

Accessing Scotland's geothermal resource: regulatory guidance

Scottish Government

Directorate for Energy and Climate Change

With input from the Scottish Environment Protection Agency, the Coal Authority, the Health and Safety Executive and the British Geological Survey.

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Introduction

This guidance outlines the regulatory framework for exploring, and exploiting, Scotland's geothermal resource. It provides a point of reference for those considering undertaking an onshore geothermal project in Scotland. But it is not intended to be a comprehensive list of all legislation relevant to projects involving the exploration and extraction of geothermal heat. This guidance also provides links to relevant legislation and related detailed guides.

We recommend contacting the relevant regulatory authorities from an early plan preparation stage to better understand the potential processes, timescales and likely costs associated with the relevant permission/consent/approval systems. Pre-application discussions, however, do not remove the need for independent legal advice being sought in respect of the potential application of the legislation in specific circumstances.

Geothermal heat explained

Geothermal energy is the natural heat that exists within our planet. The Scottish Government is targeting three geological settings within Scotland for exploration in respect of their geothermal potential:

Water is held naturally in rocks as groundwater, and flows continuously into active mine workings, requiring them to be pumped out. However, when mining and pumping ceases, the abandoned mine workings become flooded. Mines can extend to relatively deep levels so, in some cases, abandoned mine workings can provide easy access to warm water. This warm mine water can be accessed by means of a borehole, and the heat can then be made available for space heating or domestic hot water heating.

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Aquifers are bodies of permeable rock that can conduct significant quantities of groundwater. The largest and most conductive of these generally occur in sedimentary strata. Those that are deep enough to hold hot water can be classed as hot sedimentary aquifers. The hot water can be accessed and abstracted from the aquifer by means of a borehole and the heat can then be made available for space heating or domestic hot water heating.

Crystalline rocks at several kilometres depth can be hot enough to be used to generate electricity. Such rocks usually lack open fractures and consequently have very low permeability. Essentially dry, they are known as hot dry rock (HDR) resources. Some granite intrusions generate their own heat, so they can be hotter than other rocks at the same depth. Exploiting HDR resources typically relies on creating an Engineered Geothermal System (EGS), in which a network of open fractures is created to hydraulically connect boreholes drilled some distance apart into a hot rock zone. Cold water injected into the open fractures through one borehole passes through the fractures, and the resulting superheated water, or steam, is then extracted through another borehole. The thermal energy stored in the water can be converted into electricity at the surface.

Some crystalline rocks are naturally permeable. These rocks can contain significant amounts of hot water and are sometimes known as hot wet rock (HWR) resources. The water can be abstracted by means of a borehole and an EGS is not required. In the case of both HDR and HWR resources, following the extraction of the heat, the water can be re-injected at the site, maintaining the level of groundwater available for future abstraction.

Regulation of geothermal operations

There are a number of public bodies involved in the regulation and control of activities which may be undertaken during the exploration and exploitation of geothermal heat.

The [Scottish Environment Protection Agency](#) (SEPA) regulates the activities associated with geothermal energy through the [Water Environment \(Controlled Activities\) \(Scotland\) Regulations 2011](#). The construction of a borehole, the abstraction of water, and the subsequent return of water to the water environment all require authorisation from SEPA.

Significant physical works and changes in the use of land and buildings will require planning permission. Applications for planning permission are made, in the first instance, to the relevant planning authority for the area, usually the local council. The planning authority is, in most cases, responsible for the granting of planning permission for works associated with borehole construction and wellhead development. The decision would be either a refusal of planning permission, a grant of planning permission or a grant of planning permission with conditions.

Any activity which intersects, disturbs or enters coal seams requires prior written authorisation from the [Coal Authority](#) (CA). A Permit to Drill for the purpose of a Mine Water Heat Scheme is required for the drilling of boreholes and a [Mine Water Heat Access Agreement](#) must be sought in respect of any geothermal operations involving mine water.

The [Health and Safety Executive](#) (HSE) regulates the health and safety aspects of geothermal projects. The broad framework of the [Health and Safety at Work etc Act 1974](#) applies to all workplaces and will be utilised when inspecting geothermal developments.

Environmental protection

A number of potential direct, and indirect, environmental impacts have been identified as being associated with geothermal heat exploration and production:

- possibility of interaction between discharge and geological formation
- temperature and chemical composition of discharge relative to receiving water
- location of the discharge in relation to groundwater/surface water, direct/indirect to groundwater
- proximity to receptors, such as surface waters, wetlands and other water uses
- risk of thermal breakthrough, taking into account cumulative impacts from nearby schemes
- assessment of the risk of heat or substance pollution

A direct discharge to groundwater has one, or more, of the following:

- it bypasses the unsaturated zone
- it has its source in the saturated zone
- it has its source in the unsaturated zone but seasonal fluctuations in the water table mean that the source will be in direct contact with groundwater from time to time

An indirect discharge either percolates through the unsaturated zone or has its source wholly in the unsaturated zone, (even during seasonal fluctuations in the water table).

The construction of a borehole, the abstraction of water, and the subsequent return of water to the water environment all require authorisation from SEPA for an open loop system. These activities can be authorised by General Binding Rules (GBRs), provided that certain mandatory requirements can be complied with. Where these rules cannot be complied with, a higher level of authorisation will be required.

There are no abstractions or discharges in a closed loop system and SEPA authorisation for these activities is not required. In these systems, authorisation is only required for borehole construction and operation.

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The construction and operation of a geothermal borehole less than 200 metres deep is authorised by a GBR. Boreholes greater than 200 metres deep will require a licence.

The abstraction and subsequent return of water in a geothermal heat system is authorised under a GBR provided the following rules can be met:

- water is returned to the same hydraulically connected strata or mine workings from which it was abstracted
- the net abstraction is not more than 10 cubic metres a day
- the chemical composition of the water abstracted has not been altered
- the activity must not be located within 250 metres of any abstraction for human consumption and must not prevent an authorised abstraction

Where these rules cannot be met, separate authorisations for the abstraction and discharge of water will be required from SEPA. More information is available in

[SEPA's guide on requirements for activities related to geothermal energy](#) .

Contact SEPA when in doubt about the viability, or impact, of a system.

Planning

The planning system is used to make decisions about future development, and the use of land, in Scotland's towns, cities and countryside. The planning system regulates the use and development of land and buildings by granting or refusing planning permission. Decisions on planning applications are based primarily on the development plan for the area, which consists of the National Planning Framework (NPF) and the local development plan (LDP). The LDP is prepared by the planning authority for the area. There are statutory requirements on planning authorities on public engagement when it comes to the preparation of LDPs.

The [fourth NPF](#) supports development proposals for energy infrastructure where they will repurpose former fossil fuel infrastructure for the production or handling of low carbon energy.

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In the absence of any permitted development rights, planning permission from the relevant planning authority is required for any new development proposal. 'Permitted development rights' is the name given to a planning permission granted in legislation. Where development is in line with the terms of these rights, an application for such permission is not needed. 'Development' includes any building, engineering, mining or other operations in, on, over or under land. It also includes material changes to the use of buildings and land. Whether a change of use is 'material' (that is, significant in planning terms), depends on the circumstances of the individual case.

For the purposes of planning applications, developments are categorised as local, major or national. The different types involve different statutory processing requirements, to reflect their size, complexity and the issues likely to arise:

- local developments include changes to individual houses and smaller developments for new housing and retail
- major developments include developments of 50 or more homes, certain waste, water, transport and energy-related developments, and larger retail developments
- national developments are mainly large public works

National developments are identified in the NPF and major and local developments are specified by the [Town and Country Planning \(Hierarchy of Developments\) \(Scotland\) Regulations 2009](#).

All planning applications must contain a description of the proposed development, a site address or location and details of who is applying for the planning permission.

The planning authority will also require:

- drawings and plans
- a certificate showing the site owners and any agricultural tenants, and stating whether they have been notified that an application has been made
- the planning application fee

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The size of the planning application fee will depend on the type, and usually the size, of development. A further charge may apply where the application requires the publication of a notice in a newspaper.

Depending on the scale and/or area of the development, and the nature of the application, a 'design and access statement' or a 'design statement' may also be required. This statement sets out how the design of the proposal has been considered.

If the proposal is for a major or national development, a pre-application consultation (PAC) with the community will also be required. These requirements are placed on the party intending to make a planning application – the 'prospective applicant'. PAC includes sending details of the proposal to the planning authority and to every community council any part of whose area is within, or adjoins, the land on which the proposed development is situated. This may include community councils in a neighbouring planning authority area.

PAC also involves consulting the wider community using at least two locally advertised public events. A planning authority can require additional consultation beyond this statutory minimum. The objective of PAC is for communities to be better informed about major and national development proposals, and to have an opportunity to contribute their views before a formal planning application is submitted to the planning authority. As indicated PAC is about communities making their views known to the prospective applicant. PAC does not, therefore, take away the need for, and right of, individuals and communities to express formal views to the planning authority during the planning application process itself.

A screening process is available allowing prospective applicants to seek the planning authority's view on whether their proposal is a national development or a major development and therefore requires PAC. Exemptions from PAC can apply where an earlier application for essentially the same proposal was made, and had gone through the PAC process.

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A planning authority has up to four months to determine applications for planning permission for national developments and major developments. It has up to two months to determine planning permission for local development proposals (this is extended to four months if an Environmental Impact Assessment (EIA) is required (more information in next section)). An applicant can challenge a planning authority's decision to refuse permission or a condition attached to the grant of planning permission. The applicant can require either a local review or appeal of the decision, as appropriate. A local review or appeal can also be sought if the planning authority does not issue a decision within the relevant statutory period, or any extended period agreed to, in writing, by the applicant and the planning authority.

Local reviews apply where applications for local development are delegated to an officer for decision, rather than elected members of the planning authority taking the decision. In all other cases, a right of appeal to Scottish Ministers applies. Where a decision is issued, local reviews, or appeals, must be requested within three months from the date of the decision. In relation to reviews and appeals where a decision has not been issued, these must be sought within three months of the end of the statutory period or any agreed extended period.

Some developments need a specialist report, for example on retail, transport or noise. Whether any specialist assessments are needed will depend on the type of development and its location. An application may also need an EIA, where there is likely to be a significant effect on the environment (see next section).

A person who intends to start development that has been granted planning permission (including planning permission in principle) must, once they have decided the date they will start work, inform the planning authority of that date as soon as is practicable and before starting work. There is no minimum period of notice.

The applicant is required to submit other information set out in the [Town and Country Planning \(Development Management Procedure \(Scotland\) Regulations 2013](#) which may be useful to the planning authority, including:

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- the full name and address of the person intending to carry out the development
- the full name and address of the landowner, if they are a different person
- the full name and address of any site agent appointed in respect of the development
- the date of issue and the reference number of the planning permission

Some developments require an on-site notice while a development is being carried out.

A person who completes a development for which planning permission (including planning permission in principle) has been given must, as soon as practicable after doing so, give notice of completion to the planning authority.

Environmental impact assessments

An EIA is mandatory for projects identified in Schedule 1 of the [Town and Country Planning \(Environmental Impact Assessment\) \(Scotland\) Regulations 2017](#) and may be required for projects identified in Schedule 2. Some geothermal projects may be relevant to Schedule 1 of the Regulations, such as large scale or more complex projects which have groundwater abstraction, or recharge schemes, where the annual volume of groundwater abstracted or recharged is equivalent to, or exceeds, 10 million cubic metres. Guidance for establishing whether an EIA is required is available in [Planning Circular 1/2017](#).

Where an EIA is required, the developer needs to compile a detailed report about the likely significant environmental effects of a development. The environmental information compiled by the developer is known as an EIA Report. The EIA Report (and the application to which it relates) must then be publicised.

Certain designated sites are defined in regulation 2(1) of the Regulations as 'sensitive areas' and the thresholds/criteria outlined in Schedule 2 do not apply. Special considerations apply to these 'sensitive areas'. All developments of a type

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listed in Schedule 2 and which are due to be located in a 'sensitive area', must be screened for the need for an EIA. These 'sensitive areas' include:

- Sites of Special Scientific Interest
- land subject to Nature Conservation Orders
- European sites
- World Heritage Sites
- Scheduled Monuments
- National Scenic Areas
- National Parks
- marine protected areas

The applicant is responsible for preparing an EIA Report. The information for inclusion in an EIA Report is outlined in Schedule 4 of the 2017 Regulations. The 2017 Regulations also require the developer to have the EIA report prepared by competent experts. The report must be accompanied by a statement outlining how the competence of the experts is demonstrated, such as their relevant expertise or qualifications. The emphasis of the EIA Report is on the main, or significant, environmental effects to which a development is likely to give rise.

A number of aspects of the environment may be significantly affected by a project, including:

- population
- human health
- biodiversity
- land
- soil
- water
- air
- climate
- landscape
- material assets (including architectural and archaeological heritage)
- the interaction between any of the above

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Consideration should also be given to the likely significant effects of:

- the use of natural resources
- the emission of pollutants
- the creation of nuisances
- the elimination of waste

Public bodies must make environmental information available to any person who requests it. Where a developer has given the planning authority notice in writing of the intention to submit an EIA Report, the authority must inform the consultation bodies and remind them of their obligation to make available, if requested, any relevant information in their possession.

The consultation bodies are:

- any adjoining planning authority, where the development is likely to affect land in their area
- NatureScot
- Scottish Water
- SEPA
- Historic Environment Scotland
- any other bodies designated by statutory provision as having specific environmental responsibilities

Planning authorities will often have useful local and specialised information. It can be helpful to those preparing an EIA Report to obtain information from the consultation bodies.

Before making a planning application, a developer may seek a formal scoping opinion from the relevant planning authority. The opinion allows the developer to be clear about what the planning authority considers the significant effects of the development are likely to be and, therefore, the topics on which the EIA Report should focus. The planning authority must adopt a scoping opinion within 35 days of receiving a request, or longer if the authority and developer agree to this in writing. Where the planning authority fails to offer a scoping opinion, the developer may

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request a scoping direction from Scottish Ministers. Scottish Ministers must make a scoping direction within 35 days from the date of receipt of a request, or such longer period as they may reasonably require.

The planning authority must consult the consultation bodies on the EIA Report. For local EIA developments, the planning authority should determine the planning application within four months from the date of receipt of the EIA Report, instead of the normal two months from the receipt of the planning application.

European designations

Developments likely to have an adverse effect on European designations (including Special Protection Areas, Special Areas of Conservation, and certain Ramsar sites) will be subject to an appropriate assessment. Qualifying interests for European designations may not be confined to the boundary of a designated site. Where an assessment is unable to conclude that a development will not adversely affect the integrity of the site, development can only be permitted where there are no alternative solutions, and there is an imperative reason of overriding public interest. These can be of a social, or economic, nature except where the site has been designated for a European priority habitat or species. In these cases, consent can only be issued where the reasons for overriding public interest relate to human health, public safety, beneficial consequences of primary importance for the environment or other reasons, subject to the opinion of Scottish Ministers. If this is the route that is taken, there is also a need to make sure that compensatory measures are taken. These measures will need to fully offset the damage which will or could be caused to the site. [Guidance on Habitats Regulations Appraisal](#) is available from NatureScot.

Health and safety

There are no regulations specific to the drilling of an onshore borehole (well) for the purposes of exploring and exploiting the geothermal resource, except when the drilling takes place within one kilometre of a mining area (see later section on

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permission to access land and property). Existing regulations apply only to boreholes (wells) drilled with a view to the extraction of petroleum. However, the broad framework of the [Health and Safety at Work etc Act 1974](#) (HSW Act), which applies to all workplaces, applies to geothermal boreholes (wells) and well operations. HSE Inspectors will ascribe the principles of specific regulations, standards and guidance as representing relevant good practice through which the operator, as dutyholder, can demonstrate compliance with the HSW Act.

This approach will involve ensuring that operators drilling boreholes (wells) voluntarily follow the [Borehole Sites and Operations Regulations 1995](#) (BSOR), and the [Offshore Installations and Wells \(Design and Construction, etc\) Regulations 1996](#) (DCR), as the basis for their approach to managing, and controlling, the risks associated with the drilling and operation of geothermal boreholes (wells). HSE has specialist inspectors who inspect onshore and offshore wells and borehole construction and operations. This includes boreholes drilled for geothermal energy.

If enforcement action is required to be taken for the construction and operation of a geothermal borehole (well), it will be conducted under the HSW Act, with the principles of DCR, BSOR, and the standards and guidance associated with these regulations in determining the risk gap and subsequent level of enforcement. HSE will also expect the voluntary adoption of the specific requirements within DCR and BSOR to be followed, such as notification, the production of a health and safety document, weekly well reports and the appointment of an independent well examiner.

Just as with boreholes drilled for hydrocarbons, HSE inspectors will expect operators of geothermal projects to maintain a life cycle approach to the management of the well. That means ensuring that a well is designed, modified, commissioned, constructed, equipped, operated, maintained, suspended and abandoned that, so far as is reasonably practicable, there can be no unplanned escape of fluids from the well. In addition, ensuring that risks to the health and safety of persons from it, or anything in it, or in strata to which it is connected are as low as is reasonably practicable.

Construction projects

The [Construction \(Design and Management\) Regulations 2015](#) (CDM) define a system of management roles and processes and prescribe a large number of practical health and safety precautions and welfare requirements for construction projects. The roles are:

- the client (the person for whom the project is carried out)
- the principal contractor (persons who co-ordinate health and safety during the pre-construction and construction stages of the project respectively)
- contractors (persons who carry out the construction work)
- the principal designer (the person who designs structures to be constructed by the contractors)

Additionally, CDM impose duties on the self-employed, in recognition of the high degree of self-employment in the construction industry.

These regulations are intended to protect persons from health and safety risks arising from construction work through the establishment of a systematic framework for management of those risks.

The law applies to the whole construction process, on all construction projects, from concept to completion.

The HSE must be notified of a construction project before the construction phase begins, if the construction work on a site is scheduled to last longer than 30 working days and have more than 20 workers working simultaneously at any point in the project, or if the construction work is scheduled to exceed 500 person days.

Provisions within CDM include, but are not limited to:

- safe places of construction work
- demolition or dismantling
- explosives
- excavations

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- prevention of risk from fire, flooding or asphyxiation
- traffic routes
- vehicles
- emergency procedures
- fire detection and fire fighting
- fresh air

Boreholes

BSOR require operators of geothermal projects which are 30 metres deep, or more, inside a mining area, to notify the HSE of:

- the commencement of drilling within 30 days, and of any material changes to the name and address of the person entitled to drill the borehole
- the Ordnance Survey National Grid reference of the location of the top of the borehole
- its directional path
- its terminal depth and location and a description of the operation performed and programme of works

A mining area means land which lies within one kilometre of the workings of any mine whether currently being worked or disused, or land in relation to which a licence to mine minerals has been granted.

Operators should consult with knowledgeable bodies and authorities, such as the CA and the British Geological Survey (BGS), mineral owners, mine owners, the owners of other underground structures, facilities or boreholes and other sources of relevant information which will allow them to assess the effect which a borehole operation is likely to have on other persons.

Operators using BSOR as a framework to demonstrate compliance with the HSW Act should ensure constant site supervision by a competent person able to maintain the safety of the well. Operators have a duty to co-ordinate their work and their safety measures with those of other employers and self-employed persons on site.

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They will also be required to ensure that a sufficient number of competent persons are provided with a view to enabling those operations can be carried out safely.

Borehole operations should be planned, and organised, from the outset with health and safety in mind. Operators should ensure that operations do not commence until a health and safety document has been prepared. The document should be appropriate to the hazards of the operation to which it applies.

The health and safety document should demonstrate that the risks to employees at the borehole site have been determined, and assessed, and that adequate measures will be taken to safeguard their health and safety. The health and safety document should also, where appropriate, include plans suitable for the particular site and operations carried out there. Good co-ordination of the work of contractors is essential for safe working. Borehole sites during drilling, and workover operations particularly, become compact areas of high activity. The co-ordination of work at the site is aimed at planning, organising and controlling the programme of work and the contributions made by various contractors so that they may be conducted with risks to health and safety reduced to as low as is reasonably practicable. Suitable well control equipment will also be required to be provided, and deployed, during borehole operations to protect against blowouts. The operator will also be required to determine if those personnel working at the borehole site may be exposed to atmospheres hazardous to their health.

Local factors should be considered, such as:

- the proximity of highways
- rights of way
- buildings
- housing
- woodland
- crops
- any other matters which may affect the safety of the site

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Where necessary the relevant authorities should be consulted. Sites should be located and be of suitable size and layout to allow hazards to be confined within the site boundaries. Consideration should be given to the need for site security to minimize hazards from, and to, persons other than those authorised to be on the site. The area of land given to a site should allow adequate space for suitable siting of equipment.

Consideration should also be given to the risks of displacing pressurised gases such as carbon monoxide or methane from coal strata or mine workings into nearby receptor premises. More information is available in [Guidance on managing the risk of hazardous gases when drilling or piling near coal](#) .

Emergency services should be informed of the location of borehole sites, access routes from public roads and the nature of the operations and circumstances which they may be called upon to attend. Provision should be made for suitable rendezvous and forward control points with sufficient suitable parking space for emergency vehicles close to the site. The health and safety document should include arrangements and plans for escape and rescue and fire and explosion protection.

The health and safety document should be kept up to date. It should be reviewed if any relevant changes occur to the site, or operations, carried out there. Operators have a duty to ensure that the health and safety document is made available to each employer who has employees at work on the site.

Operators should also ensure that all workplaces on a borehole site are designed, constructed, erected and maintained in provision of sufficient stability and protection of employees and to withstand anticipated environmental forces on site.

Borehole records

The [Water \(Scotland\) Act 1980](#) requires anyone proposing to sink a well, or drill a borehole to a depth greater than 15 metres (50 feet), for the purpose of searching for, or abstracting, water to notify the Natural Environment Research Council (as

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represented by the BGS). In addition, a record must be kept of the progress of the work. On completion, or abandonment, of the work, the record must be deposited with the BGS' National Geoscience Data Centre along with details of any test made before completion or abandonment, specifying the flow of water and, where practicable, the water levels during the test and thereafter until the water returned to its natural level. All borehole logs are accepted, and welcomed, by the National Geoscience Data Centre, not just those required under the Water (Scotland) Act.

Well integrity

The DCR are mostly concerned with the integrity of onshore and offshore wells which are drilled with a view to the extraction of petroleum. The general duty of the well operator is that they must ensure the integrity of the well for its entire lifecycle such that, so far as is reasonably practicable, there can be no unplanned escape of fluids from the well, and that risks to the health and safety of persons from it, or anything in it or in strata to which it is connected, are as low as is reasonably practicable. In the pre-design stage, the well-operator is required to take all appropriate steps to obtain predictions of the sub-surface environment to be experienced within. As far as is reasonably practicable, all potential hazards and circumstances likely to lead to unsafe well conditions should be identified by the well operator. In the post-design stage, the well operator should ensure sufficient measures are taken of well conditions and sub-surface properties.

The design and construction of the well should account for the health and safety of those tasked with suspending or abandoning it and for the continued integrity of the well after its suspension and/or abandonment. This will prevent unplanned escapes of fluids from its reservoir. Many elements of suspension and abandonment can only be decided at the time of suspension or abandonment when actual well conditions can be fully assessed. Elements which can be considered at the time of well design and during drilling will, however, have an important bearing on the effectiveness of the subsequent suspension and/or abandonment.

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The well-operator shall ensure that all materials used in the construction, and any subsequent modifications to the well, are suitable for its purpose. This is to ensure the well maintains its integrity for its entire lifecycle and risks to people from it are reduced to as low as is reasonably practicable.

The well-operator is required to report certain information regularly to HSE at such intervals as may be agreed between the operator and the authority or, failing agreement, at intervals of one week from operation commencement. The information to be provided includes start and end dates, the setting of casings and the depth achieved.

Co-operation is required between the well-operator, the installation operator/owner and other relevant contractors to ensure that their management systems and operating procedures are sufficiently integrated to provide a safe system of work.

The installation duty holder or well-operator (where the well is being worked on other than from an installation) must ensure that all staff are capable of carrying out the tasks that have been allocated to them by ensuring that they receive appropriate information, instruction, training and supervision.

Other health and safety legislation

The [Provision and Use of Work Equipment Regulations 1998](#) (PUWER) cover workplaces where the HSW Act applies. PUWER also apply in common parts of shared buildings and temporary places of work. Generally, any equipment which is used by an employee at work, including any provided by the employee, is covered.

It must be ensured that equipment is suitable for use, and for the purpose and conditions in which it is to be used. The equipment must also be maintained in a safe condition for use so that people's health and safety is not at risk.

Regulation 6 of the [Management of Health and Safety at Work Regulations 1999](#), requires employers to provide employees with health surveillance. Employers must

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begin health surveillance on employees newly assigned to borehole operations prior to deploying them to that work.

If operators determine that personnel working at a borehole site may be exposed to atmospheres hazardous to their health then appropriate breathing and resuscitation equipment will be required to be provided and personnel trained in its use. The assessment and provision of equipment will enable the operator to comply with the [Control of Substances Hazardous to Health Regulations 2002](#).

Other health and safety regulations apply to geothermal borehole sites, such as the [Work at Height Regulations 2005](#), the [Pressure Systems Safety Regulations 2000](#), the [Personal Protective Equipment at Work Regulations 1992](#) and the [Lifting Operations and Lifting Equipment Regulations 1998](#).

Permission to access land and property

In Scotland, anyone wishing to carry out geothermal drilling operations may have to pass through land belonging to a number of owners. To pass through the land, they must obtain the landowner's permission to do so. Operators must negotiate these rights of access with every owner of the site, or sites, of proposed underground drilling.

Those wishing to gain access to abandoned coal mine workings for the purpose of extracting heat from mine water require the permission of the owner of the coal mine workings in addition to any other permissions required. In most cases, the owner will be the CA.

To develop and operate a scheme, a [Permit to Drill for the purpose of a Mine Water Heat Scheme and a Mine Water Heat Access Agreement](#) are required. Under a Permit to Drill, prospective operators can drill boreholes to establish a connection to the mine water, following which an Access Agreement is required for the longer term occupation of the coal mine workings to develop, and operate, a scheme. An Access Agreement has two phases to it:

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- the Exploratory Phase where testing and development is completed to establish if a scheme is viable - this phase of the Agreement is for a period of 12 months
- the Production Phase which provides longer term access to CA infrastructure to enable a scheme to operate

An application for a Mine Water Heat Access Agreement may be made to the CA at any time. The CA will consider the implications on existing, and future, coal mining and the potential for coal bed methane exploitation. The CA will also review technical submissions from the potential operator in relation to the risks associated with gas, ground stability, water levels and water chemistry so that appropriate monitoring and controls can be agreed and implemented.

All applications for new Mine Water Heat schemes will be publicised by the CA on its website and in an industry wide newsletter, so that other coal mining operators are given an opportunity to express any interests in the area concerned.

In most circumstances, a period of 30 days from the publication of an application will be allowed for an expression of interest and a further 30 days for the submission of alternative applications. The applicant will be kept fully informed of any expressions of interest received. Where no expressions of interest are received, the CA will consider the Mine Water Heat application as soon as is reasonably practicable. If an application is refused, the applicant will be contacted in writing by the CA with a statement outlining the reasons for refusal. The applicant can then request, in writing, within 28 days of receiving the statement, a review of the refusal.

Interaction comprises, broadly, the effects on one operation of another operation entering the coal. Those effects include the flows of water and effects on the structural integrity of workings, seams and surface. An Interaction Agreement provides a framework to facilitate arrangements between relevant parties. An applicant who has not already done so will be required to become a party to any relevant interaction agreement before being granted a Mine Water Heat Access Agreement.

Reference material

Environmental protection

[Scottish Environment Protection Agency](#)

[SEPA: Guidance on Requirements for Activities Related to Geothermal Energy Water Environment \(Controlled Activities\)\(Scotland\) Regulations 2011](#)

[SEPA: Practical guide to the Water Environment \(Controlled Activities\)\(Scotland\) Regulations 2011](#)

[SEPA: Guidance on licences required for drilling and operation of deep boreholes Environmental Authorisations \(Scotland\) Regulations 2018](#)

[SEPA: Authorisation guide for radioactive substances activities](#)

[SEPA: Good practice for decommissioning redundant boreholes and wells](#)

[SEPA: An applicant's guide to water supply boreholes](#)

[SEPA: Regulatory Method: Licensing Groundwater Abstractions including Dewatering](#)

[SEPA: Regulatory Method: Modelling methods for groundwater abstractions](#)

[SEPA: Supporting Guidance: Application of Standards to Thermal Discharges](#)

[SEPA: Regulatory Method: Trade Effluent Discharges to Groundwater](#)

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