

**From:** [REDACTED]  
**To:** [REDACTED]  
**Cc:** [UKRI FOI Requests](#)  
**Subject:** RE: BGS WWW MAIL FROM: [REDACTED] : FOR ACTION: Groundwater Level/Aquifer Properties Enquiry -  
Knottingley. Our ref IDA 276523  
**Date:** 16 September 2020 17:53:55  
**Attachments:** [image003.png](#)

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Dear [REDACTED]

Our ref: IDA 276523

Thank you for your request made under the Freedom of Information Act 2000 and the Environmental Information Regulations 2004. Because it concerns environmental information we have considered it under the terms of the Environmental Information Regulations (EIR).

We identified four separate requests:

1. The regional groundwater levels in the aquifer units within a 10km radius of 450294 (E) 421931 (N) (NGR: SE 50294 21931)
2. Any information/data you can provide on both current regional groundwater levels and long-term groundwater level trends within the Brotherton Formation (Upper Magnesian Limestone) and the Cadeby Formation (Lower Magnesian Limestone).
3. Recommendations of any publicly available papers which examine the potential impact of climate change on groundwater levels in/around the Knottingley/West Yorkshire area or provide any narrative of the expected impacts on regional groundwater levels going forward.
4. A summary of the main hydrogeological parameters for the main on-site lithologies (i.e. permeability, porosity storage coefficient etc.). The identified main lithologies are the Brotherton Formation (Upper Magnesian Limestone), the Edlington Formation (Middle Permian Marl) and the Cadeby Formation (Lower Magnesian Limestone).

The answers to these requests are as follows:

**1. The regional groundwater levels in the aquifer units within a 10km radius of 450294 (E) 421931 (N) (NGR: SE 50294 21931)**

The information BGS holds is freely available on the On-shore Geoindex <http://mapapps2.bgs.ac.uk/geoindex/home.html>. Please search for borehole sites. Many of these will indicate historic groundwater levels dated at the time the boreholes were drilled, rather than currently. Please note that site investigation records detail water strikes or levels during drilling that may not have fully stabilised, or may not represent the whole formation (but could be perched levels representing just the small thickness penetrated). A subset of these records 'water wells' (under 'boreholes other') gives water levels for just the water boreholes.

Hydrogeological maps have been published for the South Yorkshire area, which includes your area of interest <http://www.largeimages.bgs.ac.uk/iip/hydromaps.html?id=southern-yorkshire.jp2>  
The North East Midlands map lies just to the south, <http://www.largeimages.bgs.ac.uk/iip/hydromaps.html?id=northern-east->

[midlands.jp2](#)

I'm afraid there is no information on water levels in the Magnesian Limestone on either map for the area of interest. The Environment Agency may have produced regional groundwater level contours for this area, and often hold more recent data for a wider variety of sites.

**2 Any information/data you can provide on both current regional groundwater levels and long-term groundwater level trends within the Brotherton Formation (Upper Magnesian Limestone) and the Cadeby Formation (Lower Magnesian Limestone).**

This report on the physical properties of the Major Aquifers has some useful back ground information on the regional Upper and Lower Magnesian Limestone aquifers <http://nora.nerc.ac.uk/id/eprint/13137/1/WD97034.pdf>

Sites with long term with groundwater level data are also found in the Geindex <http://mapapps2.bgs.ac.uk/geoindex/home.html> The dataset is called 'well water levels' and is listed under the 'boreholes other' theme, where you can view the location and start and end dates we hold data for. To access the data there is a charge for the administration of supplying this data of £5 + VAT per site. Please contact [hydroenq@bgs.ac.uk](mailto:hydroenq@bgs.ac.uk) if this is of interest to you.

BGS holds groundwater data for only one site within 10k of your site, in the Lower Magnesian Limestone: Westfield Farm SE51/2 NGR SE 5210 1530, monthly data from 1971 – 2019, however, there may be other observation boreholes in the area which the Environment Agency (EA) hold data for. The EA may be able to comment on long-term trends as they are the regulatory authority for groundwater in England and their local offices will have more detailed knowledge of the local area. There may be relevant EA reports on the Gov.uk website.

**3 Recommendations of any publicly available papers which examine the potential impact of climate change on groundwater levels in/around the Knottingley/West Yorkshire area or provide any narrative of the expected impacts on regional groundwater levels going forward.**

The only work that BGS has done that is relevant to the historic or future impacts of climate change on the Zechstein/Magnesian Limestone in the Knottingley/West Yorkshire area would be any sites modelled as part of the original Future Flows project. See the web pages at <https://www.bgs.ac.uk/research/groundwater/change/FutureFlows/sites.html>

Dalton Holme (in the Chalk) is the closest site modelled. There is one site in the Magnesian Limestone at Swan House (NZ 252 199; but this is significantly further north).

The only other work that might be relevant is a paper by Bloomfield et al published on historic changes in drought in the Chalk at Dalton Holme, Yorkshire and the effect of anthropogenic warming in HESS at <https://hess.copernicus.org/articles/23/1393/2019/hess-23-1393-2019.pdf>, but again this is a Chalk site.

**4 A summary of the main hydrogeological parameters for the main on-site lithologies (i.e. permeability, porosity storage coefficient etc.). The identified main lithologies are the Brotherton Formation (Upper Magnesian Limestone), the Edlington Formation (Middle Permian Marl) and the Cadeby Formation (Lower Magnesian Limestone).**

The sites for which we hold aquifer properties data (laboratory measurements of porosity and permeability values and field scale transmissivity, specific capacity and storage coefficients) are also in the Geindex, <http://mapapps2.bgs.ac.uk/geindex/home.html> (see 'aquifer properties under the 'boreholes other' theme). There is a charge for the administration of supplying this data of £5+ VAT per site. If this is something that is of interest please contact [hydroenq@bgs.ac.uk](mailto:hydroenq@bgs.ac.uk). The summary data was originally available on the CD that is provided with the physical copy of the report, 'Physical properties of the Major Aquifers of England and Wales, WD/97/34'. However, due to the format of the data files, this is no longer the case, and currently the data for both the major and minor aquifers is available on the CD that is provided with the physical copy of the report, 'Physical properties of the Minor Aquifers of England and Wales, WD/00/04'.

BGS could summarise all the hydrogeological data we hold for the Magnesian Limestone aquifers (Cadeby and Brotherton formations) in the area around Knottingley in a report that could be ordered through our GeoReports service <https://shop.bgs.ac.uk/Shop/Department/GeoReports>. Alternatively, we could tailor something to the large size of your search area, however there would be a charge for these services. If they are of interest to you please let us know and we can prepare a quote. The reports would be based on all the above mentioned resources. We have noted however that you have access to more local data, that is also more recent, and therefore it could be that our reports might not be that useful to you.

I hope this fully answers your questions. If you feel we have failed to comply with your request in accordance with the requirements of the Regulations, you have the right to ask for an internal review (Regulation 11). Internal review requests should be submitted in writing within 40 working days after the date on which you believe we failed to comply with the requirements – normally the date of receipt of our response to your request. This should be addressed to The Complaints Officer at NERC, Polaris House, North Star Avenue, Swindon, Wilts SN2 1EU. There is no charge for this review.

Please remember to quote the reference number above in any future communications.

If you are not content with the outcome of the internal review, you then have the right to apply directly to the Information Commissioner for a decision. The Information Commissioner can be contacted at the Information Commissioner's Office, Wycliffe House, Water Lane, Wilmslow, Cheshire, SK9 5AF. Telephone: 08456 306060, or: 01625 545745. Website: <https://ico.org.uk/>

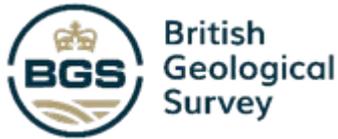
Regards



Enquiry Service Manager

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**Sent:** 18 August 2020 15:08  
**To:** [REDACTED]  
**Cc:** enquiries <[enquiries@bgs.ac.uk](mailto:enquiries@bgs.ac.uk)>  
**Subject:** BGS WWW MAIL FROM: [REDACTED] : FOR ACTION: Groundwater Level/Aquifer Properties Enquiry - Knottingley

## BGS Website Email from: [REDACTED]

### FOR ACTION: Groundwater Level/Aquifer Properties Enquiry - Knottingley

**From** [REDACTED]

Dear [REDACTED],

I am writing to you as following a review of the BGS' groundwater level page, I understand that you are in the best position to assist me with my enquiry. My company has been commissioned to undertake a review of local and regional groundwater levels at their site in Knottingley, West Yorkshire; the centre of which is located at approximately 450294 (E) 421931 (N) (NGR: SE 50294 21931), to ensure that have as complete and up to date understanding of the surrounding hydrogeological environment.

To best accomplish this I would be most grateful if information regarding the regional groundwater levels in the aquifer units within a 10km radius of our Client's landholding. A review of the site's geology indicate that the main aquifer units present at the site are the Brotherton Formation (Upper Magnesian Limestone) and the Cadeby Formation (Lower Magnesian Limestone). Any information/data you can provide on both current regional groundwater levels and long-term groundwater level trends within both of these lithologies would be greatly appreciated.

In addition to the above, I was wondering whether you would be willing to recommend any publicly available papers which examine the potential impact of climate change on groundwater levels in/around the Knottingley/West Yorkshire area or provide any narrative of the expected impacts on regional groundwater levels going forward.

Finally, we have geotechnical and hydrogeological data derived through site investigations undertaken at the Client's landholding, however, to validate this data and further develop the Site's Conceptual Site Model I would be grateful if you could provide a summary of the main hydrogeological parameters for the main on-site lithologies (i.e. permeability, porosity storage coefficient etc.). The identified main lithologies are the Brotherton Formation (Upper Magnesian Limestone), the

Edlington Formation (Middle Permian Marl) and the Cadeby Formation (Lower Magnesian Limestone).

Please confirm whether this request would fall under the Freedom of Information Act 2000 and Environmental Information Regulations 2004 or whether this request falls under a different mechanism.

I look forward to receiving your response at your earliest convenience. Should you require any further information to support this request, please do not hesitate to contact me by return email.

Yours Sincerely

[Redacted signature block]

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