Notes on aquifers and geology of King's Pond

Notes on the geology beneath Kings Pond and around Alton

In the below the following definitions are used:

Aquifer - the geology that holds water

Aquiclude - the geology that excludes water from passing through it

Aquifers There are three aquifers below Alton:

1. The Chalk aquifer (in the Zigzag Chalk Formation) which is held up by the West Melbury Marly Chalk below i.e an aquiclude and stops further drainage downwards. However, water leaks out from the edge where the Zigzag Formation outcrops at the surface with springs all the way along from the source of the Wey through past Holybourne where the Upper Greensand outcrops on the surface as bedrock. It is from the chalk aquifer that Alton obtains its water supply, initially from the Weysprings pumping station on the Basingstoke Road which was closed in 2003 as unsustainable and now from Lasham where again it exploits the same aquifer in the Zigzag Formation but there, deep underground.

2. There is a small aquifer at the base of the Upper Greensand with the Gault Clay below acting as the aquiclude and a small springline at the Upper Greensand/Gault junction where they outcrop at the surface. This aquifer has only a limited catchment area where the Upper Greensand outcrops on the surface and so has limited water store, sufficient for well uses in cottages but not significant to supply a town, hence ignored by Water Abstraction services.

3. There is a significant aquifer at the base of the Lower Greensand in the lower parts of the Hythe Formation sandstone that is underpinned by the Atherfield Clay aquiclude. The junction outcrops at the surface behind Haslemere Museum where there are springs and this aquifer supplied the old town well and now this aquifer, away from the spring seepages is accessed for the water supply of Haslemere. It is this Lower Greensand aquifer that is monitored by the Environment Agency by a deep borehole at Weysprings, presumably with a view to future water supply for Alton should the chalk aquifer prove unsustainable with large scale development in future. This has water of a totally different chemistry and is iron-rich rather than calcareous with brown scale inside kettles in Haslemere instead of white limescale in Alton. The Upper Greensand aquifer does not impinge on the surface in Alton – all Alton's springs derive from the chalk aquifer.

Water Environment Limited (WEL) in their Weir Removal Feasibility Study made the observation that, *given the nature of the superficial deposits beneath the site, it is likely that groundwater is in hydraulic continuity with the watercourse. This allows groundwater to enter the river and also drain from the river during drier periods.* This can be observed through the season as the river progressively dries along its course as the level in the aquifer falls. In late summer 2025 the river dried all the way to Kings Pond. Despite there being no inflow there was still some outflow from the pond indicating that it is also spring fed. WEL also commented: *at present, the thick silt layer in the pond is likely to prevent significant direct interaction with groundwater at the base of the pond.....*

Note that the height of the aquifer (the water table) rises and falls seasonally and the chalk being a shallow aquifer soon responds to replenishment by rain but there can sometimes be a lag in the springs flowing. The depth of the acquifer at the Wey Springs monitoring point, there are three monitoring points and their borehole references can be found at environment.data.gov.uk - search for Wey Spring Chalk in "hydrology data explorer".

Dr J.Chatfield and T.Pinchen

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Note: To be read in conjunction with the Alton Geology Diagram, attached.

Also, attached Geotechnical information from the recent CALA development on the Wey upstream of Kings Pond.