

Basingstoke Canal – Report to JMC – February 2013

Summary of BGS ‘Water Prognosis Reports’

1) Background

The Basingstoke Canal Water Strategy Group (WSG) is exploring a wide range of options to retain and/or provide extra water to the canal during dry weather conditions, to ensure through navigation is available throughout the year. One option under consideration is the use of existing or new borehole(s). Following recommendations from the WSG, the Canal Owners (HCC & SCC), agreed to place an order (£1,900) with the British Geological Survey (BGS) for ‘Water Prognosis Reports’ at seven sites along the canal (see Map of Search Area for Extra Water).

A Water Balance diagram produced by WSG indicated that nominally 4.5MI/day extra water is required in dry weather, to allow through navigation (all to be verified). Recently the Environment Agency have agreed to an increase in the Woodham abstraction rate from 1.7 to 3.4MI/day, hence reducing the amount of extra water now required to nominally 2.8MI/day in dry weather conditions.

2) Salient observations from BGS Conclusions

- a) Two areas are considered appropriate for further investigation;-
 - Colt Hill, Odiham (potential of 0.9MI/day)
 - Former South East Water pumping station, now owned by Mitie Group, this is also the location of the BCA Frimley ground drainage water pump, (potential of 0.4MI/day)
- b) Brief characteristics for each of the sites are shown in the attached Table. The extra date provided for the former South East Water pumping station is shown as site 6a.
- c) The general levels of yield are lower than anticipated, particularly as within a 10Km of the canal there are three public water pumping stations (Greywell, Itchel and Boxall) , plus the Greywell aquifer feeding the canal, each producing 4 to 6MI/day.
- d) The public water pumping stations all produce much larger water volumes for two main reasons, (a) they are located in river valleys which enhance the general yield from the chalk and (b) each has a series of boreholes with interconnected headers to combine their flows.

3) Summary of BGS Data

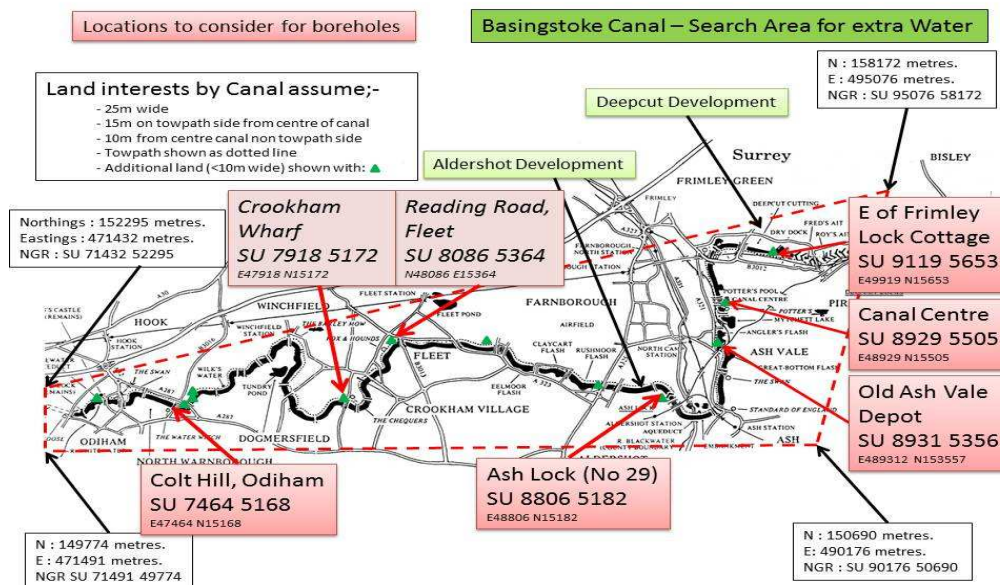
Throughout Southern England, the bed rock is the Chalk which provides the major aquifers. Chalk is the bed rock throughout all seven sites, all with a layer of London Clay. The clay provides some protection against contamination of water in the chalk. Above the clay are varying depths of Superficial Deposits (these are sands, silt and some friable clays, which include the Bagshot Formation and Bracklesham Group).

Water may be pumped from a borehole that is either deep into the Chalk or from a shallower borehole into the Superficial Deposits. Water from the Chalk will generally be cleaner than water from the Superficial Deposits. Water tests would be required from any chosen location to assess if the yield, salt content and acidity of the water were appropriate for the Canal and if a sand screen and filter pack was required to prevent ingress of fine grained material.

The success of a borehole into chalk is dependent on the number, size and distribution of fractures it intercepts. Drilling deeper than 60m into saturated chalk is unlikely to increase yield. The Chalk becomes deeper towards the north-east and correspondingly becomes less saturated, as fewer fractures are available.

Each of the seven reports is very detailed and highly technical, comprising nominally 30 to 40 pages, half specific to the site, the rest detailing known data of boreholes within a 2Km radius of the site. In addition there are specific sections on ‘aquifer properties’ and ‘aquifer re-charging’.

Map of Search Area for Extra Water



Overview of BGS Reports - The following table provides salient data from the BGS Conclusions.

Location	Site No.	Aquifer	Yield potential		Total Depth m	Dia mm	Depth in aquifer
			L/sec	MI/day			
Colt Hill	1	Chalk	10	0.9	100-110	150-250	50-60
Crookham Wharf	2	Chalk	<2	0.17	180-200	150-250	50-60
Reading Road, Fleet	3	Chalk	<1	0.09	200-220	150-250	50-60
Ash Lock (Lock 29)	4	Chalk	<1	0.09	220-230	150-250	50-60
Ash Vale Depot	5	Chalk	<2	0.17	240-270	150-250	?
Canal Centre	6	Chalk	<2	0.17	260-300	150-250	?
Old Frimly Pump Stn	6a	Bracklesham Grp	4	0.35	?	150-200	?
Frimley Lock Cottage	7	Chalk	<2	0.17	255-275	150-250	?

General Notes

- Chalk bedrock occurs for all 7 sites.
- A layer of London Clay above the Chalk provides some protection against contamination.
- Above the London Clay are varying depths of Superficial Deposits (Sands; Silts and Friable Clays)
- Possible yeild from Superficial Deposits, generally <2 in all sites expect 6a
- Yield is unlikely to be increased with increased depth in chalk
- Potential Yield might be increased with 600mm dia bore, or by additional bores
- Water testing essential for pH and fines etc.
- Potential for dry well if no fractures in chalk for sites 5,6 & 7

Saillient Observations from BGS Reports dated Dec 2012, by J How February 2013.

Contact details with BGS

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