

importance because it provides open ground, varied substrates and potential habitat for invertebrates, reptiles and locally diverse flora. It can, however, be recreated and enhanced through restoration and is not irreplaceable.

u1b5 – Buildings

Three derelict buildings associated with the former quarry are located within the southern parcel. Building B1 comprises a tall corrugated metal-clad processing structure with attached lower sheds and a small masonry outbuilding. Building B2 is a large steel-framed former workshop with a corrugated metal roof, blockwork lower walls, wide open access and a hardstanding floor. Building B3 is a small single-storey brick-built former utility building with a flat concrete roof, open doorway and single window opening. The buildings are surrounded by former quarry hardstanding, sparse vegetation and scrub. Due to the presence of bat roosts for two species, including one rarer one, the buildings are classed as of **local importance**.

Summary of habitat value

The Site is not a uniformly high-value semi-natural habitat complex. Its ecological interest lies mainly in the mire and residual heathland in the northern parcel, the ponds, reedbed and other wetland features, and the older woodland and tree belts along historic walls, banks and tracks. These habitats should guide the design of quarry working, phasing and restoration. In isolation, the modified grassland, bracken, dense scrub, young secondary woodland and much of the disturbed quarry ground are of **neighbourhood importance**, although they add to the wider habitat mosaic.

A restoration-led approach will retain and protect the limited areas of mire, remnant heath, wetland and older woodland, while recognising that much of the existing post-industrial vegetation can be recreated or improved through phased restoration. The value of individual habitat units is being reviewed against the final working and restoration proposals as part of the Green Infrastructure Statement, while taking into account that the site value will be retained through habitat management as a principal tool.

4.1.6 Water features

Plate 2, below, show all mapped watercourses within 250m of the Site boundary.



Plate 2 – Locations of watercourses within 250m of the Site boundary

There are no watercourses within the Site boundary. Two watercourses are located either side of the Site, one approximately 15 m west and the other approximately 110 m east of the site boundary at their closest points. They flow broadly southwards to their respective confluences with the River Terrig.

The River Terrig flows broadly northwards from Llyn Cyfynwy to Graianrhyd, from where it continues broadly eastwards. The river is situated approximately 50 m south of the site boundary at its closest point. Two further short tributaries join the River Terrig at Graianrhyd from the west.

Plate 3, below, shows all mapped waterbodies within 250m of the Site boundary.



Plate 3 – Locations of waterbodies within 500m of the Site boundary

A total of eleven ponds (P1 – P11) are located within the Site boundary, six within the northern part of the Site and five within the southern part of the Site. All of these are either artificially created basins or previously quarried areas which have become flooded.

Two ponds (P12 and P13) are located within woodland or scrub, just beyond the Site boundary (5 m and 20 m respectively).

The remaining ponds are over 250 m from the Site boundary. P14 is located within a farmstead approximately 320 m south of the Site boundary while P15 is situated within an area of agricultural pasture 370 m north of the Site boundary. P16 and P17 appear to be artificial waterbodies associated with holiday lodge accommodation, approximately 440m and 460m northwest of the Site boundary at their closest points.

4.1.7 Notable species

As records are not usually deleted from databases but can be out of date due to changing conditions, a time limit has been placed on the data reported within this document. When referring to protected species records from Cofnod, only those dated within the last ten years have been included unless otherwise referenced. Where records have been provided without dates, these have been included to ensure a thorough assessment is conducted. Distances are provided from the record grid reference to the site boundary at its nearest point.

Invertebrates

Cofnod returned the following records of notable invertebrates:

- Two records of dingy skipper, the closest of which is located approximately 1.4 km northwest of the site;

- One record of grayling *Hipparchia semele* located approximately 1.6 km west of the Site;
- One record of shaded broad-bar *Scotopteryx chenopodiata* located approximately 1.6 km west of the Site;
- Two records of small heath *Coenonympha pamphilus*, the closest of which is located approximately 1.2 km south of the Site;
- One record of V-moth *Macaria wauaria* located approximately 1.6 km west of the Site; and
- Two records of wall *Lasiommata megera*, the closest of which is located 1.5 km north of the Site.

No terrestrial invertebrate species of note were recorded during the survey. The mosaic of habitats present on site is likely to support some common pollinators and other invertebrates, however the recent past of the site as a working quarry likely limits the value of the site for rare and notable species.

Features such as hedgerows and trees comprise common species assemblages but do have some potential to support a range of common terrestrial invertebrates.

Overall, the site is considered to be of **neighbourhood importance** for invertebrates. Invertebrates are not considered to be a VER and are not considered further in this assessment.

Amphibians

Cofnod returned the following records of amphibians within 2 km of the Site boundary:

- Two records of common frog *Rana temporaria*, the closest of which is located approximately 990 m north of the Site boundary;
- Three records of common toad *Bufo bufo*, one of which is located within the northern Site parcel;
- Three records of GCN, the closest of which is located approximately 630 m north of the site boundary. A historic record, from 2007 or earlier, of a GCN within P12, approximately 5 m from the Site boundary, was also returned by Cofnod;
- Three records of palmate newt *Lissotriton helveticus*, the closest of which is located 620 m north of the Site boundary; and
- One record of smooth newt *Lissotriton vulgaris* located approximately 1 km north of the Site boundary.

Onsite habitats, both terrestrial and aquatic are suitable for amphibians including great crested newts (GCN) and the species was found present on site. A full population size class assessment was carried out in 2025 and revealed a medium population to be present across the 11 ponds, a three visit re-assessment in 2026 confirmed this assessment. The meta-population is likely to also use the ponds present in the wider area, none of which were surveyed as part of this assessment, owing to access constraints.

The majority of the terrestrial habitat within the site is considered to be suitable for the species at different stages of its lifecycle, including hibernation potential within the woodland areas.

The site is assessed as being of **local importance** with respect to GCN and other amphibians.

Reptiles

Cofnod returned the following records of reptiles within 2 km of the Site:

- Eight records of adder *Vipera berus*, the closest of which is located approximately 1.8 km south of the Site boundary;
- Thirty-one records of common lizard *Zootoca vivipara*, including nine records within the Site

boundary; and

- Four records of grass snake *Natrix helvetica*, including one within the Site boundary.

An updated reptile survey using artificial refugia was carried out in 2025, finding a population of common lizards present on site, with a peak count of 12 individuals, all of which were adults. No grass snakes were found present during this survey, which is unsurprising given their large ranges and does not necessarily mean they are not utilising the site anymore, their presence should still be assumed as part of the mitigation process. Habitats on site are suitable for reptiles in respect of the scrub areas, wet areas and grassland. The woodland edges also have potential and in all the site can likely support all stages of the lifecycle including hibernation. The wider area beyond the site is similarly suitable for reptiles.

The site is therefore considered to be of **neighbourhood importance** in respect of reptiles. Reptiles are not considered to be a VER and are not considered further in this assessment.

White-Clawed Crayfish

Cofnod returned no records of white-clawed crayfish *Austropotamobius pallipes* within 2km of the site.

The site is considered to be of **negligible importance** for the species.

Birds

Cofnod returned records of the following bird species of conservation interest within 2km of the site boundary, which have some potential to be present on site. For the purposes of the below, birds of conservation interest are considered to be those on the BoCC Red List, Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), Section 7 of the Environment (Wales) Act 2016 or Annex I of the European Birds Directive. N.B. – This is not a list of species considered *likely* to be on site, merely those for which the broad habitats present on site may be suitable.

- | | |
|---|---|
| • Barn owl <i>Tyto alba</i> ; | • Nightjar; |
| • Brambling <i>Fringilla montifringilla</i> ; | • Pied flycatcher <i>Ficedula hypoleuca</i> ; |
| • Bullfinch <i>Pyrrhula pyrrhula</i> ; | • Red kite <i>Milvus milvus</i> ; |
| • Crossbill <i>Loxia curvirostra</i> ; | • Redwing <i>Turdus iliacus</i> ; |
| • Cuckoo <i>Cuculus canorus</i> ; | • Reed bunting <i>Emberiza schoeniclus</i> ; |
| • Dunnock <i>Prunella modularis</i> ; | • Short-eared owl; |
| • Fieldfare <i>Turdus pilaris</i> ; | • Skylark <i>Alauda arvensis</i> ; |
| • Greenfinch <i>Chloris chloris</i> ; | • Song thrush <i>Turdus philomelos</i> ; |
| • House martin <i>Delichon urbicum</i> ; | • Spotted flycatcher <i>Muscicapa striata</i> ; |
| • House sparrow <i>Passer domesticus</i> ; | • Starling <i>Sturnus vulgaris</i> ; |
| • Kestrel <i>Falco tinnunculus</i> ; | • Swift <i>Apus apus</i> ; |
| • Lesser redpoll <i>Acanthis cabaret</i> ; | • Tree pipit <i>Anthus trivialis</i> ; |
| • Linnet <i>Linaria cannabina</i> ; | • Woodcock; and |
| • Little egret <i>Egretta garzetta</i> ; | • Yellowhammer <i>Emberiza citrinella</i> . |
| • Mistle thrush <i>Turdus viscivorus</i> ; | |

A full suite of breeding bird surveys was carried out during the 2025 season. This revealed a good diversity of breeding birds with an assemblage of largely common passerine species on site and somewhat surprisingly few notable species. Section 7 species considered likely to have bred on site are dunnoek, linnet and song thrush, which are among the commonest of these species.

The site is considered to be of **neighbourhood importance** for birds. Birds are therefore not considered to be a VER and are not referenced further in this report.

Bats

Cofnod returned the following records of bats within 2km of the Site boundary:

- One record of a brown long-eared bat *Plecotus auritus* roost approximately 2 km northwest of the Site boundary, dated 2019;
- Two records of common pipistrelle *Pipistrellus pipistrellus*, the closest of which is located approximately 1.4 km north of the Site boundary;
- One record of Daubenton's bat *Myotis daubentonii* located approximately 2 km northwest of the Site boundary;
- Two records of lesser horseshoe, the closest of which is located approximately 900 m east of the Site boundary;
- One record of noctule *Nyctalus noctula* located approximately 2 km northwest of the Site boundary;
- Two records of soprano pipistrelle *Pipistrellus pygmaeus*, located approximately 1.4 km north of the Site boundary; and
- One record of whiskered bat *Myotis mystacinus*, located approximately 2 km northwest of the Site boundary.

The mosaic of habitats present across the site, along with the waterbodies, provides suitable foraging habitat for bats. A suite of bat surveys comprising emergence surveys, static monitoring and walked transect surveys was carried out, spanning the period of 2024 and 2025.

Surveys on the buildings found the presence of soprano pipistrelle and lesser horseshoe roosts within the building. Surveys were carried out between August and September 2024, and the number of lesser horseshoe bats increased from survey to survey.

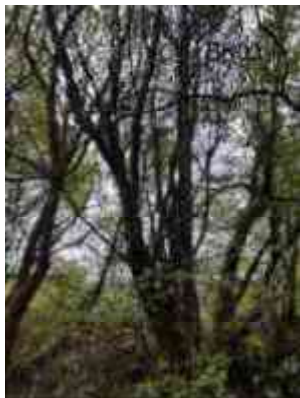
Transect surveys were carried out showing low to moderate levels of common bat species, as well as some less common species including lesser horseshoe records, which is unsurprising considering there is a roost on site.

Static detector surveys were carried out between June and October 2025. Two detectors were located within the southern parcel, none were put into the northern parcel. Detectors were left out for five nights per month. Unfortunately, the data for location 2, the more northerly point, was lost for the months of June and October, so only three months' worth of data is available for this location. The data shows relatively low amounts of bat calls across the season, with a notable uptick in bat presence in July at the more southern location and August at the more northern location. However, as an example, across the five months, a total of 606 passes of common pipistrelle were recorded at the southern position, which is very low. 22 lesser horseshoe passes were recorded in that time and 102 noctule passes.

Quarries as a whole have been identified as potential good swarming sites for bats, although this mostly applies to stone quarries that include caves and shelves, less so sand quarries. However, restored quarries including industrial sand have been found to host significant increases in biodiversity. Activity in September and October was low at both survey points for the static detectors and also during the transect surveys, showing no indication of the site being important for swarming.

A ground level tree assessment (GLTA) for roosting bats was undertaken in 2026; this covered the trees to be removed for the visibility splay only. A wider site assessment of trees for roosting potential will need to be carried out in stages along with the phasing programme for the site, as roost potential may develop in the intervening time. Four trees require further assessment. See Table 3 below for details of trees with bat potential.

Table 3: Ground Level Tree Assessment

No.	Potential Roost Features (PRFs)	Photograph
SK01	Ash, knot holes and some broken limbs. PRF-I from ground-level, need to climb to confirm	
SK02	Mature ash with numerous broken limbs PRF-I from ground-level, need to climb to confirm	
SK03	Lime sp., large tear-out on main stem PRF-M from ground-level, need to climb to confirm	

SK04	Ash, ivy clad with broken rotting limb PRF-I	
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Given the presence of multiple confirmed roosts, potential roost features within trees, and strong habitat connectivity to the wider landscape via the boundary hedgerows, alongside a relatively low number of bat records and an absence of evidence of swarming activity, the site is considered to be of **local importance** in relation to bats.

Hazel Dormouse

Cofnod returned no records of hazel dormouse within 2km of the Site boundary from the last ten years.

An initial assessment comprising a habitat assessment and search for opened hazel nuts was carried out in March 2026 by an experienced surveyor. Habitats on site were deemed as of low suitability for dormice, little hazel was found present on site and no nuts opened in the characteristic way were found. While the site is partially covered in trees, the pockets are fragmented and the scrub habitat on site largely consists of young successional growth. This, combined with the lack of recent records and more suitable habitats in the form of woodland beyond but connected to the site has led to Maes y Droell being assessed as not being suitable to support dormice at this time.

The site is therefore considered to be of **negligible importance** in respect of dormouse. Dormice are not considered a VER and are not considered further in this assessment.

Red squirrel

Cofnod returned no records of red squirrel within 2km of the Site boundary within the last ten years.

Red squirrels are known to be largely absent from Denbighshire, with the notable exception of Clocaenog forest, which is some 13km from the site. Similar to dormice, the habitats on site hold some suitability for red squirrels, but not enough in themselves to warrant further assessment in the absence of further suitable habitat and records in the area.

The site is therefore considered to be of **negligible importance** in respect of red squirrel. Red squirrels are not considered a VER and are not considered further in this assessment.

Otter

Cofnod returned no records of otter *Lutra lutra* located within 2km of the Site from the last ten years.

Otters are considered to be present along every catchment within Wales and the river Terrig and its tributaries are likely no exception. No potential resting features were identified during the Preliminary Ecological Assessment. There are no watercourses present on site, the two small watercourses running either side of the site are likely at least commuting corridors. However, at certain times of the year the ponds on site are likely frequented by otters for feeding purposes, or in order to teach cubs to swim. Their presence on site can therefore not entirely be discounted.

The site is therefore considered to be of **local importance** in respect of otter.

Water Vole

Cofnod returned no records of water vole *Arvicola amphibius* located within 2km of the Site from the last ten years.

No evidence of water vole was recorded on site during the survey and the shaded edges of the waterbodies mean the suitability of the ponds is limited.

Given this, and the absence of records, the site is considered to be of **negligible importance** in respect of water vole. Water voles are not a VER and are not considered further within the assessment.

Badger

Cofnod returned ten records of badger *Meles meles*, the closest of which is located approximately 1.4 km north of the Site boundary. A historic record of a sett, dated 2001, was identified approximately 10 m west of the northern site parcel, within a stand of coniferous trees.

No evidence of badger setts was found within the site boundary. Numerous field signs of European rabbit *Oryctolagus cuniculus* made it difficult to conclusively assess whether there were snuffle marks on site left behind by badgers, but it is assessed as likely that badgers are utilising the site at least some of the time.

The site is considered to be of **local importance** for badgers.

Other Notable Species

Cofnod returned four records of brown hare *Lepus europaeus*, the closest of which is located approximately 700 m east of the Site.

Cofnod returned six records of hedgehog *Erinaceus europaeus*, the closest of which is located approximately 450m east of the Site.

Cofnod returned one record of pine marten *Martes martes* located approximately 1.8 km northwest of the Site.

The site has some potential to support hedgehog and pine marten, less so to support brown hare. However, the habitats are common in the surrounding area and therefore the Site is considered to be of **neighbourhood importance** for hedgehog and pine marten. These species are not VER and are not considered further within this assessment.

Invasive Non-Native Species

Cofnod returned records of the following plant species listed on Schedule 9 of the WCA.

- Three records of entire-leaved cotoneaster *Cotoneaster integrifolius*, the closest of which is located approximately 20 m west of the Site boundary;
- One record of Himalayan balsam *Impatiens glandulifera* located approximately 450 m north of the Site boundary;
- One record of Himalayan cotoneaster *Cotoneaster simonsii* located approximately 1.6 km west of the Site boundary;
- One record of hollyberry cotoneaster *Cotoneaster bullatus* located approximately 20 m west of the Site boundary;
- Three records of monbretia *Cocosmia* sp., the closest of which is located approximately 650 m northwest of the Site;

- Three records of variegated yellow archangel *Lamium galeobdolon subsp. argentatum*, the closest of which is located approximately 20 m west of the Site boundary; and
- One record of wall cotoneaster *Cotoneaster horizontalis* located approximately 20 m west of the Site boundary.

New Zealand pygmyweed *Crassula helmsii* is locally abundant in polygon 51. This invasive non-native species reduces the condition of the wetland and will need to be addressed through biosecurity measures and a site-specific management approach. No other invasive species were found present on site.

Invasive flora species are therefore considered to be of **neighbourhood importance**. While needing to be appropriately dealt with, invasive non-native species are not considered to be a VER and are not discussed further in this report.

Flora and bryophytes

Cofnod returned the following records of notable flora and bryophytes:

- Five records of bluebell *Hyacinthoides non-scripta*, including one record located within the Site boundary;
- Three records of common fragrant-orchid *Gymnadenia conopsea*, the closest of which is located approximately 1.1 km west of the Site;
- One record of field gentian *Gentianella campestris* located approximately 1.7 km northwest of the Site boundary;
- Four records of frog orchid *Coeloglossum viride*, the closest of which is located approximately 1.2 km west of the Site boundary; and
- One record of pale bristle-moss *Orthotrichum pallens* located approximately 1.5 km northwest of the Site boundary.

No notable plant species were recorded during the site survey.

Overall, the site is considered to be of **neighbourhood importance** with regard to protected/notable flora species. Notable flora is not considered to be a VER and is not discussed further in this assessment.

4.1.8 Assessment of valued ecological receptors

Valued ecological receptors (VERs) are those features/sites that are considered to be valued at a local level or higher. Only VERs are considered further within this assessment.

A summary of the valuation assessment and the VERs identified for the proposed development are summarised in Table 4 below.

Table 4: Summary of Valued Ecological Receptors

Site/Habitat/Species	Value	VER?
Designated Sites		
SSSIs	National	VER
LNR	Regional	VER

Site/Habitat/Species	Value	VER?
Non-statutory sites - SINC's	County	VER
Habitats located within the proposed site		
g4 – modified grassland	Neighbourhood	Not VER
g3c – other neutral grassland	Neighbourhood	Not VER
h1a5 – dry heath	Neighbourhood	Not VER
h1a7 – wet heath	Neighbourhood	Not VER
f1a – mire/blanket bog	Local	VER
g1c – bracken	Neighbourhood	Not VER
h3h – mixed scrub	Neighbourhood	Not VER
h3e – gorse scrub	Neighbourhood	Not VER
h3j – grey willow scrub	Neighbourhood	Not VER
w1g – regenerated broadleaved woodland	Local	VER
w1d – wet woodland	Local	VER
f2e – reedbed	Local	VER
f2f – other wetland		
r1g – other standing water		
s1d – sparsely vegetated rock, scree and quarry spoil	Local	VER
u1b5 - buildings	Local	VER
Species		
Invertebrates	Neighbourhood	Not VER
Amphibians	Local	VER
Reptiles	Neighbourhood	Not VER
Bird species	Neighbourhood	Not VER
Bat species	Local	VER
Otter	Local	VER
Badger	Local	VER

Site/Habitat/Species	Value	VER?
Other notable species	Neighbourhood	Not VER
Invasive Species	Negligible	Not VER
Notable/Protected Flora	Neighbourhood	Not VER

4.1.9 DECCA Framework and Ecosystem Resilience

Owing to the mosaic of habitats present on site, the diversity of common species is relatively high when considered against the fact that the growth is relatively young. The presence of GCN and reptiles, as well as occasional likely use by badger and otter does show that the site has some value for a number of species. A variety of habitats are present, however this by nature means that the extent of each type of habitat is relatively small. The mire and heath within the northern part do extend beyond the site to the north in particular. Scrub and inland rock are the largest habitat categories at the site and of relatively moderate value in the larger context of the site and its environs.

The condition of the habitats is moderate due to their relative youth, with habitats on the northern part being more developed than those within the southern part. The nature of quarrying activities means that there was no historic seedbank from which to re-establish from and colonising species have mostly taken advantage of the available space. It is unclear how the *Crassula* has arrived on site, left unchecked this is likely to become more and more dominant and adversely impact the open water habitats on site.

Connectivity of habitats varies between the different types. There is little connectivity between the on-site woodland and further woodland in the wider environment, Nercwys Forest to the north being the closest larger woodland, there is little connectivity in the form of hedgerows and other linear features either. Pond habitats however form part of a network, with additional ponds being located right outside the site boundary and further afield, the ponds to be created must continue to form part of this network. The mire habitat in the northern parcel forms part of a larger patch of this habitat to the north and is therefore very well connected.

In terms of adaptability, the variety of habitats including tree growth and prevalence of common, non-specialist species is likely to buffer some of the effects of impacts from a climate change point of view, as discussed above. In terms of the pressures of the proposed activity, there is obviously no way to adapt to the removal of the habitat, however lesser pressures including noise, vibration and dust are likely to be tolerated by most of the VER present on site, with the likely exception of the lesser horseshoe bats utilising the site for roosting and foraging.

Future Baseline Conditions – Do Nothing Scenario

In the absence of the proposed development, it is anticipated that successional processes would continue at the site and eventually it would turn into a woodland habitat, with the mosaic and some of the scarcer habitats, such as the mire, being lost, due to their being no management or grazing occurring.

Climate change could influence future ecological baseline if changes in temperature were to put stress on local ecosystems. However, changes resulting from climate change will be gradual and over a long period of time. Therefore, within the operational lifeline of the proposed quarry any changes would be predicted to be very small.

Mitigation, Compensation and Enhancement Measures Adopted as Part of the Proposed Quarry (Embedded Mitigation)

The potential ecological constraints have been taken into consideration at an early stage and as such the 'mitigation hierarchy' of avoidance, mitigation, compensation and habitat enhancement has been built into the proposed design at the outset. Works are designed to be carried out in four stages, with compensatory habitat being created in advance of each stage. While not all types of habitats present can be retained at all times during the lifespan of the proposed quarrying works, a network of waterbodies and connective tree corridor will be present on site at all times. This is of particular importance with regard to the presence of a medium population of GCN on site and the requirement to ensure suitable habitats for all stages of the lifecycle is available. A funded, long term management plan and conservation strategy for this species will be drawn up and also include measures benefitting other species, such as reptiles. Any relocation effort will include a robust terrestrial element, and any reptiles will be relocated at the same time. The implementation of a long-term management plan for GCN will require the granting of an EPSM licence through NRW.

The proposed quarrying operations will include most parts of the site at some stage of the extraction process and removal of nearly all habitats on site will be required, with the exception of a strip of woodland along the eastern edge of the site, a field at the northern end of the southern parcel and a small area at the southern tip of the southern part of the Site. The phasing will however allow for compensatory habitat to be created prior to destruction of habitat. The habitats of greatest value on site are considered to be the mire, remnant strips of woodland and ponds. The details of the proposed phasing restoration can be seen in ES Vol IV – Figures 1 – 7 The site layout has been designed to utilise the existing access gates to keep associated habitat loss and/or disturbance to a minimum, however in order to create the required visibility splay, a number of trees must be felled. Further surveys of four trees with features along the visibility splay must be carried out prior to removal and inspections of all trees to be removed within the interior of the Site will be carried out alongside the proposed phasing.

A woodland corridor along the eastern boundary will be retained to ensure continuous connectivity across the Site. The habitats within the north eastern part of the north parcel of the Site will be retained and enhanced for biodiversity, particularly for amphibians (GCN) and reptile. A further area will be created solely to promote biodiversity within the north eastern section of the southern parcel of the Site. The details of the precise nature of these habitats and their long-term management will form the basis of the site wide management and long-term monitoring proposals underpinning the licence application for GCN. The wider Site will retain parcels of habitat throughout the phased extraction that will support the population of the GCN on site. This will maintain a continuous corridor of connective habitat for all life stages of GCN and reptiles. Details of habitat creation can be seen in ES Vol IV – Figures 1 – 7 Following the works to extract industrial sand, a full restoration of the site will be carried out and a management plan will be put in place in order to maintain the mosaic of habitats to be created. Restoration of each phase will be followed by a statutory five-year aftercare period, during which the restored land and habitats will be actively managed, monitored and maintained to ensure the successful establishment of the approved restoration scheme and long-term biodiversity objectives. Funding mechanisms must be put in place in order to facilitate this. This will be a more favourable outcome than the do nothing at the site, as successional processes would invariably reduce the biodiversity value of the site.

Further Enhancements on the site beyond the active habitat creation associated with the quarrying phase will be created for a variety of species and should include:

- a suite of bat and bird boxes to be erected in suitable locations across the Site for species such owls and pied flycatchers;
- GCN / reptile hibernacula created as part of the Site wide GCN mitigation strategy for long term management and monitoring;

- a Cathedine type night-roost for lesser horseshoe bats;
- two pine marten boxes;
- management of the created habitats for 5 years with the exception of great crested newt habitat, which will be managed for 25 years.

Although birds have not been identified as a VER, where hedgerow and tree trimming/pruning is required to facilitate site access, this will be undertaken outside of breeding bird season (March – August inclusive). If this is not possible, vegetation works should be conducted under the supervision of a suitably qualified Ecological Clerk of Works (ECoW) following a nest check. Should a nest be identified works must be delayed until such time as the young have fledged.

An Environmental Management Plan (EMP) will be required, to ensure that best practice methods are adhered to in order to limit the generation of litter, dust, noise, traffic pollution relating to vehicles coming onto and off the site and vibration. This will be controlled and monitored through the EMP. Measures will be implemented to avoid/minimise potential for problems such as fuel and other chemical spills. There will be no storage of potentially contaminating materials on the site. In addition, the following measures should be included in the EMP:

- ensure that work compounds and access tracks etc. are not located in, or adjacent to, areas that maintain habitat value;
- establish site fencing to prevent access to areas outside working areas, particularly in areas adjacent to features of interest/value;
- provide briefings and instruction to contractors regarding the biodiversity issues present on the site; and
- follow pollution prevention guidelines provided by Natural Resources Wales to prevent pollution from dust or chemical spills.

The EMP will also detail measures to safeguard mammals, such as badgers and hedgehogs, during the operational phase as follows:

- Any man-made excavations, trenches or pits relating to the development will either be securely fenced off or covered up overnight to avoid entrapment or, if left open, an egress point (e.g. mammal ladders or a roughened plank) will be placed within the excavation to form a ramp to allow mammals to escape; and
- Any excavations will be inspected each morning to ensure no mammals have become trapped overnight. Contractors will be made aware that trapped animals such as badgers may dig a temporary sett into the side of a trench. If a badger is found within any excavations, an ecologist must be contacted immediately for further advice.

A management plan for the lifetime of the quarrying operations will also be required. This will include specifications regarding artificial lighting, access to restoration areas and fencing specifications. Fencing is to be erected to prevent unauthorised access. However, the fencing will include continuous 'mammal gaps' of a minimum of 150mm to ensure that wildlife has continued access across the whole of the proposed quarry for foraging and commuting.

Potential Effects

This section identifies the likely effects of the proposed development on VERs during operational and decommissioning phases and characterises the potential ecological impacts that are likely to arise, taking into consideration the following parameters: beneficial/adverse effect, magnitude, extent, duration, reversibility and timing/frequency.

The impacts are assessed on the basis of the details of quarrying operations and eventual restoration of the proposed quarry. For the purpose of this assessment, the phasing of the works is taken into account.

The potential impacts of the proposal to the valuable ecological features are identified as follows:

- Direct loss of habitat and associated impacts on species that utilise them;
- Direct mortality of protected/notable species during site clearance, fencing works and commencement of quarrying works, construction of access routes and inverter cabins;
- Direct and indirect disturbance from quarrying activities including noise, dust and lighting;
- Habitat fragmentation caused by perimeter fencing; and
- Pollution caused by use of hazardous materials and release of waste materials.

Impact Assessment

Statutory Designated Sites

There are six SSSIs and one LNR located within 5km, as well as one SAC. None of the sites are within 1km of the proposed quarry, hydrologically connected to it or designated for species found present on site. The heath habitats are the ones the Site has in common with the designated sites in the wider area. In-built mitigation means that operational works will adhere to best practice guidelines, as will be set out in the EMP to limit the generation of dust, noise, traffic pollution relating to vehicles coming onto and off the site and vibration. Therefore, no direct or indirect impacts on the sites are anticipated. The impact of the operational/quarrying phase on all nationally designated sites is anticipated to be **negligible (adverse)** and a **non-significant negligible (adverse)** effect is anticipated.

Non-Statutory Designated Sites

There are twenty-four non-statutory sites (LWS') located within 2km of the Site. This includes 2/3 sites partially or wholly located within the Site, as it is unclear whether northern Maes y Droell quarry and upland LWS and Maes y Droell LWS are the same site, although one is mapped to be adjacent to the site, rather than within it. The parts of the LWS' located within the site will be lost in their entirety. Caeau Fron LWS, consisting of two fields of neutral grassland is also located partially within the Site, this field will be retained, but is put forward for habitat creation for mitigation purposes.

A further seven LWS' are located within 1km from the site, including some within the same village. These are similarly largely designated for their upland habitat. Upland bird species are present within some of them. These species may utilise the northern part of the site, however not for breeding, as evidenced by the breeding bird survey. Impacts of dust, noise and vibration may have impacts on the site located 0.2km away. The remainder of the site may be impacted by dust during adverse weather conditions but are unlikely to be affected in any other way.

The remainder of the Local Wildlife Sites are situated further afield and not likely to be impacted directly or indirectly by these works.

In-built mitigation means that operational and quarrying works will adhere to best practice guidelines, as will be set out in the EMP to limit the generation of dust, noise, traffic pollution relating to vehicles coming onto and off the site and vibration.

The impact of the quarrying phase on non-statutory designated sites is anticipated to be **negligible (adverse)** and a **non-significant negligible (adverse)** effect is anticipated.

Habitats

Across their lifetime, the works will result in a near-total loss of all habitats on site, with the exception of a woodland belt and the grassland field within the southern parcel. However, the phasing means that

habitats will be created as the quarrying process progresses. These habitats will be managed beneficially during and for a period of 25 years beyond the works. The UK habitat survey works has confirmed the mire and woodland habitat to be of the highest value in this location, while all types of habitat have some discrete intrinsic value and the restoration works will therefore focus on creating a variety of habitats similar to those present on site. In addition, enhancements will be carried out to make newly created habitats attractive to a variety of species. At any one point, up to half of the site will be given over to quarrying operations, while the other half will either be retained or newly created enhanced habitat.

At the present time, no impacts to the building used by bats for roosting purposes is planned. Should this change, further survey and works being carried out under a license will be necessary, the bats must not be left without a place to roost at any time.

The above outlines the principals of what will be a detailed restoration plan and a habitat management plan following on from creation.

The impact on habitats will be **moderate (adverse)** during the quarrying works and **moderate (beneficial)** after the restoration process and a **non significant low (beneficial)** effect is anticipated in the medium to longer term.

Species

Amphibians

A medium population of GCN is present on site, likely part of a meta-population across the wider area. Prior to quarrying activities, it will be necessary to create suitable terrestrial and aquatic habitats across the Site in order to relocate the population in stages – the details of this will be determined in the long term management and monitoring plan for the site which will form the basis of the EPSM application. A relatively low maximum count means that it will be possible to create suitable habitat for the population within relatively small, discrete areas across the Site. Furthermore, existing suitable habitat will also be retained in various parts of the Site. A detailed GCN conservation strategy will be developed as part of this process, ensuring that new habitats are created at the right stage, in line with the phased restoration and that relocation is kept to a minimum, with individuals only being physically relocated once over the course of the four phases and that any retained / newly created habitat will be managed for the benefit of GCN and other wildlife in line with the long term management strategy to be agreed.

It will be necessary to apply for European Protected Species Mitigation license in order to achieve the above activities, ensuring a robust approach to the habitat creation and restoration, with long term monitoring proposed.

Quarrying works will be designed so as to minimise adverse effects, lighting will not be required, as quarrying activities will be restricted to daylight hours. Best practice guidelines to prevent dust, silt and pollution entering any ponds or impacting GCN terrestrial habitat will be detailed within an Environmental Management Plan.

Traffic movements during quarrying and restoration will generally be during daylight hours; amphibians are usually more active at night so increased traffic is unlikely to impact amphibian species.

Therefore, the impact of the works on GCN as seen across the longer term would be **low (beneficial)** and a **non-significant negligible (beneficial)** effect is anticipated.

Reptiles

Some suitable habitat for reptiles is present on site and surveys identified a small population of common lizards on site. Previously, grass snake has also been found present within the site perimeter. Suitable habitats will be lost as part of the works. Creation of suitable habitat for GCN as described above will also lead to the creation of suitable habitat for reptiles and the relocations will occur concurrently. The restoration scheme will include hibernacula and species-rich grassland, while preserving basking areas of more open habitat, improving the habitat on site from its current position and also preventing

successional processes from reducing suitable habitat availability. Quarrying works will adhere to best practice guidelines to prevent dust and pollution.

Therefore, the impact of the quarrying and restoration works on reptiles would be **low (adverse)** and a **non-significant negligible (adverse)** effect is anticipated.

Bats

Trees with bat potential will be removed, in particular with regard to the visibility splay on site. The retained corridor to the east is likely to hold the most suitability for roosting purposes by bats, however activity recorded during the transect surveys was generally low.

Suitable foraging habitat for bats is present on site. Standing water on site, grassland habitats and retained tree lines are going to be available throughout the quarrying works and the quarried areas will have some suitability for foraging.

A building on site has been identified as a roost for two species of bat, one common and one less so. At present, no impacts on the building are anticipated, however the loss of tree cover and other habitat as part of the quarrying works is likely to have an impact on flight lines to and from the roost, as well as reducing available habitat for foraging. Studies show, however that restored quarry sites can create enhanced habitats for bats over and above what was present on site prior to quarrying works commencing. It is unclear whether this effect will apply at this site, as it has previously been quarried, however there is nothing to suggest that negative impacts will occur instead and any effects will be temporary. If any impacts on the buildings are anticipated, further survey work will be necessary. This includes if the building is to be removed as part of any restoration works.

Swarming

It is proposed that a Cathedine type night roost will be installed within the retained habitats on site as an enhancement for the lesser horseshoe bats in particular.

In built mitigation means that quarrying works will adhere to best practice guidelines to prevent dust and pollution. Increased traffic and noise during operations and decommissioning will be temporary and is considered unlikely to be sufficient to alter the behaviour of bats within the proposed site for any period of time.

Additional lighting will not be required on site as quarrying works will be restricted to daylight hours, therefore there will be no impact to bats as a result of lighting.

Therefore, the impact of the operational/decommission phase on bats would be **low (adverse)** and a **non-significant minor (adverse)** effect is anticipated.

Otter

While there are no watercourses on site, otters are likely using the ponds on site at discrete times of year, namely the spawning season for frog *Rana temporaria* and toad *Bufo bufo*. It is also possible they may take cubs there to teach swimming. No resting places for otter were found present on site, nor are they likely to occur there. The works will therefore not have direct impacts on otter, with the potential exception of the modification of a single resource. At no point will there not be any ponds on site. In built mitigation means that works will adhere to best practice guidelines to prevent dust and pollution.

Increased traffic and noise will be temporary and is considered unlikely to impact otter as the increased traffic will be during the day, whilst otters are usually active at night.

Additional lighting will not be required on site as quarrying works will be restricted to daylight hours, therefore there will be no impact to otters as a result of lighting.

Therefore, the impact of the quarrying and restoration on otter would be negligible (adverse) and a non-significant negligible (adverse) effect is anticipated.

Badger

There is potential for badgers to be using the site, for foraging purposes in particular. No evidence of any setts was found present during any of the survey work, nor were any latrines found. Entrance to the site for foraging purposes at least some of the time is however likely, especially given the previous records in close proximity. Opportunistic creation of setts can occur at any time of the year and a pre-commencement badger survey prior to each phase of the quarrying works will be carried out. This will include the area to be quarried, alongside a 50m buffer in order to ascertain whether a natal sett is present, as these types of setts are highly sensitive. Standard avoidance measures for impacts on badgers during the quarrying works will be included within the Environmental Management Plan. In built mitigation means that quarrying works will adhere to best practice guidelines to prevent dust and pollution. Excavations will be covered or supplied with an exit ramp. Following restoration, the site will once again be suitable for badgers.

Additional lighting will not be required on site as quarrying works will be restricted to daylight hours, therefore there will be no impact to badgers as a result of lighting.

Therefore, the impact of the quarrying and restoration phase on badgers would be **negligible (adverse)** and a **non-significant negligible (adverse)** effect is anticipated.

Summary of Impacts

Table 5 below summarises the potential impacts during both quarrying and restoration, and their significance for all VERs associated with the proposed development. As the quarrying impacts are temporary, the final outcome has been considered as the impact to be assessed.

Table 5: Summary of Impacts

VER	Value	Phase	Type of Impact	Magnitude and extent of impacts	Confidence, duration and reversibility	Significance of impact
SSSIs / LNR	National / Regional	Quarrying and Restoration	Habitat loss/ creation/ enhancement	Negligible (adverse)	Unlikely Temporary Reversible	Not significant
			Disturbance	Negligible (adverse)	Unlikely Temporary Reversible	Not significant
			Pollution	Negligible (adverse)	Unlikely Temporary Not Reversible	Not significant
SINCs	County	Quarrying	Habitat loss/ creation/ enhancement	Negligible (adverse)	Certain Long term Reversible	Not significant
			Disturbance	Negligible (adverse)	Certain Long term Reversible	Not significant
			Pollution	Negligible (adverse)	Likely Temporary Not Reversible	Not significant
Site Habitats	Local - District	Quarrying and Restoration	Habitat loss/ creation/ enhancement	Low (beneficial)	Certain Long term Reversible	Not significant
			Disturbance	Low (adverse)	Certain Temporary Reversible	Not significant
			Pollution	Negligible (adverse)	Unlikely Temporary Not Reversible	Not significant
Amphibians	Local	Quarrying and Restoration	Habitat loss/ creation/ enhancement	Negligible (beneficial)	Certain Long Term Reversible	Not significant

			Disturbance	Moderate (adverse)	Certain Temporary Reversible	Not significant
			Pollution	Negligible (adverse)	Unlikely Temporary Not Reversible	Not significant
Reptiles	Local	Quarrying and Restoration	Habitat loss/creation/enhancement	Negligible (adverse)	Certain Long Term Reversible	Not significant
			Disturbance	Negligible (adverse)	Unlikely Temporary Reversible	Not significant
			Pollution	Negligible (adverse)	Unlikely Temporary Not Reversible	Not significant
Bats	Local	Quarrying and Restoration	Habitat loss/creation/enhancement	Low (adverse)	Certain Long Term Reversible	Not significant
			Disturbance	Low (adverse)	Certain Temporary Not Reversible	Not significant
			Pollution	Negligible (adverse)	Unlikely Temporary Not Reversible	Not significant
Otter	Local	Quarrying and Restoration	Habitat loss/creation/enhancement	Negligible (adverse)	Potentially Long Term Reversible	Not significant
			Disturbance	Negligible (adverse)	Potentially Temporary Reversible	Not significant
			Pollution	Negligible (adverse)	Unlikely Temporary Not Reversible	Not significant

Badger	Local	Operational	Habitat loss/ creation/ enhancement	Negligible (adverse)	Likely Long Term Reversible	Not significant
			Disturbance	Negligible (adverse)	Likely Temporary Reversible	Not significant
			Pollution	Negligible (adverse)	Unlikely Temporary Not Reversible	Not significant

Assessment of residual effects

There are no significant residual effects anticipated as a result of the proposed quarrying and restoration works.

Summary of Avoidance, Mitigation, Compensation and Enhancement Measures

Avoidance/Mitigation

Mitigation measures are those that avoid/reduce potential impacts. For the proposed quarry, the following embedded mitigation measures are included:

- Retain and safeguard roost in existing building;
- Carry out vegetation clearance outside of bird nesting season;
- Retain and safeguard woodland corridor along the eastern boundary;
- Assess any trees within the site marked for removal for their potential to support roosting bats;
- Create mitigation ponds, improving retained and created habitat in phases in line with the restoration scheme;
- Relocate GCN (under licence) and reptiles under an agreed strategy, where individuals are being moved once only, with a secured, funded long term management strategy underpinning the EPSM licence;
- Ensure there is no habitat fragmentation by installing a continuous gap at the base of perimeter fencing. These gaps can be used by badgers and other species to maintain full access across the site;
- Safeguard animals during the operational phase by ensuring excavations are fenced/covered overnight (or an egress point such as a ramp is provided). Excavations will be inspected each morning to ensure no animals have become trapped;
- Adhere to an Environmental Management Plan (EMP) to ensure that best practice methods are adhered to in order to limit the generation of litter, dust, noise, vibration and pollution prevention. The EMP will also include details of briefings and instruction to contractors regarding the biodiversity present on the site as appropriate;

Compensation

Compensation measures are those that have been incorporated to compensate for impacts. For the proposed quarry, the following compensation measures are embedded within the scheme:

- Full restoration in phases to ensure improved habitat availability post quarrying phase;
- Post creation management of restored habitats for 10 years

- Full management and monitoring of GCN and their retained / created habitats for a minimum period of 25 years following completion of restoration works

Enhancement

Enhancement measures are those that have been incorporated into the scheme to ensure the final development delivers a net benefit for biodiversity in accordance with local and national planning policy. For the proposed site, the following enhancement measures are embedded within the scheme:

- a suite of bat and bird boxes including for owls and pied flycatchers;
- creation of GCN and reptile refugia / hibernacula;
- a Cathedine type night-roost for lesser horseshoe bats;
- two pine marten boxes;

Statement of Significance

No significant long-term effects are anticipated for designated sites, habitats or species as a result of the proposed quarry. While adverse impacts will occur during the quarrying phase, the restoration and long-term management will create low beneficial impacts beyond the medium term and leave the site in a better condition than it currently is. Where the required avoidance, mitigation, compensation and enhancement measures are fully followed, impacts will be kept to a minimum and the site will benefit from the works in the longer term. Mitigation areas will be managed for the benefit of GCN for 25 years from the creation of the mitigation areas. The proposed development includes the phased restoration of the Site, with long-term restoration and aftercare extending beyond the operational life of the quarry. Once the statutory aftercare period has concluded, the ongoing management, maintenance and restoration objectives for the Site will continue to be secured through planning conditions and associated obligations. These mechanisms will ensure the delivery and long-term stewardship of the approved restoration scheme, providing certainty that the Site will be restored and managed for the benefit of landscape and biodiversity in the long term. .