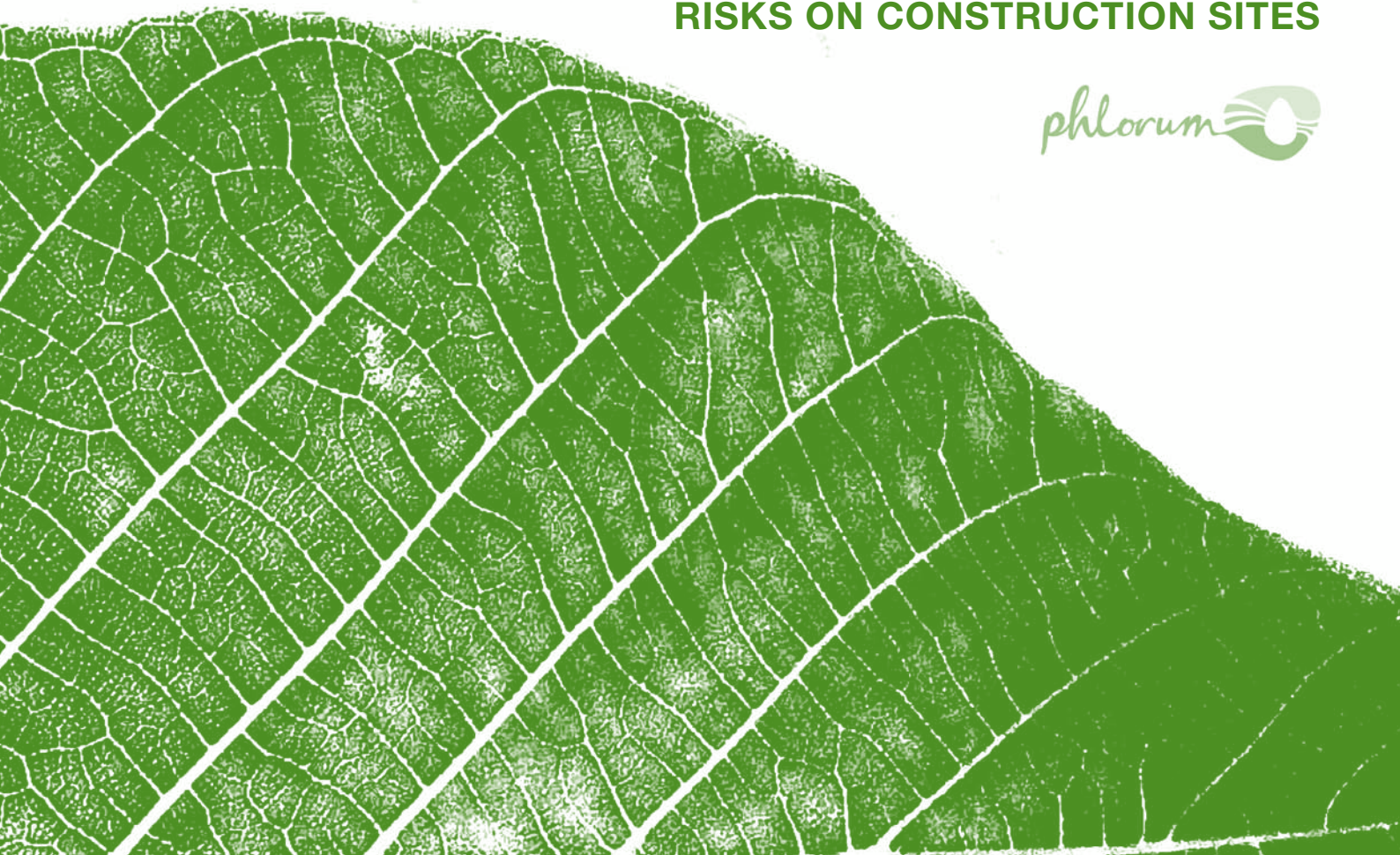
ECOLOGICAL AND ENVIRONMENTAL RISKS ON CONSTRUCTION SITES

phlorum



ABOUT PHLORUM

At Phlorum we are committed to providing cost effective solutions that surpass our clients' expectations and benefit the natural environment. Our mission is to understand your needs, providing a transparent and personalised service in an approachable and honest manner.

We have expertise in a wide range of environmental monitoring and assessment disciplines, and are UKAS certified to OHSAS18001 (Safety), ISO14001 (Environment) and ISO9001 (Quality), leaving you safe in the knowledge that your requirements will be dealt with in a professional manner from start to finish.

CONTENTS

ECOLOGY

Some of the more common ecological risks that can affect construction sites in the UK are associated with the following, which are described in detail in later sections of this booklet:

- badgers
- bats
- birds
- reptiles
- amphibians
- water voles
- dormice
- otters
- invertebrates
- white-clawed crayfish
- trees
- hedgerows
- plants
- designated wildlife sites
- invasive species

QUICK GUIDE TO POTENTIAL ECOLOGICAL RISKS FOR DIFFERENT HABITAT/SITE TYPES:

	BADGERS	BATS	BIRDS (NESTING)	DESIGNATED WILDLIFE SITES	DORMICE	AMPHIBIANS	HEDGEROWS	INVERTEBRATES	OTTERS	REPTILES	PLANTS	TREES	WATER VOLES	WHITE-CLAWED CRAYFISH	INVASIVE SPECIES
GRASSLAND	√		√	√				√		√	√				
SCRUB	√		√	√				√		√		√			√
MARSH			√	√		√		√		√	√	√			√
ROADSIDES	√		√			√	√	√		√	√	√			√
SAND DUNES	√		√	√		√		√		√	√				
SHINGLE			√	√				√		√	√				
WASTE GROUND	√		√			√				√		√			√
WOODLAND	√	√	√	√	√	√	√	√		√	√	√			√
WATERCOURSES			√	√		√		√	√	√	√		√	√	√
BUILDINGS		√	√												

BADGERS *(Meles meles)*

REASONS WHY BADGERS PRESENT AN ECOLOGICAL RISK

It is illegal, under UK law, to intentionally or recklessly interfere with a badger sett. A rough guide to what might, potentially, constitute interference is if the following equipment is used within the stated distances from an active badger sett:

- heavy machinery within 30m;
- light machinery within 20m; or
- hand tools within 10m.

Guidance should be sought if you think there are badgers, or a badger sett, on or near a site you are working on.

SIGNS TO LOOK OUT FOR

Badger setts are made up of one or more holes approximately 20cm in diameter. The holes are often wider than they are tall. Rabbit holes generally are more round. Large setts are sometimes located in a mound, with spoil heaps littered around, but they can also be found in dense vegetation or around tree roots.

OTHER INDICATORS:

- course black and white hairs (rabbit fur is much softer);
- badger latrines, “dung pits” (shallow scrapes in the ground, that often smell of ammonia, with droppings in them);
- cleared pathways through vegetation leading to burrows or to latrines;
- badger footprints in soil particularly around sets; and
- areas of scratched, foraging snuffle holes in the earth (a bit like golf green divots), usually close to setts.

Brown Long-Eared Bat *(Plecotus auritus)*

BATS

REASONS WHY BATS PRESENT AN ECOLOGICAL RISK

All UK bats are European Protected Species. It is illegal to intentionally kill, injure or take bats or intentionally (or recklessly in England and Wales) damage or destroy their roosts (even if bats are not occupying the roost at the time). Roosts have been interpreted to mean any structure or place that is used by a bat for shelter or protection.

Bat roosts can be found in buildings, under bridges, on rock faces in caves, in cracks or holes in trees or under ivy on trees and buildings.

A survey for bats should be undertaken before any works that might disturb potential roosts are undertaken. Bats are very mobile so even if there has been a bat survey in the last year, tree felling and demolition of buildings could require supervision by a bat expert as they are removed.

A licence from an appropriate regulatory body is required if someone is going to enter an area where there is a known bat roost. Bats hibernate during winter.

SIGNS TO LOOK OUT FOR

Signs that bats may be present include:

- droppings that are similar to mouse droppings, dark brown or black and between 4mm and 8mm long, but crumble to dust when squeezed (unlike mouse droppings);
- urine stains or oily marks (from their fur) under cracks or holes in buildings;
- scattered wings from moths and other insects under roosts and feeding perches; and
- fine scratches around cracks or holes on trees or buildings.

Bats will often feed around the edges of a woodland or near water and tend to use linear features such as hedgerows to navigate along.

Bats will emerge from roosts around dusk between April and October.

Marsh Tit *(Parus palustris)*

BIRDS

REASONS WHY BIRDS PRESENT AN ECOLOGICAL RISK

It is illegal, under UK law, to kill, injure, take, damage or destroy birds’ eggs or nests. Certain bird species and their habitats have greater European protection.

Clearing of vegetation between the bird nesting period (mid February to mid August – later for some waterfowl and migratory species) should be avoided or a qualified ecologist should be present to conduct a search of vegetation.

SIGNS TO LOOK OUT FOR

Signs that birds are nesting include:

- during nesting season, any areas of scrub, trees and some buildings could contain nesting birds;
- birds forming pairs and circling the same area of scrub, trees, buildings;
- alarm calls or aggressive swooping of birds protecting a nest; and
- birds returning to a particular area of vegetation with nesting material or food in their beaks.

Kestrel (*Falco tinnunculus)*

REPTILES

REASONS WHY REPTILES PRESENT AN ECOLOGICAL RISK

There are only six native species of reptile in the UK. Under UK legislation it is illegal to intentionally kill, injure or sell all British reptiles. The smooth snake and sand lizard are also European Protected Species. However, they are rare and are unlikely to be encountered on many development sites. Slow worm, common lizard, grass snake and adder are much more common.

SIGNS TO LOOK OUT FOR

Information that might help identify whether a site could contains reptiles:

- reptiles are normally active between March and October (they hibernate from November to February);
- they may be found under logs, discarded sheet metal, bits of carpet, wooden boards or roofing felt, or found basking on rubble piles/stones or on areas of hard standing;
- their preferred habitat is long grass or scrubby vegetation, often with denser areas for them to seek refuge in; and
- on hotter days (18°C and above) they are likely to be more active and therefore harder to see.

AMPHIBIANS

The native amphibian species in the UK include the common frog, the common toad, natterjack toad, pool frog, smooth newt, palmate newt and great crested newt. All amphibians have limited protection under UK law, from sale only. However, the natterjack toad, pool frog and great crested newt are European Protected Species.

Natterjack toads are rare, mainly being confined to sand dunes and lowland, sandy heaths. The native pool frog is all but extinct in the UK. The great crested newt is much more prevalent and can range over a wide area.

GREAT CRESTED NEWTS

(Triturus cristatus)

REASONS WHY GREAT CRESTED NEWTS PRESENT AN ECOLOGICAL RISK

Suitable ponds and other water bodies are essential for great crested newts to breed. However, the majority of their lifecycle is spent on land, usually within 100m of a water body. Great crested newts and their habitat are protected by UK and European legislation, making it an offence to intentionally kill, injure, trade, capture or disturb a great crested newt, or to intentionally or recklessly disturb them or damage, destroy or obstruct habitats where they live and breed.

Natural England guidance recommends that all water bodies within 500m of a development site should be surveyed for the presence or absence of great crested newts.

SIGNS TO LOOK OUT FOR

Features of water bodies that make them more suitable for supporting a population of great crested newts:

- large ponds (e.g. >5m in diameter) that are only partially shaded;
- long grass or vegetation all the way to the edge of a pond;
- an absence, or small numbers, of wildfowl using the water body;
- several ponds in the same area;
- no fish (fish eat newt eggs and larvae);
- the presence of aquatic plants increases the likelihood of finding great crested newts, since they need them to lay their eggs on;
- non-polluted water - i.e. no oily sheen on the surface (many amphibians are sensitive to poor water quality); and
- significant numbers of invertebrates in the water (which provide food for newts).

WATER VOLES *(Arvicola terrestris)*

REASONS WHY WATER VOLES PRESENT AN ECOLOGICAL RISK

Under UK legislation it is illegal to damage, destroy or obstruct access to any structure or place that water voles use for shelter or protection, or to disturb water voles while they are using such a place. The actual water vole itself is not protected. It is the water vole's habitat that receives the protection.

Water voles live along suitable stretches of river and dig burrows into the bank. They generally do not range further than a few metres from the water's edge into the bank side vegetation.

SIGNS TO LOOK OUT FOR

Signs that might indicate the presence of water voles include:

- water voles require quite steep banks by canals, ditches or slow flowing rivers;
- water vole droppings are 8 to 12 mm long, cylindrical with blunt ends and are usually green, but colour can vary between green and black; and
- water voles tend to get waterlogged fur and they swim much higher up in the water than rats do.

DORMICE *(Muscardinus avellanarius)*

REASONS WHY DORMICE PRESENT AN ECOLOGICAL RISK

The dormouse is a European Protected Species and is also protected by UK law. It is illegal to intentionally kill, injure, take, or trade a dormouse. It is also illegal to intentionally or recklessly disturb a dormouse whilst it is in a nest or hibernating, or to damage, destroy or obstruct habitats where they live and breed.

A licence from an appropriate regulatory body is required where disturbance of dormice or damage to their habitat is likely to occur.

SIGNS TO LOOK OUT FOR

Information that may indicate the presence of dormice includes:

- dormice are now mainly restricted to southern England and prefer broadleaved woodland but they can also be found in hedgerows, scrub and coniferous plantations;
- they are more likely to be found in areas with fruiting trees, particularly hazel;
- dropped hazelnuts with a neat, round hole with smooth edges nibbled in them (squirrels make jagged, uneven or cracked holes);
- dormice make small nests in trees or hedgerows out of fairly neatly bound or loosely woven vegetation (honeysuckle stems are stripped for this purpose; and are another good indicator of dormice being present); and
- they can be distinguished from other mice by their furry tail and they spend most of their time off the ground.

OTTERS *(Lutra lutra)*

REASONS WHY OTTERS PRESENT AN ECOLOGICAL RISK

In addition to protection under UK law, the otter is also a European Protected Species. It is therefore illegal to capture, disturb, injure or kill an otter. It is also illegal to damage or destroy an otter's breeding site or resting place.

Otters are found in rivers, streams, ditches, lakes, canals and coastal areas. They can inhabit stretches of water over 10 miles long. They make holts, where they rest, in secluded areas close to riverbanks and other watercourses, often amongst tree roots or old building structures. Holts can be difficult to identify as the entrances are often underwater.

SIGNS TO LOOK OUT FOR

The likely presence of otters on a watercourse is usually known to appropriate regulatory bodies. It is therefore important to liaise with local ecological stakeholders if a proposed construction site is close to such habitat.

Potential indicators of otter habitat include:

- clean watercourses well-stocked with fish; and
- overhanging trees and dense scrub near clean, fresh water, which could provide good holt habitat.

INVERTEBRATES

REASONS WHY INVERTEBRATES PRESENT AN ECOLOGICAL RISK

Invertebrates include insects, worms, molluscs and marine and aquatic arthropods like crayfish and lobsters. Insects in particular are hugely important in most ecosystems as they are vital for plant pollination, decomposition of organic matter and are a food source for many birds, mammals and other animals.

There are a few species of invertebrates that are partially protected under UK legislation. However, these are rare and are usually only found within designated wildlife sites. It is important, therefore, to carry out invertebrate surveys on proposed development sites that border, or are close to designated wildlife sites where protected invertebrates might be found.

WHITE-CLAWED CRAYFISH

(Austropotamobius pallipes)

REASONS WHY WHITE-CLAWED CRAYFISH PRESENT AN ECOLOGICAL RISK

The white-clawed crayfish is the only crayfish in the UK protected by both UK and European legislation. A licence is required to trap them, the aim of which is to prevent commercial harvesting. White-clawed crayfish habitat is often protected indirectly through other legislation and local authorities may consider white-clawed crayfish when determining planning applications.

White-clawed crayfish are found in slow flowing fresh water streams/ rivers, often with boulders and other suitable features that can provide them with shelter.

TREES

REASONS WHY SOME TREES PRESENT AN ECOLOGICAL RISK

Trees may have Tree Preservation Orders (TPOs) on them that protect them from being felled or damaged. Damage can be caused by placing heavy objects or construction plant close to trees. Placing even a few inches of soil or rubble on top of tree roots in the area under the canopy can suffocate roots and kill a tree.

It is important to check with the tree officer at the local council if any trees or groups of trees are within a conservation area and/or protected by Tree Preservation Orders. If a site contains a number of mature trees it should be surveyed by an arboriculturalist.

Trees can provide habitat for wildlife, including protected species such as bats and nesting birds. They are also a valuable amenity resource. Efforts should be made to retain mature trees within development proposals.

English Oak
(*Quercus robur*)

HEDGEROWS

REASONS WHY HEDGEROWS PRESENT AN ECOLOGICAL RISK

Planning authorities may consider species rich or ancient hedgerows when granting planning permission. The UK legislation aims to prevent the damage or destruction of such hedges. However, by their very nature, they can be trimmed or maintained without approval.

Some hedgerows can be removed. However, the following must be considered before such works take place:

- the relevant local authority should receive notice from the owner of the hedgerow of plans to damage it;
- the local authority should supply written notice to the relevant person stating that the hedgerow can be removed through a hedgerow removal notice; and
- removal should be carried out in accordance with the hedgerow removal notice and should be done within two years of its service.

SIGNS TO LOOK OUT FOR

The bulleted points below summarise some of the features that can indicate that a hedgerow might be valuable and/or protected:

- hedgerows that are longer than 20m, or are less than 20m but meet another hedgerow at each end; and
- hedgerows that are more than 30 years old.

PLANT SPECIES

REASONS WHY SOME PLANT SPECIES PRESENT AN ECOLOGICAL RISK

In the UK nine plant species are protected under European legislation, and a further 185 plant species are protected under UK legislation. However, all of these species are very rare, and are unlikely to be found on development sites unless they are near designated wildlife sites where populations are known to exist. It is therefore important to liaise with local ecological stakeholders if a proposed development site is close to such habitat.

DESIGNATED WILDLIFE SITES

REASONS WHY DESIGNATED WILDLIFE SITES PRESENT AN ECOLOGICAL RISK

The habitats on the following list of site designations are classified as statutory wildlife sites:

- Ramsar Sites (international designation);
- Special Protection Ares (SPAs) (European designation);
- Special Areas of Conservation (SACs) (European designation);
- Sites of Special Scientific Interest (SSSIs) (national designation);
- National Nature Reserves (NNR) (national designation);
- Areas of Outstanding Natural Beauty (AONBs) national designation); and
- Local Nature Reserves (LNR) (local authority designation).

Natural England has to be consulted for proposed developments within SSSIs (or International sites) or within a consultation area that can be within a 500m to 2km radius from a SSSI (or International sites).

As part of the planning process for a proposed development, a search should be carried out to determine if there are any wildlife sites nearby that could be affected by the construction and/or operation of the development.

INVASIVE PLANT SPECIES

REASONS WHY INVASIVE PLANT SPECIES PRESENT AN ECOLOGICAL RISK

There are a number of non-native plant species that have been introduced to the UK that can invade sites to the detriment of biodiversity. A number of plants are specified in legislation that makes it illegal to allow them to grow in the wild. Case law shows that this can mean that a land owner who allows an invasive plant to spread from their site onto that of their neighbour could be guilty of an offence.

The main invasive, introduced plant species that are likely to be encountered on or close to a development site include the following:

- Japanese knotweed (including giant knotweed and all hybrids);
- giant hogweed;
- Himalayan balsam; and
- rhododendron.

If significant standing water is within, or close to, a development site, the following invasive, aquatic plants might also present a risk:

- New Zealand pygmyweed; and
- floating pennywort.

SIGNS TO LOOK OUT FOR

Japanese knotweed *(Fallopia japonica)*

- can grow 3m tall in one season and has large shield-shaped leaves. Produces spikes of small white flowers around September/October. Above ground growth dies back over winter leaving dead, bamboo-like stems, before sending up new shoots from large, red buds the following spring.

Giant hogweed *(Heracleum sphondylium)*

- is a very large Apiaceae, which looks like carrot or cow parsley. It can grow 3- 5.5m tall, often along the banks of the rivers. It flowers from late spring to early summer. It has dark reddish–purple pigments on its stem and spotted leaf stalks that are hollow and produce sturdy bristles. The stem varies from 3-8cm in diameter, sometimes 10cm. The leaves are spiked and can be 1.5m across.

Himalayan balsam *(Impatiens glandulifera)*

- is a summer annual that can grow 3m tall, mainly along river banks and ditches. It has smooth, hollow stems with no hairs. The flowers are very pretty, bell-shaped and lipped and loosely resemble those of foxgloves in shape and colour. They vary from pale pink to purple and appear from June to October.

New Zealand pygmyweed *(Crassula helmsii)*

- is an aquatic or semi aquatic plant. The plant is very small but forms dense mats on standing water. The leaves are 2cm long and about 0.5cm wide.

Rhododendron *(Ponticum)*

- can grow 5m tall and has a woody stem. The leaves are dark green and very shiny with a thick waxy cover. The leaves are 6-18cm long and 2-5cm wide. The flowers are red-purple and are formed in clusters.

Floating pennywort *(Hydrocotyle Ranunculoides)*

- grows along riverbanks and out across open freshwater. It has deep green kidney shaped leaves 2-8cm in diameter. It forms dense mats on water bodies growing in from the banks.

NATIVE SPECIES LISTED IN UK LEGISLATION TO PREVENT THEIR SPREAD.

Common ragwort *(Senecio Jacobaea)*

- is poisonous to livestock. The flowering stalk is often 0.3-1m tall and produces yellow, daisy like-flowers between June to November.

AIR POLLUTION

Air pollutants affecting air quality, such as dust, odour, smoke and fumes, are regulated by several pieces of UK legislation. These include, but are not limited to:

- nuisance effects (dust and odour);
- ambient concentration limits; and
- limits on emission rates from industrial and transport sources.

WHAT ARE THE MAIN AIR POLLUTION SOURCES:

Dust is airborne solid matter up to about 2mm in size, sources include:

- wind blowing over dry bare ground, including haul roads;
- wind blowing over stores of fine material (eg sand, soil); and
- loading or unloading of fine dry material/earth moving operations.

Odours or fumes are caused by the release of volatile chemicals from:

- fuel tanks;
- vehicle exhausts; and
- remediation of sites.

REASONS WHY AIR QUALITY CAN CAUSE NUISANCES:

Neighbours: simple things like residents having to rewash clothes, cars and windows will annoy them and cause complaints. Dust and odours may also cause eye irritation and asthma. Toxic volatile chemicals can cause breathing problems and serious adverse health effects.

Farmers: claims may arise due to dust affecting plant and fruit crops.

Ecology: dust blown into water courses can affect aquatic life, and trees may drop their leaves up to two months early if they are covered in dust.

Plant and equipment: dust can clog filters and cause mechanical/ electrical faults to equipment.

CONTROL MEASURES:

- ensure plant keeps to designated haul routes;
- ensure fumes from exhaust are directed upwards and not into the ground;
- maintain speed limits on site;
- in dry conditions dampen bare ground, fine stores, haul routes, as appropriate;
- reduce drop height of hoppers and loads from lorries;
- cover stores of fine materials;
- use enclosed chutes during demolition;
- if materials are moved ensure that they are covered;
- ensure all vehicles and equipment are regularly maintained;
- ensure emissions standards for plant and vehicles are met at all times;
- turn off plant/vehicle engines when not in use or queuing;
- locate crushing plants/concrete batching plants away from sensitive areas;
- minimise cutting and grinding activities on site, where possible;
- no fires on site;
- have effective traffic management on site to reduce vehicle movements and idling emissions;
- ensure all waste and muck away lorries are sheeted when leaving site;
- position toilets away from residential areas;
- cover containers for odorous wastes – vegetation etc; and
- plan odorous activities – digging out contamination etc – on cold days, in winter and/or in a manner that will prevent strong smells affecting sensitive neighbours.

NOISE

Noise and vibration is covered by UK legislation, including nuisance issues. Noise levels can be agreed with the council for proposed works through agreements, prior to works commencing.

REASONS NOISE CAN CAUSE NUISANCES:

Noise emissions must be eliminated at source or reduced to a minimum. When risks can not be prevented, individual hearing protection must be made available. Noise exposure should be assessed at the point where workers are, or for neighbours on site boundaries.

Noise and vibration can be transmitted large distances and/or though materials and therefore operatives need to be aware of the potential impacts their work could be having off-site.

CONTROL MEASURES:

- review operations and use the appropriate equipment or methods that create minimum noise/vibration, where practical;
- reduce noise impacts at certain times of the day;
- use noise protection measures when necessary/legally required;
- use noise screens, if required;
- ensure engine compartments are closed while plant is running;
- ensure silencers are fitted to exhausts;
- ensure all vehicles and equipment are regularly maintained;
- turn off plant when not in use;
- reduce fabrication activities on site, where possible;
- arrange deliveries at certain times of the day as appropriate for the site and area;
- reduce the drop height of hoppers, lorries and other plant; and
- ensure all operatives on site are considerate of neighbours.

TRANSPORT

Transport impacts are generated by most sites and are generally caused by: the movement of plant on site; the transport of staff to and from site; delivery of supplies; and the removal of waste/products.

The legislation covering transport issues is varied depending on the issues. Environmental issues covered by legislation include, but are not limited to: waste carrier licences; emission rates; and nuisance issues, such as dust and noise/vibration impacts.

CONTROL MEASURES

Deliveries and removals:

- ensure all staff are aware of the site parking rules/areas;
- provide, or promote, alternative staff transport such as minibus, car share, bicycles;
- programme delivery and removal routes, and times, as necessary, taking into account the local issues;
- ensure all waste and muck-away lorries are sheeted when leaving site;
- provide a suitable hard-standing, or clean area, at site entrance to reduce dust and/or mud impacts on the adjacent roads;
- use wheel wash or jet wash, as necessary, to prevent dust and/or mud impacts on the adjacent roads;
- ensure banksman directs vehicles on and offsite, as necessary; and
- ensure deliveries do not queue outside the site boundary.

On-site:

- provide designated and clearly marked haul routes on-site;
- provide designated walkways on and around site;
- ensure that exhausts, of site plant, do not discharge directly at the ground, as this could generate dust which could cause nuisance issues on or off-site;
- ensure all plant and vehicles are in good working order, to reduce dust, vibration and/or noise issues;
- wash out concrete lorries in a designated area;
- all engines to be switched off whilst waiting on-site; and
- ensure that drivers adhere to the site speed limit.

WATER

Watercourses, water abstractions and discharges to watercourses/sewers are covered by UK legislation, and sections are also covered by European legislation. Prior to any works on-site it is important to identify any water courses on or near the site and establish any specific water controls in the area.

WATER ISSUES

Silt entering watercourses can prevent light penetration and cover aquatic plants preventing them from photosynthesising. Silt can also clog up the gills of aquatic animals. Certain chemicals including hydrocarbons such as oil, can travel vast distances in water affecting aquatic organisms and potentially affecting drinking water abstractions.

CONTROL MEASURES:

- ensure appropriate licences are obtained prior to abstracting or discharging any water/liquids on-site;
- never discharge oily, silty water into a watercourse or ditch;
- ensure any fuel/oil spillage is remediated;
- any excavations next to a watercourse need approval from the EA/SEPA;
- monitor the water quality of watercourses on/adjacent to site;
- monitor any discharge to ensure it complies with the consent;
- ensure all plant is well maintained;
- ensure all fuels are stored in bunded containers;
- silt traps and/or hay bales may be required for water discharges, ensure they are securely fixed;
- fuel and chemical stores to be bunded with a 110% capacity;
- rain water removed from bunds in appropriate way;
- store chemicals away from watercourses or drains;
- ensure a spill response kit is available on-site;
- ensure all staff know where the spill kits are and how to use them; and
- wash out concrete lorries in a designated area.

WASTE

WASTE ISSUES

Waste needs to be appropriately stored and segregated. Waste skips should be covered, in order to prevent the potential of waste material being blown off site. Food waste should be sealed in order to prevent the potential for rodents on site. The storage, treatment and removal of waste on/off sites is covered by several pieces of UK and European legislation.

CONTROL MEASURES:

- create a waste management plan for the site and ensure that it is implemented and monitored.

Waste storage:

- segregate and appropriately store all waste;
- label waste containers with the types of waste they can receive;
- do not mix hazardous and non-hazardous waste;
- avoid mixing hazardous waste types;
- seal food waste;
- cover waste skips to prevent waste being blown across site; and
- ensure there is no wind-blown litter or debris.

Waste removal:

- ensure all waste is removed in accordance with the Duty of Care;
- ensure transfer notes/consignment notes are appropriately filled in with description of the waste and appropriate waste codes;
- ensure waste haulier is appropriately licensed (check on the EA's website, public registers);
- ensure waste facility is appropriately licensed (check on the EA's website, public registers); and
- ensure transfer notes/consignment notes are kept for the appropriate period.

CONTAMINATION

CONTAMINATION ISSUES

An appropriate ground investigation should be undertaken of all development sites. Assessment needs to comply with current UK guidance, including identification of the Sources, Pathways and Receptors present. If necessary, a remediation plan should be agreed with the local authority or appropriate body. Ensure appropriate permits are in place for any remedial works. Monitoring of the ground, water and gases may be required as part of the remediation plan for the site.

Prior to any excavation, services plans of the site need to be reviewed. Even if services are not marked on the site, the excavation area should be regularly scanned, e.g. with a Cable Avoidance Tool (CAT) as necessary. A geophysical survey of the site may be required prior to any excavation works to identify buried structures, such as services or tanks. In certain areas an unexploded ordnance (UXO) report and/or watching brief by a UXO engineer may be required.

During any excavation work it is important to continually assess the ground for signs of contamination.

Visual Signs:

- buried material (e.g. waste items, asbestos 'fibrous material');
- made ground (in-filled material and mounds);
- burned areas;
- discoloured soil (eg chemical residues, hydrocarbons stains, cyanide oxides "blue billy");
- odours (e.g. hydrocarbons, hydrogen sulphide "rotten eggs");
- buried structures, tanks and drains; and
- unexploded ordnance.

ARCHAEOLOGY

KEY ISSUES

Certain archaeological and built heritage structures and areas have varying degrees of protection internationally and in the UK. Some sites are internationally protected as World Heritage Sites, such as Stonehenge. Most of these sites will also have national protection as Scheduled Ancient Monuments.

UK protection includes, but is not limited to: Scheduled Ancient Monuments; listed buildings; registered parks and gardens; registered historic battle fields; protected wrecks sites, and conservation areas.

VISUAL SIGNS:

During site survey:

- changes in ground level (e.g. mounds, dips); and
- presence of buildings/walls.

During excavation work:

- in-filled areas/ditches; post holes;
- burned material;
- buried foundations such as brick or stone;
- manmade items such as brick, tile, pottery or glass fragments;
- coins and other metal items; and
- human or animal remains such as bone fragments or skeletons.

If archaeological finds are discovered on site, then stop work immediately, protect the find, and contact an archaeologist.

If known archaeological or built heritage sites are present on site, ensure they are protected. This will often also include protecting a buffer area around them. An archaeological watching brief may be required when working inside these buffer areas.

SURVEY TIMES FOR ECOLOGICAL SPECIES

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
HABITATS/ VEGETATION	Phase 1 and NVC			Phase 1 and National Vegetation Classification (NVC)						Phase 1 and NVC		
BIRDS	Wintering bird surveys		Breeding bird and migrant species		Breeding Bird Surveys		Low activity - breeding bird surveys		Surveys of migrant bird species		Wintering bird surveys	
BADGER	Limited sett/ bait surveys	Bait marking and sett surveys			Limited bait marking and sett surveys				Sett surveys			Limited sett/ bait surveys
BAT	Inspection of hibernation roosts			Limited activity	Summer roosts, emergence (dawn & dusk) activity surveys					Limited activity	Inspection of hibernation roosts	
	Surveys of potential roosts, and internal surveys of buildings/structures are possible all year round											
DORMOUSE (NEST BOX & TUBES)				Nest box and nest tube surveys								
DORMOUSE (HAZELNUT SEARCH)	Gnawed hazel nut search	Gnawed hazel nut search							Gnawed hazel nut search			
OTTERS	Surveys can be conducted all year round. Survey limited by vegetation cover and weather conditions											
WATER VOLES	Initial habitat survey			Survey for habit and field signs. Surveys for water vole activity may be limited by vegetation cover and weather							Initial habitat survey	
REPTILES	Reptiles hibernating		Limited activity - lower effectiveness of refugia	Peak survey months - natural and artificial refugia searches			Warmer weather resulting in reduced basking time and lower effectiveness of refugia		Peak survey month - refugia searches	Limited activity - lower effectiveness of refugia	Reptiles hibernating	
GREAT CRESTED NEWTS (AQUATIC)	Newts hibernating on land	Limited activity	Netting, bottle trap, torching, surveys for adults	Netting, bottle trap, torching, surveys for adults - egg searches from mid May survey for larvae		Netting, bottle trap, torching, egg & larva surveys	Larvae surveys - adult newts on land		Adult newts on land		Newts hibernating on land	
GREAT CRESTED NEWTS (TERRESTRIAL)	Newts hibernating	Limited activity	Search of natural refugia			Search of natural refugia			Search of natural refugia	Search of natural refugia	Newts hibernating	
NATTERJACK TOADS	Toads hibernating			Pond survey for adults. terrestrial survey & egg surveys April to mid-June. Larvae surveys from mid-May				Survey for adults on land		Toads hibernating		
WHITE-CLAWED CRAYFISH	Reduced activity			Hand, search, torchlight trapping	Breeding period - torchlight survey only		Substrate search by hand. Torchlight and trapping surveys				Reduced activity	
STAG BEETLES	Underground				Above ground			Underground				

KEY: Survey optimal Survey sub-optimal Survey not possible

SURVEY PERIOD:

HABITAT SURVEYS: Provided the habitat has not been significantly altered then habitat surveys need to be reviewed every one to three years.

PROTECTED SPECIES: Most protected species surveys need to be repeated each year.

BAT SURVEYS: As bats are very mobile, demolition of building/structures, or felling of trees, should be carried out within a week of a bat survey stating that there are no signs of bats there.

MITIGATION OF SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
BADGERS	No disturbance to existing setts/building of artificial setts only							Stopping up/destruction of existing setts				Same as Jan-June
BATS	Works on maternity roosts only				Works on hibernation roosts only					Works on maternity roosts only		
GREAT CRESTED NEWTS	Pond management only (hibernation)		Newt trapping in ponds and on land				Newt trapping on land only				Pond management only (hibernation)	
REPTILES	Aboveground shrub clearance only (hibernation)		Capture and translocation programmes				Capture and translocation		Capture and translocation programmes - scrub clearance		Aboveground scrub clearance only (hibernnation)	
WATER VOLE	Avoid works in habitat		Trapping/exclusion			Mitigation restricted due to breeding			Trapping/exclusion		Avoid all works in habitat	
CLEARANCE TO AVOID BREEDING BIRDS	Clearance		Avoid clearance/construction works as birds nesting						Clearance			
HABITATS/VEGETATION	Planting & translocation		Sub-optimal		Planting and translocation not recommended for the majority of larger species				Sub-optimal	Planting and translocation		
DORMICE	Avoid ground vegetation clearance				Capture & release & stump and root clearance		Capture only		Aboveground vegetation clearance			
WHITE-CLAWED CRAYFISH	Avoid capture programme			As Jul-Oct	Avoid capture programmes		Capture and exclusion from construction areas				Avoid capture programmes	
OTTERS	No seasonal constraints but likely to be restricted where otters are breeding											

KEY: Mitigation possible Mitigation restricted Mitigation not possible

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The survey and mitigation timings provided are given as a guide only and may vary depending on the specific circumstances.
We recommend that if you wish to discuss survey and mitigation times and options for your particular site you contact Phlorum Ltd.

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