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solutions for your environment



22 June 2004

Mr Stuart Donaldson Marlborough District Council P O Box 443 BLENHEIM

Dear Stuart

RE: DEEP WELL OPTIONS FOR RENWICK

With regard to our report on "Investigation into an alternative source for the Renwick Water Supply" dated August 2003, you have asked about the prospect of a deeper drilling option.

As part of our original report we did consider deeper well options. In general, the geologic formations will tend to become less permeable at depth, although there is always considerable variability in these gravel strata so there is still the prospect of encountering permeable gravels in deeper bores. However, high yielding permeable gravel strata will occur less frequently at depth compared to the known yields that occur in the shallower strata.

We are aware of three deep bores in the Renwick area. Two were reportedly drilled to 39.6 m (P28w/O426) and 47.4 m (P28w/3936) but were either abandoned or screened at shallower depths (<20 m). The third deep bore in the area is P28w/4025 which is screened from 49.2 – 52.2 m deep and yielded 18.8 L/s for a drawdown of 18.66 m. This is a relatively low yielding well compared to wells at shallower depths, as indicated in Figure 10 of our report (which is attached to this letter). There is no information on drilling to depths greater than 52 m in this area, but permeable gravels could still be encountered at these greater depths, although at a lower frequency than in the shallower strata.

On the basis of the available information we recommended a target well depth of 20 – 25 m. This depth is chosen as a balance between going deeper, to seek better quality water (and avoiding turbidity effects from the river) and going shallower, to achieve the best yields.

The possibility of a successful deeper bore cannot be ruled out, however, based on the existing data such an approach should be viewed very much as an exploratory venture to investigate deeper strata. The drilling of a deeper bore is more likely to find a "secure" groundwater source, as defined by Ministry of Health, but there is no firm evidence to suggest that a high yielding bore will be found.

Therefore, our recommendation for the most likely successful bore for Renwick remains unchanged, at a target depth of 20 - 25 m. However, drilling deep bores into new areas is always of interest. If you choose to drill a deeper bore it should be done on the basis of an exploratory venture rather than a recommended approach for the most successful supply option. That being the case, the target depth for a deep bore should be determined by the budget you are prepared to allow for exploratory purposes (with no guarantee of a successful water supply that will be any deeper than the more conservative approach of less than 25 m deep).

PATTLE DELAMORE PARTNERS LIMITED

RE: DEEP WELL OPTIONS FOR RENWICK

We trust this information clarifies this situation. Please contact us if you have any further questions.

Yours sincerely

PATTLE DELAMORE PARTNERS LIMITED

P.F. Callack

Peter Callander

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Figure 10a: Plot of depth to base of well screen (m) versus well specific capacity $(m^3/hour/m)$.

Figure 10b: Plot of depth to base of well screen (m) versus well yield (m³/hour).