

Treatment of Disused Lead Mine Shafts: A Guide to Good Practice



Cover: The many surviving lead mining shafts and sites of Derbyshire and the Peak District feature a wide variety of conservation interests. As shown here (top left - David Webb) shafts provide access for cave exploration, though a safe method of access may need to be provided as shown here (bottom right – Ian Gates). On the surface there is archaeological interest in the waste hillocks and other structure (top right John Humble) and specialist plant communities survive that include metal tolerant species such as this spring sandwort (bottom left – John Humble). Shafts were often lined with a dry stone walling known as ginging (centre right – David Webb) which can be vulnerable to damage when they are capped.

Report prepared by Entec UK Ltd for Derbyshire County Council, Peak District National Park Authority, Natural England, English Heritage and Derbyshire Caving Association.

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Foreword

The lead mining remains of Derbyshire and the Peak District are of national importance for their ecological, archaeological, historical, geological and landscape value, as well as providing opportunities for recreation and enjoyment which are valued by many people. Many of the surface remains have been lost over time and important surviving remains need to be safeguarded for the future.

However, any former mining site can have its dangers and open shafts and adits may be a risk to the public. In response to this, many shafts have been capped in the past, and the treatment of shafts in the future will be required. A range of treatment methods are available to secure shafts and it is important that these are chosen and used sensitively and with care.

This good practice guidance has been prepared for those responsible for shafts to do this and to assist in promoting conservation-minded landscape management. It is hoped that the guidance will be widely adopted.

The funding for the preparation of this guidance has been provided by the Peak District National Park Authority, Natural England, English Heritage, Derbyshire County Council and East Midlands Development Agency under the overall management of Derbyshire County Council. It has been prepared by Entec UK Ltd under the guidance of a Steering Group of John Barnatt (PDNPA), Jon Humble (English Heritage), Audra Hurst (Natural England), Peter Storey, Mike Wright (both of Derbyshire County Council) and David Webb (Derbyshire Caving Association).

Many others have helped in the preparation of the guidance, by attending stakeholder meetings and by offering valuable advice and information. These include, but are not limited to Tony Mitchell-Jones (Natural England), Jean Matthews (Countryside Council for Wales), Alison Rasey and Katie Parsons (Bat Conservation Trust), Pete Bush (Derbyshire Bat Conservation Group), Helen Ball (Staffordshire Bat Group), Esther Pawley (Peak District National Park Authority), Steve Price (Derbyshire Wildlife Trust), Paul Mortimer (The National Trust), Frank Greenaway (Natural History Museum), Rod Gillatt (Peak Ecology), Sarah Whiteley (Peak District National Park Authority), Martin Roe (National Association of Mining History Organisations), Len Kirkham (Peak District Mines Historical Society), Lynn Willies (Peak District Mines Historical Society), Terry Worthington (Peak District Mines Historical Society), Jenny Potts (Derbyshire Caving Association) and Gary Ellis (Derbyshire County Council).

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Introduction

1.1 Aims of Guidance

The legacy of lead mining within Derbyshire and the Peak District includes a large number of abandoned mineshafts. Where these are open and within land which is accessible to people then it may be necessary to take steps to make the shaft safe. In some cases, existing shaft caps may fail, resulting in a hazard which was not previously present or known. Shafts are also recognised as important resources for geology, ecology, archaeology and recreation, and some are protected by law.

All shafts are unique, and there is great variation in terms of their size, condition, location, aspect and accessibility. These guidelines have been prepared in order to provide practical advice for anyone who is involved in the planning, design and implementation of capping or treatment of shaft or (adit) entrances. The legal situation is explained, together with the responsibilities of those who may be involved in shaft treatment. The principal issues which need to be considered are described, with an explanation of how these can be incorporated into shaft treatments. Finally, a range of practical design options are provided which can be adapted for use at particular sites.

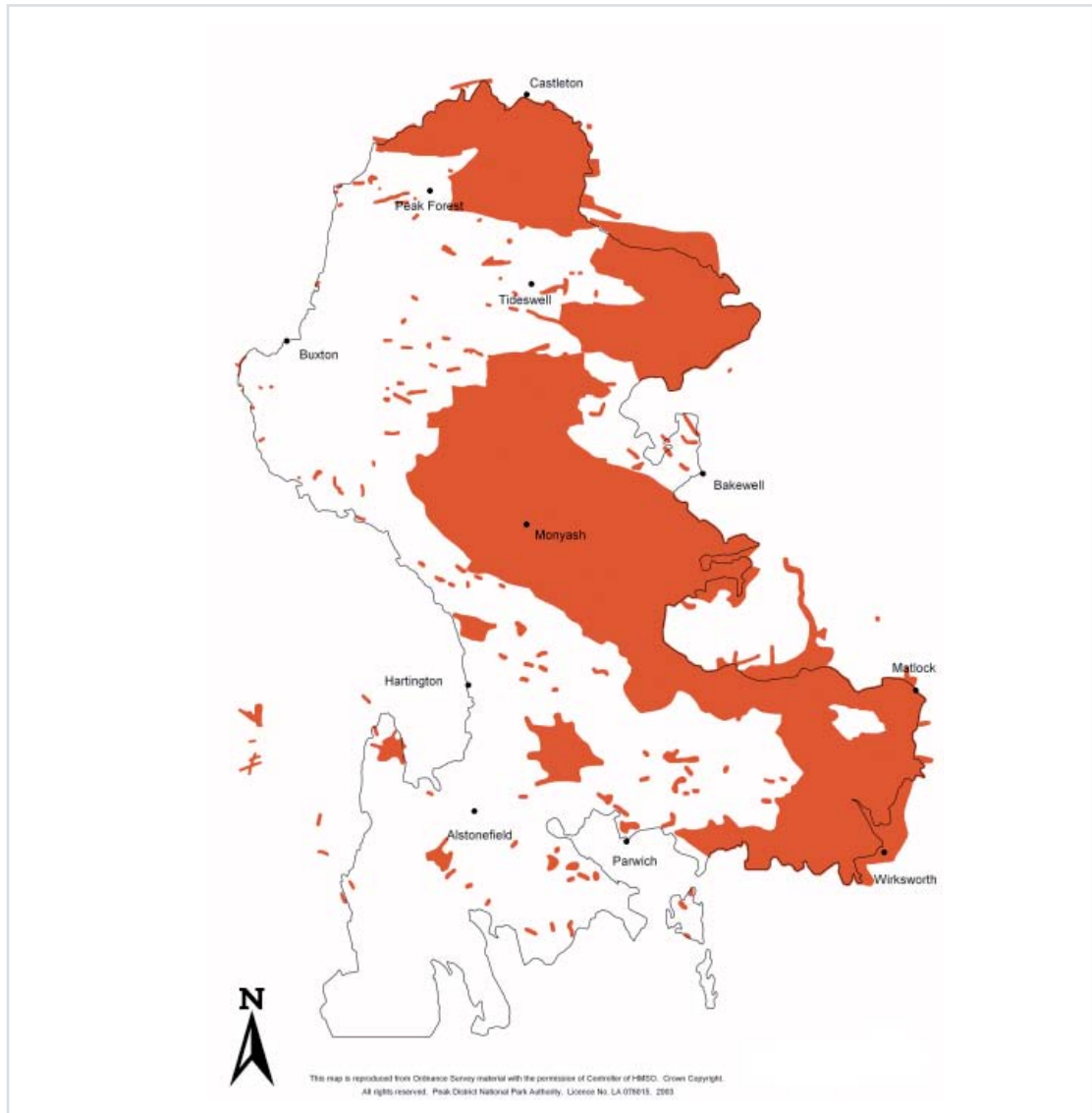
Abandoned shafts are an important part of the landscape in the Orefield of Derbyshire and the Peak District



The guidelines have been prepared following consultations with key practitioners and with reference to recent technical research, best practice literature, and using professional judgement and good scientific practice. They have been designed to cover as wide a range of situations as possible and information is given on how to recognise the important issues at a particular site which may in exceptional circumstances, include further survey work. However, it is recognised that in the great majority of cases where treatment is required, time and cost constraints are important and a pragmatic solution is required, and surveys will not always be practical. The key to a successful outcome will therefore be early consultation with relevant bodies in order to identify the most appropriate action.

These guidelines have been prepared with specific reference to the Derbyshire and Peak District lead orefield, and the extent of this is shown below. However, other areas of the country also contain the remains of lead and other metal mines. Whilst each historic mining area has its own regional distinctiveness, many of the issues highlighted in these guidelines will be common to all.

Map showing extent of lead orefield



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1.2 Current Position

Lead has been worked in Derbyshire and the Peak District since at least Roman times, and the industry continued into the twentieth century. By the seventeenth and eighteenth centuries there were extensive workings throughout the orefields and the area played a large part in making Britain the largest producer of lead, and lead vied with iron as Britain's second major export behind wool. The legacy of this activity survives at the surface in the form of disused shafts, adits and surface workings, as well as mounds of waste material and the remains of structures used by the mining and associated processing industries. Taken together, these play a large part in shaping the historic character of parts of the Derbyshire and Peak District landscape as well as providing a valuable geological, ecological, archaeological and recreational resource.

The presence of an open shaft or adit within publicly accessible areas also presents a potential hazard and treatment of shaft entrances is often required in order to make them safe. Many of the surviving shafts within Derbyshire and the Peak District have been capped in the past using a variety of methods. These include grilles, solid concrete covers, concrete sleepers and wooden sleepers along with less formal methods using, for example, old pieces of sheet metal and timber posts. There remain an unknown number of open shafts, and occasionally the presence of a shaft is only realised when injuries or collapses occur resulting in the need for emergency shaft capping work. It has been estimated that the total number of shafts within the ore-field may exceed 50,000. In comparison, adits are relatively uncommon but examples of both open and grilled entrances are known.

Some of the older shaft covers are likely to require replacement



There is therefore a continuing need to cap or otherwise treat shaft and adit entrances. Some existing shaft-blockings and caps (such as wooden sleepers) will in due course fail and will need to be replaced, whilst part-filled but currently-unsuspected shafts may open up in the future and create a need for treatment. Whether treating open shaft entrances for the first time, or replacing an existing deteriorating cap, there are a number of important issues which will need to be considered in the design and execution of any proposed works.

1.3 Summary of Issues

The underlying need behind shaft treatment is for the safety of the public as well as of livestock and other animals. Though accidents involving lead mine shafts in Derbyshire and the Peak District are not frequent, they do occur and it is particularly important that shafts adjacent to or in publicly accessible areas are made safe.

However, it is also important to consider shafts and the associated features as a valuable natural heritage and cultural heritage resource and an important part of the historical legacy of Derbyshire and the Peak District and its people. The shafts, hillocks and mounds are an important cultural resource and, as well as forming a distinctive feature of the Derbyshire and Peak District landscape, can also provide information on the types of mining and ore processing activity carried on at the site. As well as the hillocks, archaeological features around shafts may include for example ore processing areas, horse gin platforms and building remains. Recognised sites of national importance are protected as Scheduled Monuments (English Heritage must be consulted before any work is carried out within Scheduled Monuments).

Former lead mines are also an important ecological resource, and can support a variety of flora and fauna within the mine and on surrounding land. The mine, including shafts, adits, tunnels, caves and related remains, and the surrounding habitat may support bat populations which are legally protected by national and European wildlife legislation. The mines can form complex habitats for bats and the requirements of different bat species vary. It is therefore important to understand the bat species that may use the mine on each site, the sites' importance for bats, as well as the actions that could potentially harm bats and their habitat. The design and implementation of an appropriate mine treatment method at an appropriate time of year is vital to avoid damaging the species and their habitat and to meet the requirements of wildlife legislation. Appropriate consultations with relevant nature conservation organisations, ecological surveys, and a licence from the Department for Environment, Food and Rural Affairs (Defra) may all be required.

Land adjacent to mines may support other wildlife interest including legally protected species. Grassland associated with the mine deposits around the mine shafts and adits may be designated as a Site of Special Scientific Interest (SSSI), or Special Area

of Conservation (SAC) because of its high nature conservation interest. Appropriate mitigation under licence must be employed with respect to all legally protected species, and consents obtained for work which could potentially damage the interest of protected sites. Inappropriate or careless work around mine entrances and along access routes may damage important plants, habitats and fauna.

The Peak District National Park Authority has prepared and is constantly updating an Inventory of Regionally and Nationally Important Lead Mining Sites in the Peak District Orefield, and include identified mine sites outside of the National Park. Each site included within the inventory has been graded for its key archaeological and ecological importance though survey work is not yet complete and more information needs to be added on sites within the inventory, whilst other sites will need to be added.

The shafts themselves also contain clues to the mining techniques of the past and are vital means of access to many mines and caves, many of which are yet to be explored and assessed for its archaeological and ecological importance. Mine and cave exploration is also a valued activity in its own right, and is enjoyed by many people who live in the area, as well as attracting visitors to the former lead mining areas.

Coal mine shafts also exist throughout Derbyshire and parts of the Peak District and these are often the responsibility of the Coal Authority. Any activities which intersect, disturb, or enter any of the Coal Authority's interests require the prior written permission of the Authority. Such activities include initial investigation and any subsequent treatment of coal mine entries.

1.4 Historical Background

Lead has been mined within Derbyshire and the Peak District from at least the Roman period and mining was extensively carried out in the orefield during the Medieval period. Mining activity was at its greatest in the seventeenth and eighteenth centuries, when the area played a large part in making Britain the world's largest producer of lead.

Earlier mines mostly comprised open workings at the lead veins ('rakes' or 'scrins') which appeared at surface, with some shallow underground mining. However, by the seventeenth century the exhaustion of shallower deposits, often down to the water table, together with the availability of new technologies led to the development of deeper and larger mines. As mines were dug deeper drainage soughs were required, as well as engines for pumping water and lifting ore. A variety of power sources were used, including horse gins, waterwheels and steam engines. The use of gunpowder from the seventeenth century also made the excavation of shafts and levels easier.

As well as the larger mines, smaller scale mining continued, often by farmers who supplemented their agricultural income at slow times of the year. Conversely, miners would often maintain smallholdings providing a close link between agriculture and mining within the county.

In the nineteenth century profitable lead veins became increasingly scarce in the region and competition from elsewhere in Britain and other countries made it harder for the local industry to continue. Activity went into a steep decline in the second half of the nineteenth century and very little lead mining continued into the twentieth century, although older mines and spoil were reworked for other minerals such as barite, fluorspar and calcite.

The longevity of the industry, together with the extensive nature of the ore deposits and the presence of many relatively small scale mines has left a legacy of a large number of shafts and associated remains spread throughout the orefield. Whilst the location of many of these has been recorded, if often not yet in adequate detail, others have not and their locations have been forgotten.

Roles and Responsibilities

2.1 Historical Position

The formal organisation of lead mining in Derbyshire followed a complex set of mining laws from the Medieval period onwards. The orefield was divided into 'Liberties' which owned mining rights and to which royalties were paid. The largest of the Liberties was the Crown, and the Duchy of Lancaster remains the largest owner of mineral rights. Other historic mining was also undertaken in the Staffordshire part of the orefield and for other minerals throughout Derbyshire but outside of this legal framework.

Within each Liberty, lead miners were allowed to mine anywhere on open land without restriction from the mineral owner. Barmote Courts were responsible for overseeing this activity and the mineral right owner appointed a Barmaster to assist in the collection of royalties.

The organisation of mines themselves varied according to their size and capital available. Some were large-scale ventures, whilst many miners worked on a small scale, either alone or in small groups. Non-working partners may have been involved to provide capital, or for larger mines companies were formed to finance and run the operation with the lead merchants often in the best position to provide finance.

Though lead mining no longer takes place, the Barmote Courts remain and have responsibility for any lead produced from the reworking of old waste material, and from within mines where lead ore is a by-product.

2.2 Mine and Mineral Rights Owner

The owner of a mine would normally be responsible for its maintenance and safety under the Mine and Quarries Act. However, given the age of mining remains in Derbyshire and the Peak District it can normally be expected that these will be long dead. Responsibility therefore falls on the mineral rights owner, and it may be possible to trace these through the Barmote Courts.

2.3 Landowner/Occupier

Where the owner of the mineral rights can not be traced then responsibility falls on the landowner or occupier. The landowner has a number of legal responsibilities with respect to abandoned workings, and these are set out in Appendix F. The landowner has to be consulted and his permission granted before any investigative or capping works are undertaken on his land.

2.4 Local Authorities

Local authorities have a role in shaft treatment, principally through their responsibility with regard to shafts or adits which are a 'statutory nuisance' to prevent injury to members of the public entering the land and also in their capacity as Highways Authority or Access Authority, which in Derbyshire is Derbyshire County Council. They may require that these are made safe, or undertake to do this work themselves and in some cases could seek to recover costs from the responsible person.

The Land Reclamation Section of Derbyshire County Council have a team of competent engineers experienced in the design and construction management of shaft treatment projects and continue to be active in where this is required. The County Council hold a comprehensive up to date database of known lead mineshafts detailing location,

ownership, condition as well as details of previous capping work. Information from this database can be made available by contacting the County Council (see Appendix C).

Local authorities are able to advise on the need for planning approval, and where this is required applications will need to be made to the local authority for planning permission or prior approval.

Local authorities also have an interest in maintaining the natural heritage and cultural heritage values of sites.

Much of the Derbyshire orefield falls within the Peak District National Park. The Peak District National Park Authority's statutory purposes are to conserve and enhance natural beauty, wildlife and cultural heritage and promote opportunities for the understanding and enjoyment of the special qualities of the Park by the public.

2.5 Statutory Agencies

In addition to local authorities there are a number of statutory agencies which have responsibilities in regard to some sites containing shafts.

English Heritage has responsibility over scheduled monuments and provides advice to the Department for Culture, Media and Sport on all application for scheduled monument consent. They will therefore need to be consulted on any proposals to cap shafts within a scheduled monument, preferably during the preparation of an application for consent.

Natural England is a Government agency funded by Defra and is the statutory body responsible for the conservation of wildlife, geology and wild places in England. Natural England will need to be consulted if works occur within, or are likely to affect, statutory designated wildlife sites. Natural England and Defra will need to be consulted if works are likely to affect species protected by national and/or European wildlife legislation.

Statutory agencies that may have an interest in the treatment of mine entrances also include The Health and Safety Executive, Environment Agency and The Coal Authority.

2.6 Special Interest Groups

In addition to the statutory authorities, there are a wide range of groups with an interest in shafts and associated remains. These include:

- Mining history and archaeology groups;
- Caving clubs;
- Outdoor Pursuit Centres;
- Derbyshire/Staffordshire Wildlife Trusts;
- Bat groups;
- Other wildlife groups;
- Landowners and farmers organisations;
- Local history groups;
- Regionally Important Geological Sites (RIGS) groups;
- Parish Councils.
- Local residents

These groups often include members with a considerable knowledge of the natural heritage and cultural heritage of shaft sites and may be able to provide practical or other assistance in capping shafts.

Environmental Issues

3.1 Nature Conservation

3.1.1 Introduction

Some mines may occur within statutory designated wildlife sites (SSSIs), or contain species which are legally protected (Appendix F). However, other mines may occur within non-statutory designated wildlife sites, or contain habitats and species that are not legally protected, but may nonetheless still be important for nature conservation. Within the Peak District there were 195 former lead mine sites known in 2004 to be of regional/national importance for nature conservation of which only 30 were legally protected, occurring fully or partially within statutory designated wildlife sites. Statutory designated site boundaries and reasons for designation can be obtained from www.magic.gov.uk.

In the context of these guidelines, 'important wildlife features' refers to statutory and non-statutory designated wildlife sites, legally protected species, and habitats and species that are not legally protected but nevertheless are still of nature conservation importance (conservation notable).

The principal important wildlife features which can be affected by the treatment of shafts are:

- bats associated with mines;
- important plants and grassland habitats associated with the landscape immediately surrounding the mine; and
- other important fauna (with or without legal protection) associated with the landscape immediately surrounding the mine.

3.1.2 Important Wildlife Features

Bats

Bats are nocturnal and use roosts for shelter and protection during the day, as places to hibernate during the winter, and as places to gather, mate and raise young in the summer. In Derbyshire and the Peak District five species of bat make significant use of mines for hibernation, with two species recorded using mines during summer (Table 3.1).

Table 3.1 Species Present in Mines in Derbyshire and the Peak District

Species and common name	Roost Usage	
	For hibernation (winter)	For maternity (summer)
Brandt's bat <i>Myotis brandtii</i>	Highly dependent, regularly recorded	No known records of use
Daubenton's bat <i>Myotis daubentonii</i>	Highly dependent, regularly recorded	Medium dependency, fairly regularly recorded
Whiskered bat <i>Myotis mystacinus</i>	Highly dependent, regularly recorded	No known records of use
Natterer's bat <i>Myotis nattereri</i>	Highly dependent, regularly recorded	Low dependency, occasionally recorded
Common pipistrelle bat <i>Pipistrellus pipistrellus</i>	Low dependency, occasionally recorded	No known records of use
Soprano pipistrelle bat <i>Pipistrellus pygmaeus</i>	Low dependency, occasionally recorded	No known records of use
Brown long-eared bat <i>Plecotus auritus</i>	Medium dependency, fairly regularly recorded	No known records of use

Table compiled from information provided by Pete Bush, Derbyshire Bat Group and Rod Gillatt, Peak Ecology.

Mines are used because they provide protection and a varied, albeit relatively stable, range of conditions throughout the year. The key conditions for bats inside a mine are humidity and temperature. There is relatively little fluctuation in humidity and temperature within mines although different mines will provide a range of conditions at different times of the year. Suitable temperatures and humidity within the mine are largely dependent upon airflow in and out of the mine, and the internal topography of the mine (the size, position and aspect of tunnels, recesses and domes). Airflow is created by differences in temperature inside and outside the cave (which in turn depends upon the time of year). Mines with a flow-through of air are known as dynamic systems and bats generally prefer these. Non-dynamic systems are generally too warm for hibernation roosts although they may be used temporarily as summer roosts.

At the mine entrance the surrounding vegetation and topography is important for bats, providing cover at the mine entrance and also feeding opportunities. In addition, bats may use the areas surrounding mine entrances for swarming (gathering).

Bat population sizes and fluctuations are difficult to measure. In addition historical data on bat populations and their geographical distribution is fragmentary and scarce, and some species were only discovered relatively recently. Notwithstanding this, it is widely accepted that in general bat populations are vulnerable and declining throughout Europe and that Great Britain holds populations of species of nature conservation importance at the European level. Bats are legally protected and are also UK and local BAP species.

Bats are threatened directly by disturbance from human activity within, or in close proximity to the mines, or indirectly by physical changes to the mines and surrounding areas (their habitat). Although bats may tolerate temporary and low levels of disturbance from human activity, persistent and excessive disturbance may cause bats to leave a roost altogether. Bats are particularly vulnerable to direct disturbance during winter when they are hibernating (disturbance causes them to wake from torpor (sleep) using up vital energy reserves), or during the breeding season in summer whilst mating and raising young (disturbance could affect breeding success).

Bats are also threatened by physical alterations inside or outside, but within close proximity to, the mine, which may affect the suitability of the mine as a roost, including subtle changes such as vegetation clearance at the mine entrance, mineshaft

stabilisation works/repair or installation of shaft or adit cap. These physical changes, either inside the mine, at the entrance, or within close proximity to a mine entrance can all affect the way in which air, and bats, enter and exit a mine. Changes to the airflow in and out of the mine may alter the internal environmental conditions of the mine and therefore its suitability as a roost for bats. Aside from actual physical blockage, such as from infilling, particular bats species are accustomed to particular ways of exiting and entering mines. Alterations to their exiting/entering behaviour, such as the installation of an unsuitable grille could affect their ability to successfully utilise the roost.

Underground sites, particularly those that are difficult to access are notoriously difficult to survey for the presence of bats and to understand how species are using the mine system. Bats may potentially use any mines, wherever there is an access point, even if the gap is only several centimetres. Only for shafts and adits that are currently completely blocked with no gaps through which bats may access, can it be certain that bats are not present though where mine entrances have recently opened up due to a collapse, it is less likely that bats will be present.

Grassland and other important nature conservation features

The hummocks and hollows (lead rakes) created by the deposition of waste material from lead mining typically contain a variety of grassland habitats, often occurring as an intricate mosaic, containing plants which have become established since the abandonment of the mines. Calaminarian grasslands are those that establish on lead rakes supporting vegetation tolerant to metal. Metal tolerant plants are known as metallophytes. Lead rakes may also support calcareous, neutral and acidic grassland habitats depending on the range of substrates and soil pH occurring at these sites. Some of the best sites in Europe for Calaminarian grassland are found in Derbyshire and the Peak District, and are protected as SSSIs and Special Areas of Conservation (SACs). All these grassland types are BAP habitats.

Some plant species are nationally important, such as the metallophytes spring sandwort (*Minuartia verna*) and alpine penny-cress (*Thlaspi alpestre*). Other species are locally rare but nonetheless are indicative of the special conditions at these sites and have a restricted distribution nationally. The grasslands may also support conservation notable terrestrial invertebrates such as butterflies and birds, and other legally protected species such as reptiles.

Former lead mining sites contain important grassland habitats



These important plants and grassland habitats, and the fauna they support are threatened by inappropriate site working practices such as trampling and temporary landtake. Licences would be required for works affecting legally protected species (Appendix F). Consents, issued by Natural England may be required for work within SSSIs (and SACs)

Other former mining sites have been 'improved' for grazing and are therefore of much less ecological value. However, there are a number of agri-environment schemes available to landowners that may provide financial incentives for managing land in an ecologically appropriate way following the works, in order to protect and or improve the biodiversity value of the site. Natural England and / or the Peak District National Park Authority should be approached for information regarding these schemes.

3.2 Archaeology

3.2.1 Surface Features

The mining of lead required a range of activities, which have left a variety of surface features around shaft and adit entrances. The quality of preservation varies, and many may be inherently difficult to recognise except by a mine archaeologist, but all contribute to an understanding of how the site was worked and are an important part of the archaeological resource. They tell us much about the date and history of a particular mine, the scale of extraction here and the methods used to extract and process the ores, which varied significantly from site to site.

Often the most prominent of surface features are the hillocks and mounds of waste material excavated along with the ore. The waste material is important in its own right as the nature of the material can provide valuable clues to the type of ore dressing and smelting technology used. Extensive areas of hillocks still survive in Derbyshire and the Peak District, many aligned along mineral veins that have been followed by the miners. However, many other hillocks have been removed either to re-process the residual gangue minerals or to improve the land for grazing.

The extraction of lead was a more complex process than simply removing the ore. Structures were required to lift the ore to the surface and then to process it (termed 'dressing' by miners) in order to separate the ore from other minerals, which required crushing, washing and sorting. Drainage to prevent workings becoming flooded was increasingly important as mines were sunk deeper, and various methods of drainage were used including soughs (drainage levels), hand pumps, water-wheel pumps and later, steam engines.

Early methods of lifting ore out of a mine involved simply carrying it out in a basket or dragging it in a sled. A development of this would involve a hand turned windlass at the top of a shallow shaft, though as shafts were cut deeper, larger scale winding gear was required. A common method for drawing up ore and for lifting water was the horse gin, which involved a horse walking in a circle to turn a wooden drum for a shaft winding rope. The wooden gins and headgear will have long since been removed or rotted away, though at some sites it is possible to see the circular gin platform alongside the shaft which it served. From the early eighteenth century some larger mines were able to afford to install steam engines for lifting ore and pumping water, and these required the construction of engine houses, boiler houses, chimneys and reservoirs. The remains of these structures survive at a number of sites, where the tall engine houses and chimneys form particularly evocative symbols of the historic mining landscape.

Shafts are often associated with surface archeological features such as this gin engine site



Initial processing of the ore was usually carried out at the site, and sometimes even underground, in order to reduce the bulk of the material to be transported to the smelters. The ore processing, or dressing, was often a fairly simple process and involved breaking with a hammer, hand sieving and buddling. Buddling relied on the fact that ore is heavier than the other material with which it was mixed. Therefore crushed ore was added to agitated water and passed through a trough, with the ore falling to the floor whilst other material would be washed away. In some areas, crushing was done with a horse drawn crushing stone which was pulled round a circular crushing bed.

There may therefore be a range of archaeological remains associated with ore dressing, including the mounds of waste material, crushing floors, buddle troughs and dams as well as the ponds, dams and leats which were required to supply the water.

Another common feature at mine sites is the coe, which was a small stone built shed used for storing tools and ore. Often the only surviving remains are stone footings and collapsed walls.

Damage to any archaeological features around shafts and across mine sites in general reduces the potential for understanding the history of the mine in question and mining across the orefield as a whole. Often this damage is unnecessary or carried out unwittingly and can be avoided by consultation with specialists with a detailed knowledge of mine archaeology.

3.2.2 Shaft and Adit Entrances

Shafts and adits are important archaeological features in their own right, and potentially vital as they give access to the underground archaeological mining resource. Shaft entrances were normally lined by dry stone walling, known as ginging, which would be built down to the bedrock. The preservation of the ginging is important to maintaining the stability of the shaft entrance as a failure of this can result in a wider shaft collapse. The ginging was often founded on wooden supports at the top of the bedrock, and it can therefore be in a fragile or poor condition.

Further down the shafts, there will often be evidence surviving for how the shaft was sunk and operated. This could include pick marks, gunpowder shotholes or rope-wear marks from haulage.

Shaft entrances were usually lined by dry-stone walling known as ginging



Around the edge of the shaft entrance may be remains associated with shaft top structures such as winding gear. These may survive only as sub-surface features such as infilled holes left behind by posts and may not be visible at all on the surface. However, they may still be vital to understanding how the mine was operated. Sometimes mine access shafts were within coes and the footings of these may remain; buried archaeological features within the coe, when carefully excavated using archaeological techniques can tell us much about how the coe was used and the mine workings accessed. From a conservation perspective, coes and their interiors should not be disturbed when capping takes place until archaeological evaluation has been carried out.

An adit, or level, formed an alternative type of mine entrance which took advantage of topography to reach underground mine working via a horizontal tunnel. These were also used to remove ore from the mines as it was often easier to use these for this than a vertical shaft. Adit entrances sometimes have drystone walled sides and arching, which can be in a dangerous state and require stabilisation. Some levels acted as drainage tunnels, known as soughs, taking out water from workings above the horizon where the level met the mineralization. While used in other mining regions, they were a particularly important features of Peak District lead mining from the 17th century onwards. Blocking these can have serious implications, for as water backs up behind it can lead to flooding problems at other entrances to the mine, or to the collapse of workings.

3.3 Landscape

An appreciation of the landscape is a key aspect for many of the people who live and work in Derbyshire and the Peak District and the legacy of mining forms an important element in this landscape within many areas of the orefield.

The mining landscape is characterised by a profusion of hillocks and hollows set amongst the dry stone walls enclosing the upland fields, creating in effect a relict industrial landscape. Many former mining areas are characterised by a strong sense of openness with low levels of vegetation cover rendering shaft entrances and the associated hillocks as potentially prominent elements in close and middle distance views.

The lead mining remains also impart a strong sense of time, helping to show that this is an historic landscape with an intimate relationship with the people who have made their livelihoods from it and within it in the past.

It is the visual prominence and strong historic aspect to the mining features which make them sensitive to the visual changes which may be caused by even small scale inappropriate developments, such as shaft caps which form a strong contrast through the use of inappropriate materials or colour, or which stand well-proud of the ground.

The Peak District National Park Authority has prepared an Inventory of Regionally and Nationally Important Lead Mining Landscapes in the Peak District Orefield, including two further identified landscapes outside of the National Park. Each of these has been selected as they represent a good example of a particular type of mining landscape, where the mining remains are of sufficient quality to make significant contribution to the historic landscape.

Derbyshire County Council has produced The Landscape Character of Derbyshire, which whilst excluding the Peak District National Park where much of the historic lead mining activity occurred, it includes other adjacent parts of Derbyshire where lead mining occurred. The Landscape Character of Derbyshire document sets out to promote the primary planning aim of maintaining and enhancing the overall quality and diversity of landscape character and the distinctive sense of place and individual identity of each particular area. It also aims to support planning policy to helping ensure that new development respects and contributes towards enhancing the local character and sense of place of the landscape. The Peak District National Park Authority hopes to produce a similar Landscape Character assessment in the near future.

3.4 Access and Recreation

Derbyshire and the Peak District offer many opportunities for outdoor recreation, which are taken advantage of by residents and visitors. Land containing mining remains may be used for walking, either on footpaths or within open access areas and the remains may attract visitors with an interest in their history.

3.4.1 Underground Activities

Shafts provide a ready access to many caves and mines within Derbyshire and the Peak District, and this access is valued by caving clubs for the purposes of recreation and underground exploration. Cave and mine exploration is also undertaken by those with an interest in mining history and industrial archaeology, with the aim of researching and surveying the remains of former mine workings.

Shafts provide ready access to caves and mines



Whilst many cave and mines are known and regularly visited it is certain that there are others which remain to be discovered. It is possible that shafts which have not been visited by caving groups may lead to further important and sometimes extensive caves and mines and provide excellent opportunities for further exploration and research.

Provision of access shaft caps will also provide the opportunity to identify shafts which are in danger of collapse. There may be no visible sign of an impending shaft collapse at the surface, and inspections of the ginging may allow potential problems to be identified and remedied before they become serious.

Given the potential for the build up of gases in old mine workings it is important that mine and cave systems which may be visited, retain adequate ventilation through shafts and adits.

Regardless of how physical access to a shaft is provided, it must be stressed that actual access will in all cases require a verbal or written agreement with the mine owner and/or landowner.

3.4.2 Surface Activities

More and more visitors are accessing former lead mining areas who generally have no intention of entering shafts or adits, even when areas of former mining are indicated on Ordnance Survey maps. Many mining remains are located near to public rights of way, whilst other remains are in open access areas which may be used for public recreation (eg walking, fell running, trekking etc). Though accidents involving lead mine shafts in Derbyshire are not frequent, they do occur and it is particularly important that shafts in or adjacent to publicly accessible areas are made safe.

Shafts are located in areas to which the public have access



The safety of the public with access to these areas must be a primary consideration in the treatment of shaft and adit entrances. Where a land owner or occupier knows of a danger within their land (such as an open shaft), they are required to take reasonable care to prevent injury to members of the public entering the land. This applies to trespassers as well as those with a legitimate right to access. In addition, local authorities have duties placed on them whether as the Highways Authority, the Access Authority or as District Council to ensure the safe treatment of statutory nuisances and ensure that access along footpaths, bridleways and open access areas are managed safely.

3.5 Geology

Lead ore derives from the mineralization of fluids which collected within faults and fissures in the Carboniferous Limestone. In reaching the lead veins, the miners have exposed many of the areas where this mineralization occurred, and some of these are of significant geological interest. This has been recognised by the designation of a number of sites as SSSIs on the basis of their mineralogical value, as well as Regionally Important Geological and Geomorphological Sites (RIGs).

Some of these sites include remains of surface extraction, which are accessible above ground, whilst others include only underground features which can only be reached through shafts and adits.

3.6 Farming and Land Management

Most mining remains are located within active farms, often being used for the grazing of livestock, and this will be a key consideration in their treatment.

As well as having a responsibility for the safety of visitors, including those which may be trespassing, a landowner must also be concerned with the safety of farmworkers who are working around shafts. Stock management often requires the use of four wheel drive vehicles or tractors and this may involve a risk of driving over a shaft whose presence is unknown or a capped shaft which has been obscured, such as by snow. It is therefore imperative that any shaft cap be suitably designed and constructed to a standard suitable to carry loading from heavy agricultural vehicles and machinery, or any other vehicle that may traverse the site.

The safety of livestock will also be an important consideration in the decision to treat a shaft and the selected design.

Livestock often graze within former mining areas



Agricultural enclosures within Derbyshire and the Peak District are generally marked by drystone walls rather than fencing. As a result of this, the use of fencing around shaft entrances will often not fit well within the wider agricultural landscape.

Treatment Methods

4.1 Introduction

There are a variety of ways in which an open shaft can be made safe and the best option will depend on the nature of the site in question, and how accessible it is for the public, as well as the need to protect farmworker/employees and livestock. This section briefly outlines the different ways in which shafts may be made safe. Indicative drawings illustrate a range of available treatment methods which can be adapted to the needs of a specific site are included as Appendix A. The detailed designs employed within each option can vary from the drawings given here to suit individual circumstances.

Historically, in the 20th century, some unreliable treatment methods were occasionally used and these may be liable to collapse. For example, shafts capped with timber, particularly where hidden are often now particularly dangerous. Other redundant shafts were blocked during periods of mining activity with small trees, such as blackthorn and hawthorn, and then partially infilled and levelled off with soil and mining waste. Thereafter, voids may develop as a consequence of decay and gravity, and such shafts can be particularly susceptible to the passage of heavy vehicles and agricultural equipment.

4.2 Fencing and Signs

The erection of fencing and warning signs around a shaft may be sufficient to make it safe and discharge a landowner's obligation to take reasonable care to protect the public from harm. However, it should be recognised that the actual protection provided by these measures may be limited. Fences have a limited lifespan and need regular inspection and maintenance to be kept in good order. Animals may pass through any fences which are not well maintained and even if in good order it may still be possible for people to climb them. Warning signs may sometimes be ignored, and in particular, children may be liable to do this.

Most mining remains survive in a landscape which is either open or enclosed by drystone walls, so the use of fencing may damage the appearance of this landscape.

Given these drawbacks, in most cases the use of fencing may be appropriate as a temporary measure only. However, it may be suitable as a means of enclosing a group of shafts or an area where continuing shaft collapse makes the installation of a cap impracticable.

4.3 Capping

Capping involves the installation or placing of a cover over the entrance to a shaft. A variety of cap types have been used in Derbyshire and the Peak District from the traditional 'Beehive' cap comprising a rounded mound of drystone construction to the galvanised metal grille. Solid covers level with the ground are also present and generally made of concrete slabs or concrete or wooden railway sleepers. Grilles are either secured into the shaft lining, set within a concrete ring around the shaft entrance or simply secured to the ground around the shaft with metal pins. Grilles can also be designed specifically to allow access for cave exploration and maintenance inspection, or to ensure that they are 'friendly' to bats.

Grilles have also been used to restrict access to the entrances to adits and are often set just within the entrance.

4.4 Filling

Shaft filling is a drastic measure from a conservation perspective, which should only be considered in extreme cases where there is no other way to make them safe. This could be where there is ongoing shaft collapse causing a risk to people and livestock. If a shaft is connected to a cave system or extensive mine workings then filling it is likely to cause problems elsewhere with ventilation and drainage.

Selection of Shaft Treatment

5.1 General

The first decision on treatment will be as to whether it is required at all. Shaft treatment is normally implemented in response to an identified concern over safety, so if an open shaft is judged not to be a hazard then it may be that no action is required.

All sites are unique and where treatment is required, the most appropriate option must be selected, designed and implemented with the particular site's circumstances in mind. This section discusses in turn the key factors which are likely to determine which is the most suitable treatment option. However, it is worth considering at the outset what the treatment is hoped to achieve, such as:

- Is the primary aim to make the shaft safe against injuries to people and livestock?;
- Is there a desire to enhance the site for access, biodiversity or heritage conservation and landscape value?;
- Is the intention to 'blend' the shaft into the wider landscape and/or to emphasise the mining history of the site?;
- Where a shaft has previously been capped, is the intention to replace like for like or to do something different?. It is also worth considering the extent to which an existing structure, such as the original ginging or the remains of a former cap, can be incorporated into the design.

5.2 Health and Safety

The safety of the public, farm workers and other employees, as well as of livestock must be a key consideration in the decisions on if and how to treat a shaft. The extent to which an area is used by the public will be an issue in deciding on a treatment method. Safety concerns will carry more weight with regard to shafts or adits when they are within publicly accessible areas, such as near to a public right of way or within an open access area.

The Construction (Design and Management) Regulations 1994 require all those involved in construction to adopt an integrated approach to health and safety management. Clients, designers and contractors must work together to ensure that health and safety management issues are considered throughout all phases of a project. Whilst current mining activities are excluded from these regulations it is considered that the treatment and capping of disused shafts, adits and other entrances are covered.

The Regulations place legal requirements not just on those involved with on-site construction management but also clients and those undertaking design work. It requires a holistic approach linking all construction parties together in order to account for the health and safety management of all related issues from feasibility, through the intervening stages of design and construction. Therefore, not only does the management of the construction of a mineshaft cap need to comply with the regulations but so does the design of a mineshaft cap.

The designers of a mineshaft capping treatment should take into consideration pertinent factors including availability of historic information, site investigation, existing condition of the shaft, loading, abnormal loading, ground loading, avoidance of imposing loads on to the ginging, safe access and unauthorised access, safe working, durability of materials and design, safe working of construction personnel, manual handling,

provision and use of appropriate PPE. This list is not exhaustive.

The Act specifically requires that key people are competent for their roles and have sufficient resources to meet their legal duties. Failure to comply with the Regulations is an offence.

5.3 Nature Conservation

Bats and their habitat are the key wildlife features in terms of sensitivity to the type of treatment options being considered. The sensitivity of other wildlife features such as important plants and grassland habitats, are less dependent upon treatment type but rather on inappropriate or careless work, such as trampling and temporary landtake around mine entrances and access routes to sites. Advice can be obtained from the County Council, Natural England, the Wildlife Trusts or the Peak District National Park Authority Ecology Service.

5.3.1 Protected species: Bats

The location of some bat populations may already be known, based upon previous survey work or anecdotal sightings, and therefore some mines may have already been identified as important for bats. Bats may potentially use any mine, wherever there is an access point, even if the gap is only a few centimetres. Only for shafts/adits that are currently completely blocked with no gaps, however small, through which bats may access, can it be certain that bats are not present. Furthermore, this condition must apply to all points of original access and egress into the mine.

For all other shafts/adits it is advisable to consult with Natural England, the Bat Conservation Trust or Derbyshire Bat Conservation Group/Staffordshire Bat Group. This will be to determine if bats are known to be present in the mine, or if not a known bat roost site, to seek advice on whether the mine is likely to be used as a bat roost. Staff from the aforementioned organisations may be pleased to visit the mine to determine its suitability as a bat roost.

Use of a mine as a roost depends upon a range of complex and interacting factors both inside and outside the mine, including the internal dimensions of the mine, and habitat requirements of bats. It is possible to provide, in broad terms, an indication of which mines may be more suitable for bats than others (Table 5.1), although it must be stressed that potentially any mine could be important in some way for roosting bats at different times of the year.

Table 5.1 Broad Indication of Factors Affecting Mine Roost Suitability

More suitable roost sites - Dynamic mines with airflow		Less suitable - non-dynamic mines with no airflow	
Most suitable		Least suitable	
Multi entrance mine; Entrances at different elevations; Large internal volume; A variety of sump areas of varying size/volume and aspect below the lowest entrance, A variety of raises of differing size/volume and aspect in the mine roof; Sufficient vegetative cover around the site entrances; Abundant, linear foraging habitat adjacent to the mine; and Known roost sites within 2 km of the mine	Single entrance mine; Large internal volume; A variety of sump areas of varying size/volume and aspect below the lowest entrance, A variety of raises of differing size/volume and aspect in the mine roof; Sufficient vegetative cover around the site entrances; Abundant, linear foraging habitat adjacent to the mine; and Known roost sites within 2 km of the mine	Single entrance mine; Small internal volume; Few sump areas of limited size/volume and aspect below the entrance, Few raises of limited size/volume and aspect in the mine roof; Little vegetative cover around the site entrance; Abundant, linear foraging habitat adjacent to the mine; and Known roost sites within 2 km of the mine	Single entrance mine; Small internal volume; No sump areas; No raise areas; No vegetative cover around the site entrance; No linear foraging habitat adjacent to the mine; and No known roost sites within 2 km of the mine

If bats are not known to be present but the mine is deemed to be suitable as a roost site, then installation of a 'bat friendly' grille would be acceptable.

Informed by consultations with the relevant nature conservation organisations, the importance of different sites for bats can be graded in importance, and a treatment outcome determined (Table 5.2).

Table 5.2 Suggested Treatment Outcomes for Sites with Varying Degrees of Importance for Bats

Level	Significance for bats	Criteria	Suggested Outcome
1	High	Sites known to be used by bats for maternity or hibernation	Fencing (not barbed wire) should be considered first as a viable option, and if not appropriate then bat friendly cap/grille installation at a time of year that will least disrupt the bats. There should be a strong presumption against complete infilling/sealing. Complete infilling/sealing should only be considered in the most extreme of circumstances and following extensive discussions with nature conservation organisations.

2	Medium	Sites which are suitable for bat use, as judged by the criteria set out in Table 5.1.	<p>Bat friendly cap/grille installation at a time of year that will least disrupt the bats will likely be appropriate.</p> <p>There should be a presumption against complete infilling/sealing. Complete infilling/sealing should only be considered in the most extreme of circumstances and following extensive discussions with relevant nature conservation organisations.</p>
3	Low	Sites not suitable for bat. Shaft/adit has been completely blocked/covered.	<p>Bat friendly grille not formally required, but may be fitted to increase opportunities for roosting bats.</p> <p>If shaft is not currently completely blocked then completely sealing the shaft could adversely affect ventilation of the mine.</p> <p>Proposals to change the type of existing cap in order to benefit bats should be informed by discussions with relevant nature conservation organisations.</p>
<p>Table adapted from Bat Workers Manual and the Bat Mitigation Guidelines</p>			

Complete sealing of a shaft or adit would prevent bat access and may therefore exclude them from a mine, or alter the airflow into a mine system which may reduce the suitability of the mine for bats. The habitat requirements of bats in mines is not fully understood and therefore assessing the effect of such action on bats can be very difficult. Therefore due to the presence, or potential presence of bats, the complete sealing of a previously open shaft should only be the preferred option where there are strong overriding health and safety concerns, and no other method of site protection is possible or permitted.

Where bats are present and there is a need for a cap over a shaft/adit entrance, then in order to comply with wildlife legislation the cap should be designed and installed in such a way as to allow the existing bat population to freely access the mine, whilst ensuring that the existing airflow is also not detrimentally affected. It will therefore be appropriate to ensure that the cap design allows access for bats. This could include a grill or other cap design with the correct spacings. The horizontal and vertical spacings between the bars of a grille are critical, because this spacing may affect which species can use the mine. However, at the time of reporting, there appears to be little published research on the effects of grille installation on bats roosting in mine systems, such that the effects of grilling on bat species is not fully understood (pers. comms Alison Racey, Bat Conservation Trust; Jean Matthews, Countryside Council for Wales).

As a precautionary approach it is considered that at least one gap of at least 60cm by 15 cm at a height of 50 cm is the minimum requirement until such time as more research is available.

Bat Friendly Grilles

The Bat Workers Manual (Mitchell-Jones and Mcleish, 2004) suggests that a horizontal grille bar spacing of 15cm and vertical bar spacing of the upper end of 45 to 75 cm is appropriate for roosts where greater horseshoe bats (*Rhinolophus hipposideros*) are present, with 13cm horizontal spacing considered to be appropriate where other bats species only are present. However, recent unpublished research by John Altringham at Leeds University suggests that Natterer's bats are affected by horizontal grille bar spacings of 13cm when swarming (pers. comms. Alison Rasey, Bat Conservation Trust; Jean Matthews, Countryside Council for Wales). Contrary to this there is evidence from work undertaken in Portugal involving most of the underground dwelling species occurring in Britain, including Natterer's bats, that suggests Natterer's bats and the other species are unaffected by horizontal grille bar spacing of 15cm and vertical grille bar spacing of 60cm (Rodrigues, M.L.S.V, 1996 Utilizacao de Grandes Para Proteccao de Abrigos de Morcegos Cavernicolas. Dissertation presented to the University of Lisbon translation provided in part by Katie Parsons, Bat Conservation Trust).

A raised grille with a height of up to 60 cm provide bats with the best opportunities to access a mine through the vertical and horizontal sides of the grille. Suitable grille designs are included in Appendix A as drawings 3d and 3e. The raised structure will be just visually prominent enough to prevent grazing stock, domestic animals and humans from accidentally stumbling into, and becoming trapped in the structure. For adit grilles, the designs included in Appendix A as drawing 3f are appropriate provided that an opening is provided with a space of 15cm between horizontal grille bars and 60cm between vertical grille bars, at a height of about 50 cm. Bars may be closer below this height if necessary, for increased safety.

In all cases of cap and grille installation, the aim will be, as a minimum, to leave the dimensions of the shaft or adit entrance unaltered wherever possible to ensure airflow is not detrimentally disrupted. Therefore it is generally recommended that the grille is not installed in the narrowest part of the shaft/adit, or if this is unavoidable, then as far as possible minimise the obstruction to airflow at the roof and floor level. However opportunities may exist to improve the roost suitability of the mine by altering airflow or facilitating access, for example, by changing the existing cap type. Before considering and implementing such proposals, the mineowner, the landowner, Natural England, and other appropriate nature conservation groups should be consulted in addition to health and safety access issues. Further reading on opportunities for improvement of roosts for bats can be found in The Bat Workers Manual and The Bat Mitigation Guidelines.

More specific advice on grille installation can be found in the Bat Workers Manual, available for download at www.jncc.gov.uk/page-2861. In addition to consultation held with the relevant statutory authorities and other organisations regarding bats, it is recommended that the engineering contractors and the ecologist are made aware of the Bat Workers Manual.

5.3.2 Sites of Special Scientific Interest

Sites of Special Scientific Interest (SSSIs) are the country's very best wildlife and geological sites. The special interest of an SSSI is legally protected by the Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000. Bat roosts may form part of the special interest of an SSSI although these are already legally protected and in the Peak District and Derbyshire it is more likely that the grassland surrounding shafts is of SSSI interest. Landowners and managers are

contacted by Natural England (formerly by English Nature) during notification of SSSIs, and SSSIs are registered as local land charges. The boundaries of all SSSIs can be viewed on the website www.naturalengland.org.uk or www.magic.gov.uk, where you can also find out the special interest of each SSSI.

If the shaft falls within the boundary of an SSSI, and capping work is intended, you should contact Natural England. Landowners and managers are likely to need a consent from Natural England to carry out the work, or to give permission to anyone else to carry out the work. Public bodies also need to consult Natural England if they intend to carry out work to shafts within SSSIs. Natural England can advise on how to avoid damaging the interest of the SSSI. Often a consent can be issued quickly, with certain conditions applied to working methods, such as avoiding certain areas of grassland, or only storing materials in agreed areas. Local Natural England staff will be fully aware that work often needs to be carried out quickly, and will be able to offer immediate advice if you feel a shaft requires capping for urgent health and safety reasons.

5.4 Archaeology

Many shafts are surrounded by features of archaeological interest, whilst at others agricultural improvements or the re-working of mining waste to extract gangue minerals may have removed them. Evidence for archaeological interest may only be visible as subtle changes in the landform and it is often difficult for the layman to identify whether they are present. However, a landowner or occupier will often have the best knowledge of recent activities at a site and to what extent these may have disturbed the ground. When in doubt, specialist archaeological advice should be sought.

The most obvious sign of archaeological interest is the presence of hillocks surrounding a shaft. These are not only of archaeological interest in their own right, but their survival may be an indication that other, less obvious signs of archaeological interest also survive. Other readily recognisable features include the ruined walls of coes, whilst features such as horse gin platforms and buddling troughs are likely to be more subtle and difficult to recognise.

Readily
recognisable
features of
archaeological
interest include
ruined coes



Where there is reason to think that archaeological features are, or may be, present around a shaft or adit, then careful thought to shaft treatment can prevent avoidable and unintended damage to any remains. Archaeologists at the County Council or Peak District National Park Authority can be contacted and will be happy to provide advice.

Disturbance of the ground may inadvertently remove features of archaeological interest, either visible on the ground or below the surface. Where there is reason to believe that archaeological remains may be present, ground disturbance should therefore be minimised or avoided altogether if possible. The installation of a concrete ring for a grill will normally require excavation, and so careful thought should be given to whether this is necessary, or to what depth of concrete is actually required.

The ginging is an important part of the shaft, and being drystone in construction it can be vulnerable to collapse. Any shaft treatment should therefore be carried out in a way which will avoid putting undue additional weight on to the ginging, which could potentially weaken it and contribute to a possible collapse. In some cases, it may be possible to secure a grille into the ginging, provided that this is suitably consolidated and secured. Alternatively, a grill can be pinned to the surrounding ground in ways that have minimal archaeological impact, provided that appropriate health and safety issues have been incorporated into its design.

Another important consideration is the damage that can be caused to a site more generally by bringing machinery and materials onto site to carry out the capping. Careful consideration needs to be given to access routes and weather conditions (see 6.2). Again archaeological advice should be sought.

5.4.1 Scheduled Monuments

If the shaft is within a Scheduled Monument then it is important that any proposals for shaft treatment are discussed first with English Heritage. Formal Scheduled Monument Consent may be required, but this will depend on the nature of the shaft and the type of treatment which is to be used, and English Heritage will be able to provide advice on this (applications do not incur a fee).

Under The Ancient Monuments (Class Consents) Order 1994 (SI 1994 No. 1381) class consent can be granted for works necessary for safety and health. This is only granted for works which are the minimum immediate measures necessary and notification (with a justification) must be made to the Secretary of State as soon as possible.

Scheduled Monument status will certainly affect the type of treatment which can be used on a shaft. They are features of particularly high archaeological interest and importance, and the maintenance of this should be a priority in any treatment options. In general shaft treatment should aim to avoid disturbance of archaeological deposits and to maintain the historic character of the monument. Ideally, any work should be reversible, meaning that the treatment option could be removed at a later date without leaving a visible trace, in case a different management option was chosen in the future.

Normally, the landowner is informed when an area is designated as a Scheduled Monument, and this information is included on the Land Registry. However, if you are unsure as to whether a particular shaft is within a Scheduled Monument then you should be able to check this by contacting English Heritage, the local authority, or by checking on www.magic.gov.uk. The boundaries of all Scheduled Monuments and a description of these nationally archaeologically important sites can be obtained from this web-site.

5.5 Landscape

It is important at the outset when considering treatment options to be clear about what type of visual appearance it is hoped to achieve. In some cases it may be desirable to make the shaft more prominent in order to emphasise the mining legacy of a site and measures may be taken on or near to the shaft to highlight its presence. Elsewhere an alternative objective could be to minimise the visual impact of a treated shaft in order to disguise or hide it within the landscape. The desired objective for a particular site will affect the most appropriate solution in any particular case.

In considering whether landscape issues may be important in the selection of a cap design it is important to be clear about how visible and sensitive the site may be. Given the scale of the likely works it is appropriate to consider possible views up to a distance of 250 m of the shaft from the following potential sensitive locations where there are:

- Residential properties;
- Users of any public right of way (such as footpath, bridleway or road);
- Visitors to any facility within the area;
- People who may be using open access land (under the CROW Act).

It is possible to identify these from an Ordnance Survey 1:25 000 Explorer map, with verification on the ground.

Where sensitive locations can be identified within 250 m of a shaft then the following considerations should be taken into account:

- The distance of the closest view to the sensitive location ie less than 50 m/50-100 m/100-200 m/over 200 m;
- To what extent the actual shaft entrance is visible from a sensitive location, or how far it is screened by vegetation, hillocks etc;
- The number of shaft entrances within a particular view;
- To what extent other visually prominent remains of former mining are available within the frame of view;
- Where an existing cap is present, is this visible or visually intrusive;
- Where it may be necessary to use a cap which is raised above the surface, will this be visually intrusive in this location;

Where it appears likely that the required shaft treatment design will be visually intrusive, and that this will damage a visual appreciation of a site then consideration should be given to the potential to introduce screening around a shaft. This could involve the use of vegetation, soil mounds or even the use of locally sourced stone to create stone walls. However, measures such as these could involve greater damage to the natural and heritage value of a site than the capping itself and should only be considered with the benefit of specialist advice. Care should also be taken to ensure that measures should fit with the wider landscape. For example, introducing new stone walls or vegetation into an open landscape may not be appropriate. The use of fencing should not generally be used in areas where the predominant boundary treatment is drystone walling as this will significantly impact on the landscape character; however it may be appropriate as a temporary measure pending further works.

The height of the shaft location in relation to viewpoints is important as a shaft which is overlooked will be more visible than those which are only viewed from lower lying ground.

The beehive cap is a traditional form of cap, which being of drystone construction of local materials form a distinctive historic landscape feature that are increasingly rare within the orefield. Where original beehive caps already exist, if safety work is necessary, these should normally be replaced like with like.

5.6 Access to Mines

Provision for physical access can most easily be provided by inclusion of a hinged lid or removable grille section. This can be incorporated into most treatment designs but are more easily fitted into a grille or concrete ring. The hinged lid or removable section needs to be secured to prevent unauthorised access but allowing mine explorers ease of access, and this is most conveniently achieved with a simple nut and bolt. A padlock can be used but these have the disadvantages that they can be vulnerable to vandalism and may rust when left in the open air. Bolts or bars secured into the ground can be placed within or near to the opening in order to attach ropes or a flexible ladder for those entering the shaft.

A secure hinged grille can provide access to a shaft



Grilles, whether with access openings or not, provide some visual and intellectual access for the public not intending to access the mines and therefore they can contribute to the overall cultural and amenity value of mining sites and landscape.

Installation Guidelines

Whichever method of treatment is chosen, there are a number of principles which should be adhered to in order to avoid unnecessary disturbance and damage to sites and to comply with the appropriate legislation.

6.1 Health and safety

The Construction (Design & Management) Regulations 1994 (CDM) are unlikely to come into full effect for the majority of shaft capping activities due to the short periods of construction activity and number of men likely to be working on site. However, Regulation 13 (in respect of design) will always apply. This requires that the designer of a shaft treatment has adequate regard to avoiding foreseeable risks involved in its construction and use. It is important to ensure that the treatment will not only provide a safe solution when installed, but also that it can be built in a safe manner.

Consideration also needs to be given to safe working practices, particularly around the shaft entrance. This is likely to require the provision of appropriate personal protective equipment (PPE), which could include safety harnesses. Machinery should be kept away from the edge of the shaft as the additional weight may cause collapse and consideration should also be given to providing temporary protection, such as fencing, whilst construction is underway.

6.2 Site Access

The means and route for access to a site is important in minimising disturbance, and careful thought should be given to how a site will be reached. It may be that vehicles and excavators will need to reach the shaft to deliver material and tools, as well as assisting in the work. Vehicles have considerable potential to churn up the ground, causing lasting damage to plants, habitats and features of archaeological interest.

Careful consideration should therefore be given to suitable access route and the type of vehicle to be used, and it may be necessary to take advice on this, and to provide temporary protection (e.g with the use of bunting) to sensitive areas. In some cases constraints over access may affect the type of treatment or design which can be used as it may be difficult to transport large or heavy items to a particular site.

The time of year is also important, as disturbance to the ground is more likely to occur when the ground is wet. Therefore where possible work should be scheduled for when the ground is likely to be firm, which will be when it is most dry, or frozen. Of course, if work is urgently required then the timing will not be a matter of choice.

Permission from the landowner or mineowner may be required, and this may also affect the required access arrangements. It is also important that all contractors are fully briefed upon the aims of the works and any environmental constraints.

6.3 Surveys and Assessments

New surveys are often not required, but consultation with appropriate bodies is always essential. These organisations can consult each other to save you time, and will often hold information on the value of a site, often removing the need for new surveys.

The habitat requirements of, and subtle interactions between, wildlife associated with mine are complex. Similarly, successful interpretation of, and implementation of appropriate action in respect of, wildlife legislation, nature conservation policy and best practice requires informed advice. Therefore early consultation with Natural England,

the County Council, Peak District National Park Authority or Derbyshire Bat Group will help to ensure that the works proceed as smoothly as possible without committing an offence under wildlife legislation, and will avoid detrimental impacts on important wildlife features from inappropriate design and implementation.

In some circumstances, it may be appropriate to engage the services of an ecological consultant to undertake further survey and provide advice on the treatment design and installation. Procedures for ecological survey and assessment are set out in Appendix D, but in summary, the process consists of the ecologist making an assessment of the nature conservation importance of the wildlife features present, or potentially present at a site. Assessments are based upon data from surveys, undertaken where required, in conjunction with consultation with the relevant statutory authorities (Natural England / Defra) and other nature conservation organisations (e.g. Bat Conservation Trust and Derbyshire Bat Conservation Group).

Ecological surveys, consultations and assessments of important wildlife features will enable licences / permission to be obtained from the statutory authorities where required, and to identify any appropriate working methods and mitigation to be designed and implemented. Works undertaken at the appropriate time of year, subject to a method statement, and with licences / permission in place where required, will ensure that the impact on important wildlife features is minimised, whilst allowing the works to proceed smoothly without causing an offence.

Similarly, archaeological interest needs careful consideration in advance of the capping work. Experienced archaeological practitioners with specialist knowledge of mine archaeology should be consulted, both to identify what interest exists and how to militate against damaging this. At Scheduled Monuments it is a requirement that English Heritage are consulted. Archaeologists at the Peak District National Park Authority and the relevant County Council can provide advice and where appropriate provide contact information on suitable archaeological consultants. The conservation officer at the Peak District Mines Historical Society can provide informal advice

Investigation is also required to identify the information required to assist in the engineering design process, such as the condition or presence of ginging, stability of the surrounding ground, determination of safe working distances, existing condition of shaft and historic capping solutions. It is advised that only competent engineers should be used to collate and interpret this information.

Derbyshire County Council, the Peak District Mines Historical Society and Derbyshire Caving Association all hold, or have access to, extensive records, documents and information that may prove helpful at the assessment stage.

6.4 Monitoring

Where the treatment works require ground disturbance within ecologically or archaeologically sensitive sites then monitoring while the work is being undertaken by appropriate specialists may be required. In particular, the monitoring of ground disturbance within archaeologically sensitive sites will allow the identification and recording of any sub-surface features exposed during the works. It is important that this is done by an archaeologist who is suitably familiar with the nature of the mining features which may be encountered. Advice on contacting a suitably qualified archaeologist can be obtained from the relevant County Council or Park Authority.

Post-works monitoring by an ecologist may sometimes be useful in order to confirm that adverse effects have not occurred as a result of treatment works, and that any mitigation implemented has been successful.

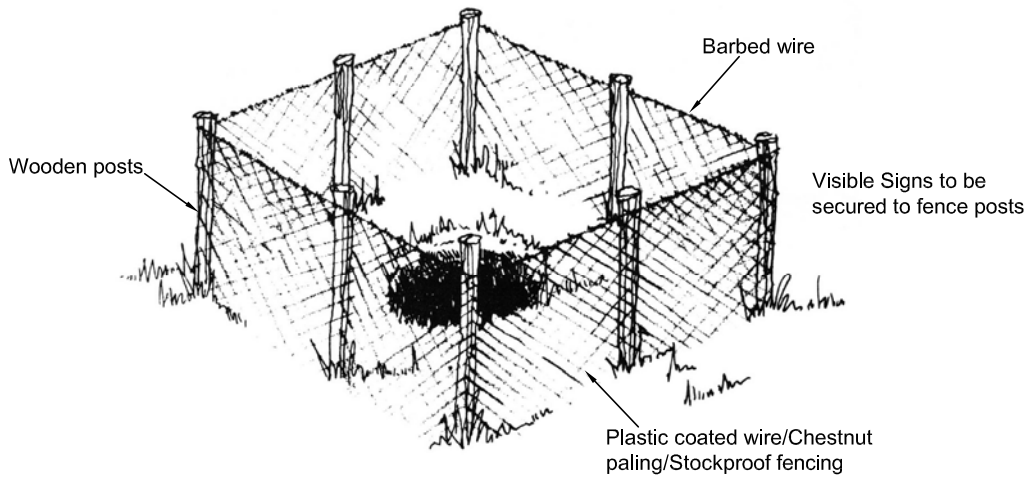
6.5 Filling

Shaft filling should be seen as a last resort and only considered in exceptional circumstances, such as a collapsing shaft which may threaten a building or road. Where shafts are being filled it is important this is done to the true base of the shaft, and that only suitable inert material is used. Advice should be sought from appropriately qualified engineers before embarking on any such course of action.

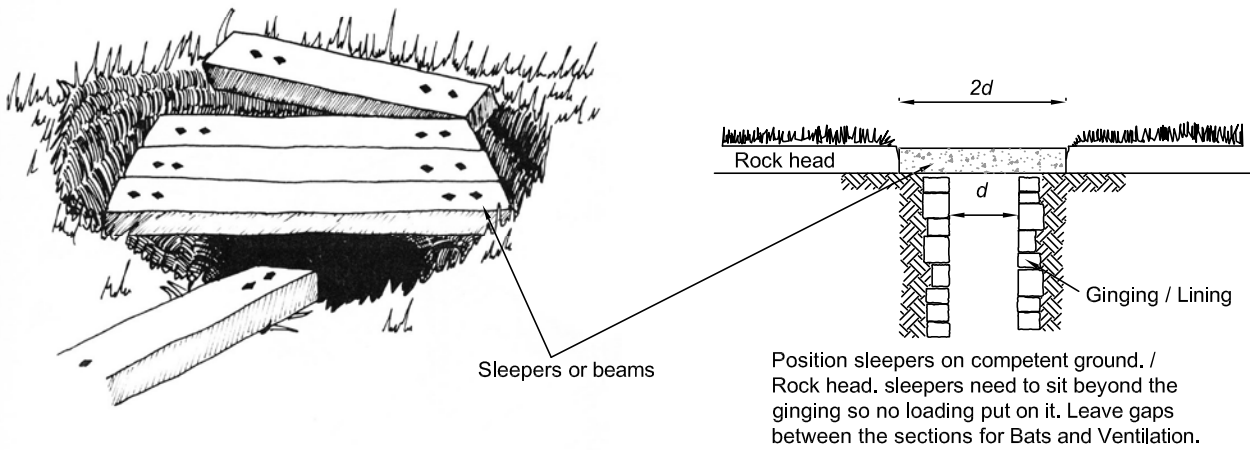
Appendix A

Treatment Designs

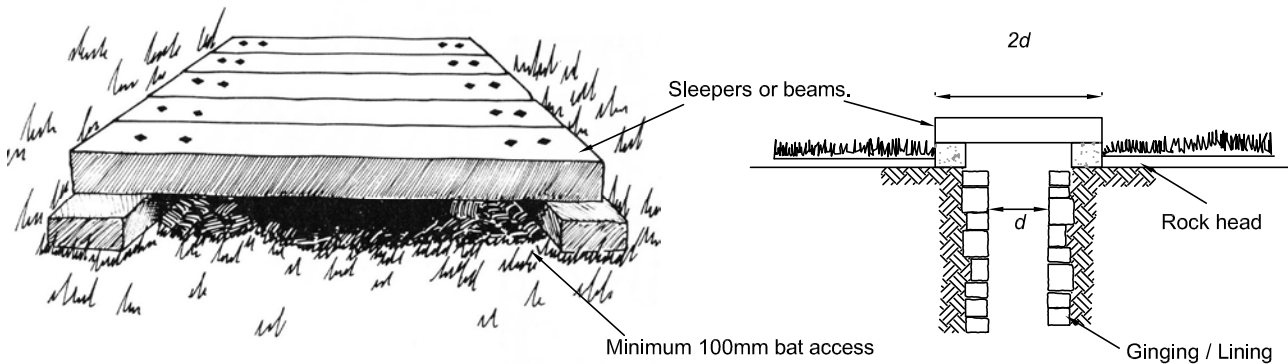
1. FENCING AND SIGNS



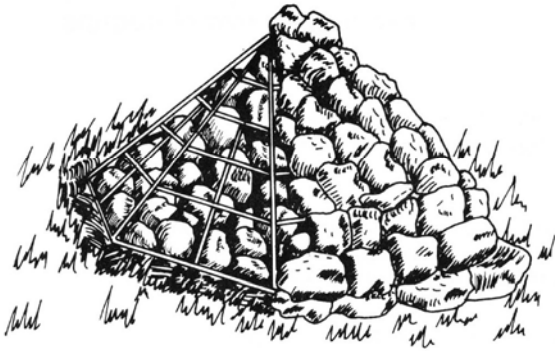
2 a. CONCRETE SLEEPERS OR BEAMS



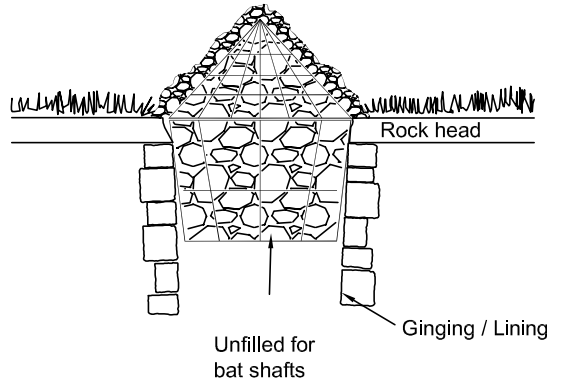
2 b. CONCRETE SLEEPERS OR BEAMS - BAT ACCESS



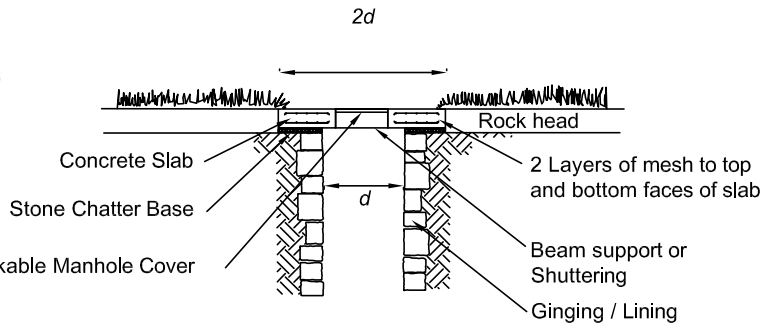
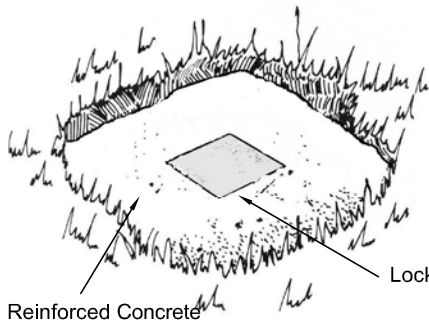
2 c . CLWYD MINE CAP



Only used for shafts less than 1350mm

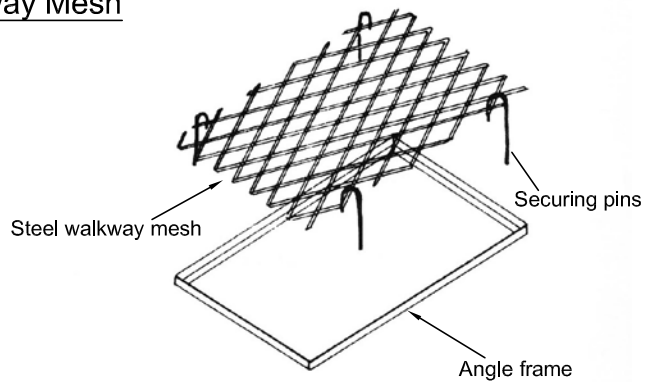
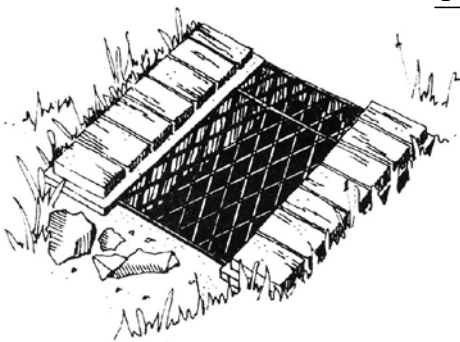


2 d. REINFORCED CONCRETE CAP



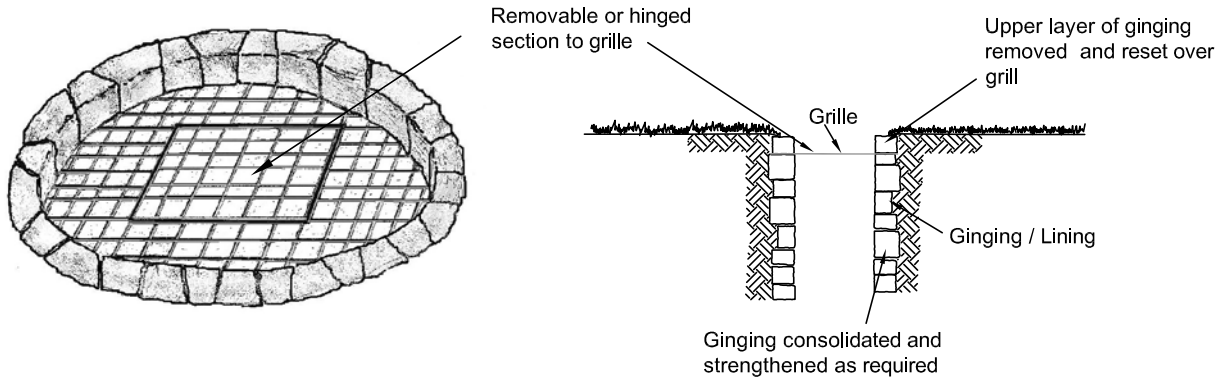
3. GRILLES

3a Metal Grille Steel Walkway Mesh

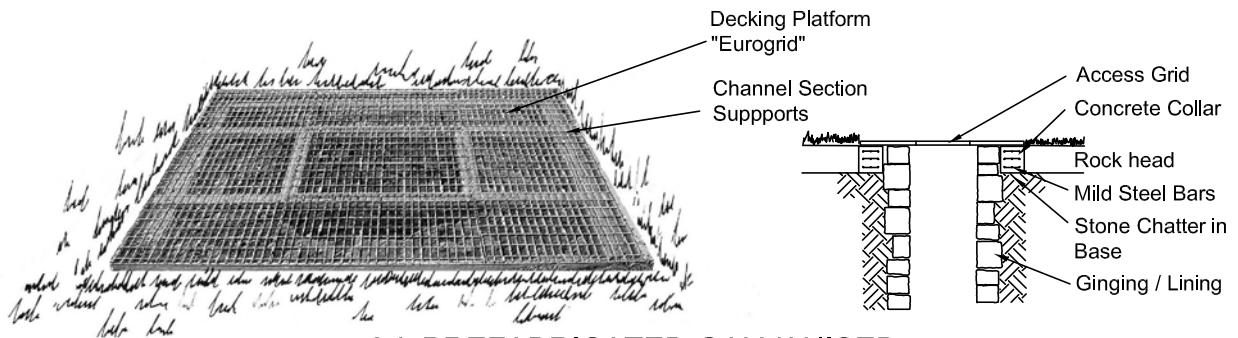


Only suitable for small diameter shafts

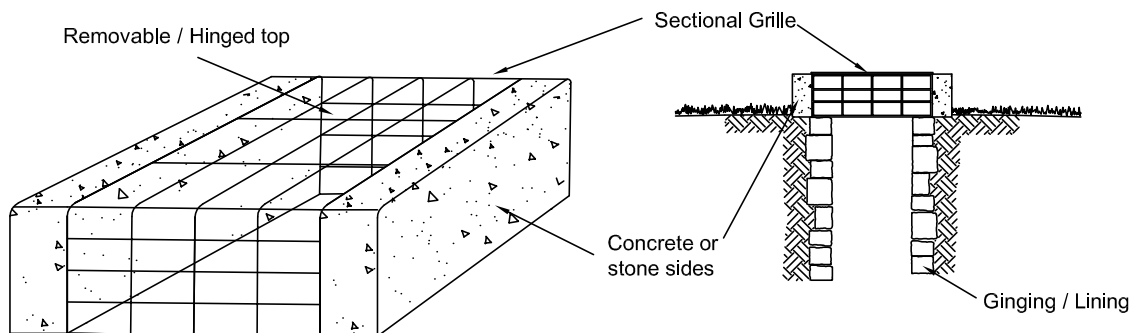
3b. GRILLE FITTED INTO UPPER LAYER OF GINGING



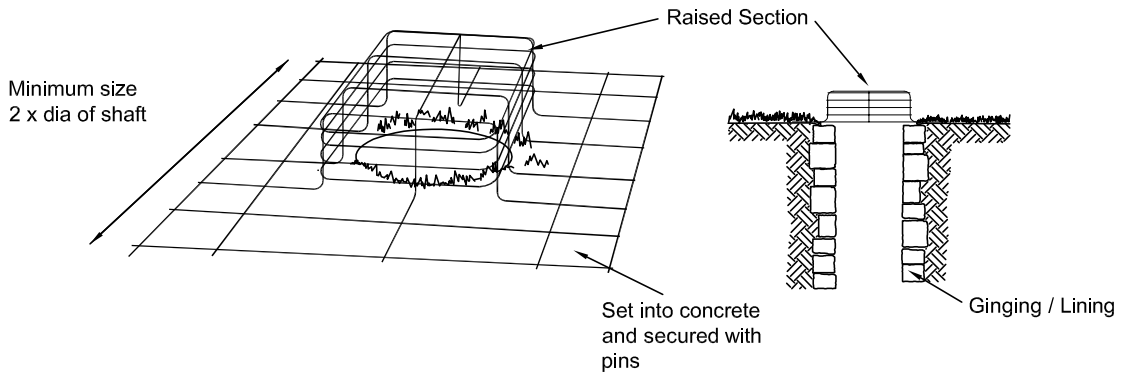
3c. PREFABRICATED GALVANISED GRILLE BOLTED TO PERIMETER REINFORCED CONCRETE COLLAR



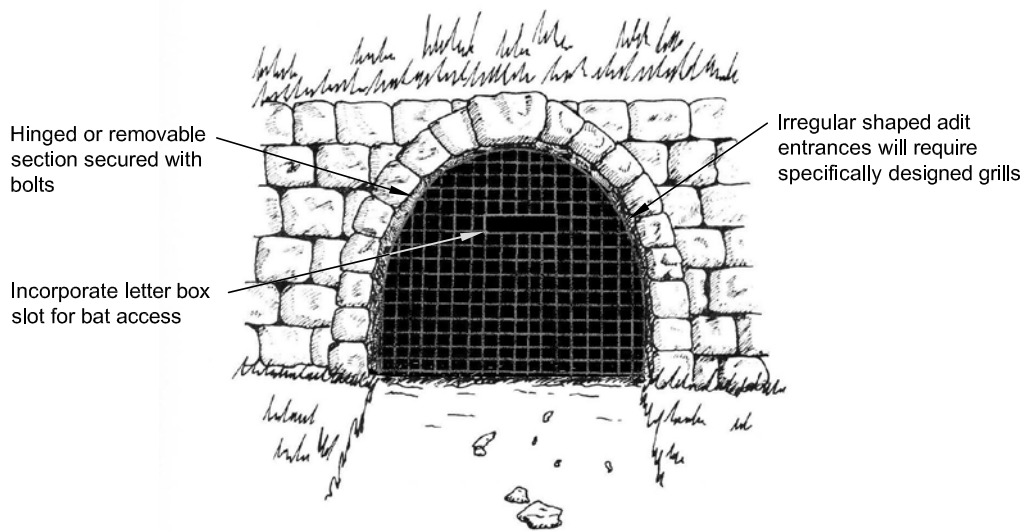
3d. PREFABRICATED GALVANISED GRID FOR BAT ACCESS WITH SOLID SIDES



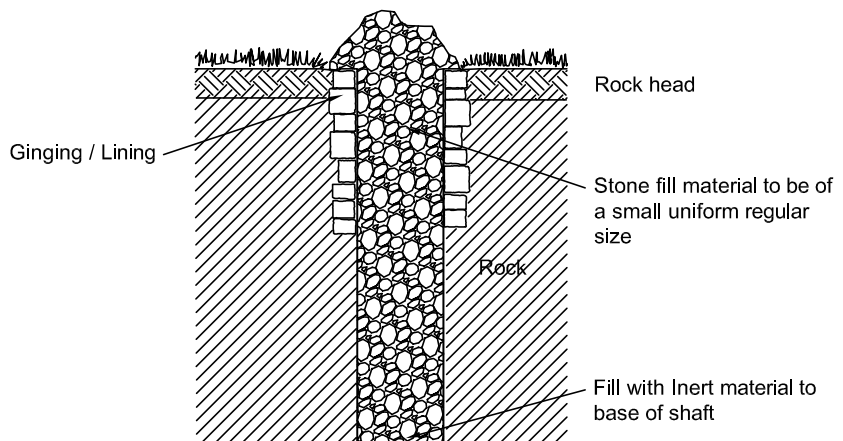
3e. PREFABRICATED GALVANISED GRID WITH RAISED SECTION FOR BAT ACCESS



3 f . ADIT GALVANISED GRILLE



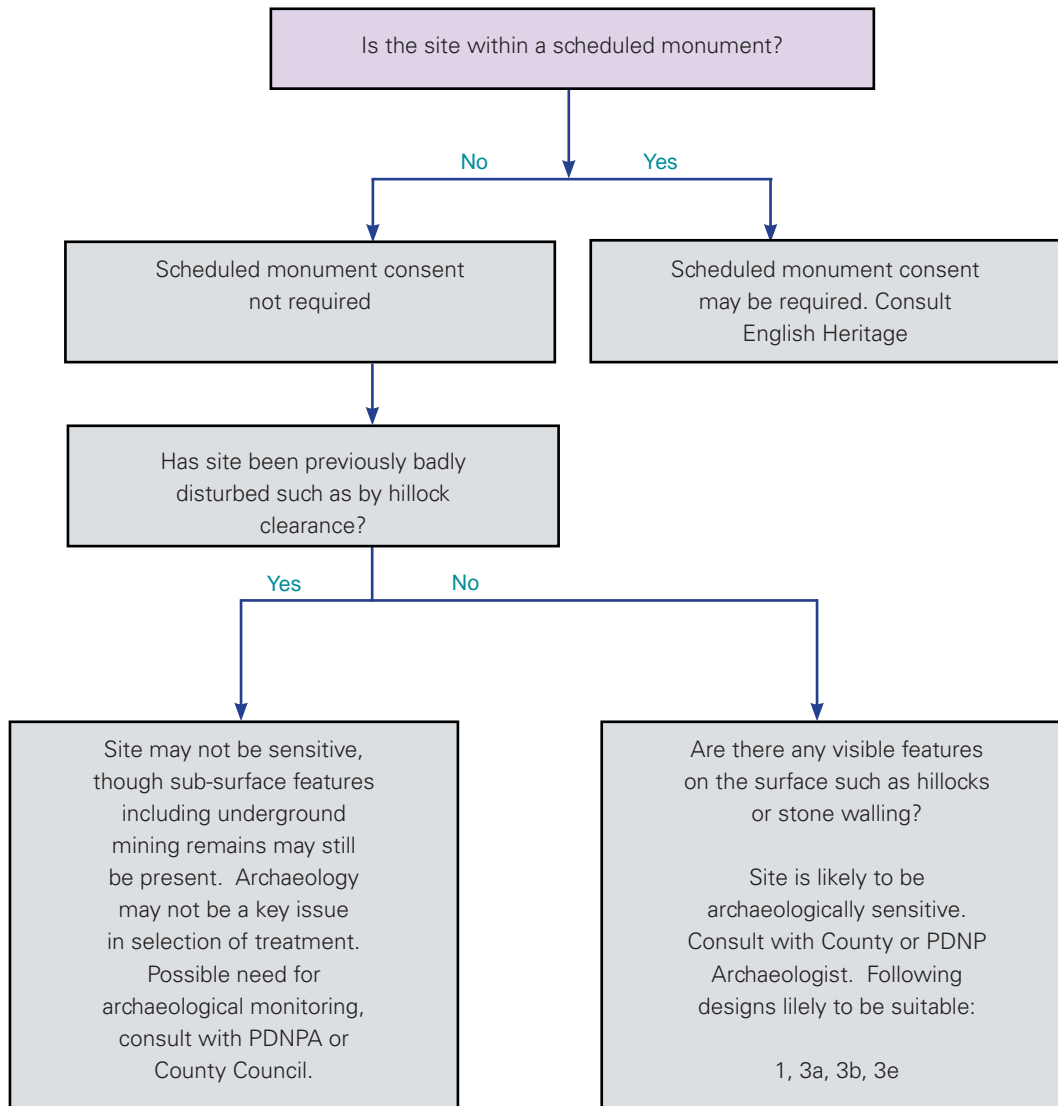
4. FILLING



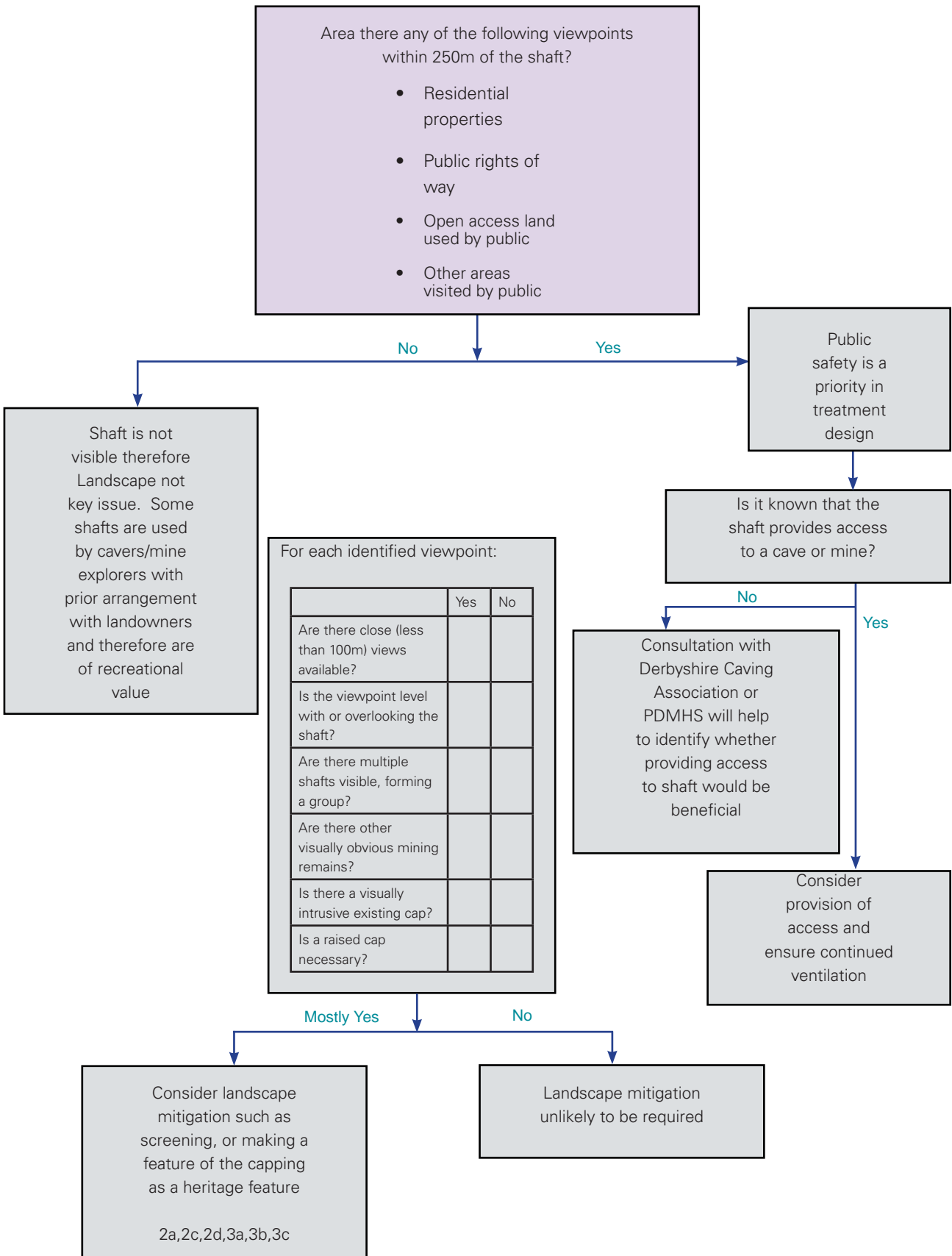
Appendix B

The Decision Process

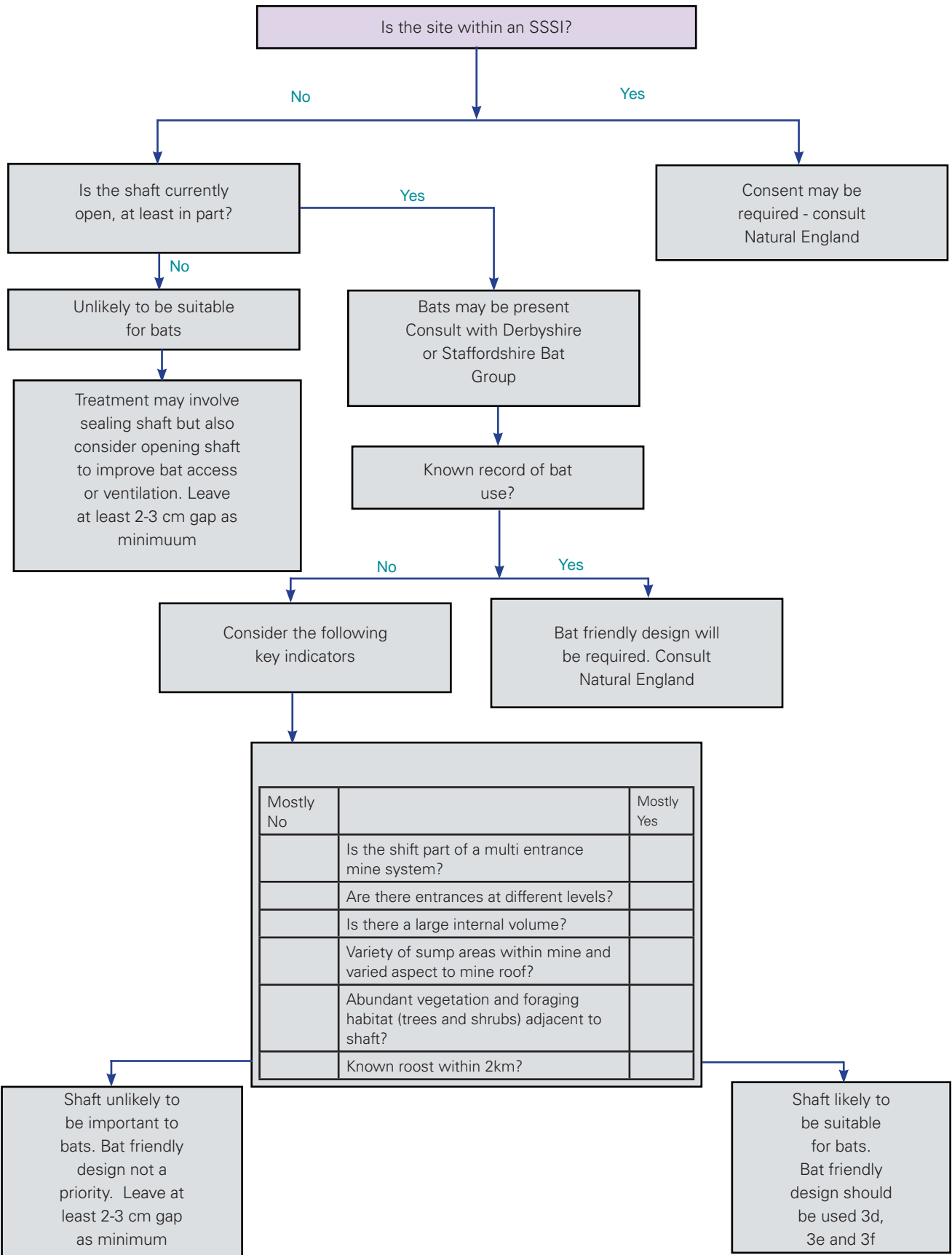
Archaeology



Landscape & Recreational Amenity



Ecology



Appendix C

Sources of Advice/Information

If you need to deal with treatment of lead mine shafts then your first point of contact should be to the relevant County Council or the Peak District National Park, Authority. They will be able to give you general advice and may also refer you to other bodies to help address any specific issues. Bodies with knowledge in regard to issues highlighted in this guidance are listed below.

Nature Conservation

Peak District National Park Authority – Ecology Team
Aldern House
Baslow Road
Bakewell
Derbyshire
DE45 1AE
T: 01629 816200
F: 01629 816310
E: aldern@peakdistrict.gov.uk

Natural England
Peak to Trent Area Team
Endcliffe', Deepdale Business Park
Ashford Road
Bakewell
Derbyshire
DE45 1GT
T: 01629 816640
F: 01629 816679
www.naturalengland.org.uk

Derbyshire County Council
Conservation and Design
County Hall
Matlock
DE4 3AG
T: 01629 580000

Derbyshire Wildlife Trust
East Mill
Bridge Foot
Belper
Derbys
DE56 1XH
T: 01773 881188
F: 01773 821826
E: enquiries@derbyshirewt.co.uk

Derbyshire Bat Conservation Group
Staffordshire Bat Group
c/o Staffordshire Wildlife Trust
The Wolseley Centre
Wolseley Bridge
Stafford
ST17 0WT
T 01889 880100
F 01889 880101
E staffswt@cix.co.uk

Bat Conservation Trust
15 Cloisters House
8 Battersea Park Road
London
SW8 4BG
T: 020 7627 2629
F: 020 7627 2628
E: enquiries@bats.org.uk

Archaeology

Peak District National Park Authority
Cultural Heritage Team
as above
Derbyshire County Council
Conservation and Design
as above

English Heritage
East Midlands Region
44 Derngate
Northampton
NN1 1UH
T 01604 735400
F 01604 735401

Peak District Mines Historical Society
c/o Peak District Mining Museum
The Pavilion
Matlock Bath
Derbyshire
DE4 3NR
T: 01629 583834

National Association of Mining History Organisations
c/o Peak District Mining Museum

Access Authority

Derbyshire County Council
Conservation and Design
as above

Access and Recreation

Derbyshire Caving Association
www.theDCA.org.uk
E: conservation-off@theDCA.org.uk

Design and Construction

Derbyshire County Council
Consultancy and Contracting Division
Land Reclamation Section
Station Road
Darley Dale
Matlock
Derbyshire
DE4 2EQ
T: 01629 580000
F: 01629 585488

http://www.derbyshire.gov.uk/environment/land_premises/derelict_contaminated_land
http://www.derbyshire.gov.uk/environment/land_premises/mines/

The Coal Authority
200 Lichfield Lane
Berry Hill
Mansfield
Nottinghamshire
NG18 4RG
www.coal.gov.uk
T: 01623 637000

Lead Mines Database

Derbyshire County Council
Consultancy and Contracting Division
Land Reclamation Section
Station Road
Darley Dale
Matlock
Derbyshire
DE4 2EQ
T: 01629 580000
F: 01629 585488

http://www.derbyshire.gov.uk/environment/land_premises/mines/

Appendix D

Ecological Survey and Assessment

Contact Details for Ecologists

Environmental Data Services (ENDS) has a directory (ENDS Directory) containing a searchable database of engineering and environmental consultancies throughout Great Britain, and their contact details. To search for an ecological consultancy for the Derbyshire region, go to the left side of the webpage, and enter the following search terms:

- Region: 'East' and / or 'Midlands';
- Type of work: 'env. impact assessment' and / or 'ecological management';
- Client experience: 'mining and quarrying' and / or 'construction'

Alternatively search the Institute of Ecology and Environmental Management's website at www.ieem.org.uk

The Peak District National Park Authority also has a list of local consultant ecologists

Baseline Ecological Assessment

A baseline ecological assessment, of the site and immediately surrounding land will identify the main wildlife features of nature conservation importance that will need to be considered, as well as any important wildlife features requiring more detailed surveys to assess their nature conservation value more accurately.

The baseline ecological assessment and results from more detailed survey work can inform discussions with the relevant authorities. This information will also enable licence applications for protected species such as bats, as well as informing appropriate mitigation measures, and working methods. The baseline ecological assessment will also identify at what time of year works should be undertaken to minimise impacts on important wildlife features.

The baseline ecological assessment and subsequent more detailed surveys should be undertaken by a suitably experienced ecologist at an appropriate time of year. In accordance with guidelines from the Institute of Environmental Assessment regarding the assessment of the nature conservation value of sites, baseline ecological assessments comprise a desk study of existing wildlife records held by relevant organisations within 2km, and an Extended Phase 1 Survey of the site and immediately surrounding land undertaken in the field. Appropriate authorities to be consulted by the ecologist may include Natural England, Derbyshire/Staffordshire Wildlife Trust, the County Council, the Bat Conservation Trust, Derbyshire/Staffordshire Bat Conservation Group. In addition, the Inventory of Regionally and Nationally Important Lead Mining Sites in the Peak District Orefield can be reviewed as a component of the desk study. Extended Phase 1 Survey incorporates a habitat survey (Phase 1 Habitat Survey) and a survey for other feature of nature conservation interest, such as protected species, which the surveyor feels are relevant to the survey. The habitat component of Extended Phase 1 Surveys are undertaken in accordance with the method from the JNCC, and are generally undertaken between April and October.

Further Ecological Surveys

The baseline ecological assessment will have identified whether or not more detailed surveys of important wildlife features are required in order to assess their nature conservation value more accurately.

In some cases further surveys for bats may be required to determine presence and to estimate population size. Bats are present in most mines surveyed in Derbyshire, and just because bats are not seen, it does not mean they are not present. Similarly, apparent blockage of a mine shaft or adit does not mean that bats are absent from the mine as certain bat species can crawl through very small gaps.

Appropriate bat surveys can only be undertaken by suitably experienced and licensed ecologists. Surveys over a minimum of one season are desired at most sites and should ideally be undertaken well in advance of treatment (at least one year before). The survey approach, based upon Natural England guidelines for underground sites consists of emergence surveys in the summer (May to July), swarming surveys in the autumn (August to October) outside the mine, followed by hibernation surveys inside the mine during the winter (November and March). Two visits on each seasonal occasion (i.e. summer, autumn and winter) giving a total of six survey visits will be appropriate for most sites. Guidelines for survey of underground sites were currently in production by the Bat Conservation Trust.

Health and safety guidance for bat surveyors working in and around mines is provided in the Bat Workers Manual.

It must be stressed that bats are notoriously difficult to detect in underground sites, particularly if access into the mine is difficult due to health and safety reasons. There is a risk that bats or a particular species of bat may still be present despite evading detection during an appropriate bat survey. Therefore, where a shaft has been identified as being suitable for bats but no bats have been identified an appropriate solution may be to fit a grille which would allow continued use of a shaft by bats. This would remove any need for a survey, though bat groups may wish to carry out a survey to determine bat use and population size at a later date.

Appendix E

Archaeological Survey and Assessment

Desk-Based Archaeological Assessment

A desk-based assessment is often the first step in establishing the archaeological importance and condition of a site, and needs to be undertaken in accordance with the Institute of Field Archaeologists' Standard and Guidance for Archaeological Desk Based Assessments (2001).

This type of assessment involves a review of available and relevant information for a site, in order to identify the activities which have occurred within a site and the extent of remains which appear to survive. The following sources of information likely to be relevant:

- Records held by Derbyshire County Council, Peak District National Park and Peak District Mines Historical Society;
- Historic Maps (including Geological Survey) and published sources;
- Reports of previous archaeological investigations and surveys;
- Aerial photographs;

Consultation with any other mining history or caving groups active in the area may well also yield useful information on the use of a site and surviving remains.

Though the assessment would be principally desk-based, a site visit would normally be undertaken in conjunction with this in order to identify the visible remains and attempt to relate these to the historic records. The site visit would also allow the identification of any additional visible features.

Archaeological Field Survey

Where initial assessment identified the presence of features of archaeological interest within a site, then field survey may be required to provide further information on the extent and nature of features. This is normally a non-intrusive process aimed at production of a plan of visible remains. This may help to identify the more subtle relief features which may not be initially discernable, as well as providing information on the phasing of the use of a site. Where the disturbance of surface features cannot be avoided then the completion of a survey may form part of the appropriate mitigation for this.

Field survey of mining remains needs to be undertaken by an archaeologist who not only possesses the necessary survey skills, but also has a good understanding of the types of mining remains which may be present.

Archaeological Monitoring

Ground disturbance involved in construction operations, such as for installation of a concrete ring, have the potential to disturb sub-surface as well as surface features of archaeological interest. Where ground disturbance within a site of potential archaeological interest can-not be avoided then archaeological monitoring may be able to mitigate this through creating a record of any disturbed features.

Monitoring involves the presence of an archaeologist during removal of soils and any other material in advance of construction. In order for the monitoring to be most

effective, soils should be removed in successive spits using a toothless ditching bucket (or in some circumstances, as for example where known structures would be damaged by machinery, removal by hand will be necessary using archaeological digging techniques). This will create a clean smooth surface which should allow for the recognition of features of archaeological interest. Careful provision should be made for the disposal of any soil that is removed during works. Where machinery is used some provision of time will need to be made in order to allow for the hand excavation and recording of any exposed features. Recording should normally include written descriptions, photographs and a detailed plan of features exposed.

Archaeological monitoring within mining remains needs to be undertaken by an archaeologist who not only possesses the necessary skills, but also has a good understanding of the types of mining remains which may be present.

Scheduled Monuments

English Heritage must be contacted and will advise on the requirements for obtaining Scheduled Monument Consent. All applications for consent must contain adequate information upon:

- the proposed works, location, methods of working and materials
- the likely archaeological impacts of the proposed works
- proposals for the appropriate mitigation of those impacts. These will normally entail archaeological control and supervision of the works (a 'watching brief'), and/or more detailed archaeological excavation and recording, and/or the preservation in situ of any archaeological remains that are encountered.

There is a general presumption in favour of the preservation in situ of nationally important archaeological remains, and this should be borne in mind during the design of the proposed treatment method in order to minimise the likely impacts.

Appendix F

The Legal Position and Policy Frameworks

Mine and Quarries Act 1954

Under this act, any metalliferous mine last worked before 1872 (applicable to most Derbyshire and Peak District lead mines) with an unsecured entrance or shaft and which is a danger to the public as a result of being in a publicly accessible place will be considered as a statutory nuisance. Section 151(1) of the 1954 Act requires the owners of mines which are either abandoned or not worked for a period of 12 months or more, to secure and maintain the entrance to every shaft or outlet with a sufficient enclosure or other device to prevent any person accidentally entering the outlet or falling down the shaft. This statutory duty applies irrespective of whether or not the land on which the mines are on are accessible from a public space. Failure to secure the surface entrance is an offence under this legislation

The statutory duty under Section 151(1) of the 1954 act does not apply to certain metalliferous mines. Instead Section 151(2)(b) provides that any metalliferous mine that has not been worked since 1872 which has a surface entrance not sufficiently secured in the manner described in the preceding paragraph, and which by virtue of its accessibility from a public space constitutes a danger to the public, is deemed to be a statutory nuisance and requires it to be dealt with by the means provided in the Public Health Act 1936. This is reinforced in Part III of the Environmental Protection Act 1990.

Public Health Act 1936

This act states that if the local authority is satisfied a statutory nuisance does exist then they are obliged to require the person responsible to abate it.

In the case of open shafts the responsible person will be the owner of the mineral rights, or where the mineral rights owner can not be traced then the requirement falls on the landowner or occupier. Where a person with responsibility for the nuisance can not be found, and the nuisance is not caused by an act of the owner or occupier then the local authority may themselves take steps to abate the nuisance.

Local Government (Miscellaneous Provisions) Act 1976

This act provides powers to local authorities to deal with dangerous excavations which are accessible to the public. Section 25 of the Act enables a local authority to take action where it considers that an excavation made on land is accessible to the public from either a highway or a public place and, by reason of its being unenclosed or inadequately enclosed, is a danger to the public. If the authority does not know the name of the owner or occupier of the land, it may carry out any necessary works to remove the danger.

The Act does not give authorities power to charge landowners for carrying out work and therefore authorities are encouraged to consult the landowner closely before making a decision about whether to carry out work.

Occupier's Liability Act 1957 and 1984

Where a land owner or occupier know of a danger within their land (such as an open shaft), they are required to take reasonable care to prevent injury to members of the

public entering the land. This applies to trespassers as well as those with a legitimate right to access. What constitutes reasonable care will depend on the specific circumstances, but may be limited to the erection of warning signs.

Ancient Monuments and Archaeological Areas Act 1979

A number of lead mining sites are designated as Scheduled Monuments (SMs) under this act and these usually cover shaft entrances and linings, as well as associated surface features. The Act states that it is an offence to carry out any works for the purpose of removing or repairing a scheduled monument or any part of it or of making any alteration or additions thereto, unless written consent has been obtained from the Secretary of State.

Therefore the capping of a shaft within a scheduled monument may well constitute works (additions, removals or alterations) which would require scheduled monument consent, even where this involves the repair or replacement of an existing cap.

Under The Ancient Monuments (Class Consents) Order 1994 (SI 1994 No. 1381) class consent can be granted for works necessary for safety and health. This is only granted for works which are the minimum immediate measures necessary and notification (with a justification) must be made to the Secretary of State as soon as possible.

Construction (Design and Management) Regulations

The Construction (Design and Management) Regulations 1994 require all those involved in construction to adopt an integrated approach to health and safety management. Clients, designers and contractors must work together to ensure that health and safety management issues are considered throughout all phases of a project. Whilst mining activities are excluded from these regulations it is considered that the treatment and capping of disused shafts, adits and other entrances are covered.

The Regulations place legal requirements not just on those involved with on-site construction management but also clients and those undertaking design work. It requires a holistic approach linking all construction parties together in order to account for the health and safety management of all related issues from feasibility, through the intervening stages of design and construction and maintenance thereafter. Therefore, not only does the management of the construction of a mineshaft cap need to comply with the regulations but so does the design of a mineshaft cap. It specifically requires that key people are competent for their roles and have sufficient resources to meet their legal duties. Failure to comply with the Regulations is an offence.

Wildlife Legislation

Wildlife and Countryside Act 1981 (as amended) and the Conservation (Natural Habitats & c.) Regulations 1994 (Conservation Regulations).

Protected Species

Species which are legally protected by national (Wildlife and Countryside Act) and European (Conservation Regulations) wildlife legislation may be present in and around mines. Protected species most likely to be associated with mines and surrounding land are listed in Table G.1, with bats being the most important in relation to shaft/adit treatment.

Table G.1 Protected species potentially associated with mines

Species	Protection Extended to	Duration of Protection	Level of Protection
Bats	Species and habitat	Constant	National and European
Great crested newt	Species and habitat	Constant	National and European
Common lizard	Species	Constant	National
Slow worm	Species	Constant	National
Badger	Species and habitat	Constant	National
Breeding birds	Species, nest, eggs and dependant young	During the bird breeding season ¹	National
¹ Bird breeding season taken to be March to July although this period may be extended in warmer years			

Under these pieces of legislation, the law makes it an offence to:

- intentionally kill, injure, take (handle) or capture the species;
- intentionally or recklessly damage, destroy or obstruct access to any place that the species uses for shelter or protection (for bats this is taken to mean all bat roosts whether bats are present or not) - under the Conservation Regulations it is an offence to damage or destroy a breeding site or resting place of the species; or
- intentionally or recklessly disturb the species while it is occupying a structure or place that it uses for shelter or protection - under the Conservation Regulations it is an offence to deliberately disturb the species (this applies anywhere, not just at its place of shelter/protection).

The legislation is interpreted by Defra and Natural England to require that, if the species or its habitat will be affected by proposed works then this can only proceed without causing an offence if it is licensed by Defra. Defra only issue licences for projects that will not be detrimental to the maintenance of the favourable conservation status of the species.

In advance of works proceeding, licences for works affecting species and their habitat protected by national wildlife legislation may be required from Natural England, and from Defra for species and their habitat protected by European wildlife legislation. This is to legally enable the mine treatment and any species mitigation required, to proceed. Applications for such licences will normally be made by a suitably experienced ecologist and informed by up to date survey results. Some licences may take up to 30 working days to process.

All wild birds (during the bird breeding season), common lizard and slow-worm, are afforded protection, from intentional killing, injury or taking, under the Wildlife and Countryside Act (WCA). Additionally it is an offence to intentionally take, damage, or destroy the nest/eggs of any wild bird whilst in use or being built and intentionally (or recklessly) disturb any wild bird listed on Schedule 1 of the Act whilst it is nest building or near a nest with eggs, young, or disturb the dependent young of such a bird.

Statutory sites

The legislation also provides for the designation and protection of statutory wildlife sites, within which mines may wholly or partially occur. National statutory wildlife sites include Sites of Special Scientific Interest (SSSIs). Within the Peak District National Park SSSIs covered a total of 49 988 ha of land in 2004/5, and this includes a number of former lead mining sites. SSSIs may also be designated as Special Areas of Conservation (SACs), candidate SACs or Special Protection Areas (SPAs). These sites

collectively form a European network known as Natura 2000. The Natura 2000 series of sites contains habitats and species which are rare, endangered or vulnerable in the European Union.

If the works need to be undertaken within, or are likely to affect wildlife features associated with, a statutory designated wildlife site, and the works are not associated with the management of the wildlife site, then consultation will be required with Natural England prior to any works proceeding. This will be in order to provide Natural England with the information it requires to determine the impact of the works, and ultimately to grant permission for the works. If the work has the potential to damage the notified features of the SSSI (and this is not always the case), then Natural England will advise on how to avoid such damage. A consent or assent, under Section 28 of the Wildlife and Countryside Act (as amended), will be issued with conditions or time limits which will ensure the work does not damage the SSSI.

Other Wildlife legislation

Protection of Badgers Act 1992

Prior to the implementation of the Conservation Regulations in 1994, the principal national wildlife legislation was the WCA. At the national level the WCA covers the protection of wildlife and national statutory wildlife sites.

Badgers and their habitat are protected under the WCA which makes it an offence to wilfully take, kill, injure or mistreat a badger, and under the Protection of Badgers Act 1992, which makes it an offence to obstruct, damage, or destroy a badger sett. It is also an offence under the 1992 Act to disturb badgers whilst they are occupying setts.

Countryside and Rights of Way (CRoW) Act 2000

This was enacted in order to provide for greater access to the public to land which is open countryside or common land. In Derbyshire and the Peak District some of the land made accessible will contain mining remains, possibly including open shafts. The act has been designed in order to avoid placing undue burdens on landowners and so it is intended that it should not involve any greater responsibilities than those already in existence as a result of the Occupier's Liability Act 1984.

Guidance has been issued to address concerns raised in connection with the possible effect of the public place provisions in the Mines and Quarries Act 1954, the Local Government (Miscellaneous Provisions) Act 1976 and the Environmental Protection Act 1990.

If an enforcing authority is unsure whether a disused working may constitute a statutory nuisance then, as a first step, the authority is encouraged to discuss the matter informally with the person who appears to be responsible i.e. the person who owns the mineral rights to the site, to see whether low impact work can be carried out to manage any danger to the public to an acceptable level, and to prevent the site from being a statutory nuisance. In addition, the Highway Authority as the Access Authority needs to be contacted for advice about how access can be managed at the site.

With regard to wildlife, in summary, the CRoW Act 'enhances' the level of protection afforded to species protected under the WCA, by including, for example, offences occurring due to reckless activities. Statutory authorities such as English Nature, now Natural England, were also provided with more enforcement powers.

Environmental Protection Act 1990

Under section 79 (1) of the 1990 Act, Local Authorities have a duty to inspect their areas from time to time to detect any statutory nuisance, and to investigate complaints about statutory nuisances. Under section 80 of that Act, where an enforcing authority is satisfied that a statutory nuisance exists, or is likely to occur or recur, the authority is required to serve a notice on the person who appears responsible for the nuisance, requiring the abatement of the nuisance and the execution of works necessary for this purpose. The Authority may also undertake the works themselves and may recover its costs, although it is not under a duty to do so.

It is important to remember that enforcing authorities have to form their own view about whether a statutory nuisance exists. Authorities will need to use their judgement to decide whether a working which is accessible from a public place, does in fact pose a danger to the public before making a decision about whether it constitutes a statutory nuisance. Guidance on using this part of the Act has been provided as part of Part 1 of the Countryside and Rights of Way Act 2000.

Planning Policy and Guidance

The Town and Country Planning (General Permitted Development) Order 1995

This sets the regulations concerning the need for planning permission for the treatment of mineshafts.

Schedule 2, Part 19 (Development Ancillary to Mining Operations), Class C states that the following works are permitted development (do not require formal planning permission):

The carrying out with the prior approval of the mineral planning authority of development required for the maintenance or safety of a mine or disused mine or for the purposes of ensuring the safety of the surface of the land at or adjacent to a mine or a disused mine.

Prior approval is essentially a mini planning application, although the detail required in terms of drawings to be supplied is the same as for a full application.

Under paragraph C.2 (1) the prior approval of the mineral planning authority to development permitted by Class C is not required if:

- a) the external appearance of the mine or disused mine at or adjacent to which the development is to be carried out would not be materially affected;
- b) no building, plant or machinery, structure or erection would exceed a height of 15m above ground level; or where any building, plant, machinery, structure or erection is rearranged, replaced or repaired, would exceed a height of 15m above ground level or the height of what was arranged, replaced or repaired, whichever is the greater; and
- c) the development consists of the extension, alteration or replacement of an existing building.

In general therefore, the treatment of shafts for the purposes of health and safety can be considered as permitted development, and does not require planning permission. Treatment for the preservation or enhancement of conservation interests will often coincide with work required for health and safety and so may also not require planning permission. However, where it does not, then it is likely that the work would require planning permission.

MPG12 Treatment of Disused Mine Opening and Availability of Information on Mined Ground

This sets out government policy on the treatment of disused shafts, and the re-use of land containing disused shafts. It notes the potential hazards involved with open shafts, but also recognises that disused shafts may continue to serve useful purposes such as:

- Providing access to monitor the stability of underground voids and structures;
- Providing continued ventilation to mineshafts, to prevent the build up of dangerous gases as well as allowing the monitoring of gas levels;

The potential ecological, geological, archaeological recreational and tourist value of shafts is also noted.

PPG 16

PPG 16 sets out guidance on government policy for the treatment of archaeological remains in the planning process. It gives advice on the handling of archaeological remains including provision where necessary for their preservation or recording in advance of development proposals.

Archaeological remains are described as a finite and non-renewable resource which should not be thoughtlessly or needlessly destroyed.

PPG 15

PPG 15 provides a statement of government policy for the identification and protection of historic buildings, conservation areas, and other elements of the historic environment within and without the planning process. PPG 15 also gives guidance on other aspects of the historic environment for which there are no specific statutory controls; namely World Heritage Sites, historic parks and gardens and historic battlefields.

The guidance stresses the importance of the historic environment in enhancing the quality of our lives and local distinctiveness, as well as promoting leisure and recreation.

PPGs 15 and 16 are due to be replaced as part of a wider review of national planning policy guidance.

PPS9

PPS9 sets out planning policies on protection of biodiversity and geological conservation through the planning system. This stresses the need for planning decisions to aim maintain or improve biodiversity and geological conservation interests.