



Department for the
Economy
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GSNI Geological
Survey of
Northern
Ireland
www.bgs.ac.uk/gsni

Guidance for planning developments in areas of abandoned mines

**Geological Survey of
Northern Ireland**



1. Geological Survey of Northern Ireland

The Geological Survey of Northern Ireland (GSNI) is an office of the Department for the Economy (DfE) staffed by scientists of the British Geological Survey (BGS). We provide data, information and advice to support legislative responsibilities and strategic priorities of the DfE and other government departments and agencies.

GSNI, through the DfE, is a statutory consultee for development proposals, requiring planning permission for all mineral applications and for all applications for hydrocarbon exploration or extraction. The circumstances in which we are consulted upon applications are set out in the following legislation.

- The Planning (General Development Procedure) Order (Northern Ireland) 2015
» <https://www.legislation.gov.uk/nisr/2015/72/contents>
- The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2015
» <https://www.legislation.gov.uk/nisr/2015/74/contents>

GSNI, through the DfE, is a non-statutory consultee for development proposals within areas of abandoned mines.

This document should be used in conjunction with general GSNI Planning guidance that can be found at <https://www.bgs.ac.uk/gsni/ConsultingGSNI.pdf>.

2. Guidance for planning developments in areas of abandoned mines

Northern Ireland's abandoned mines are vested in the DfE under the Mineral Development Act (Northern Ireland) 1969. In total there are more than 2,400 abandoned mine workings, including mine shafts and adits.

GSNI has provided digital data to all NI Planning Authorities identifying the areas that may be affected by abandoned mines. Any planning application that falls within these areas should be sent to GSNI for consultation.

All enquiries should be sent to gsni@economy-ni.gov.uk to ensure they are registered with GSNI to enable an appropriate response within the specified timescale.

3. The Risk-Based Approach to Development Management

GSNI hold records of approximately 2,400 abandoned mine workings within Northern Ireland. Spatial datasets have been developed to define areas of risk for development. These areas may be subject to land instability and other mining-legacy-related hazards. The Northern Ireland Abandoned Mines dataset has been supplied to all Planning Authorities and is reviewed annually or when new information becomes available at which point the Planning Authorities will receive the latest version.

The data can be also be viewed online at: http://mapapps2.bgs.ac.uk/GSNI_Geoindex/home.html or on www.spatialni.gov.uk.

If a proposed development is not within an area of potential risk, there is no need to consult GSNI for this purpose.



Shaft and Adit data displayed on the GSNI GeoIndex



Mine plans shown on www.geologicalmaps.net

3.1 Area of Risk

The area of risk is determined from detailed mining legacy records that indicate a public safety risk and/or ground instability risk to the surface. These include:

- Mine entries
- Known extent of underground mine
- Shallow mine workings
- Workable coal seam outcrops
- Recorded mining-related hazards
- Geological features (surface fractures and break lines)
- Recorded instability associated with mine workings
- Recorded gas/water emissions

Mine Entries (20m buffer)

Mine entries consist of mine shafts (vertical portals) and mine adits (horizontal/inclined portals). The majority of adits remain visible after mine abandonment, but most shafts are not visible on the landscape due to reworking of the surface. There is little information on how most mine shafts were treated after abandonment. GSNI only hold records of shaft treatment for those that have undergone recent remediation work carried out by the DfE.

Mine shafts generally have a zone of influence of 20m radius and no development should take place within this zone even after remediation.

Mine entries have the potential to collapse causing potential risk to the public. Further risks are present through entries providing a potential pathway for mine gases and mine water to reach the surface.

Known extent of underground mine

GSNI holds 162 mine plans detailing the extent of individual mines. The quality of these plans is variable and the confidence in accurate geospatial locations is sometimes low. Not all the plans can be verified as being the *final* abandonment plan and in some instances mines have been reworked for a considerable time after the plan was deposited. There are a high number of mines where no mine plan exists as a result of them not being deposited

as per legislative requirements and/or the mine was operating without the required permissions at the time.

Mine plans can be viewed at http://www.geologicalmaps.net/IrishHistMaps/mine_plans.cfm

Shallow mine workings

Land overlying a subsurface mine may potentially be subject to surface instability due to internal mine collapse. This can pose significant risk to the public and surface development. This risk is increased with shallow mine workings, classified as those less than 50m below ground level. However, the dimensions of the mine, the condition of support pillars and the strength of the overlying geological strata are factors that greatly contribute to surface stability within these areas.

Most mine workings in Northern Ireland are shallow in nature. Where mining has taken place at shallow depth there is an increased risk that these workings could collapse and cause instability issues at surface. Development activities could potentially provide a trigger for these problems to occur.

Workable coal seam outcrops

The earliest coal mining activities originated at locations where coal seams occurred at surface or very shallow depths. There are no records retained detailing these activities resulting in the potential for unrecorded shallow mine workings in areas of coal seam outcrops and very shallow seams. GSNI has indicated the areas of workable coal seams which are derived from geological data and reports.

Recorded mining-related hazards

GSNI holds records of sites that that previously suffered mining-related hazards such as surface instability, water emissions and ground contamination. These sites are contained within the 'development at risk' area and may provide some indication as to the issues associated with a particular location and need to be taken into consideration.

Geological features

The surface over an area of historic mining activity may contain visible geological disturbances such as surface fractures. Fractures (also known as fissures or faults) are breaks and weaknesses which are natural geological features. These can be exacerbated due to stresses and strains induced by mining activity leading to weaknesses developing within the underlying rock and/or appearing at the surface. This may cause land instability issues as well as providing a pathway for gas and water emissions.

Recorded instability associated with mine workings

GSNI holds a record of sites where incidents of subsidence have been known to occur in the past or are currently undergoing sub-surface movement. This record provides valuable information of potential public safety issues associated with a location that need to be considered.

Recorded gas/water emissions

Mine workings can contain naturally-occurring toxic and explosive gases. These can include carbon dioxide, methane, carbon monoxide, hydrogen sulphide and oxygen-deficient air. Mine gases can be transported through pathways such as mine entries, weakness in the overlying strata and porous rock such as sandstone. The gas can also be transported considerable distances from the source and are difficult to predict without an environmental monitoring system.

Many old mine workings are flooded, and this water can be transported through pathways to the surface leading to ground contamination creating potential issues for any proposed development.

3.2 Submission requirements for development within areas of potential risk

New development proposals that are within areas identified as potentially at risk need to assess and mitigate the risks associated with historic mining activity in the interest of public safety.

All development proposals that are within these areas will need to provide a Mine Risk Assessment (MRA) which should accompany any planning application for GSNI to consider the application. A MRA is a desk-based exercise that will provide an assessment of the risk posed by historic mining activities and any proposed mitigation measures. See Section 5 for more information.

By submitting a MRA, the time taken to process the consultation will be reduced. When GSNI is consulted on a development application that falls within an area of mining risk and a MRA is not submitted, GSNI will request this additional document within its interim response. This will delay the process for planning authorities to make their decision. There are some exemptions to this principle, and these are set out in the Exemptions List. See Section 4 for further information.

4. Exemptions

The nature of some developments that fall within areas of mining risk should be exempt from completing a MRA as part of the planning application. This exemption will apply to cases where the building and/or engineering operations are minimal and therefore do not increase the potential risks posed by abandoned mine workings. Below is a list of examples that do not require a MRA.

Nature of development	Example	Justification
Change of Use with no associated works (land or buildings) where no engineering works or ground works are proposed	Agriculture to garden; office to residential	No significant ground works / scale of groundworks
Household Development	Attic & garage conversions; sunroom; conservatory; minor extensions	No spatial influence over development location (i.e. No/ limited ability to re-position)
Non-permanent structures with no ground works	Back-up generators; portacabins; decking	No significant ground works
Means of enclosure	Fences; walls	No significant ground works
Street type furniture	Signage; public art; lighting	No significant ground works
Alterations to existing buildings that create no new floor space	New shop frontages; new windows or door openings; signage	No significant ground works

This list is not exhaustive but is an illustration based on some common examples. If there is any doubt as to whether or not you will need to submit a MRA you should contact GSNI at gсни@economy-ni.gov.uk.

Regardless of whether a planning application requires a MRA, the applicant should always be informed if their application falls within an area defined as an area of mining risk.

5. Desk-based Mine Risk Assessment Reports

A MRA report must be prepared by a competent person with a recognised relevant qualification, experience in dealing with ground stability and mining legacy issues and ideally holding a professional accreditation from a relevant organisation.

Below are links to some relevant professional organisations:

- Geological Society
» <https://www.geolsoc.org.uk/>
- Institute of Geologists of Ireland
» <https://igi.ie/>
- Institute of Civil Engineers
» <https://www.ice.org.uk/>
- Institute of Materials, Minerals and Mining
» <https://www.iom3.org/>
- Royal Institute of Chartered Surveyors
» <https://www.rics.org/uk/>
- Institution of Structural Engineers
» <https://www.istructe.org/>

In addition, there may be members of other relevant professional disciplines or institutions that have the appropriate expertise to undertake MRAs. When commissioning a MRA, it is the responsibility of the applicant to ensure the author/s of the report are suitably qualified. This should be determined at the earliest stage prior to commissioning the report.

Mine Risk Assessment (example report template)

Section 1

Application

- Name of applicant, site location, description of development
- Name of company/person commissioned to prepare the MRA report and evidence of their competency
- Site location and description
- Relevant information outlining the proposed development and site location plan
- Scope of the MRA
 - » *Present a desk-based review of all available relevant information on mining activities that occurred on the application site or that may affect the application site*
 - » *Identify and assess the risks to the proposed development from historic mining activities, including the cumulative impact of issues*
 - » *Detail any further investigation work, intrusive and/or non-intrusive, that is required to adequately assess the risk posed*
 - » *Provide detail on appropriate mitigation measures to address the risk posed to the application site from historic mining activity including any necessary remedial works and/or demonstrate how mining activity issues have influenced the proposed development and its design*
 - » *Demonstrate to the Planning Authorities that the application site is, or can be made, safe and stable to meet requirements of Planning Policy PSU 10 Development at Risk*

Section 2

Sources of information used to inform the report

The MRA should provide details of the sources of information upon which the risk assessment of mining issues has been based. Reports/extracts referred to within the report should be appended. This could include, but is not limited to:

- Information obtained from GSNI including mine records, mine plans, recorded mine hazards, borehole records and geological information
- Previous desk-based assessments of ground conditions for the site under application or relevant sites nearby
- Results and reports of past intrusive investigation works undertaken to assess ground conditions for the site under application or relevant sites nearby
- Site history records based on Ordnance Survey and geological mapping of the area
- Information obtained from mine company reports, mine inspection reports and any other relevant verifiable source

Section 3

Identification and assessment of the site

The table below summarises the potential risks associated with historic mining for the proposed development site.

For those issues identified as “yes”, a more detailed discussion and assessment should be made of the risks, both individually and cumulatively, to the application site and proposed development. Consideration of how the groundworks may trigger or exacerbate these issues needs to be discussed.

Mining Issue	Yes	No	Risk Assessment
Underground mining (recorded at shallow depths)			
Underground mining (unknown depth or extent)			
Mine entries (shafts and adits)			
Geological features (fissures or subsidence)			
Record of past gas emissions or potential			
Recorded surface mining hazards			

Potential risks associated with historic mining for the proposed development site.

Section 4

Mitigation strategy proposed

This section is the key part of the MRA report. It should record how mining issues have influenced the proposed layout and design of the development. The mitigation strategy will set out and illustrate with plans, where necessary, how the issues identified in Section 3 will be dealt with to ensure the safety and stability of the development.

You may wish to refer to the Construction Industry Research and Information Association (CIRIA) Abandoned mine workings manual [C758D](#).

In circumstances where the desk-based assessment cannot conclude with certainty the extent of mine-related risks, the report should provide detailed proposals for onsite non-intrusive and intrusive works to be carried out. A work plan for these further investigations should provide details of the scope of work and include assurance that the work is overseen by a suitably-qualified competent person.

A report on any further investigation work that needs to be carried out will be requested by GSNI to assess the risk(s) to the development.

Section 5

Conclusion

The MRA report should provide a conclusion with a summary of the risks, proposed further investigation work (where required) and any remedial measures required for the proposed development site.

It is of paramount importance that the conclusion does not evade or play down the risk of the development site. In such cases, GSNI will raise their concerns with the Planning Authorities during the consultation process which may result in a delay in the application process or planning permission not being granted.

Section 6

Relevant appendices

GSNI will expect copies of the information identified in Section 2 and used elsewhere within the report to be included as appendices.

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