is likely to be better in bores in the north-eastern part of the run than those in the south.

Runs between Lyell Highway and Bare Hills

This area is generally lowlying with scanty exposures of rock and has for the most part been cultivated. The underlying rocks are probably mainly Lower Triassic shales similar to those outcropping on Clyde Hill above Hamilton. These shales are broken by small intrusions of dolerite. On the whole the set-up is not promising for underground water supplies and there is no permanent surface water in the area. However, geological information is scanty, and it is not impossible that well water could be obtained. The best hope is probably from a shallow dug well near the course of the natural drainage because the greatest movement of underground water in this area probably takes place at shallow depth not far below the soil level. The marshy tendency of the drainage channel south of the race course rather suggests this possibility.

Bare Hills

The Bare Hills Run is mainly composed of dolerite and has no surface water except where it runs down to the Derwent opposite the mouth of Jones Rivulet. Underground water could probably be obtained by bores several hundred feet deep located along the southern boundary of this run. This water is likely to be high in NaCl, though probably tolerable by sheep.

Lord's Hill

This run is almost entirely on dolerite and is unsuitable for underground water. It has permanent water in the small creek on its southern boundary. This water is largely of

sub-basaltic origin. There is not much prospect of improving the supply.

Big Black Hill Run

This run is entirely in dolerite except for a patch of basalt near the north-west corner and a few fringes of basalt which just cross the fence line from the main basalt plateau. There is no underground source of water, but the run is a natural catchment basin and permanent water is available in the creek which runs down its centre. If there is any doubt concerning the permanence of this supply, this creek is very suitable for damming at several points.

Big Single Tree Run

This run is mainly on top of the basalt plateau but on the south drops down onto the Miocene lacustrine clays and ferruginous sands. At present the run is watered by three permanent springs, which issue from points low in the basalt. Further supplies of underground water could be obtained from bores in the basalt area.

Little Single Tree Run

Is entirely on Tertiary lacustrine sediments consisting mainly of white clays below with cappings of ferruginous sand above. The run is watered from a spring issuing from the base of the ferruginous sandstones, and also from the Lawrenny irrigation canal at the lower end. The area is not particularly promising for underground water but there is some prospect of finding satisfactory wells in the Miocene sediments.

Top Run

Conditions here are much the same as on Little Single Tree Run. The only existing water is from a spring from the base of the ferruginous sandstones beside the Lawrenny Lane.

Lower Run

Has frontage to the Derwent River which at present constitutes its source of water. Away from the river there are reasonable prospects of obtaining bore water at depths less than 500 feet from Triassic sandstones. This water is likely to be salty but tolerable by stock. The portion between the dolerite ridge and the main highway is not so promising.

Lodge Run

This run consists of felspathic sandstones intruded by sills of dolerite. At present permanent water is supplied by the Ouse River which adjoins it on the west. Back from the river there are good prospects of obtaining water of good quality from bores of less than 500 feet depth.

Derwent Flats

The flat country along the Lower Ouse and the Derwent River down to the Ellendale Road should yield water readily to dug wells of moderate depth. This water should be of satisfactory quality for stock and possibly for other purposes.

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