

Decommissioning Wells and Boreholes

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Introduction

Boreholes and wells inevitably become redundant as brownfield sites once used for industrial or commercial purposes are redeveloped or at domestic properties where mains water has been connected. These redundant boreholes present an environmental and physical risk.

Risks

If unsuitably abandoned these boreholes and wells may provide a potential pathway for contaminant transport from the surface, shallow or at depth, or present a physical risk.

This may take the form of contaminants entering or being produced by the borehole...

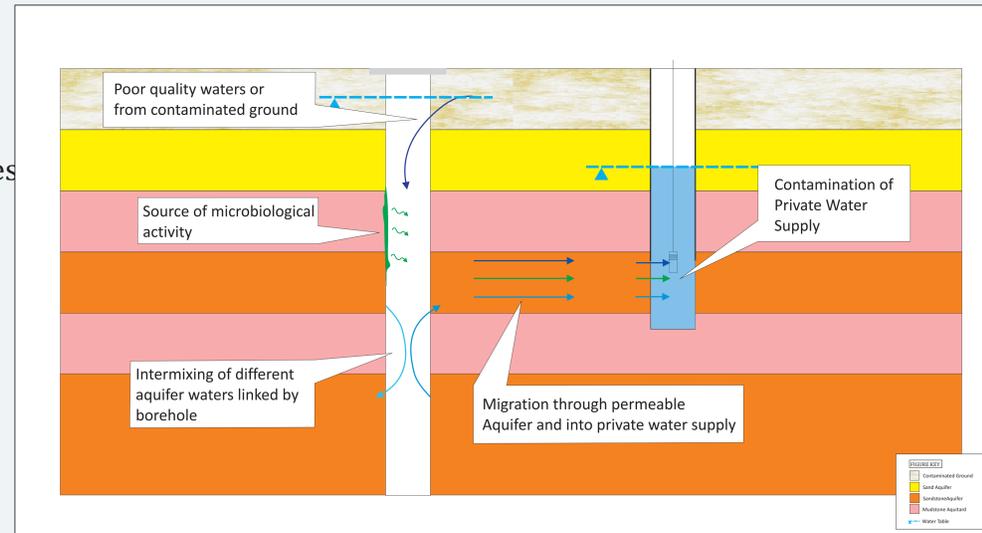


Fig 1: Sources and mechanisms of contamination and contaminant migration.



Photo 3: An example of Artesian conditions at well head. As well as being a waste of water uncontrolled conditions over time deplete the Aquifer and depress the local water level and therefore affect other users of the groundwater.



Photo 1: Deteriorating casing creates a pathway into the borehole

...physical detrimental effects at the surface...

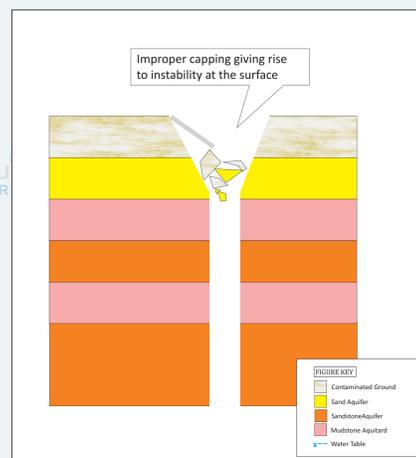


Fig 2: Surface instability and eventual collapse due to poorly constructed or designed caps.

...or its effect on the water table:

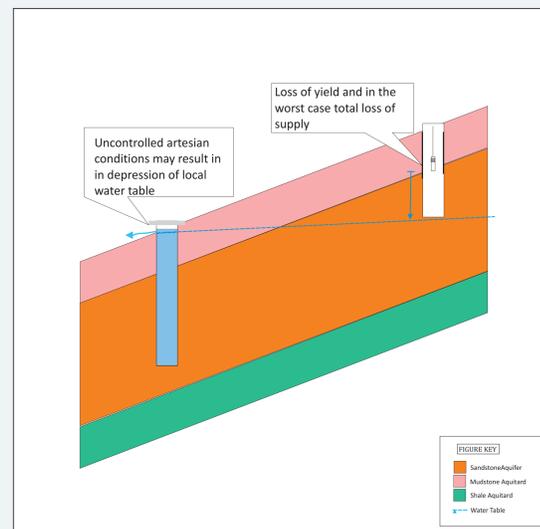


Fig 3: uncontrolled Artesian conditions in the redundant hole allow the reduce the local water table.

Treatment

It is therefore necessary to decommission redundant boreholes and wells to mitigate these risks. figure 4 below Gives examples of how this can be achieved:

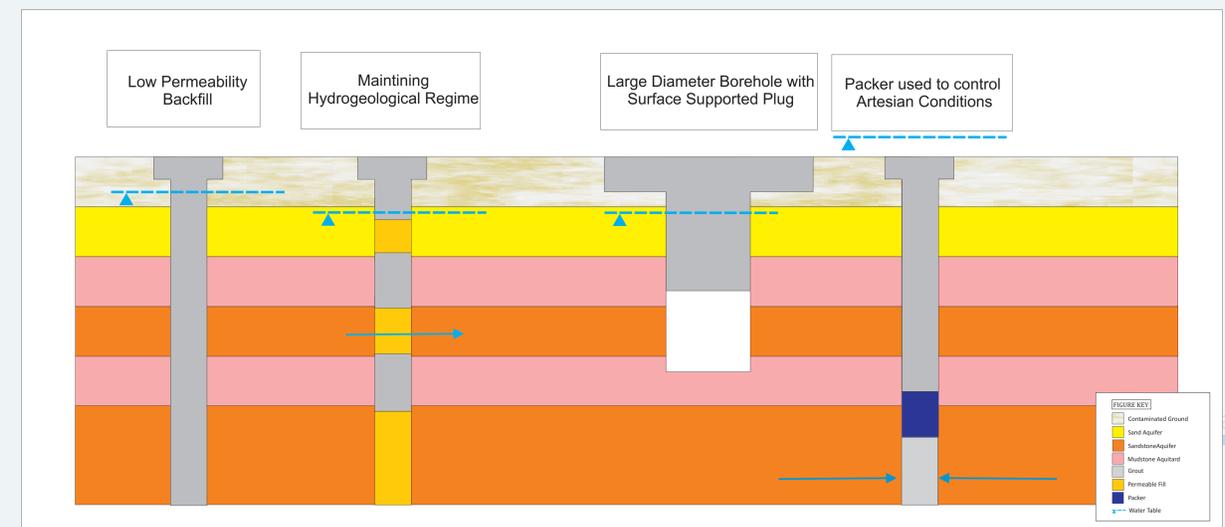


Fig 4: Examples of Treatment

Investigation

Most of the time, little information is available on the redundant borehole, it is therefore necessary to conduct a geophysical survey. The information collected during the survey provides a basis for the decommissioning procedure and back fill design.

Table 1 below lists specific tests and why they are conducted:

Geophysical Test	Reason
CCTV	Visually establish the condition of the casing
Caliper	Confirm the diameter & calculate volume
Natural Gamma	Confirm the recorded geological log
Fluid Temperature and EC	Detect and establish main inflow horizons
Flow	Detect and establish main inflow horizons
Sonic Bond	Establish the integrity of the casing

Table 1: Geophysical Survey

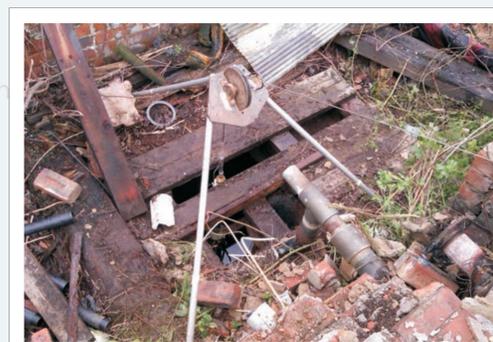


Photo 2: Geophysical testing being conducted on an Artesian Well. The survey uncovered information which fundamentally changed final design method it is therefore critical that a geophysical survey be conducted on the borehole.

Summary

The Key requirements for decommissioning are:

- ✓ Closure of contaminant pathway from surface
- ✓ Remove any connection between different aquifers
- ✓ Make Borehole Safe
- ✓ Prevent uncontrolled artesian conditions
- ✓ Maintain previous hydrogeological regime