

Who we are

Aquaterra are specialist water and environmental consultant providing practical services for ground source heating and cooling (GSHC) systems.

We have a wealth of geological and hydrogeological expertise spanning many countries and industries.

Our in-depth understanding of the subsurface environment and hydraulic and thermal transport mechanisms enables us to provide practical solutions that meet our clients' goals, schedules and budgets.

Our capabilities

It is our aim to provide practical support to drilling contractors, developers, surveyors, architects, regulators and planners.

Our services include geological assessments, system design, interference modelling, test pumping and Long-term Sustainable Output (LSO) analysis. These are essential tools which allow system installers to ensure maximum system efficiency and to quantify the potential impacts of seasonal or climate change related water table fluctuations.

Regulatory

We maintain up to date knowledge of UK and international legislation, which is essential for fast moving sectors such as the GSHC industry.

Some schemes require environmental impact assessments and/or geotechnical investigations. We maintain partnering relationships with a number of specialist consultancies and can bring these services to your projects as required to efficiently meet these regulatory requirements.

Feasibility

- Borehole Prognosis (water)
- Geo Assessments (GSHC)
- Investigate:
 - Environmental Restrictions
 - EIA Requirement
 - Monitoring Requirement



Design and Costing

- Borehole and Array Design
- Modelling and Optimisation
- Consent Applications
- Complete Costing
- EIA if required



Implementation

- Drilling Supervision
- Geophysical Logging
- Hydraulic/Thermal Testing
- Liaison with Regulators
- Reporting
- Advice on Funding

Knowledge is good; insight is better.

Our services

Borehole Prognosis

We provide detailed geological and water supply feasibility assessments. Our reports include:

- Thermo-geology/Hydrogeology
- Likely water quality, yield and depth to water table
- Local borehole search
- Recommended supply options

Borehole and Borefield Design

Borehole construction requires careful design and optimisation to account for key factors such as heating & cooling requirement, available space and budget. We partner with our clients to ensure that the specifications of a system provide maximum efficiency and longevity, and are appropriate for our clients' installation and operational budgets.

Heat Flux and Interference Modelling

Thermal interference between boreholes can adversely affect GSHC system efficiency. We use industry leading software to optimise the borehole and array design of closed loop systems. We have also developed numerical groundwater flow, solute transport and heat flux models, which can be used for open loop systems.

Thermal Response Testing

Accurate measurement of the collective thermal properties of the ground and borehole is very important during closed-loop installation. We manage thermal testing and use the results to calibrate the system design models to provide higher levels of certainty for system longevity and efficiency.

Consent Applications, Licensing and Drilling Supervision

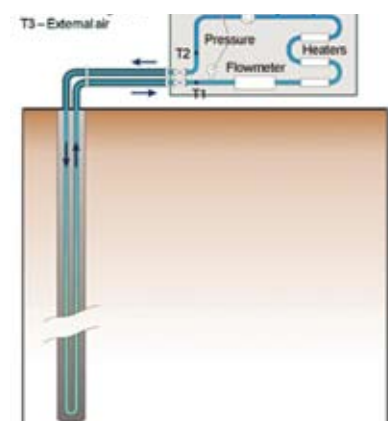
We provide management of abstraction licences and consent to drill approvals and provide drilling supervision, test pumping and data analysis for our clients as required. We work closely with drillers and to provide practical solutions to unforeseen system installation problems.

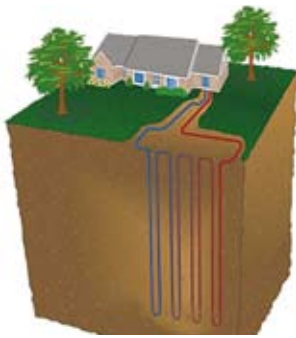
EIA and Risk Assessment

Environmental Impact Assessments and environmental risk assessments are often required as part of the planning stage for GSHC schemes. We liaise with regulators and organise all planning and regulatory requirements at the earliest possible stage to avoid unnecessary delays.

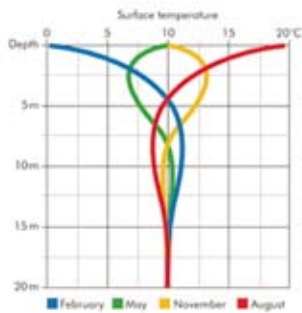


Open loop GSHC system showing abstraction and injection wells





Closed loop system utilising an array of four boreholes



Temperature variation with depth below ground throughout the year. GSHC utilises the stable temperature of the subsurface

Our services (continued)

Hydraulic Testing and Analysis

Data analysis includes yield analysis and vulnerability to seasonal and longer-term fluctuations in the water table. We also provide recommendations on pump suitability, refurbishment and replacement, and operating strategies.

Monitoring

We are able to continuously monitor surface and groundwater levels and temperatures through the use of hydrometric and barometric data loggers. Water quality may also be analysed onsite or samples taken to UKAS accredited laboratories to measure a range of determinants.

Geophysical Logging

We provide down-hole geophysical logging and interpretation services including CCTV, Gamma, Calliper, Flow, Resistivity Conductivity and Temperature.

Reporting

We provide clear, factual reports that allow our clients and project stakeholders to easily understand project approach, methodology and predicted impacts and outcomes.

Recent experience

Feasibility

We have undertaken over 50 thermo geological assessments across the UK. Recent projects include a borehole in complex geological structures on the Isle of Wight; and strategic advice on contaminated land issues across an area to be used for GSHC.

Design

We have undertaken concept and detailed design on a range of projects, from individual boreholes to multiple bore closed loop systems and have used a range of practical tools to optimise borehole depth and array. Recent examples include design of groundworks for a heat pump in East Sussex; and working with a drilling contractor to undertake 30 year simulations for a multiple-bore project in Kent.

Funding

An important aspect of our project management is supporting clients in obtaining funding for installations. For one project in East Sussex, we have helped our client to claim 75% of the capital costs with a further 25% pending.

Providing practical solutions to meet your project requirements.

Our people

Andrew Ball

Principal Hydrogeologist

Andrew has 20 years experience providing hydrogeological advice to clients, including drilling contractors, regulators, architects and project managers. His first ground source heating project was in the early 1990s and he has also been a consultant on geothermal projects in the UK.

Sean Daykin

Project Hydrogeologist

Sean has 5 years experience on a full range of water supply and GSHC projects in the UK and Australia. He has been involved in feasibility, design and implementation stages of water supply and GSHC systems. Sean has developed strong relationships with clients and regulatory bodies.

Nick Honeyball

Project Hydrogeologist

Nick has undertaken numerous borehole prognoses and thermo-geological assessments in the UK. He is currently providing consultancy services on various aspects of feasibility, design and implementation for GSHC systems and public water supply boreholes.

Hugh Middlemis

Senior Principal Modeller

Hugh is one of the industry's leading groundwater modelling specialists. His experience includes modelling groundwater and surface water systems. He also has engineering design, construction and operational experience on bore, pipeline and pumping systems for water resource development, salt interception and mining projects.

Faisal Butt

Senior Water Resources Planner

Faisal is a groundwater modeller, with experience of both analytical and numerical modelling approaches. Faisal has worked on a number of UK projects including yield assessments, test pumping, drought planning and environmental impact assessments.

Jane Burstow

Project Hydrogeologist

Jane has 7 years experience and has completed many desk-top assessments and borehole design projects for GSHC schemes in the UK. She has supervised the installation of numerous GSHC, water supply and mine dewatering schemes in the UK, Australia and Mongolia.

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