CHAPTER 9: ECOLOGY

Introduction

9.1 This chapter addresses the impacts of the proposed development on flora and fauna. A description of the baseline ecological conditions currently at the site and an explanation of their value is provided in addition to the survey and assessment methodology. It also describes the potential direct and indirect impacts of the development and the avoidance, mitigation and compensation measures proposed to address any ecological impacts.

9.2 A key element of the ecological assessment has been the consideration of the development proposals with respect to the Approved Restoration Plan which was a requirement of Condition 35 of Planning Permission SM.96/935.

9.3 Volume 3 of this Environmental Statement includes **Appendix 9.1** which provides ecological data collected from a range of ecological surveys (extended Phase 1 survey, detailed vegetation survey, water vole habitat assessment, reptile survey, breeding bird survey, otter survey, crayfish survey and bat survey). A badger survey was also undertaken the results of which are confidential therefore are not included within this document; the confidential badger survey information is provided separately to SMDC. **Appendix 9.2** provides an arboriculture survey, **Appendix 9.3** provides an Outline Construction Ecological Management Plan and **Appendix 9.4** provides an Outline Habitat Management Plan.

9.4 This chapter has been completed by Bowland Ecology Ltd.

Planning Policy Context

National Planning Policy

National Planning Policy Framework

9.5 The planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.

9.6 Paragraph 118 states that when determining planning applications local planning authorities should aim to conserve and enhance biodiversity by applying the following principles:

- Proposed development on land within or outside a Site of Special Scientific Interest likely to have an adverse effect on a Site of Special Scientific Interest (either individually or in combination with other developments) should not normally be permitted. Where an adverse effect on the site's notified special interest features is likely, an exception should only be made where the benefits of the development, clearly outweigh both the impacts that it is likely to have on the features of the site that make it of special scientific interest.
- development proposals where the primary objective is to conserve or enhance biodiversity should be permitted;
- opportunities to incorporate biodiversity in and around developments should be encouraged;

- planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland and the loss of aged or veteran trees found outside ancient woodland, unless the need for, and benefits of, the development in that location clearly outweigh the loss; and
- the following wildlife sites should be given the same protection as European sites:
  - Potential Special Protection Areas and possible Special Areas of Conservation;
  - listed or proposed Ramsar sites; and
  - sites identified, or required, as compensatory measures for adverse effects on European sites, potential Special Protection Areas, possible Special Areas of Conservation, and listed or proposed Ramsar sites.

9.7 Paragraph 121 states that planning policies and decisions should also ensure that: the site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining, pollution arising from previous uses and any proposals for mitigation including land remediation or impacts on the natural environment arising from that remediation; after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and adequate site investigation.

Local Planning Policy

Staffordshire Moorlands Core Strategy

9.8 Policy SS7 of the Core Strategy supports development where actions to protect and enhance the biodiversity of the valley, including the maintenance, buffering and connection of designated sites. The strategy requires that "Any development should be of a scale and nature and of a high standard of design which conserves and enhances the heritage, landscape and biodiversity of the area and demonstrates strong sustainable development and environmental management principles."

9.9 Policy E3 requires "All development shall be of an appropriate quality; scale and character compatible with the local area, protect the residential amenity of the area, enhance the heritage, landscape and biodiversity of the area and shall not harm interests of acknowledged importance."

9.10 Policy NE1 relates to Biodiversity and Geological Resources, of particular relevance to this application are the following:

- Conserving and enhancing any Sites of Special Scientific Interest. The Council will not permit any development proposal which would directly or indirectly (either individually or in combination with other developments) have an adverse effect on a Site of Special Scientific Interest.
- Conserving, and enhancing regional and locally designated sites. The Council will not permit any development proposal which would directly or indirectly result in significant harm to geological and biodiversity conservation interests including ancient woodland, unless it can be demonstrated that: there is no appropriate alternative site available; and all statutory and regulatory requirements relating to any such proposal have been satisfied; and appropriate conservation and mitigation measures are provided; or if it is demonstrated that this is not possible the need for, and benefit of, the development is demonstrated to clearly outweigh the need to safeguard the intrinsic nature conservation value of the site and compensatory measures are implemented.

- Supporting opportunities to improve site management and increase public access to wildlife sites including supporting the objectives of the Staffordshire County Council Rights of Way Improvement Plan.

- Staffordshire Moorlands Core Strategy – March 2014 143 Adopted Core Strategy 5. Ensuring development where appropriate produces a net gain in biodiversity, and ensuring that any unavoidable impacts are appropriately mitigated for.
- Ensuring development promotes the appropriate maintenance, enhancement, restoration and/or re-creation of biodiversity through its proposed nature, scale, location and design. The Staffordshire Moorlands Biodiversity Opportunity Map, in conjunction with the Staffordshire Biodiversity Action Plan, will be used to guide biodiversity enhancement measures to be included in development proposals as appropriate to the nature and scale of development proposed and other environmental interest, in particular supporting opportunities to increase grassland and heathland habitats including supporting targets in the UK and Staffordshire Biodiversity Action Plan.
- Protecting and enhancing habitats and species of principal importance for the conservation of biodiversity as identified in legislation, and recognising and implementing appropriate measures, including landscape-scale conservation management, to take account of the fact that the distribution of habitats and species will be affected by climate change.
- Recognising the value of the natural environment for sport and leisure activities and the need to manage such activities to ensure there is no conflict.'

Churnet Valley Masterplan SPD

9.11 Section 6 sets out the Spatial Strategy which is one of 'Balanced Development' across the whole of the area. Eight character areas are identified. Moneystone Quarry is identified as a key opportunity site within the Moneystone Character Area. Section 8.1 of the document sets out principles in relation to Natural Heritage, of relevance to this application are the following:

- Proposals and associated infrastructure measures should not be detrimental to the sensitive ecology and geology of the area.
- Opportunities should be sought to ensure the management of land for nature conservation and the enjoyment of areas of wildlife and geological interest and to create links between sites of nature conservation.
- Where appropriate, development should create a net gain in biodiversity and encourage habitat connectivity informed by a natural landscape conservation strategy. This should be informed by the Staffordshire Moorlands Biodiversity Opportunity Map and Staffordshire Biodiversity Action Plan.
- There should be recognition of the wider benefits of ecosystem services. There are links between biodiversity and heritage features such as dry stone walls and these links should be given consideration. With regard to areas under SSSI designation the landowners and planners have a legal duty to comply with a sites legal protection.

Legislative Context

9.12 Statutory wildlife sites are those which have protection in law, at international and/or national level:

- Special Protection Areas for birds (SPAs) and Wetlands of International Importance (Ramsar sites) are identified under various European Community Directives and international conventions.
- Special Areas of Conservation (SACs) are designated by the UK Government under EC Directive 92/43 on the Conservation of Natural Habitats and of Wild Fauna and Flora (the Habitats Directive).
- Sites of Special Scientific Interest (SSSI) are areas of land notified by Natural England under section 28 of the Wildlife and Countryside Act 1981 as being of special value for nature conservation.

9.13 Legally protected species are those with statutory protection according to the following legal Acts and Regulations:

- The Wildlife and Countryside Act 1981 (as amended) gives general protection measures for wildlife and special measures for species included on Schedules of the Act.
- The Countryside and Rights of Way Act (2000) amends the Wildlife and Countryside Act to also make it an offence to intentionally or recklessly damage, destroy or obstruct a place that a species, listed on schedules of the Wildlife and Countryside Act, use for shelter or protection.
- The Protection of Badgers Act (1992); and
- The European Communities Council Directive on the Conservation of Natural Habitats and Wild Fauna and Flora (implemented in the UK by the Conservation of Habitats and Species Regulations 2010).

9.14 Legal reference for Biodiversity Action Plan Species and Habitats is given under Section 41 of the Natural Environment and Rural Communities Act (2006). The Secretary of State must, as respects England, publish a list of the living organisms and types of habitat which are of principal importance for the purpose of conserving biodiversity. Further, the Secretary of State must take steps and promote the taking of steps by others, to further the conservation of the habitats and species on the list.

9.15 To focus more specifically to the application site, reference is also made to Ecosystem Action Plans (EAPs) and the Staffordshire Moorlands Biodiversity Opportunities Plan[1]. EAPs are aimed to work at a landscape level to focus conservation efforts on the areas within the county that will result in the greatest benefit for ecological networks, habitats and species:

'By integrating biodiversity objectives with other environmental, social and economic needs, the SBAP aims to provide a sustainable living and working environment that benefits both people and nature.'

'By replacing Habitat and Species Action Plans with 14 "Ecosystem Action Plans" (EAPs) and one Rivers Action Plan, the SBAP aims to prioritise conservation management at a landscape level and contribute to local, regional and national conservation targets.'

Approach

9.16 A range of studies have been undertaken to gather ecological information relating to the site. Detailed studies were carried out in 2010 and 2011. These studies included a wide range of ecological surveys of the whole land holding at that time plus a buffer area of 500 m to identify relevant ponds. Updating surveys were

[1]http://www.staffsmoorlands.gov.uk/sites/default/files/documents/pages/Biodiversity%20Opportunity%20Mapping_0.pdf

carried out in 2014 and during April and June 2016. The purpose of the updating survey was to re-check the baseline conditions previously recorded and to provide information to support the current application.

9.17 In terms of this application, studies have involved desk study, extended Phase 1 survey, detailed vegetation survey, water vole habitat assessment, crayfish survey, reptile survey, breeding bird survey, badger survey, otter survey and bat survey. Standard survey methodologies have been employed which are detailed below and the data collected from these surveys are contained in Appendix 9.1.

9.18 The following is a description of survey methods employed at the site. The final part of this section describes the ecological impact assessment methodology.

Desk Study & Consultation

9.19 The purpose of the desk study was to identify the presence of relevant statutory and non-statutory wildlife sites, protected species, BAP habitats and species and other relevant species records of note.

9.20 A detailed desk study was carried out in 2010 and 2011 and included consultation of the following resources:

- Staffordshire Moorlands District Council;
- Staffordshire County Council
- Natural England;
- Staffordshire Ecological Record (the key ecological data holder);
- Staffordshire Wildlife Trust;
- Staffordshire Badger Conservation Group;
- Staffordshire Mammal Group;
- Multi-Agency Geographic Information for the Countryside (MAGIC); and
- Nature on the Map.

9.21 Updating targeted consultation was held with Staffordshire Moorlands District Council (Arne Swithenbank) and Staffordshire County Council in April and May 2014. This consultation focused upon the scope of updating surveys which were described as follows:

- Updating Phase 1 habitat survey to map vegetation and carry out checks for mobile species such as badger and new habitats for species such as amphibians. The survey will focus upon the proposed development area plus a buffer of up to 500 m for GCN and 50 m for other protected species (e.g. badger).
- Great crested newt – two visits during the peak period to confirm that previous population assessment (medium sized population of great crested newts). This survey will concentrate on the restored lagoon in L1, lined ponds by the Sibelco lab buildings and the former settling lagoons in Q1 – these water bodies, particularly the restored lagoon and lab ponds, are the focus for the GCN population utilising habitats within the quarry and wider area. The quarry tailings lagoons were considered unsuitable for GCN and unsafe to survey. They may provide suitable habitat in the future.
- Updating breeding bird survey – 2 visits during the peak period between May-June. The survey will concentrate upon the proposed development areas in Q1 and Q2.
- Bat surveys – general activity survey within the quarry. The majority of buildings have now been removed and the current proposals will have a limited effect upon potential roosting habitat (mainly mature trees in the woodland activity area in the south of Quarry 1).

9.22 The response to that consultation was as follows:

- *Following our phone discussion I am happy with these proposals. Just a note: should Phase 1 survey identify any new water bodies – ponds or ditches that may have been colonised by great crested newt survey should include these. Staffordshire County Council 13th May 2014.*

- *In terms of consultation, SCC remains a key consultee - doubly so given their role in ensuring satisfactory re-instatement following the cessation of quarrying. We have received some interim comments from Ali Glaisher (SCC Ecologist) which will be forwarded to the applicants - she does underline the need for up-dates to surveys - broadly as you have indicated I think. Staffordshire Moorlands District Council 13th May 2014*

9.23 Further comments were received from SCC (12th of August 2014) regarding Draft proposals for the site:

- *The reduced scale of the proposal means that impacts are less significant. SCC position remains the same, however, – that any proposals should be assessed in the light of the approved restoration plan as the baseline, taking into account legal and policy issues relating to the current site status. Therefore compensation will be required for restoration plan habitats which are not maintained/delivered. This would indicate that the footprint of the scheme needs to be wider to include compensation habitats. Previously the Crowtree/Car Wood Crowtree Fields grassland areas were discussed as potential areas for grassland compensation. It is not clear what the red line on the Masterplan refers to as one section of Quarry 2 including a solar farm area is outside the red line. I have had some difficulty assessing the Masterplan and quarry plans due to the several very similar greens and differences between Key and map colours.*
- *In terms of habitat loss and compensation it should be considered that lodge areas will not support natural habitat. Even if areas around lodges were subject to habitat creation the fragmented nature of these areas and the intensive recreational and access use likely means that they cannot be considered of any significant value. Similarly the nature and operation of the solar farm will mean that it is unlikely that habitat of value will be maintained in these areas. Therefore calculation of compensation habitats needs to include the solar farm areas, the areas containing lodges and access roads/tracks in quarries 1 & 2 and the hub facilities. That said, small scale embankment habitat areas around lodges and inclusion of rocky outcrop features are welcomed as these are likely to be of value for invertebrates. These can be seen as biodiversity enhancements but will only marginally compensate for restoration habitat loss. Discussions on habitat compensation measures would be welcomed.*
- *The reduction of impact on the Little Eaves Farm Site of Biological Importance is welcomed though this site is missed off the Masterplan. Small areas of ancient woodland appear to be within the Masterplan area; measure here would need to be commensurate with preservation of ancient woodland ecology; there may be potential for delivery of enhanced woodland quality through management.*

9.24 Comments were received form Staffordshire County Council on the 3rd of October 2014 in response to the scoping report for the development. In terms of the ecological assessment the key issues raised were: 1. in relation to assessing the approved restoration plan as part of the baseline conditions for the site; and 2. In relation to the scope of ecological survey. The first point is addressed within the baseline and impact assessment sections of this chapter. Largely the points relating

to ecological surveys are dealt within in the methodology and baseline conditions sections of this chapter. Two points regarding consultation and great crested newt surveys are addressed here with responses:

- *SCC has discussed surveys with Bowland Ecology but only in the context of informing the implementation of the approved restoration plan, not for EIA purposes which will require a more comprehensive approach. Therefore any agreement for surveys in that context is not relevant to this Scoping Report.*

  Response: referring to para 9.21 above consultation regarding the survey methods were specifically made in relation to development proposals (note use of bold for emphasis above at 9.21). Updating ecological surveys were not required in respect of the approved restoration proposals.

- *Great crested newts: Two visits is insufficient to allow for updated population assessment after 4 years and does not meet Natural England requirements for licensing as 2010 survey data is out of date. The District Planning Authority has a duty to establish whether a Natural England licence would be granted. Natural England guidance for great crested newt survey and population size assessment should be followed: i.e. four survey visits for water bodies where no great crested newts are recorded and six visits where the species is recorded. Different survey methods should be employed in line with Natural England guidance.*

  Response: In the context of this outline application 2 surveys visits [2014 and 2016] are considered to be sufficient. A comprehensive baseline survey was carried out in 2010-2011 the update surveys was undertaken to confirm the baseline conditions. This in line with Natural England Guidance[2] which requests a 'walkover' at least should be undertaken within 3 months prior to submission of a licence application. The survey employed was beyond this scope and was used in the Ecological Impact Assessment which supports this outline application rather than a licence application. As pointed out the key issue is ascertaining whether or not a licence could be granted in respect of development proposals – which in this case are small scale impacts (in terms of permanent habitat loss in the context of the wider landscape) due to lodge construction with no loss of breeding habitat. Further detail regarding survey methods, results, impacts and mitigation are presented within the relevant sections of this Chapter.

Phase 1 Habitat Survey

9.25 The extended Phase 1 survey followed Phase 1 habitat survey methodology (JNCC, 1993). This survey involves walking the whole site, mapping and describing different habitats (for example: woodland, grassland, scrub).

9.26 The Phase 1 survey was extended to assess faunal potential in which evidence of fauna and faunal habitat is also recorded (for example droppings, tracks or specialist habitat such as ponds for breeding amphibians). The extended Phase 1 survey is a modified approach to the Phase 1 survey which follows the approach recommended by the Guidelines for Preliminary Ecological Appraisal (CIEEM, 2012)

[2] The Guidance in question states: Newt survey data **must be sufficient to accurately reflect the status of the site at the time the licence application is submitted.** The older the survey data, the more likely it is to misrepresent status, and in general you are advised to carry out surveys as close as possible to submission. The larger the predicted impacts, the more important it is to have recent data. Particular care must be taken if there have been changes to the habitats on or adjacent to the site since the last survey. **A walk-over survey, at the least, should be undertaken within 3 months prior to submission to check for habitat changes since the survey was carried out. If circumstances have changed, then only those areas affected by the changes need to be re-surveyed.**

and the British Standard 42020:2013 Biodiversity – Code of practice for planning and development.

9.27 Phase 1 surveys have been undertaken in 2010 and 2011 and further updated in between April – July 2014 and April – June 2016, focussing upon the habitats present within and adjacent to the application boundary.

9.28 Following the extended Phase 1 survey and updating surveys, the presence of vegetation of value; and the presence of potential habitat for protected and notable species was confirmed. The following specialist surveys were therefore undertaken;

Detailed Vegetation Survey

9.29 The vegetation survey comprised an initial walkover of the development area in order to map the different vegetation types that are present. The detailed vegetation survey subsequently concentrated upon areas of neutral grassland within Q1.

9.30 The survey method followed the approach outlined in the volumes describing the National Vegetation Classification (Rodwell, J.S. 1990 et seq.) and the NVC Users Handbook (Rodwell, J.S. 2006). This involved a slow walk through each vegetation type to enable mapping of visually homogenous vegetation stands. 2 x 2 m quadrats were recorded in each stand of sampled vegetation, the number of quadrats varied depending upon the complexity of vegetation within each survey area. For each quadrat, all species including vascular plants and bryophytes present were recorded according to visual estimates of percentage cover. Additional information such as management, vegetation height and aspect were also recorded.

9.31 The survey was conducted by Jeremy James during July and September 2010. The timing of the survey was suitable for undertaking such a survey, allowing a thorough assessment of the vegetation present across the site.

9.32 Using the quadrat data, constancy tables were produced for each community type, ordering the species by decreasing frequency class. The floristic data was analysed to find the most appropriate NVC community fit using dichotomous keys, software (MAVIS - Modular Analysis of Vegetation Information System) and the surveyor's interpretation.

9.33 During 2014 and 2016 these areas were re-checked to assess the current status of these habitats.

Reptiles

9.34 The reptile surveys comprised an initial walkover of the initial land take in order to assess areas of potentially suitable habitat. In 2010 suitable reptile habitat was identified within four distinct sites within the survey area (Sites A, B, C and D) including the following:

- Site A (subdivided into Site A1 – A4) - North of Quarry 2
- Site B (subdivided into Site B1 – B4) - within Whiston Eaves
- Site C - east of Carr Wood, and
- Site D (subdivided into Site D1 – D3) - within the western and southern section of the working quarry area.

9.35 Of relevance to the application site are areas A and D, see **Figure 9.1** for locations. Once suitable habitat was identified, artificial refugia (in the form of corrugated tin,

carpet underlay and Oduline roofing material) were placed in suitable positions to provide basking habitat to aid further survey. The refugia were surveyed on seven separate occasions between September and October 2010 and April 2011. Whilst these seven dedicated survey visits were carried out in respect of reptiles, observations were made during surveys for other species to record incidental observations of reptiles across the site. T

9.36 Following the methods outlined in Gent & Gibson (2003), the refugia surveys were carried out from early morning (approximately 6 am) on mild sunny or slightly overcast days. Where possible surveys were undertaken on warm days after periods of cooler weather, which increases the likelihood that reptiles would be basking. Eight survey visits were considered to be sufficient effort to assess the use of the site by reptiles.

9.37 Habitats within the application boundary were re-assessed during 2014 and 2016 to confirm that baseline conditions for reptiles were generally similar to those recorded in 2010 and 2011. The 2016 survey involved two walkover observation surveys and searches of refugia in April and June.

Amphibians

9.38 The amphibian surveys were undertaken during April, May and June 2010. Thirteen ponds (P1 – P13) have been surveyed between 2010 – 2016 in respect of the application site. Update surveys have been undertaken in 2014 and 2016 and these involved:

- two visits - 19th May and 3rd June 2014 were undertaken of those ponds considered to be relevant to the current application site.
- two visits – 18th April and 6th June 2016 were undertaken of the previously confirmed great crested newt ponds to confirm the current status of the great crested newt population at the site.

9.39 The update survey in 2014 involved an initial daytime walkover survey to assess the condition of the previously surveyed ponds and to identify any new features requiring survey (refer to 9.24 for further clarification regarding the approach to amphibian surveys). Following the walkover survey, the update survey focused upon eight ponds: P6, P7, P8, P9, P10, P11, P12 and P13. These ponds were considered to be the key locations for assessing impacts to amphibians arising from the development proposals, and had either previously been recorded with great crested newt presence, and/or were considered to be linked to habitat potentially affected by the development proposals which would be of value for great crested newts.

9.40 The update survey in 2016 involved a daytime walkover survey to assess the condition of the previously surveyed ponds and to identify any new features requiring survey. Subsequently the survey focused upon assessing the population status of great crested newts in relation to the site and development; as a result standard survey methods were employed on a single visit in April (peak period) and early June. These two surveys concentrated on the known great crested newt ponds (P6, P9, P10 and P11).

9.41 A number of temporary ponds have formed at the site, these are either unsafe to survey as they are located within former tailings lagoons (Lagoon 4 and Lagoon 7) or were short term and temporary in nature (hence the survey concentrated on permanent water features within the areas affected by development proposals). Lagoon 4 had dried significantly by 2016 with little standing water in evidence; in

contrast the area of open water had expanded over Lagoon 7 following a winter of high rainfall.

9.42 The period of survey was within the optimum period for surveying amphibians. The surveys followed the methodology outlined in Natural England's *Great Crested Newt Mitigation Guidelines* (Natural England 2001). The survey method was adapted for each pond due to the physical characteristics of each feature. A combination of methods were employed including egg searching, night-time torch surveying, netting, refuge searching and bottle trapping as follows:

- Direct daylight observation was used at each survey visit to search for frog spawn and tadpoles, toad strings and tadpoles and newt eggs (often found within folded leaves).
- A night-search was completed at each survey visit using a high powered torch (500, 000 candlepower Clu-lite lamp). The edge of each pond was searched for approximately 15 minutes for each 50 linear metres.
- Bottle-traps were set at approximately 2m intervals around the margins of ponds which were suitable for this survey technique. The traps were set just before dusk and checked the next morning before 8am and removed. The traps were two-litre bottle-traps with green canes (tipped with fluorescent yellow tape).
- Netting was used to search for adult newts and amphibian larvae and spawn where appropriate. Fifteen minutes were allocated per 50 metres of bank edge (or part thereof) rule (NCC 1989).
- Potential refugia such as logs and stones adjacent to ponds were lifted and searched for amphibians at each survey visit.

Breeding Birds

9.43 The bird survey was carried out between 25th May 2010 and 15th March 2011 of the initial land take. Update surveys were undertaken over:

- two visits on the 30th April and 20th May 2014 concentrating on the application boundary
- two visits on the 18th of April and 7th of June 2016 concentrating on Q1, Q2 and Q3 habitats within the application site.

9.44 The methodology used was broadly in accordance with the Breeding Bird Survey (BBS) Methodology (Gilbert, Gibbons and Evans, 1998). The BBS is a transect method, which requires a minimum of three visits, the first to establish the survey transect and second and third to record species present. Due to the incongruent nature of the site the BBS methods were modified to be more akin to the Common Bird Census (CBC) method and all sightings were mapped over each visit. These maps were then compared and probable breeding territories counted to generate a minimum population estimate.

Badger

9.45 The badger surveys were carried out between December 2010 and March 2011, with further update surveys were undertaken during the Phase 1 surveys in April – July 2014, and April and June 2016. Each survey consisted of a walkover of all accessible parts of the site. On each occasion all signs of badger activity were noted, including badger setts, spoil mounds, paths, latrines, snuffle holes, badger hairs, and scratching posts.

Otter

9.46 The otter surveys were carried out in line with Natural England's advice on standard survey methods for otter surveys. The surveys were carried out by an ecologist experienced in otter survey and involved four survey visits on the 11th and 12th January 2011 and the 14th and 15th March of 2011. Further update surveys were undertaken within the proposed application site in April – July 2014, and April and June 2016. Each survey consisted of a careful examination of the banks of suitable watercourses for signs of otter activity, including footprints in mud, slides (where otters enter the water down steep banks), feeding signs (e.g. part-eaten remnants of fish, amphibians or crayfish), otter holts (well-hidden places in which otters will hide during the day), and otter spraint (droppings). Prominent tree stumps or rocks beneath bridges in particular were examined for the presence of otter spraint, as these are often favoured positions for marking their territorial boundaries.

Water Vole

9.47 A water vole habitat potential assessment was undertaken during the otter surveys in order to identify the need, or otherwise, for a full water vole survey. No potential water vole habitat was identified within the survey area; therefore no further dedicated water vole surveys were undertaken. However, regular checks of watercourses were made during ongoing surveys for other species to ensure that water voles were still absent from watercourses within the site. This assessment was again confirmed during walkover surveys in 2016.

Bats

9.47 A range of bat surveys were undertaken between 2010 and 2011 (detailed below), which were in relation to the original landholding. Further surveys were undertaken in 2014 to confirm baseline conditions for bats. Details of the surveys undertaken are described in the methodologies below. All survey results and associated plans are included within Appendix 9.1.

Surveys 2010 and 2011

9.48 The approach to the bat surveys followed *Bat Surveys - Good Practice Guidelines* (Bat Conservation Trust) and all bat work was lead by Kerry Rhodes BSc (Hons) MIEEM who is a Natural England licensed bat ecologist (license number 2009 4173). The bat survey involved: 1) building inspections, 2) tree inspections, 3) emergence and return surveys, 4) evening activity surveys and 5) the use of remote detectors (Anabat).

9.49 The daytime inspections entailed external, and where accessible, internal investigations of buildings; and external investigations of trees within the footprint of the development proposals. A high power torch (500,000 candlepower), ladders and close focus binoculars were used to aid these surveys.

9.50 The surveys were undertaken during a number of visits between July 2010 and March 2011). All buildings and structures were subject to an assessment of the potential for bat use in addition to visual investigations to search for evidence of bat use. It was only possible to get partial internal access to some buildings. This is a constraint to gathering evidence of previous bat use within buildings. However, it was considered that sufficient information for assessing bat use and potential roosting value of the site was gained from the daytime inspections and evening activity surveys.

9.51 The evening activity and emergence surveys were undertaken using Duet Frequency Division Bat Detectors which were connected to Edirol recorders. All recordings were analysed using BatSound to verify species identification.

9.52 Activity surveys were undertaken in the vicinity of all buildings which may be affected by the proposals between July and September 2010. The aim of the surveys was to assess the use of the surrounding habitat by foraging and commuting bats.

9.53 The remote recorders (Anabat) were placed in suitable habitat which had been identified during the Extended Phase 1 habitat survey. The Anabats were placed in position at least two hours before sunset and retrieved at least two hours after sunrise the following morning. All recordings were analysed using Analook sound analysis software, to identify which species of bat had been active within the recording range of the Anabats.

9.54 A survey of trees was carried out in winter 2011. The aim of this survey was to assess the potential for trees within the site to support bat roosts. A standard survey form was adapted from the Bat Conservation Trust (2007) guidelines. Features assessed included the presence of natural holes, woodpecker holes, cracks and splits in major limbs, hollows and cavities, bat/bird boxes, loose bark, dead wood, thinning in crown, damaged branch ends, dense ivy, epicormic growth and an assessment of the connecting habitats. Trees were assessed as either: being negligible, low, medium, high potential/risk for supporting a bat roost according to the features present; or a confirmed bat roost.

9.55 The timing of the tree inspection during winter was within the optimal period for the assessment of trees for potential bat usage. This period is when nursery roosts are not present, and also when the majority of foliage has died back and a better view of the tree can be gained. Staining, droppings, scratches can be found on the tree when a roost is not currently being used in the winter period, to give an indication of use by bats.

Surveys 2014

9.56 Dusk activity surveys were completed on the 2nd June 2014 and 8th July 2014, commencing at 22:35 pm and 21:30 pm respectively. Sunset was at approximately 20:45 on the 2nd June and 20:55 on 24th July 2014. The dates and timing of the surveys follow the guidance for survey standards presented in the Hundt, Bat Surveys Good Practice Guidelines 2nd Edition 2012.

9.57 The dusk activity surveys were undertaken with the aid of hand held bat detectors (Batbox Duet/Heterodyne/EM3) and Anabat Express/SM2 static bat detectors by Emma Kilduff BSc (Hons), AIEEM, Jeremy James BSc (Hons), MSc, CEnv, MCIEEM and Jack Kellett BSc (Hons). The activity survey involved walking a transect within the application boundary undertaking spot counts, where the surveyors stopped at regular intervals for a set period of time (a minimum of 3 minutes) and recorded the number, species and activity of passing bats. All bat activity, including the; time of the pass, number of bats, bat species, activity type (foraging, commuting) and the direction of flight was mapped and recorded. The survey was undertaken in optimal conditions and at the optimal time of year for such a survey.

Surveys 2016

9.58 Due to the generally low levels of bat activity recorded within the application site during previous surveys, updating information utilised the deployment of static detectors (anabat express) during April and June 2016. Static detectors were

placed to sample a range of habitats within the application site to provide an overview of the bat fauna likely to be utilising the site, primarily for foraging.

9.59 All recorded bat activity was analysed using Analook software. The survey was undertaken in optimal conditions and at the optimal time of year for such a survey.

White clawed crayfish

9.60 The survey was carried out over two visits in October 2011 by Jeremy James Licence no. 20114367 and Dr Phil Eades Licence no. 20113349.

9.61 Surveys were carried out during periods of low rainfall, resulting in low stream flow and good water clarity. The survey method followed that recommended in Peay (2003). A handheld global positioning system (GPS) was used to record sample locations, and digital photographs were taken to illustrate general habitat type. Standard habitat features were recorded, as were water temperature, pH and electrical conductivity (using a Hanna Instruments Combo meter HI 98129). Refuge searching was utilised as the survey method, which involved suitable refuges (generally rocks, but also submerged logs, vegetation, and dense clumps of fallen leaves) being gently overturned and placed to one side.

9.62 Any uncovered crayfish were caught by hand or net and placed into a holding tank for examination. A total of five reaches were sampled, and 50 refuges were searched within each survey stretch. Upstream sites were surveyed first.

9.63 Signal crayfish were observed in former settling ponds at the southern end of Quarry 1 during 2014.

Additional Faunal Assessments

9.64 Additional faunal assessments were undertaken during the course of the other surveys. This included an assessment of habitat for polecat, pine marten and dormouse.

9.65 Due to the secretive nature of both polecats and pine marten, the difficulties inherent in population surveys, the fragmented nature of their population and the distance between the site and the nearest known population of each species it was not considered necessary to undertake dedicated surveys for either species. However, the site was assessed on its ability to provide habitat for both species.

9.66 In terms of dormouse, dedicated surveys were not considered to be necessary as no information relating to their presence was received during the data search. However, nut searches were undertaken during surveys for other species within stands of old hazel coppice within woodland at Whiston Eaves. A habitat suitability assessment was also undertaken.

9.67 The updating Phase 1 survey included an assessment of baseline conditions for other fauna.

Tree Survey

9.68 An arboriculture survey was undertaken by Urban Green in August 2014, the details of which are included in Appendix 9.2.

Approved Restoration December 2013

9.69 The restoration plan for the site was approved by Staffordshire County Council in March 2014 and is dated December 2013 (provided at Figure 3.1). The restoration proposals within the application site include; mosaic of bare ground, heath and acid grassland, marginal aquatic planting, scrub/wetland, open grassland and broadleaved woodland planting. The approved restoration forms part of the baseline conditions for the site and evaluation of impacts and identifications of mitigation measures are made with reference to these proposed habitats.

Impact Assessment

9.70 The value of ecological receptors is based on the guidance given in 'Guidelines on Ecological Impact Assessment, 2nd edition' (CIEEM, 2016) and the British Standard 42020:2013 Biodiversity – Code of practice for planning and development.

9.71 Individual ecological receptors (habitats and species that could be affected by the development) were assigned levels of importance for nature conservation in one of the following categories:

- International,
- UK,
- National,
- Regional,
- County,
- Borough/District,
- Local, and,
- Within zone of influence only (which might be the project site or a larger area).

9.72 For a given receptor determination of value includes consideration of the size, conservation status and quality of the population of species or habitat.

9.73 Some sites are automatically assigned a nature conservation value through designation and the reason for designation is taken into account in the assessment. Designated sites are considered at the following levels:

- International – Special Areas of Conservation (SAC), Special Protected Areas (SPA) and RAMSAR Sites. World Heritage Sites also are considered to be of international value at the site level, but not necessarily in terms of their ecological value.
- National – Sites of Special Scientific Interest (SSSI) in England, Scotland or Wales and Areas of Special Scientific Interest (ASSI) in Northern Ireland.
- County or Borough/District – sites designated by Local Authorities or County Wildlife Trusts and others. In Staffordshire such sites are called Sites of Biological Importance (SBI).

9.74 In determining values of habitats, consideration has also been given to national and local Habitat Action Plans/NERC S41 Habitats of Principal Importance and the appropriate ancient woodland inventory in conjunction with the critical appraisal of the size, status and quality of the habitat affected. In assigning values to species, consideration is given to their population size and status on the site and within the geographic area. Certain species receive protection under various pieces of legislation and this is referenced within this chapter but is not taken into account when determining value.

9.75 The key sources of impact to the nature conservation interests of the area resulting from the development may arise as direct and indirect effects, examples of which are given below.

Direct effects:

- Habitat loss (land take), where the severity of impact is directly related to the amount of habitat lost and the conservation value of that habitat.
- Habitat fragmentation (severance of habitats and/or wildlife corridors linking them). This can lead to reduced genetic diversity and increase the likelihood of species being lost.

Indirect effects including:

- Disturbance (visual, noise or vibration),
- Dust deposition,
- Incidental vehicle trafficking, and
- Water discharge and surface runoff.

9.76 Impacts may affect habitats and species both within and outside the footprint of the development. Impacts may also be either temporary or permanent in nature. Temporary effects occur during the construction phase of development and may include impacts such as short-term increases in dust deposition resulting from construction traffic.

9.77 The magnitudes of impacts are evaluated in terms of their predicted effect on the integrity of an ecological receptor, where integrity is defined as 'the coherence of ecological structure and function that enables the feature [receptor] to be maintained in its present condition'. Consideration is given to the nature and duration of the disturbance, its reversibility, timing and frequency as well as any cumulative effects.

9.78 The assessment of potential and residual effects has used the following seven level scale of significance:

- Major Beneficial - The change is likely to restore an ecological receptor to favourable conservation status, or to create a feature of recognisable value.
- Moderate Beneficial - The change is likely to benefit the receptor in terms of its conservation status, but not so far as to achieve favourable conservation status.
- Minor Beneficial - The change is likely to benefit the receptor but not in terms of its conservation status.
- Negligible - No effect.
- Minor Adverse - The change adversely affects the valued ecological receptor, but there will probably be no permanent effect on its integrity.
- Moderate Adverse - The change adversely affects the valued ecological receptor, but there will probably be a temporary effect on its integrity.
- Major Adverse - The change is likely to cause a permanent adverse effect on the integrity of an ecological receptor.

Assumptions / Limitations

9.79 There are not considered to be any major constraints to the surveys. All were completed within the suitable survey windows for the species/groups concerned. This report serves to indicate the value of the site in nature conservation terms based upon the survey and desk study data gathered. As with any assessment of this kind, the information collected defines the habitat types and quality and is not intended to be a record of every species present.

9.80 Due to health and safety concerns areas of tailings lagoons were not walked over and therefore subject to limited survey in terms of observations from firm ground using binoculars. Due to the extensive of bare mud/quick sand around their

perimeters it was considered to be unsafe to walk over these areas. It is not considered that these restrictions affect the robustness of ecological survey and assessment with respect to the current application.

9.81 It is difficult to assign a level of significance to potential effects to a future established Approved Restoration Plan, therefore the assessment of impacts and mitigation will take account of both the current ecological interests of the site and the future Approved Restoration Plan in order to assess impact significance and subsequently identify appropriate mitigation and compensation measures.

9.82 In accordance with the CIEEM 2016 guidance, the evaluation of significant is based on the best available scientific evidence. In cases where there is reasonable doubt, where it has not been possible to robustly justify a conclusion of no significant effect, a significant effect is assumed.

Baseline Conditions

9.83 This section describes the wildlife interests of the site using information collated from desk study and field survey. Vegetation and faunal interests are described separately. Each relevant ecological receptor is evaluated and a summary evaluation table (Table 9.7) is included at the end of this section. Table 9.7 only includes reference to valued ecological receptors and also makes reference to Approved Restoration Habitats; small areas of species poor habitats (e.g. ruderals, patches of bramble scrub and hard standing areas) and/or distant designated site are not included in the assessment.

9.84 The site is located in Staffordshire between Whiston to the north-west and Oakamoor to the south east. The entire site lies within the district of Staffordshire Moorlands, in both the parish boundaries of Kingsley and Oakamoor and is centred on National Grid Reference SK 045 482.

9.85 The site is located in a predominantly rural area dominated by pastoral agriculture. The River Churnet and the eastern spur of the Churnet Valley Railway line forms the southern and western border of the site. Carr Wood forms the eastern border of the site beyond which is a steeply sloping and densely wooded valley. The northern border of the site is formed by dense coniferous woodland planted on the outermost section of the former quarry workings.

9.86 There are three statutory nature conservation designations within 2 km of the site including the following:

- Whiston Eaves SSSI is located adjacent to the site (approximately 30 m at its closest point – south eastern edge of Q3).
- Bath Pastures SSSI located approximately 1.3 km to the east of the site, due to distance from the application site it is considered that this feature will not be affected by the development proposals and is therefore not a key receptor. Excluded as a key receptor due to distance from the application site.
- Churnet Valley SSSI located approximately 1.5km to the north west of the site due to distance from the application site it is considered that this feature will not be affected by the development proposals and is therefore not a key receptor. Excluded as a key receptor due to distance from the application site.

9.87 There are 25 non - statutory Sites of Biological Importance (SBI) or Biological Alert Sites (BAS) located within 2km of the site boundary. Information on these sites is provided in Table 9.1 below.

Table 9.1: Wildlife Sites within 2km

(**bold** used to illustrate sites within close proximity to the Application site – due to their distance, all sites listed below in plain text are considered to be too distant to be vulnerable to effects from the development proposals and are therefore not considered to be key receptors)

Reference	NGR	Site Name	SBI/BAS
04/25/96	SK029456	Lockwood Pasture	SBI
04/26/65	SK026465	Whiston Bridge	SBI
04/26/70	SK027460	Kingsley Holt	SBI
04/27/71	SK027471	Froghall Bridge	SBI
04/34/29	SK032449	Gibridding Wood	SBI
04/34/55	SK035445	Hawksmoor Nature Reserve	SBI
04/35/36	SK033456	Jackson Wood	SBI
04/35/64	**SK036454**	**Little Eaves Farm**	**SBI**
04/36/03	SK030463	Tank Wood	SBI
04/36/71	**SK037461**	**Ashbourne Hey**	**SBI**
04/37/62	SK036472	Whistonbrook	SBI
04/47/11	SK041471	Whiston Hall	SBI
04/48/10	SK041480	Oldridge Farm	SBI
04/53/99	SK059439	Churnet Valley Railway	SBI
04/54/39	SK053449	Oakamoor	BAS
04/55/54	SK055454	Orchard Farm (south of)	SBI
04/56/37	SK053467	Heathy Gore (north)	SBI
04/56/54	SK055464	Heathy Gore (south)	SBI
04/57/07	SK050477	Garston Villa (west of)	BAS
04/57/15	SK051475	Upper Garston Rocks	SBI
04/57/19	SK051479	Garston House (north of)	BAS
04/57/26	SK052476	Garston Villa (east of)	SBI
04/57/45	SK054475	Upper Cotton Dell	SBI
04/57/85	SK058475	Banktop Farm (north of)	SBI
04/66/75	SK067465	Cotton College (meadows adjacent to)	SBI

9.88 There are a number of areas listed on Natural England's Ancient Woodland Inventory within 2km of the site including the following:

- Key Wood – within the south western boundary of the site extending north to Little Eaves Farm. The northern extent is listed as ancient and semi natural whilst the remainder of this woodland is listed as ancient replanted.
- Frame Wood – within the south eastern boundary of the site. A small area of this woodland is listed as ancient replanted.
- Carr Wood – adjacent to the south eastern boundary of the site. Listed as ancient replanted.
- Light Oaks Wood – to the south of railway line outside of the site boundary.

9.89 Fifteen habitats from the UK/S41 NERC Act and local BAP are present in the Staffordshire area including the following:

- lowland wood pasture and parkland
- native woodland
- wet woodland
- ancient/diverse hedgerows
- arable field margins
- lowland acid grassland
- lowland calcareous grassland
- lowland heathland
- lowland wet grassland
- unimproved neutral grassland
- inland saltmarsh

- mosses
- ponds, lakes and canals
- reedbeds
- rivers and streams

9.90 There are 28 species listed on the UK/S41 NERC Act and Local BAP that are found within the Staffordshire area. Many of these species can be protected and their populations enhanced through appropriate management of the priority habitats. Of these the following all occur at the site and within the potential zone of influence of the development proposals;

- brown hare
- noctule bat
- pipistrelle bat (including both soprano and common pipistrelle)
- otter
- water vole
- barn owl
- farmland seed eating birds
- grey partridge
- lapwing
- skylark
- snipe
- woodlark
- grass snake
- great crested newt

9.91 With regards to Staffordshire Ecosystem Action Plans (EAPs), of relevance to this application are:

- Churnet Woodlands (also coincident with Churnet Woodlands as illustrated on the Staffordshire Moorlands Biodiversity Opportunity Map);
  - Priority Habitat - Native Woodland
  - Relevant Priority Species - bats (pipistrelle, brown long-eared, noctule), common fan-foot (moth), dead-wood beetles, dormouse, lesser-spotted woodpecker, otter, barn owl, spotted flycatcher and wood warbler

- Species Rich Farmland
  - Priority Habitats - Species rich Grasslands (Lowland Meadows) and Upland & Lowland Heathland
  - Relevant Priority Species - barn owl, brown hare, bats (brown long-eared, noctule, pipistrelle), dyer's greenweed, farmland seed-eating birds, lapwing, snipe and polecat.

Approved Restoration December 2013

9.92 The restoration proposals within the application site include; mosaic of bare ground, heath and acid grassland, marginal aquatic planting, scrub/wetland, open grassland and broadleaved woodland planting. In terms of restoration habitats within the proposed application site the key features which will be affected are shown in Table 9.2 below:

Table 9.2: Summary of Approved Restoration Features within the Application Site

Habitat	Location	Significant Ecological Feature
Open Grassland	Q1, Q2	Naturally colonising grassland – not originally a key ecological feature of Sibelco approved proposals (these focused on creation of MG5 grassland within Q2). However, given low fertility substrate this habitat is likely to be of significant ecological value.

Scrub/wetland	Q1, Q2	Yes – includes the restored wetland within Q1. Limited area of proposed development over this habitat within Q2. It will be possible to retain this habitat within Q3.
Wet grassland	Q1	Lagoon 4 in Q1 is a proposed area of wetland/wet grassland. Development proposals for lodges in this area.
Broadleaved woodland	Q1	Location of broadleaved woodland likely to be altered. However, all areas provided will be accommodated within the development proposals.
Aquatic planting	Q2	Limited area of proposed development over this habitat - Q2.
Mosaic: bare ground, heath, acid grassland	Q2, Q3	Development proposals will be able to accommodate these habitats in Q2 and Q3.
Hydra seeded slopes	Q3	These areas support dense scrub – development of Q3 will impact upon these areas. However it is considered that these areas are not of significant ecological value.
Woodland planting	Q3	Area of proposed woodland in Q3 potentially affected. Development proposals will allow for further woodland planting / management.

Vegetation Description & Evaluation

9.93 Habitats recorded include: former mineral workings, standing water habitats, running water, bare ground/ephemeral habitats, neutral and acid grassland, scrub, plantation woodland, semi-natural broadleaved woodland and trees. Update surveys in 2016 confirm that habitats are largely similar to those recorded in previous years. Scrub species have become more established over former working areas, particular former tailings lagoons. Habitat management has been carried out in 2016, predominantly scrub clearance to encourage and maintain heathland and grassland habitats.

Broadleaved Woodland

9.94 The more valuable woodland within the application boundary includes Frame Wood which is present within the south-eastern boundary of the application area, a small area of which is designated as re-planted ancient woodland (representative of Churnet Woodlands Ecological Action Plan Habitats). The woodland canopy is dense in places with a steep embankment upon the eastern edge. The canopy is dominated by Scot's pine and sycamore with a dense shrub layer of holly, elder and bramble. A range of ancient woodland indicator species were noted including; wood sorrel, remote sedge, opposite leaved golden saxifrage, sanicle, bluebell and pignut. However, it should be noted that this woodland is not subject to any formal management and as a consequence the groundlayer is becoming dominated by bramble and areas of woodland groundflora are limited to scattered patches (i.e. there not possible to map as clear stands/units). A number of seepages are present within the lower slopes of the woodland, these support species such as soft rush, watercress and opposite leaved golden saxifrage. These areas of woodland and woodland ground flora are of significant value at the **Borough Level**.

9.95 A mature woodland/tree belt is present within the application area to the south of Whitson Eaves Lane. The canopy consists of a mixture of Scot's pine, horse chestnut, ash, oak and sycamore over a shrub layer of hawthorn, holly and hazel. The ground flora is generally species poor consisting of creeping soft grass, ivy and bramble. This area of woodland is considered to be representative of Churnet Woodlands Ecological Action Plan Habitat and is of significant value at the **Local Level.**

Plantation woodland

9.96 Black plantation woodland is dominated by Scot's pine with a species poor ground flora consisting mainly of needle leaf litter is present within the northern section of the application site. Broadleaf species are present around the periphery of the woodland including the following species; silver birch, elder, rowan and goat willow. Scattered patches of 'leggy' heather occur on the edges of the plantation. Himalayan balsam is also present around the edges of the woodland. Sparse stands of rhododendron are also present. The woodland is considered to be important at **Local Level**.

Scrub

9.97 Areas of dense and scattered scrub form part of the mosaic of habitats within the application boundary. The dominant species include; willow, hawthorn, silver birch, conifers and gorse.

9.98 More mature areas of scrub/secondary woodland are present within the north-eastern and northern boundaries of the site. The dominant species include; scot's pine, silver birch, sycamore and brambles. The ground layer is species poor and patchy with bare areas, however isolated patches of bluebells were noted to be present.

9.99 Areas of mature dense scrub forms part of Key Wood within the south-western boundary of the site. This scrub lies within an old cutting/depression and is dominated by willow, hawthorn, alder and bramble. The scrub habitat is considered to be important at **Local Level.**

Scattered trees

9.100 Scattered trees are present as part of the neutral grassland habitats on site. The dominant species include; willow sp, oak, ash and silver birch. There are no mature specimens within the proposed development areas. The trees are generally semi-mature/immature specimens. Scattered trees are considered to be important at **Local Level.**

Grassland

9.101 The application boundary includes a range of different grassland communities: unimproved neutral grassland, semi-improved grassland (i.e. with moderate diversity and representative of the Species Rich Farmland Ecological Action Plan) and 'secondary grassland' associated with quarrying. For the purpose of description grasslands are described according to the following broad categories: neutral grassland, acid grassland and secondary grassland.

9.102 During the detailed vegetation surveys undertaken in 2010 areas of the following neutral grassland NVC communities were identified within the application site; MG5 *Cynosurus cristatus – Centaurea nigra* grassland and MG6 *Lolium perenne – Cynosurus cristatus* grassland. The unimproved MG5 grassland is a clearance upon an embankment within Key Wood. Common knapweed, red fescue, red clover, oxeye daisy and Yorkshire fog are common components of this stand of vegetation. This vegetation is relatively diverse and also includes species such as harebell, autumn hawkbit, common spotted orchid, lesser stitchwort, selfheal, sorrel, meadow vetchling and the mosses *Calliergonella cuspidatum* and *Pseudoscelropodium purum*. This grassland is likely to become encroached with the surrounding scrub and invasive Himalayan Balsam if it is not subject to future management.

9.103 The areas of semi-improved MG6 grassland are located within the south western and eastern areas of the site. This is a relatively rich grassland type that includes woodrush, bent grasses, mouse ear hawkweed, red fescue, heather, the moss *Rhytidiadelphus squarrosus* and foliose lichens. The grassland is kept short by a large rabbit population.

9.104 The remaining areas of neutral grassland on site are considered to be 'secondary grassland' habitats associated with quarrying and areas of re-seeding/restoration. The species compositions of this grassland are moderately species rich with an abundance of common spotted orchids present throughout. The re-seeded grassland along the tops of the cliffs of Quarry 4 within the western section of the application site is generally species poor and becoming encroached with scrub species. Extensive stands of self-seeded scrub were removed from grassland to the north of the restoration lagoon in Q1 in 2016 to maintain areas of open grassland in accordance with the approved Restoration Plan.

9.105 An area of re-seeded acid grassland is present within the northern section of the site to the north-east of Lagoon 7 upon a steep spoil mound/embankment. Species diversity is low in this area with fescue being dominant.

9.106 Locations of areas of valuable grassland habitat are given in Appendix 9.1. The areas of neutral grassland and acid grassland fall within the Species Rich Farmland Ecological Action Plan with three Local BAP habitat types: Lowland Acid Grassland, Unimproved Neutral Grassland. Therefore, these habitats are considered to be of significant value at the **Borough Level.**

Running Water

9.107 The application site has one small tributary of the River Churnet, which flows from the east of the application site and through Carr Wood within the southern section of the site. Soft rush occurs intermittently within this feature, with other 'aquatic and emergent species' occurring less frequently. These other species include; fool's watercress and meadowsweet. The stream is very shallow and heavily shaded within the wooded areas. This habitat is a local BAP habitat represented under Rivers and Streams and is therefore considered to be of significant value at the **Local Level.**

Standing Water

9.108 The previously working quarry and adjacent habitats within the application boundary support a range of permanent standing water bodies including settling lagoons and ponds (locations shown on **Figure 9.1**). These water bodies vary in their nature:

- Lagoon 7 in Q2 has an area of open water towards the southern end of the lagoon and two areas of pooled water towards the north end of the lagoon. Stands of reedmace are developing around the edges of the pools in the northern part of the lagoon. It was notable that the area of standing water in this Lagoon had expanded considerably during 2016, following a winter of high rainfall.
- Q3 is currently a relatively large lake which has formed in the former quarry void. The lake is currently largely devoid of aquatic and emergent vegetation.
- A large restored pond (P6) has stands of common reed and a rocky edge with adjacent scrub and developing grassland,
- Two ponds on the western side of Q1 (P9 and P10) are artificial butyl lined ponds. Emergent vegetation has developed around the northern edge of P9,

however this ponds was extremely turbid during 2016 and appears to have deteriorated as a potential great crested newt breeding habitat.

- Five ponds are situated within the habitats in the southern section of the site (P7, P8, P11, P12 and P13).

  - On the south east side of this area are two shaded silt management ponds (P7, P8), one of which is very steep sided and both of which have dense bramble establishment bordering them. These ponds are heavily shaded with a deep leaf litter and little/ no aquatic vegetation.
  - Of the three ponds on the south west side; the most northern is relatively open but has extensive silt deposits making access to this pond hazardous (P11), the middle pond is bordered by steep sided woodland on its eastern side (P12) and dense bramble to the west, silt deposits are also extensive around this pond; and the southern pond is within heavily shaded woodland (P13).
  - Given the nature of the site areas of ephemeral standing water have and do occur in Q1 and Q2.

9.109 None of the water bodies support particularly diverse emergent or aquatic vegetation. Stands of reed are forming around P6 and a cessation in mineral operations is likely to benefit the development of aquatic vegetation at the site. Dense shading by scrub and trees is a significant constraint to a number of these features (P7, P8, P12 and P13). These open water habitats are representative of local BAP habitat represented (Ponds, Lakes and Canals) and is therefore considered to be of significant value at the **Local Level.**

Bracken and habitat mosaics

9.110 Bracken forms dense stands as part of the woodland habitats (Key Wood) within the southern and south-western sections of the application. These habitats are considered to be of **negligible value.**

9.111 A mosaic of scrub and degraded heathland is present along the northern boundary of the application site and adjacent to the tunnel entrance to Quarry 2. It is noticeable that scrub establishment has been extensive between 2010 – 2014, and as a consequence, areas of open heather are not particularly evident. Whilst stands of heather are still present, species such as birch and Scot's pine were well established in these areas in 2014. Habitat management has been carried out on the strip of habitat mosaic at the tunnel entrance of Q2 during 2016 to encourage the development of areas of heather. Habitat management involved removal of the majority of trees and shrubs to create bays of more open heathland habitat. This approach was agreed with Staffordshire County Council Ecology and Landscape Officers in 2015 and is in accordance with the Approved Restoration Plan.

9.112 These habitats have become overgrown/ encroached by dense scrub. This habitat is considered to be important at the **Local Level.**

Ephemeral vegetation

9.113 Ephemeral vegetation is present along/adjacent to the existing and former quarry tracks along with areas of bare sand/mud within Quarry 2 around the perimeter of lagoon 7. Most notable is the occurrence of species such as common cudweed, and occasional common spotted orchid and common centaury. This habitat is considered to be important at the **Local Level.**

Plant Species

9.114 Most of the plant species found at the site are common and widespread in many different habitats. A number of species are considered to be indicative of ancient woodlands (ancient woodlands are those that are considered to have been in continuous existence since at least 1600 (NCC 1986)). Such species include the bluebells, wood sorrel, remote sedge, opposite golden saxifrage, sanicle and pignut. Whilst none of the species are rare they are considered, collectively, to be indicators of potentially valuable habitat.

9.115 With respect to individual plant species, no local BAP species were recorded within the application boundary however an abundance of common spotted orchids are present throughout the neutral grassland habitats within the application site.

Faunal Description & Evaluation

Reptiles

9.116 Three species of reptile were identified across the site including grass snake, slow worm and common lizard. No adders were identified during the surveys; however, the data search provided dated records of adder from 1976. A previous assessment undertaken specifically for adder in 2008 of the working quarry site did not identify any adders. Therefore, it is likely that if adders are present, they are only present in very low numbers.

9.117 Locations of reptile survey sites are shown in Appendix 9.1. Figure 9.1 within this report shows the general locations of valuable reptile habitats which can be cross referred to the table below. Site D1 - D3 recorded the greatest number of species of reptile (3 species) and the greatest number of individuals of all species (refer to Table 9.3 below), followed by Site A1 with two species including slow worm and common lizard and Site B1 which recorded one individual grass snake.

Table 9.3 Results of Reptile Survey

Site	Reptiles Identified			
	Grass Snake	Adder	Slow Worm	Common Lizard
A1	-	-	3	3
A2	-	-	-	-
A3	-	-	-	-
A4	-	-	-	-
B1	1	-	-	-
B2	-	-	-	-
B3	-	-	-	-
B4	-	-	-	-
C	-	-	-	-
D1	-	-	7	2
D2	2 sloughed skins	-	1	-
D3	1	-	1	2

9.118 The surveys were undertaken on the 29th July, 23rd September 2010, 24th September 2010, 29th September 2010, 30th September 2010, 8th October 2010, 9th October 2010 and 20th April 2011. Surveys during 2014 recorded the presence of slow worm under refugia at the site in Q1. Surveys in 2016 recorded the presence of common lizard and slow worm under refugia along the disused railway line adjacent to Carr Wood and Key Wood, to the south of Q1.

9.119 Whilst no reptiles were recorded within the Quarry areas during 2016 it is considered that the site supports a similar assemblage to that recorded previously. Cessation of mineral production at the site has reduced disturbance thus making it more attractive to reptiles. However, ongoing scrub encroachment will ultimately reduce habitat diversity for reptiles at the site.

9.120 The data search revealed records of four species of reptile within the original land take and in the immediate surrounding area. Species include; adders, grass snake, slow worm and common lizard which is comparable to the results of the field survey.

9.121 Given the (i) nature of the habitats at the site, (ii) the results of the surveys including the presence of a BAP/S41 NERC species (grass snake) and (iii) desk study information; it has been shown that a small population of grass snake and a medium population of slow worm and common lizard occur within the areas shown on Figure 9.1. It is therefore considered that these areas of the site are of significant value for reptiles on a **Borough/District Level.**

Amphibians

Surveys 2010

9.122 Of the ten ponds surveyed in 2010 that are deemed relevant to the current application site, seven were found to support populations of amphibians. Of the seven ponds which support amphibians, three were found to support a medium sized population of great crested newts (GCN's) and smooth newts. Refer to Table 9.4 below for a summary of the results. In addition to this 6 adult GCN's were identified beneath reptile tiles placed in the vicinity of the three ponds where GCN's were identified showing that the terrestrial habitat surrounding the ponds is important outside the breeding season. Due to their proximity it is considered that great crested newts recorded within the surveys form part of a metapopulation utilising habitats in the area (max score of 66 adults from one visit).

Table 9.4 Results of Amphibian Surveys 2010

No.	Survey Number and Results					
	1	2	3	4	5	6
P1	0	Tadpoles	0	0	-	-
P2	1 SN	1 SN	2 SN Froglets	2 SN 2 adult Frogs	-	-
P3	0	0	0	0	-	-
P4	0	0	0	0	-	-
P5	1 GCN, 3 SN	0	Access denied	-	-	-
P6	11 GCN, 7 SN and 1 T	2 juv. GCN, 35 SN, 6 CF, 1 T, T & F tadpoles	31 GCN, 8 SN, 1 CF	Greater than 25 GCN, 8 SN, 1 CF, T tadpoles	25 GCN, 4 SN, 1 T	5 GCN, 7 SN.
P7	6 SN	1 SN	0	0	-	-
P8	0	0	0	0	-	-
P9	48 GCN, 50 – 100 SN/PN	1 GCN, 7 SN,	3 GCN, 18 SN,	3 GCN, 19 SN,	0	0
P10	6 GCN, 16 SN, 5 T	2 GCN, 35 SN,	11 GCN, 35 SN,	19 GCN, 7 SN	11 GCN, 25 SN	2 GCN, 20 SN, 2 T

Key: SN smooth newt, PN Palmate newt, GCN great crested newt, CF common frog, T Toad

Surveys 2014

9.123 Update surveys of a total of 8 ponds deemed suitable for survey within the application boundary were undertaken. Three small populations of GCN were found within P6, P10 and P11 forming a medium sized metapopulation (max scores of 17 adults from one visit). Refer to Table 9.5 below for a summary of the results.

9.124 The surveys confirm that a medium population of great crested newt is still present at the site. It is noticeable that this species was recorded in a settling lagoon (P 11) in the southern part of Q1. It is considered that a cessation of mineral workings has, in relation to this particular pond, increased the availability of potential great crested newt breeding habitat locally. It is however also noticeable that great crested newt counts (albeit a coarse measure of population size) are significantly lower in previously identified ponds. This could be a consequence of this species being more widely distributed throughout habitats at the site as a result of mineral extraction ceasing.

Table 9.5 Results of Amphibian Surveys 2014

Pond No.	Population Scoring	Survey Number and Results	
		1	2
Pond 1	Ponds checked in the field and appeared to be in similar condition to previous surveys. Waterfowl still present and considered to be of limited potential for great crested newt.		
Pond 2			
Pond 3			
Pond 4	Virtually no standing water present during update survey. Considered to be of limited potential for great crested newt.		
Pond 5	Daytime visit conducted – pond in similar condition to survey in 2010. Considered to support small numbers of great crested newt as part of wider medium sized metapopulation.		
Pond 6*	Small	3 GCN, 17 SN/PN	8 GCN, 38 SN/PN, T tadpoles
Pond 7	Steep sided, dense bramble – inaccessible. Considered to support a small population of smooth newts as recorded previously.		
Pond 8	-	0	1 SN
Pond 9	-	0	1 SN
Pond 10*	Small	6 GCN, 17 SN/PN	3 SN, 1 T tadpole
Pond 11*	Small	7 GCN, 36 SN/PN	9 GCN, 31 SN/PN
Pond 12	-	0	0
Pond 13	-		0. Signal crayfish present.

Key: SN smooth newt, PN Palmate newt, GCN great crested newt, CF common frog, T Toad
* Considered to be components of the same metapopulation

Surveys 2016

9.125 Walkover surveys in 2016 confirm that all 13 ponds are in similar condition to the previous survey in 2014. Update surveys of a total of 4 ponds was undertaken to assess the population status of great crested newts at the site. A medium sized population was recorded in P6 (maximum count of 14) and a small population (maximum count of 4) was recorded in P11. Great crested newts were absent from surveys of P9 and P10 and it is considered that these artificial ponds have deteriorated in value for this species. A terrestrial great crested newt (adult female) was encountered during searches of refugia along the disused railway line to the south, illustrating the wide spread of the great crested newt population at the site.

9.126 The surveys confirm that a medium population of great crested newt is still present at the site.

Table 9.5 Results of Amphibian Surveys 2016

Pond No.	Population Scoring	Survey Number and Results	
		1	2
Pond 6	Medium	14 GCN, 34 SN, T. GCN eggs confirmed	3 GCN, 1 SN, toad tadpoles
Pond 9	-	7 SN	1 SN
Pond 10*	-	2 SN	2 SN
Pond 11*	Small	4 GCN, 6 SN. GCN eggs confirmed.	5 GCN, 3 SN, 2 PN, T

Key: SN smooth newt, PN Palmate newt, GCN great crested newt, CF common frog, T Toad
* Considered to be components of the same metapopulation

9.127 The site supports 5 species of amphibian, including common toad (UK Bap/S41 species) and a medium sized population of great crested newts (UK BAP/S41 NERC and county BAP species) therefore the site is considered to be of significant value for amphibians on a **Borough/District Level**.

Breeding Birds

Surveys 2010 and 2011

9.128 The surveys in 2010 and 2011 covered the landholding at that time which was a much larger area than the current proposed application boundary. The previous surveys recorded a diverse breeding population of birds. There were several areas where there was a high concentration of breeding territories, especially on the south side of the site, near the River Churnet and in the Whiston Eaves/Rake Edge areas. Overall, 69 species of bird were recorded at the site. Of these, 62 species are thought to be either 'breeding', 'probable breeding' or 'possible breeding.

9.129 Four species of bird afforded higher protection under Schedule 1 of the Wildlife and Countryside act 1981 (as amended) where recorded within the site including goshawk, peregrine and kingfisher and a pair of little ringed plover (which were also recorded as 'probable breeding').

9.130 Eight species recorded at the site are included on the RSPB Red List of 'Birds of Conservation Concern 4' (RSPB, 2015) including lapwing (also a BAP/S41 NERC species), willow tit, starling, song thrush, spotted flycatcher, house sparrow, tree pipit and linnet. An additional 18 species which appear on the Amber list were also recorded including mallard, tufted duck, woodcock, stock dove, swift, green woodpecker, sand martin, swallow, house martin, willow warbler, whitethroat, mistle thrush, redstart, pied flycatcher, dunnock, grey wagtail, bullfinch and reed bunting.

Surveys 2014

9.131 During the targeted bird surveys of the application site at total of 38 species of bird were recorded at the site all of which were recorded to be either 'breeding', 'probable breeding' and 'possible breeding'.

9.132 A single species of bird afforded higher protection under Schedule 1 of the Wildlife and Countryside act 1981 (as amended) was recorded at the application site; little ringed plover, which was also confirmed as 'breeding'. A total of two territories were recorded at the application site over Lagoon 7 in Q2.

9.133 Five species recorded in the application site are included on the RSPB Red List of 'Birds of Conservation Concern 4' (RSPB, 2015) including lapwing, linnet, song thrush, tree pipit and wood warbler (BAP/S41 NERC species, feature of the Churnet Woodlands Ecological Action Plan and the Species Rich Farmland Ecological Action Plan). An additional 9 species which appear on the Amber list, two of which are BAP species were also recorded including Dunnock (BAP/S41 NERC species), green woodpecker, little grebe, reed bunting (BAP/S41 NERC species), red start, stock dove, tufted duck, white throat and willow warbler.

Surveys 2016

9.134 During the targeted bird surveys of the application site at total of 58 species of bird were recorded at the site, of which 52 species were recorded to be either 'confirmed breeding', 'probable breeding' and 'possible breeding'.

9.135 A single species of bird afforded higher protection under Schedule 1 of the Wildlife and Countryside act 1981 (as amended) was recorded at the application site; little ringed plover, which was also confirmed as 'probable breeding'. A total of two territories were recorded at the application site on the SPV area in Q1.

9.136 Six species recorded in the application site are included on the RSPB Red List of 'Birds of Conservation Concern 4' (RSPB, 2015): grey wagtail, lapwing (BAP/S41 NERC species), linnet (BAP/S41 NERC species), mistle thrush, song thrush (BAP/S41 NERC species) and woodcock. Eight species included on the Amber list, three of which are BAP species, were also recorded: bullfinch (BAP/S41 NERC species), dunnock (BAP/S41 NERC species), kestrel, mallard, reed bunting (BAP/S41 NERC species), stock dove, tawny owl and willow warbler.

9.137 It is considered that Lagoon 7 in Q2, provides a locally valuable breeding site for lapwing. Continued scrub establishment across this former tailings lagoon will lower the value of this area for lapwing in the longer term. Little ringed plover was recorded within the SPV application area in 2016 and not within the application site. Whilst not recorded in 2016, previous surveys highlighted the presence of tree pipit utilising habitats within the northern side of Q3 in 2014 and previously within scrubby habitats on the north western side of Q2 in 2010. It is likely that this species will use habitats within and adjacent to the application site. Due to the presence of significant species of birds including Schedule 1, red and amber list and BAP species, the site is considered to be of significant value for breeding birds at the **Borough/District Level.**

Badger

9.138 [**Badger information removed – confidential**].

Otter

9.139 Otter activity was identified along the River Churnet and along small, unnamed watercourses within woodland Whiston Eaves. Signs identified include tracks and spraint. The results of the surveys echo the information received during the data search which provided records of otter on the River Churnet near Oakamoor between 1990 and 2009.

9.140 It is likely that the River Churnet is a linear habitat between the catchments of the River Dove to the west and the River Trent to the east. It is not possible to estimate population numbers from a survey from otter signs alone, therefore it is only possible to state that otters are present.

9.141 The use of the unnamed watercourses within the woodland at Whiston Eaves is likely to be occasional investigation of various tributaries off a main territory (the River Churnet) for food sources and resting places. It is considered unlikely that the watercourses and immediate surrounding habitat within the Whiston Eaves woodland would provide sufficient food sources beyond the occasional frog or toad, being too shallow to support a significant biomass of fish.

9.142 It is considered, however, that the Whiston Eaves woodland would provide suitable resting habitat in the form of holts as it is undisturbed, not prone to flooding due to its varied terrain and close to suitable food sources along the River Churnet. No potential holt sites were identified within the woodland, however, accurate identification of otter holts remote from the water's edge is difficult as otter holts generally have no features to distinguish them from the resting sites of other mammals.

9.143 Although otter signs have been identified along the River Churnet and potential holt habitat is available within woodland immediately adjacent to the site, the often linear nature of an otters territory, their use of a number of different resting sites and the availability of a large amount of suitable habitat within the Churnet Valley leads to the value of the site for otter being considered to be significant at a **Local Level**.

Water Vole

9.144 The habitat potential assessment carried out at the same time as the otter surveys identified that no waterbodies provide suitable habitat for water vole within the study area or within the immediate vicinity. All watercourses were either too steep sided with rocky banks (such as within the Whiston Eaves woodland) or too deep and fast flowing with unsuitable bank habitat such as along the River Churnet. In addition to this, no signs of water vole including burrows, feeding remains, grazed lawns or droppings were identified during the otter survey. Although the habitat assessments were undertaken outside the active water vole season, it is still possible to identify potential water vole burrows and make an informed judgement as to the potential presence/absence of water vole.

9.145 The assessment carried out for the previous EIA in 2006 did not identify the presence of water vole.

9.146 Due to the lack of suitable habitat and the lack of signs of water vole it is considered that no further surveys are required. The value of the site for water vole is therefore considered to be **negligible**.

Bats

Surveys 2010

9.147 Surveys conducted in 2010 and 2011 covered a much larger area than the current application site. Information from the previous surveys is provided to describe the site at the time and the bat fauna recorded in the wider area. The data search revealed records of five species of bat including Pipistrelle sp., common pipistrelle, brown long eared, Daubentons and Whiskered/Brandts within a 2km radius of the site. All records, apart from two, are for bats in flight in the vicinity of Oakamoor and along the River Churnet. Significant records of bat roosts include one record of a nursery colony of brown long eared bats at Fairfield, Stoneydale which is approximately 1km south east of the southern extent of the site. The second record is for a significant summer and hibernation roost of natterers, Daubentons and

brown long eared within the disused railway tunnel which is situated approximately 300m south east of the southern extent of the land intake.

9.148 A previous EIA for quarry extension submitted in 2006 identified the presence of a small brown long eared bat roost in Whiston Barn. Ten individuals were identified roosting in the loft area. It was considered that the roost is present in the summer (although not a maternity roost) and autumn months. A small roost of unidentified bats was also noted within the loft of Littleheath House Farm during this round of assessments.

9.149 The habitat assessment, activity surveys and remote detector surveys identified that the site provides valuable foraging and commuting habitat for a number of species of bat including common and soprano pipistrelle, brown long eared, noctule, natterers and Daubentons bat. Commuting and foraging habitat is provided via the extensive network of hedgerows, stone walls, woodland, single mature trees, watercourses, ponds and standing water within the quarry and surrounding land intake.

9.150 The site lies within a heavily wooded valley which is characterised by various belts of semi natural and plantation woodland. The site itself has a high proportion of tree cover with trees present within woodland blocks of broadleaf semi natural woodland and coniferous plantation. The Oakamoor – Whiston road which dissects the centre of the site is bordered by mature broadleaf trees and coniferous plantation which also surrounds the northern section of the site. A large number of single stands of mature broadleaf trees also exist within hedgerows and pastoral fields, predominantly in the western and southern areas of the land intake.

9.151 Fifty nine trees were considered to offer high to moderate potential to provide bat roosting habitat in the wider land holding surveyed in 2010 and 2011. Of these, seven potential bat roost trees (listed in Table 9.6) occur within or close to the current application boundary. No confirmed tree roosts were identified during the assessment. However, tree roosting bats tend to be transient in their roosting habits. Therefore, it is likely that a number of the trees identified are used intermittently by individuals or small numbers of bats.

Table 9.6 Bat Tree Roost Potential Assessment

Tree	Species	Features	Facing Direction	Height above ground	Potential
T1	Oak	Rot holes in dead limbs and dense ivy	360	4m	High
T2	Dead pollarded stump	Rot holes and flaking bark	360	4m	Medium
T3	Dead sycamore	Rot holes, woodpecker holes and peeling bark	360	2m – 10m	High
T4	Sycamore	Split	N	1-1.5m	Medium
T5	Ash	Rotten branches and woodpecker holes	360	4m	High
T6	Oak	Rot holes, woodpecker holes and peeling bark	360	3m – 6m	High
T7	Ash	Split limbs	S, W	5m	High

9.152 Bat roosts were identified within two properties on the site including Heath House Farm and Rake Edge Barn. The bat roost at Heath House Farm supports a small

population of less than ten individuals of brown long eared and common pipistrelle bats within the main farm house and various farm buildings. Roost sites are located beneath lead flashing at the bottom of the farmhouse chimney and within mortar cracks in Barn 1 and Barn 2.

9.153 Rake Edge Barn also supports a roost of a small population of less than 10 individuals of common and soprano pipistrelles and brown long eared bats. Roost sites are located beneath roof and ridge tiles and in mortar gaps.

9.154 The habitat assessment of the buildings undertaken in 2011 within the quarry site concluded that they may provide suitable roosting opportunities for bats. No bats were seen to emerge from any of the buildings, therefore no further survey and/or mitigation was recommended. These buildings have now been demolished.

Surveys 2014

9.155 The activity surveys undertaken within the application site confirmed the use of the site as valuable foraging/ commuting habitat. A total of five species of bat; common pipistrelle, soprano pipistrelle, noctule, Daubenton's and brown long-eared were recorded to be utilising the site.

9.156 Pipistrelle bats were recorded regularly during surveys, particularly along Eaves Lane where mature trees provide an important foraging, commuting and roosting resource.

9.157 Notcule bats were recorded regularly during site surveys and it was noticeable, from static deployment, that this species was recorded travelling from north of Q2 after dusk, presumably to forage around woodland and habitats associated with the Churnet Valley, before returning to the north of Q2 before dawn.

9.158 The extensive open water habitat of Q3 was found to support regular foraging by Daubenton's bats and it is considered that this feature provides an important resource for this species.

9.159 Brown long eared bat is known to roost in buildings adjacent to the application site (e.g. Crow Trees farm, a single bat confirmed roosting in a barn at this site). This species will forage and commute along woodland along Eaves Lane and within the Churnet Valley.

Surveys 2016

9.160 The surveys undertaken within the application site confirmed the continued use of the site as valuable foraging/ commuting habitat. A total of three+ species of bat; common pipistrelle, soprano pipistrelle and myotis species – likely to include both Daubenton's and brown long-eared.

Survey 18-04-16

Site	Location	common pipistrelle	soprano pipistrelle	myotis
A1	Lagoon in Q3	7		3
A2	dead tree T3, Q3	26	1	4
A3	Pond 6, Q1	24		5
A4	Pond 9, Q1	354		44
A5	Pond 11, Q1	224		4
A6	Lagoon 7, Q2	failed		

Survey 7-6-16

Site	Location	common pipistrelle	soprano pipistrelle	myotis	noctule
A1	Pond 11, Q1	27		42	8
A2	Lagoon in Q3	23		7	17
A3	East of pond 6, Q1	13			17
A4	Lagoon 7, Q2	94	1	53	111
A5	Q2	failed			

9.161 The surveys in 2016 demonstrate that all three former quarry working areas support a range of foraging bat species. The highest levels of bat activity were generally recorded around P9 and P11 during April; these areas are close to woodland as well as grassland and aquatic habitats, the levels of activity reflecting the diversity of habitat (and hence insect prey) in these locations. Low levels of activity were recorded at the waters' edge in Q3 in April, increasing a little by the June 2016 survey. The June 2016 survey recorded a wider range of species but with a lower number of passes. It is notable that noctule foraging becomes significant in June suggesting that Q2 has become of greater value as a foraging resource for this species.

9.162 The mosaic of habitats within the application boundary including; woodland, dense scrub, grassland and open water habitats provides an abundance of invertebrate prey for a range bat species. The site is considered to be of significant value for bats at the **Local Level** due to the availability of a range of foraging and commuting habitat and the presence of a relatively diverse bat fauna (Daubentons, brown long eared bat, pipistrelle species and noctule).

Additional Faunal Assessments

9.163 Additional faunal assessments were undertaken during the course of the above surveys. This included an assessment of habitat for polecat, pine marten and dormouse.

Polecat

9.164 The data search revealed a record for one adult polecat identified in 2004 within a 1km grid square which is located approximately 300m to the south east of the southernmost extent of the site. The record was provided by the Staffordshire Mammal Group therefore confidence in the reliability of this record is high. It is considered that polecat is present in numbers greater than records of their presence would suggest, particularly in rural areas where road kill, and therefore the availability of specimens for verification, would be less than in urban areas. No further evidence of the presence of polecat was identified during the various fauna and flora surveys which were undertaken within the site. However, the availability of the diverse habitat which polecat require, both within the site and in the immediate vicinity, in the form of scattered housing, pastoral farmland, open water, dense woodland, hedgerows and ponds means that the site could support a population of polecat should their population increase in this area. As such, the site is considered to be of value for polecat at a **Local Level**.

Pine Marten

9.165 In terms of pine marten, the Staffordshire Mammal Group provided records of a sighting of a pine marten in Consall Country Park which was followed by a spate of

sightings until 2007. There have been no further sightings/ evidence of this species since 2007.

9.166 No evidence of the presence of this species was identified during surveys for other faunal species as outlined above. In terms of the suitability of the habitat, the dense coniferous woodland at the southern extent of the site in addition to the coniferous belt of woodland surrounding the lagoon at the northern extent of the site may provide limited habitat.

9.167 The extent and immaturity of this woodland may be the main limiting factor in its potential to provide suitable habitat as each pine marten require at least 86 – 166ha of coniferous woodland to form a territory. In the wider area, there appear to be scattered belts of large coniferous plantation which, if suitable corridors exist to link them, may provide a suitably large area of habitat. Therefore, considering the lack of evidence relating to the presence of this species and the availability of suitable habitat in the wider area surrounding the site it is considered that the site is of **negligible** value for this species.

Dormouse

9.168 In terms of dormouse, no records were received for this species either within the site or within a 2km radius of the site. The Staffordshire Mammal Group has supplied information relating to a nestbox survey within a number of woodlands within the Churnet Valley which has been ongoing for five years. No evidence of dormouse has been identified during this time.

9.169 No species specific survey was undertaken for this species during this assessment. However, nut searches were undertaken of old hazel coppice within woodland at Whiston Eaves but no evidence of dormouse was identified. It is considered that the site offers limited potential habitat within the various deciduous and coniferous woodland and dense, species rich hedgerows which form many of the field boundaries within the site. Due to the lack of evidence relating to the presence of dormouse and the availability of suitable habitat in the wider area it is considered that the site is of negligible value for this species.

9.170 Dormice have traditionally been linked to hazel coppice and semi-natural ancient woodland. They are also known to live in hazel rich hedgerows, scrub and other habitats. Research by Eden (2009) describes the dormouse as an opportunistic omnivore (exploiting a wide range of habitats and food sources).

9.171 The majority of habitat within the application site is of relatively recent occurrence and as such it is considered to be suboptimal for dormouse. However, it is considered possible that this species is present within the Churnet Valley and may at some point utilise habitats within the application site. Given the availability of abundant suitable habitat in the wider area and the relatively recent origin of habitats within the site, it is considered that the site is of **negligible** value for this species

Overview of evaluation of valued ecological receptors

9.172 Table 9.7 provides a summary evaluation of the key ecological receptors which are vulnerable to impacts from the proposed application. Following the evaluation, the impact assessment will assess receptor in terms of the types, magnitude and significance of impact which will inform mitigation and enhancement measures.

Table 9.7: Summary Evaluation of Key Ecological Receptors

Receptor	Quality	Status	Approved Restoration Feature	Location	Value
Whiston Eaves SSSI	Unfavourable Recovering/Declining	Site of Special Scientific Interest (SSSI), Churnet Woodlands Ecological Action Plan	N/A	30 m from Q3	National
Ashbourne Hey SBI	Variable condition throughout with some units of low quality semi improved grassland included within the designation.	Site of Biological Importance (SBI), Churnet Woodlands and Species Rich Farmland Ecological Action Plans	N/A	Immediately south and to the east of Q3	Borough
Little Eaves Farm SBI	Variable condition throughout with some units of low quality semi improved grassland included within the designation - in relation to the application site the most notable example of this is the field unit adjacent to the southern edge of Q3 (illustrated on Figure 9.2).	Site of Biological Importance (SBI), Churnet Woodlands and Species Rich Farmland Ecological Action Plans	N/A	Immediately south and to the east of Q3	Borough
Frame Wood	Small area of ancient re-planted woodland. Ancient woodland indicator species present (Inc. bluebell). Dense bramble ground layer.	UK and Local BAP Habitat, Churnet Woodlands Ecological Action Plan	N/A	Q1	Borough
Key Wood	Small area of ancient woodland with the large majority being re-planted Ancient woodland. Establishment of Turkey oak.	UK and Local BAP Habitat, Churnet Woodlands Ecological Action Plan	N/A	Adjacent to west side of Q1	Borough
Carr Wood	Small area of ancient woodland with the large majority being re-planted Ancient woodland. Dense bramble ground layer.	UK and Local BAP Habitat, Churnet Woodlands Ecological Action Plan	N/A	East side of Q1	Borough

Receptor	Quality	Status	Approved Restoration Feature	Location	Value
Broadleaved Woodland	Remainder of Frame Wood Ancient woodland indicator species present (Inc. Bluebell) present. Lack of management, dense bramble and invasive/none native species present Woodland bordering Eaves Lane – mature trees with species poor ground flora.	Local BAP Habitat, Churnet Woodlands Ecological Action Plan	N/A	Q1 and Eaves Lane	Local
Black Plantation	Dominated by Scot's pine with species poor ground flora.	N/A	N/A	Q2	Local
Scrub	Some dense areas of scrub/secondary woodland.	N/A	Hydra seeded slopes, mosaic of bare ground, heath & acid grassland	Throughout	Local
Scattered trees	Semi-mature/immature species.	N/A	N/A	Q1, Q2, Q3	Local
Neutral grassland	Moderately diverse MG5/ MG6 grassland. Impacted by encroachment of scrub and Himalayan balsam.	National and Local BAP Habitat, Species Rich Farmland Ecological Action Plan	Outside of Approved Restoration Areas.	Q1, Q2	Borough
Secondary grassland	Moderately species diverse grassland with an abundance of common spotted orchids.	UK and Local BAP Habitat	Open grassland, broadleaved planting	Q1, Q2	Borough
Habitat Mosaic (Heathland)	Areas of heathland which are becoming degraded by encroaching scrub.	Species Rich Farmland Ecological Action Plans	Hydra seeded slopes, mosaic of bare ground, heath & acid grassland	Q2	Local
Ephemeral	Diverse assemblage of species along existing tracks/disturbed ground (Inc. common cudweed, bladder campion, orchids).	N/A	Open grassland, broadleaved woodland planting	Q1, Q2, Q3	Local
Running Water	Heavily shaded in wooded areas and heavily poached in open grassland habitats.	Local BAP Habitat.	N/A	East side of Q1	Local
Standing Water	Woodland ponds – heavily shaded with deep leaf litter Open lagoons – heavily silted and/or surrounded by scrub.	Local BAP Habitat.	Water body, marginal aquatic planting	Q1, Q2, Q3	Local
Reptiles	Three species of reptile identified. Valuable habitat within the site.	UK BAP Priority Species, Local BAP. Churnet Woodlands and Farmland Ecological Action Plan (grass snake).	-	Q1, Q2	Borough/ District

Receptor	Quality	Status	Approved Restoration Feature	Location	Value
Amphibians	GCN have been recorded as present within five ponds, medium sized metapopulation, potential longer term deterioration of breeding habitat due to scrub encroachment/shading. Breeding habitat in wider area in poor condition due to desiccation, succession and/or the presence of water fowl.	UK BAP Priority Species, Local BAP, European protected species. Species Rich Farmland Ecological Action Plan (Toad).	-	Q1 – potential to utilise habitats within Q2 and Q3	Borough/ District
Birds	Range of woodland, wildfowl and wader species.	Six red list, eight amber list, one Schedule 1. Five UK BAP species. Churnet Woodlands and Species Rich Farmland Ecological Action Plans	-	Q1, Q2, Q3	Borough/ District
Otter	Shallow poached tributary to River Churnet within Frame Wood unlikely to be used by otter. Possible commuting route.	UK BAP Priority Species, local BAP, European protected species, Churnet Woodlands Ecological Action Plan.	-	East side of Q1	Local
Bats	Good roosting, foraging and commuting habitat. High level of connectivity between different habitats	UK BAP Priority Species, Local BAP Species, European Protected Species. Churnet Woodlands and Species Rich Farmland Ecological Action Plans.	-	Q1, Q2, Q3	Local

Potential Impacts

9.173 The project is an outline planning application, with all matters reserved except means of access, for holiday Lodges, associated access, landscaping, footpaths, Multi Activity Hub Area, footpaths, cycleways, bridleways and outdoor activities.

9.174 The development will be integrated into the landscape with habitat creation forming an important element of the scheme.

9.175 The new areas of development will have an associated road, access and parking infrastructure as well as drainage provision. Areas of new landscaping will include increased public access.

9.176 **Figure 9.2** provides an indicative overview of the key impacts on the valued ecological receptors at the site.

9.177 There are elements of the Approved Restoration Scheme that will remain largely unaltered by the development proposals (see **Figure 9.2**). This is most notable on the edges of Q2. However, the development proposals significantly undermine the overall ecological function of the Approved Restoration Proposals. This will occur because of the localised loss of habitat to lodges, hub, car parking, hard standings and also, more significantly due to disturbance that will arise as a consequence of the operation of the site. It is difficult to assign a level of significance to potential effects to a future established Approved Restoration Plan, therefore the assessment of impacts and mitigation will take account of both the current ecological interests of the site and the future Approved Restoration Plan in order to assess impact significance and subsequently identify appropriate mitigation and compensation measures.

Construction

9.178 The activities likely to cause impacts include;

- Site clearance including demolition and earthworks.
- Development of road infrastructure.
- Construction activities.
- Disturbance to habitats and species resulting from vehicle and plant movements during construction.
- Disturbance to habitats and species associated with operational use of the site including vehicle movements and recreational pressure.

9.179 The types of impacts resulting from such activities can include;

- Physical damage to vegetation from smothering effects of grounding of dust.
- Changes to water bodies.
- Disturbance to connecting habitat.
- Habitat loss or modification.
- Fragmentation or isolation of habitats.
- Impacts upon protected species.

9.180 The proposed application will impact upon the former quarry workings and semi-natural habitats. The potential direct and indirect impacts are varied due to the nature of the development proposals within differing locations at the site. Habitat and species interests in these areas are varied and impacts of the proposed application range from negligible to moderate adverse.

9.181 Proposed off-site highways improvements include two options for a junction improvement from the A52/Whiston Eaves Lane junction (refer to Transport

Chapter). These options are either within the existing highway or pavement and will not lead to any significant habitat loss. The impacts of off-site highways improvements are not considered further within this chapter.

Habitats

9.182 The Whiston Eaves SSSI is located adjacent to the southern edge of Q3. The proposed development falls within the SSSI impact zone[3] for this site. However, the proposed development does not fall within any of the categories identified as situations where the LPA should consult Natural England on likely risks[4] to the SSSI. Whilst leisure proposals are not included as a category within the SSSI impact zone, it is considered that there is still a potential risk to the SSSI from development and consequently further consideration is given within this impact assessment. The site is designated for its lowland neutral grassland habitats. The closest location of the SSSI designation to the development proposals is the south west corner of Q3 where drainage works may impact upon the boundary of the SSSI. In this area habitats comprise scrub, bare ground and secondary grassland along the edge of Q3. It is therefore considered that the designation features of the SSSI (neutral grassland) will be unaffected at the construction phase as direct impacts to these sensitive habitats have been avoided. Furthermore, impacts are likely to be localised and short term, and existing vegetation along the southern edge of Q3 will provide a buffer to the SSSI. It is considered that impacts from dust generation will be negligible as the SSSI is on land above Q3 and development activity within Q1 and Q2 are small scale. Refer to Chapter 14: Air Quality for detailed assessment. Therefore, the impact of the construction phase is likely to be **negligible**.

9.183 The Bath Pastures SSSI and Churnet Valley SSSI are situated approximately 1.3 km and 1.5 km from the proposed application site. The sites are designated for their lowland acid grassland and lowland woodland habitats respectively. Due to the distance of the sites from the application boundary the qualifying features of the SSSI's will be unaffected at the construction phase. Therefore, the impact of the construction phase is considered to be **negligible**.

9.184 A total of 25 Sites of Biological Importance are located within 2 km of the proposed application boundary. Due to the distance of all but two of these sites from the proposed application boundary (>600 m) no impacts upon the designating features of 23 of these sites are anticipated at the construction phase. Therefore, the impact of the construction phase is considered to be **negligible**.

9.185 The closest SBI to the development is Ashbourne Hey (Ref: 04/36/71) which is located immediately south of Q3. No direct impacts to the site are anticipated as the site is outside of the application site. Little Eaves Farm (Ref: 04/35/64) is adjacent to woodland on the western side of Q1. No direct impacts to the site are anticipated as the site is outside of the application site and further buffered from development by the presence of mature broadleaved woodland and grassland habitats within Q1. Although some temporary dust creation is anticipated as part of the construction phase this is considered to be negligible. This is due to the small scale nature of the works in comparison to the previous use of the site as active sandstone quarry involving large amounts of stone extraction and vehicle movements. The impacts of the construction phase on the designating features of these two SBI are therefore considered to be **negligible**.

[3] SSSI Impact Risk Zone – to assess planning applications for likely impacts on SSSIs/SACs/SPAs & Ramsar sites (England) www.magic.gov.uk

[4] The Impact Risk Zones (IRZs) are a GIS tool developed by Natural England to make a rapid initial assessment of the potential risks to SSSIs posed by development proposals.

9.186 One area of Ancient Woodland (Frame Wood) is present within the proposed application site. This designation is restricted to an area of re-planted ancient woodland within the central section of the woodland. Direct impacts to this woodland will occur as a result of the provision of shared pedestrian/cycle routes which will be approximately 1.8–3.5 m in width. This woodland is not subject to any management and as a consequence has a dense ground layer dominated by bramble. The main impacts during construction will be potential impacts upon the root systems of trees, removal of trees/saplings for access and impacts to the sensitive ground flora. Due to the significant value of this habitat, these impacts are considered to have a **moderate adverse impact**.

9.187 Two further areas of Ancient and Ancient replanted woodland are present within Key Wood situated 55 m to the west of the application boundary. Further to this Carr Wood, an area of re-planted ancient woodland is situated adjacent to the south east of the application boundary in Q1 at the closest point. No direct impacts are anticipated at the construction phase as they occur outside of the application boundary. The impact of the construction phase on the designating features is therefore considered to be **negligible**.

9.188 The remaining areas of Frame Wood situated within the application site are present as semi-natural broadleaved woodland. Direct impacts to these areas of woodland may occur at the construction phase due to the construction of woodland activity features and a network of pedestrian/cycle routes (1.8 – 3.5 m wide) through this woodland. The main impacts during construction of paths/cycle routes would be upon the root systems of trees, removal of trees, shrubs and saplings and impacts to groundflora species. Although these sections of woodland are not designated as ancient woodland the ancient woodland indicator species are present within this section of woodland which will be impacted. Therefore due to the significant value of this habitat, these impacts are considered to have a **moderate adverse impact.**

9.189 The remaining areas of Key Wood occur as semi-natural woodland. No direct impacts to these areas of woodland will occur at the construction phase as these habitats have been avoided. The impact of the construction phase on the designating features is therefore considered to be **negligible**.

9.190 A stand of conifer woodland (Black Plantation) located to the north of, and above, Quarry 2 will not be affected by the proposals. This is a feature of low ecological value and the potential for impacts are considered to be negligible.

9.191 The construction of lodges, vehicular access roads and car parking will lead to the loss of areas of scrub habitat at the construction phase. The mature areas of scrub/secondary plantation occur upon the periphery of the northern boundary of the site will be avoided. The areas to be impacted have occurred during a period of succession whilst the quarry has remained inactive. Therefore the loss of this habitat will be a permanent **minor adverse impact.**

9.192 A number of, largely self-seeded, scattered trees will require removal in order to facilitate the construction of lodges, car parking and an activity area at the construction phase. All of the trees to be impacted are semi-mature/immature in nature and no mature trees will be impacted. Therefore the loss of this habitat is considered to be a permanent **minor adverse impact.**

9.193 Small areas of MG6 *Lolium perenne – Cynosurus cristatus* grassland will be impacted at the construction phase by the implementation of an activity area, adventure play area and climbing activity within the south western section of the site. A network of footpaths will also be constructed within a grazed area of MG6

grassland within the south-eastern section of the site to the east of Frame wood. To minimise the ecological/habitat impacts the majority of the pathways will employ permeable surfacing such as bound gravel and compacted stone to allow for natural drainage. The loss of this habitat is considered to be a permanent **minor adverse impact.**

9.194 Secondary neutral and acidic grassland habitats associated with the quarry workings will be directly impacted by the construction of lodges, vehicular access, parking and buildings. These grassland habitats are considered to be diverse in nature and support a large number of orchids. The nature of development will ensure that areas of this habitat and associated species are retained within the application site. The loss of this habitat is considered to be a permanent **minor adverse impact.**

9.195 Areas of heathland are present along the northern periphery of the application site and adjacent to the access to Quarry 2. These areas have become degraded due to succession of scrub vegetation in recent years. The extensive area of this habitat upon the northern boundary will not be impacted at the construction phase due to the intention to retain this habitat as heathland and wood/scrub. However the small area of heathland adjacent to the entrance to Quarry 2 may be impacted as a result of the construction of a main vehicular access road (approximately 5.5 m road, 2 m footpath). However, this habitat occurs on rocky outcrops above the former quarry haul road and may be avoided. The potential loss of this habitat is considered to be a permanent **minor adverse impact.**

9.196 Species diverse ephemeral vegetation has colonised the areas of bare ground associated with the previous quarry workings. This habitat will be directly impacted by the construction of access roads, parking, lodges and buildings. The nature of the development will ensure that areas of this habitat type can be retained within the application site. The loss of this habitat is considered to be a permanent **minor adverse impact.**

9.197 A small tributary to the River Churnet flows along the south-eastern boundary of the application site. The watercourse is not considered to be directly impacted at the construction phase as works within close proximity have been avoided. However indirect impacts such as silt/pollution run-off into the water course are considered possible. The effects of this can include smothering of in-stream sediments and potentially toxic effects. Smothering of sediments (e.g. siltation) can temporarily lead to habitat loss for aquatic invertebrates (a food source for fish) and can cause harm to fish (e.g. gill abrasion) which in turn can affect those species which prey on fish such as otters. Runoff of polluting materials can lead to rapid de-oxygenation of the watercourse in addition to potential toxic effects upon aquatic invertebrates and fish. The potential indirect impacts are considered to be temporary **minor adverse.** However, they are considered unlikely as standard pollution prevention methods will be a statutory requirement during construction. See Chapter 11: Ground Conditions for details of this assessment.

9.198 Impacts to existing ponds and lagoons are likely to occur to P6 during lodge construction in Q1. These effects will be limited in extent and duration and habitats will be reinstated. It is possible that construction of lodges in Q1 may also give rise to silt run off/spills into P6. These impacts are considered to be temporary **minor adverse impact.**

9.199 Areas of the invasive species Himalayan Balsam is present within Key Wood immediately adjacent to the application boundary. There is potential to cause the spread of this species at the construction phase, causing the eventual degradation

of the surrounding sensitive habitats. Without mitigation, these potential impacts are considered to be **minor adverse impacts**.

Signal crayfish are present in P13 on the southern tip of Q1. No works are proposed in this area; therefore it is considered that there is a limited risk of this species spreading as a consequence of the development.

Approved Restoration

9.200 Areas of the approved restoration scheme for the site are situated within the proposed application area (see Figure 9.2). These habitats and their location at the site are listed below:

- Open Grassland; Q1, Q2
- Scrub/wetland; Q1, Q2
- Emerging wet grassland; Q1
- Broadleaved woodland; Q1
- Marginal aquatic planting; Q2
- Mosaic of bare ground, heath and acid grassland; Q2, Q3
- Hydra seeded slopes; Q3
- Recent woodland planting; Q3

9.201 The application has the potential to impact upon elements of the proposals though the construction of lodges, access roads, parking, footpaths and buildings. Impacts will occur to open grassland within the southern section of the site, a narrow belt of broadleaved woodland proposed around Quarry 1, small areas of mosaic bare ground, heath and acid grassland located within the very northern tip of the application boundary and small areas of scrub/wetland within Quarry 1 and 2. Where impacts occur to specific habitats these are dealt with under the habitat heading headings within this section. It is difficult to quantify the extent of impacts upon the Approved Restoration[5]. However, to provide a quantitative overview the following the approach adopted assess impacts in terms of (see Figure 9.2):

- Areas of the Approved Restoration Plan which are considered to be significantly affected by the development (19.78[6] ha),
- areas with minor negative effects on the Approved Restoration Plan – these areas will provide habitat and ecological value following development (13.59ha),
- areas with negligible effects upon the Approved Restoration Plan and still providing ecological value following development (20.44 ha)
- Habitats to be created / (29.2 ha) plus 1080 m of hedgerow planting.

9.202 It is considered that the loss of habitat to lodges, car parks, associated hard standing and development are **moderate adverse impacts.**

Fauna

<u>Reptiles</u>

9.203 Potential impacts to reptiles arise during the construction phase include loss of habitat, disturbance and killing and injury. As the reptile species; common lizard, slow worm and grass snake have been identified within the neutral grassland and scrub habitat present within the southern section of the application boundary this

[5] Solar PV application includes approximately 1.18ha of the Approved Restoration area which will not be affected by development.
[6] Figure does not include 0.79 ha od Black Plantation as this is habitat that will be retained.

impact is likely to be of a greater magnitude within these areas. See **Figure 9.1** for these locations. These species will be directly impacted by the construction of a grassland activity area, adventure play area and climbing facilities. There is an abundance of suitable habitat for reptiles in the wider area; therefore it is considered that construction activities within these areas will be of a small scale impact. The potential impact upon reptiles is considered to be temporary **minor adverse.**

Amphibians

9.204 Two medium and three small populations of great crested newts have been found in ponds surveyed in 2010, 2014 and 2016. In addition, smooth newt, palmate newt, common frog and common toad have also been recorded at the site. The construction phase of the project has the potential to kill, injure and disturb amphibian populations if they are present within the proposed development areas. The highest risk of this occurring is likely to be the removal of terrestrial habitats such as scrub and potential refugia. The most significant location for where these impacts are likely to occur is during lodge and hub construction in Q1. Given the abundance of available breeding and terrestrial habitat in the surrounding area, it is considered that impacts to this species will be temporary **moderate adverse.**

Birds

9.205 The construction phase has the potential to impact upon breeding and non-breeding populations of birds. The loss of breeding bird nesting and foraging habitat will occur during the initial site clearance works. The breeding bird habitat to be lost includes woodland, scrub, grassland, areas of bare shallow substrate and disturbance to the existing silt lagoons.

9.206 Of particular note is the presence of the Schedule 1 species little ringed plover and the RSPB red listed lapwing were recorded as breeding on the southern side of Lagoon 7 within Q2. Additional RSPB Red List Species were recorded at or close to the site; grey wagtail, linnet, mistle thrush, song thrush and woodcock. RSPB Amber List Species recorded were; bullfinch, dunnock, kestrel, mallard, reed bunting, stock dove, tawny owl and willow warbler. Sufficient areas of habitats will be retained to ensure that breeding and foraging habitat for these species is sustained at the site.

9.207 The loss/disturbance of such habitat will be temporary, as breeding bird habitat will be retained and incorporated into the new development as part of the landscaping proposals. Therefore the potential impacts are likely to be temporary **minor adverse**.

Badger

9.208 [**Badger Information removed – confidential**].

Otter

9.209 No signs of otter have been found within the application boundary. A small tributary to the River Churnet is situated along the south eastern boundary of the application site. Due its small and shallow nature impacts to otter are considered to be unlikely during the construction phase. The construction within the adjacent Frame woodland will be minimal with the construction of a series of footpaths/cycle routes. This species is largely nocturnal and crepuscular and so

less affected by this phase of the development. The potential impacts upon this species are therefore likely to be **negligible.**

Bats

9.210 No potential bat roost trees will be directly impacted by the proposed development. The trees highlighted as providing high bat roost potential are shown in **Figure 9.1**. The site is considered to be valuable for foraging and commuting bats, particularly along the woodland edges, open water habitats and mosaic of habitats including grassland, scrub and open water. Key features of value include the large open water body in Q3 and the mature tree line along Eaves Lane. The water body in Q3 provides a valuable local feeding resource for Daubentons bat; it is considered that this foraging resource will not be affected during construction assuming that sufficient unlit areas are retained. The tree lines along Eaves Lane provide foraging, commuting and potential roosting habitats for brown long eared bats and pipistrelle bats, it is considered that this feature will be largely unaffected by construction. There will be no severance of linear features or links with the wider landscape will occur at the construction phase. Therefore potential impacts upon bats are considered to be **negligible.**

9.211 Indirect impacts may occur if night work is required using artificial lighting, which has the ability to intercept or disrupt foraging/commuting behaviour. There are no significant roosts within the application site however any lighting would potentially interfere with foraging; however there is an abundance of available suitable habitat in the surrounding area. The potential impacts if this occurs are considered to be temporary **minor adverse**.

Completed Development

9.212 When completed the site will contain leisure led land uses.

Habitats

9.213 No impacts on the Whiston Eaves SSSI are anticipated as a result of the completed development. No impacts as a result of increasing visitor pressure are envisaged as the network of new and/existing footpaths divert around or away from the site. Therefore impacts as a result of the completed development are considered to be **negligible.**

9.214 As a result of the completed development impacts to the Ashbourne Hey SBI are not anticipated. No impacts as a result of increasing visitor pressure are envisaged as the network of new and/existing footpaths divert around or away from the site. Habitat management will be undertaken outside of the application site within a low value area of grassland adjacent to the south side of Q3 within this designation. Therefore impacts as a result of the completed development are considered to be **minor positive.**

9.215 No impacts as a result of the completed development upon Carr Wood, Key Wood and Ashbourne Hey woodland are anticipated. Although there will be increased visitor pressure, the new footpaths divert away and/or around from the areas of woodland. Therefore impacts as a result of the completed development are considered to be **negligible.**

9.216 Impacts to Frame Wood which is designated as ancient within the central section of the woodland are envisaged upon the completion of the development due to the network of footpaths and associated increased visitor pressure. Diversion from

these footpaths is likely to impact upon the ground flora species as a result of trampling by people causing erosion desirable ancient woodland indicator species from remaining and encouraging the growth of undesirable ruderal/ scrub species. There impacts as a result of the completed development are considered to be **minor adverse.**

9.217 Significant woodland planting is included within the landscaping scheme. Whilst it will take a significant period (e.g. 10 years+) for new vegetation to mature sufficiently, it is considered that on balance there will be a **major beneficial impact** upon broadleaved woodland in the area.

9.218 Impacts upon the completion of the development upon the remaining areas of MG6 grassland are anticipated as a result of increased visitor pressure from activity areas and potential diversion from footpaths through these areas of grassland within and adjacent to the eastern side of Q1. The impacts are likely to occur from potential defecation by dogs which may alter the pH of the substrate and therefore encourage the growth of coarse grassland species decreasing overall diversity. If dog access is allowed this is considered to have a **minor adverse** impact.

9.219 The proposed use of the site will lead to increased surface water runoff and an increased requirement for waste water treatment. With regard to the latter it is assumed that waste water management will be dealt with separately and will have to meet strict regulatory requirements in terms of volume and constituents of any new or increased discharges. With regard to surface water run off there is an increased risk of fuel spills, and pollution events into the water bodies on/or adjacent to the site. The potential impacts would be **minor adverse impacts** if any spillages were to occur upon completion of the development. Refer to Chapter 12: Drainage & Flood Risk for further detail.

Approved Restoration

9.220 The key impact upon the Approved Restoration as a result of the operation of the site will be increased levels of disturbance. This is a fundamental constraint to the delivery of the principles of the Approved Restoration Proposals. Habitats will be subject to increased visitor pressure which will lead to trampling of vegetation and consequently a reduction of the floristic and faunal diversity of the Approved Restoration Plan. To offset this, a range of mitigation and compensation measures will be provided. It is considered that the development proposals will have a **moderate adverse impact** upon the Approved Restoration Proposals during operation of the site.

Reptiles

9.221 The main effect on reptiles of the completed development will be disturbance caused by the increased presence of people and dogs. However, the availability of abundant suitable habitat in the wider area and the separation of reptile habitats from the main areas of human activity ensure that this impact is likely to be limited. Also as part of the landscaping proposals for the scheme habitat creation will be undertaken in the form of heathland (Q2), wood/scrub and grassland habitats. Connectivity between habitats will be improved by the woodland planting which will allow the increased colonisation of habitats which may result in greater genetic diversity within the local reptile population. These improvements are considered to have a **minor beneficial impact** on reptile habitat within the site.

Amphibians

9.222 There are also potential impacts associated with the risks of introduction of undesirable species such as fish into the ponds on site. Fish predate upon the eggs of newts, therefore impacting upon the breeding status of a population in the long term. There are also potential impacts associated with the introduction of undesirable aquatic plant species, such as those listed on Schedule 9 of the Wildlife and Countryside Act 1981 (amended) at the site. These species colonise water bodies rapidly, prevent the growth of other species and eventually causing the de-oxygenation of a pond. As part of the landscaping proposals for the scheme habitat creation will be undertaken in the form of wood/scrub, grassland and wetland habitats. This will improve the terrestrial habitats on site along with the connectivity. Overall this is considered to have a long term **minor beneficial impact** upon the amphibian population at the site and the wider area.

Breeding Birds

9.223 The impact on the breeding bird population upon the completed development is likely to be restricted to disturbance. Areas of valuable habitat within Q2 which provide breeding habitat for little ringed plover and lapwing will remain largely undisturbed. Disturbance will occur in Q1, Q2 and Q3 due to the proximity of lodges and associated development to breeding bird habitat. This will include increased noise and the increased presence of pedestrians and dog walkers. However, it is likely that increased breeding bird habitat will be available through new woodland, scrub, wetland, heathland and grassland habitats. The improved diversity and structure of the habitats on site will benefit breeding birds. Overall it is considered that there will be a **moderate beneficial impact** to breeding birds.

Badger

9.224 [**Badger information removed – confidential**].

Bats

9.225 In terms of the effects of the completed development on bats are those associated with lighting in the vicinity of potential important commuting routes and foraging areas (Eaves Lane and Q3). Further to this it is likely that foraging habitat will be improved through the planting of woodland, hedgerows, creation of wetland/scrub vegetation and grassland habitats as part of the landscaping proposals for the site. Therefore, it is considered that in the long term, the operational phase of the development is likely to have a **moderate beneficial impact** for bats.

Otter

9.226 The potential impacts on otters upon completion of the proposed development are those associated with the increased disturbance from dog walkers on the River Churnet and unnamed watercourses within the Whiston Eaves woodland complex. However, this watercourse flows through a number of urban habitats; therefore otters using this territory have already habituated to human disturbance. Therefore the impact of the completed development upon otters is considered to be **negligible**.

Mitigation and Enhancement Measures

9.227 This section includes mitigation measures which refer to (i) practices which reduce or remove potential impacts and compensation and (ii) works which offset any

damage caused by the development. Enhancement proposals are also put forward. Figure 9.2 shows the outline indicative ecological mitigation and enhancement strategy for the site and surrounding land intake.

Construction

Habitats

9.228 An outline Construction Ecological Management Plan (CEcMP) has been designed in accordance with British Standard (BS) 42020:2013. 'Biodiversity – Code of Practice for Planning and Development' and is provided in Appendix 9.3. The CEcMP has been developed through previous consultation with Staffordshire County Council ecology officer. The CEcMP sets out a series of key elements which will be addressed prior to and during construction to avoid and minimise any potential ecological impacts. Those measures are designed in accordance with the BS.

9.229 Protective fencing will be erected for adjacent retained sensitive vegetation during the construction works including woodland, scattered trees and the MG6 neutral grassland. The fencing will ensure vehicles, machinery or materials are not stored in these areas. Further to this, measures to protect adjacent trees/woodland habitats will also be implemented in accordance with the British Standards for root protection zones (British Standard 5837: 2005 - Guide for Trees in Relation to Construction).

9.230 To reduce the potential for impacts from surface water run off and pollution events construction will require implementation of the standard pollution prevention methods by following Environment Agency Guidance (Working at Construction and Demolition Sites: PPG6). Details of this are outlined in Chapter 12: Drainage & Flood Risk.

9.231 The impacts upon Frame Wood will be mitigated by the provision of significant areas of new woodland planting within the landscape proposals for the application. Sensitive working will also be adopted where pathways are located in sensitive woodland/ planting areas. This will include 'no dig' construction methods to reduce damage to root zones, and routing of pathways to avoid high value ground flora areas.

9.232 Woodland management will also be undertaken as part of the mitigation and enhancement scheme for the site, which will improve its structural diversity and prevent the eventual degradation of this habitat. Planting of species-rich hedgerows around the field boundaries to the north-west of the application site will enhance the local ecological network thus improving habitat connectivity.

9.233 A detailed tree survey will be undertaken of the application site at the reserved matters stage. This assessment will inform the selection of the lowest quality trees within Frame Wood (Ancient Woodland) to be felled in order to facilitate the construction of pathways where removal cannot be avoided.

9.234 The permanent loss of neutral grassland habitats (open grassland according to the Approved Restoration Proposals) will be mitigated in the form of the incorporation of species rich grassland and open grassland habitats included within the landscaping proposals for the site. As part of the mitigation and enhancement proposals (see **Figure 9.2**), enhancement to significant areas of low-value grassland to the north-west of the application site will be undertaken along with the management of grassland considered to be of moderate species diversity at

present. This will also include management of a species poor unit within the Ashbourne Hey SBI designation adjacent to the southern edge of Q3. Scrub management will also prevent the eventual loss/degradation of the species rich MG5 grassland in the southern part of Q1 and allow it to establish over more significant areas.

9.235 No water bodies will be lost as a result of the proposed application; the proposed landscaping scheme for the site will seek to improve the quality of the existing water bodies on site (silt lagoons) by thinning scrub to reduce shading and planting marginal aquatic vegetation.

Invasive/non-native Species

9.236 There is potential for construction activities to cause the spread of Himalayan Balsam. Causing the spread of this species would breach legislation (Wildlife and Countryside Act, 1981 (as amended)). The Infrastructure Act 2015 also makes provision for the control of invasive non-native species. Works should therefore be undertaken in accordance with best practice which should be implemented throughout the construction phase of the development. Other non-native species present include rhododendron and Turkey oak which are present within woodlands at the site. The selective removal of these species will enhance woodland habitats.

Reptiles

9.237 During construction, it would be essential to take reasonable steps to avoid killing or injuring reptiles in accordance with the requirements of the protection afforded to them under the Wildlife and Countryside Act 1981 (as amended). Therefore targeted vegetation management and removal of suitable refugia under a method statement and supervision will be undertaken within the areas of suitable impacted habitat (Zones - See Figure 9.2). The following measures must also be adhered to;

1) works to known and potential reptile habitat will need to be carefully timed to avoid the hibernation period (March to October) and in suitable weather conditions (>9^{o}C),
2) ideally any nesting bird habitat to be impacted must be removed outside of the breeding bird season (late February until September). If this is not possible a pre-clearance bird survey will be required. No vegetation will be cleared within 5m of an identified nest until the young have fledged and are no longer returning to the nest site. Vegetation will only be cleared when the scheme ecologist has declared the nest clear of dependant young.
3) It is also recommended that no materials are stock piled within close proximity of those areas occupied by reptiles. Stock piles may attract reptiles and be used as potential refugia.

9.238 The areas of reptile habitat identified in Figure 9.2 will be largely unaffected by the proposed application. The provision of habitat creation as part of the landscaping proposals for the site in the form of open grassland, scrub/woodland, heathland and scrub/wetland habitat, is considered to improve the quality of the habitats on site as well as the overall connectivity. This allow the increased colonisation of habitats which may result in greater genetic diversity within the local reptile population. Habitat management will also be undertaken within areas of reptile habitat (Key Wood) situated immediately adjacent to the site as part of the management for the site.

Amphibians

9.228 A medium sized metapopulation of great crested newts have been found in ponds surveyed in 2010, 2014 and 2016, situated in or within 250 m of the application site. It is considered that a licence will be required from Natural England for the areas of highest impact in high value habitat, particularly where lodges and access roads are proposed in Q1. These areas will require careful mitigation measures including the following:

- Vegetation management (not licensable) in advance of construction to discourage amphibians away from construction areas (strimming of herbage, removal of scrub using brushcutters, tree removal with chainsaws – to no lower than 100 mm – no grubbing up of stumps);
- Installation of temporary exclusion fencing within lodge and hub construction areas;
- Pitfall trapping - potentially up to 60 days given the presence of a medium sized metapopulation;
- Mats/refugia to be used to clear areas where pitfall trapping is not practical due to ground conditions;
- Careful removal of refugia under the supervision of an ecologist, In areas of low impact where the works are minimal;
- Careful timing of works – installation of fencing in non refugia areas in winter to minimise the likelihood of trapping amphibians within exclusion areas (thus reducing handling and transport of amphibians), removal of amphibians (by hand, exclusion etc) during the period March to October (i.e. outside of hibernation;
- Relocation to a suitable receptor site (abundant receptor areas available around the site (e.g. woodland and scrub around P12 to the south of Q1);
- Construction of footpaths or activity areas etc which will impact upon largely low-value habitat will be mitigated under the provision of Reasonable Avoidance Measures (RAM's) and/or supervision by a suitably experienced ecologist. This is likely to require vegetation management and on site supervision;
- Provision of new artificial refugia/hibernacula; and
- Management of existing water bodies to benefit local amphibian populations.

9.229 No ponds will be lost as a result of the proposed application. The improvement works to be undertaken as part of the landscape proposals and ecological mitigation/enhancement works to the existing silt lagoons/ ponds along with planting and/or scrub management is considered to improve the quality of the habitats present on site. It is considered that with mitigation and compensation measures, there will be no negative impacts upon the Favourable Conservation Status of this species as a consequence of development of the site. The development provides the opportunity to manage aquatic habitats (by maintaining areas of open water – removing scrub) to ensure that great crested newts and other amphibians benefit as a consequence of the scheme.

Breeding Birds

9.230 The bird assemblage is considered to be of Borough/District value; the species recorded are moderately diverse and a range of woodland/scrub species and ground nesting species are represented. As far as possible, all woodland and scrub habitat will be retained, with new planting replacing any affected areas. New nest boxes will be provided within woodland habitats to provide opportunities for a range of birds including barn owl and planting will include berry bearing species (e.g. rowan, holly and hawthorn) to provide a food source for birds.

9.231 The Wildlife & Countryside Act (1981, as amended) gives general protection to all wild birds from killing, injuring or taking; destroying, damaging or taking nests in use or being built; and taking or destroying eggs. Birds listed on Schedule 1 of the Wildlife and Countryside Act (1981, as amended) are afforded additional protection by a penalty system.

9.232 It is illegal to disturb any wild bird listed on this Schedule while it is nest building, or at a nest containing eggs or young, or disturb the dependent young. As little ringed plover were previously identified to be 'confirmed breeding' on Lagoon 7 in Q2[7] it will be necessary to conduct a check of suitable habitat prior to the commencement of work if programmed to be carried out during the breeding season. If this species is confirmed to be present within any working areas during the breeding season a suitable exclusion areas will need to be established to ensure that this bird is not disturbed during the breeding season.

9.233 Other breeding bird habitat (trees and scrub), removal should preferably take place outside of the breeding bird season which runs from late February until September. Any vegetation not cleared during the bird breeding season will be subject to a pre-clearance bird survey. No vegetation will be cleared within 5m of an identified nest until the young have fledged and are no longer returning to the nest site. Vegetation will only be cleared when the scheme ecologist has declared the nest clear of dependant young.

Badger

9.234 Badger is given protection under the Badgers Act 1992 (animal welfare legislation).

9.235 [**Badger information removed – confidential**].

Bats

9.236 No potential bat roosting trees will be impacted by the proposed application. The lighting scheme design for the proposed development will need to consider impacts upon bats. The design will need to avoid direct lighting and overspill into woodland or into potential foraging habitat such as woodland, water bodies and tree lines. The most relevant aspect of the lighting scheme will be to reduce the number of lights to the minimum required for public safety, the brightness of which should be as low as is feasible. Other recommended measures are to limit the height of lighting columns, directing lights away from potential roosting/foraging/commuting features and avoiding upward light spillage, achievable by the fitting of hoods or aero screen lenses. These direct the light below the horizontal plane, preferably at an angle less than 70 degrees.

9.237 New artificial bat roost sites will be installed into selected new structures. Roosts will be appropriate to each individual structure and will include bat bricks or in built crevices/voids which are suitable for bat use. Bat friendly building design will be incorporated into new buildings – this will be targeted towards buildings with a south/south-east elevation overlooking or close to water and/or woodland habitats.

9.238 A range of bat boxes will be installed within Key Wood as part of the ecological mitigation and enhancement for the site. This will create additional roosting opportunities for a range of bat species on site.

[7] Recorded in the SPV area only during 2016.

Completed Development

9.239 To manage future mitigation and maintain wildlife interests at the site, an ecological management plan[8] (EcMP) will be prepared for the site. The plan will include management required for all retained vegetation and newly created habitats. This will be submitted to Staffordshire Moorland District Council (SMDC) for approval. An Outline Habitat Management Plan, including an integrated wildlife habitat plan, is presented at Appendix 9.4. This provides an overarching strategy for habitat management that relates to the leisure scheme and the adjacent solar scheme in combination; this approach was developed in consultation with Staffordshire County Council's ecology officer. Future EcMPs at the site should be in accordance with the principles of the Outline Habitat Management Plan.

9.240 The approach to management links to the Staffordshire Ecological Actions Plans for:

- Species Rich Farmland, specifically objectives for the restoration of lowland meadows from semi-improved grassland.
- Churnet Woodlands, specifically by restoring planted ancient woodlands, maintain existing woodland and planting new broadleaved woodland.

9.241 The EcMP plan will also include the management and monitoring arrangements for notable species at the site including breeding birds, reptiles, amphibians and bats.

9.242 Additional compensation and enhancement measures will be implemented in order to off-set impacts as a result of the proposed application. The on-going management of these elements will be incorporated into the long term management plan for the site. This will include the following;

- Planting of species rich hedgerows to the north west of the application boundary. This should include the planting of native berry species.
- Woodland management in form of coppicing and thinning of selective species inc. Turkey oak within Key Wood.
- Scrub clearance and management of species rich MG5 grassland in Q1,
- The management of moderate value/high potential grassland Q1, land to the west of the application site.
- Low value grassland to be enhanced land to the west of the application site and Ashbourne Hey SBI.
- Existing pond enhancement within Key Wood and Frame Wood in form of scrub thinning/management.
- Bat and bird box scheme within Key Wood.
- Measures to control invasive aquatic species if required to protect ponds supporting populations of great crested newts.

9.243 It is difficult to quantify the balance of mitigation given the requirement to assess existing ecological interests at the site with the objectives of the Approved Restoration Proposals and the impacts of the proposed development particularly during operation. In broad terms (see **Figure 9.2**[9]) 19.78 ha will be significantly

[8] The ecological management plan will include a consideration of future climate change and how this impacts upon habitat management. Site monitoring will assess habitat changes in response to climate change and where relevant, subject to agreement with SMDC, will use this information to identify modifications to specific management objectives/prescriptions including the timing and frequency of management activities.
[9] For contextual purposes Figure 9.2 also includes the locations of mitigation areas proposed by the adjacent Solar PV application.

affected by the development proposals; however when development is completed 63.23 ha of habitats will be brought into positive long term management for wildlife. This includes:

- 12.58 ha of woodland management (Churnet Woodlands Ecological Action Plan)
- 14.93 ha of grassland management and restoration (Species Rich Farmland Ecological Action Plan)
- 34.03 ha of habitat within the Approved Restoration Plan should largely be retained at this albeit subject to disturbance from visitors.
- Other habitats to be created, managed and enhanced include 1080 m of hedgerow plantings, 1.35 of habitat mosaic to be managed (outside of the Approved Restoration Plan Area) and pond enhancement.
- 20.57 ha of the Approved Restoration Plan, whilst significantly affected, it will be possible to retain elements of the plan and create attractive habitats for wildlife such as bare ground, low fertility grassland and retention of developing scrub and grassland habitats.

9.244 The long terms aims of the landscape proposals together with the ecological management plan (EcMP) described above is to off-set any impacts on the key receptors as a result of the proposed application. It is considered that any impacts to the Approved Restoration Plan for the site are also off-set by these proposals.

Residual Impacts

Construction

Habitats

9.245 The impacts anticipated to the remaining habitats on site are considered to be **negligible** if the proposed mitigation measures are integrated into the construction process.

9.246 The implementation of woodland management to Frame woodland along with the adjacent Key Wood is considered to offer **moderate beneficial** gains to the woodland habitats within the area. There will also be the inclusion of significant woodland/tree planting within the landscaping proposals for the site which will offer long term gains to the habitats and species on site and within the wider area.

9.247 Areas of the MG6 grassland will be retained following construction and mitigation. The management of scrub within the area of MG5 grassland will create **moderate beneficial** gains, preventing the eventual degradation of this habitat and allowing it to colonise over larger areas. The inclusion of species rich and open grassland habitats within the landscape proposals will also offer the potential for substantial gains. The management of moderate and low value grassland habitats outside of the application boundary to the north-west will provide significant gains long term with regards to neutral grassland habitats within the local area.

9.248 No significant adverse impacts are anticipated with regards to the landscaping/re-grading works to the existing silt lagoons on site. The inclusion of pond management in the form of scrub thinning within the southern section of the site will provide **moderate beneficial** gains in the form of allowing more light to reach the pond allowing a more marginal/aquatic plant species to colonise.

9.249 Managing run off during construction and demolition is a standard requirement for all consented development. It is considered reasonable to expect that best practice for avoiding run off will be implemented and it is expected that there will be **negligible** impacts during construction on any water bodies present on site.

Amphibians

9.250 No significant adverse impacts upon amphibians are expected if the outlined mitigation measures are implemented. Long terms beneficial gains are anticipated in the form of planting of marginal/aquatic species and thinning of scrub around shaded ponds. The maintenance of open water habitats, provision of refugia/hibernacula and a range of optimal terrestrial habitats within the landscaping scheme such as woodland/scrub, species rich and open grassland are considered to provide **moderate beneficial** gains to amphibians in the long term.

Reptiles

9.251 With respect to reptiles it is considered reasonable to expect that, with the mitigation techniques outlined above, there will be minimal disturbance and impact to these species during construction and demolition. The provision of woodland, scrub and grassland habitats within the landscape proposals will provide **moderate beneficial** gains for reptiles along with improving the habitat continuity and connectivity across the site and to the wider landscape. The improvement of connectivity between habitats will allow the increased colonisation of habitats which may result in greater genetic diversity within the local reptile population.

Birds

9.252 No significant adverse impacts to birds are anticipated if the outlined mitigation is implemented. Any impacts during construction are considered to be temporary and the provision of additional nesting habitat in the form of woodland, scrub and nest boxes will provide gains for a range of species along with providing suitable habitat for the inclusion of the Schedule 1 species little ringed plover which was recorded on site. The implementation of a bird box scheme within the woodland habitats to the south (Key and Frame Wood) will provide an abundance of additional nesting opportunities for birds. It is considered that overall there will be **moderate beneficial** gains for birds.

Bats

9.253 No significant impacts to bats are anticipated if the mitigation proposals are implemented. The current site status suggests that the site is of value for foraging and commuting. It is therefore reasonable to expect that with the mitigation outlined above that the availability of roosting habitat will increase providing **minor beneficial** gains for bats and foraging behaviour should not be significantly affected during construction.

Otters

9.254 No residual impacts to otters are anticipated as a result of the proposed development. This is due to the fact that no signs of otter were found within the application boundary. A small tributary to the River Churnet is situated along the south eastern boundary of the application site. However due to its small and shallow nature impacts to otter are unlikely as a result of construction. This species is also largely nocturnal and crepuscular and so less affected by the

construction phase of the development. The potential impacts upon this species are therefore considered to be **negligible.**

Completed Development

Habitats

9.255 The main impact during the operation of the site is disturbance arising from increased visitor pressure at the site and the local area. The management and enhancement of land immediately adjacent to the Whiston Eaves SSSI and Ashbourne Hey SBI will increase the extent and value of this resource. This additional land will also act as a buffer to the designated sites. Therefore the impact of the completed development on the designated sites is considered to be **negligible**.

9.256 Extending woodland planting will provide some buffering of the existing woodland on site and it may be possible to encourage the establishment of native flora and increase the extent of bluebell. The implementation of habitat management and maturation of new landscape planting and woodland planting will offset the impacts of potential increased recreational activity. The impacts to the existing areas of woodland are therefore considered to be **moderate beneficial** in the long term.

9.257 Existing areas of disturbed woodland are generally species poor and it is expected that newly planted areas, with careful management, and a sufficient period of maturation, will be of higher ecological value than those lost. The impacts of the completed development on existing disturbed woodland are therefore considered to have a long term **moderate beneficial** gain.

9.258 Other retained habitats of interest include tall herb, wetland and riparian vegetation. It is expected that there will be a slight increase in the extent and quality of these vegetation types. The impacts of the completed development on the remaining retained habitats on site are considered to be a **minor beneficial** gain.

9.259 Managing run-off and pollution is a standard requirement for all consented development. It is considered reasonable to expect that best practice for avoiding run off will be implemented and it is expected that there will be **negligible** impacts from run off or increased discharges when the site is completed.

Protected species

9.260 When the site is operational and with maturation of newly established habitats it is expected that species groups including bats, birds, amphibians and reptiles will reoccupy the site. Areas of low disturbance may well benefit grass snake. It is certain that bat species such as *Pipistrelle* sp. and Daubenton's will benefit from the provision of new roosting features, the creation of the new wetland features and the strengthening of commuting routes. New landscape planting, the provision and sensitive management of land for ground nesting birds and the provision of barn owl boxes will provide a wide range of new nesting opportunities for birds. The long term impacts upon protected species are therefore considered to be **moderate beneficial** as a result of the completed development.

9.261 Increased disturbance from dog walkers may affect otters using the River Churnet and unnamed watercourses within the Whiston Eaves woodland complex. However, this watercourse flows through a number of urban habitats; therefore

otters using this territory have already habituated to human disturbance. Therefore, this impact is considered to be **negligible**.

Conclusions

9.262 A desk study and a range of ecological surveys have been undertaken to identify and evaluate ecological features at the site. The site is dominated by former quarry workings with additional woodland, grassland and hedgerow habitat within the wider area. Of particular interest are areas designated as SSSI and SBI in the western extent of the site, remnant ancient woodland, broadleaved woodland and grassland habitats. The assessment of baseline conditions, impacts and mitigation also taken into account Quarry Restoration Proposals Approved by Staffordshire County Council in December 2013.

9.263 The development will impact upon habitats that have formed within the former quarry areas (Q1, Q2 andQ3) which predominantly comprise developing grassland, ephemeral habitats, scrub and areas of planting (trees, hydra seeding). In addition, the development will fragment the Approved Restoration Plan and introduce disturbance to the site which will also negatively affect the function of the proposed Approved Restoration Habitats.

9.264 To mitigate and compensate for these impacts a strategic approach is taken which also links to the objectives the Churnet Valley Masterplan, Staffordshire Ecosystem Action Plans (Churnet Woodlands and Species Rich Farmland), and the Staffordshire Moorlands Biodiversity Opportunities Map (Churnet Woodlands). The key elements are measures to enhance/restore lowland grassland, plant new woodland and manage and enhance existing woodlands. Further measures will include planting of new hedgerow to enhance the ecological network value of the area (green infrastructure) and retention and management of Approved Restoration Habitats within the application site.

9.265 With regards to fauna, the site is of interest for three species of reptile which were identified mainly within the quarry site. Amphibians, including great crested newt, were identified throughout the site. A number of significant bird species were also identified within varying habitat across the site. The site also provides valuable roosting and foraging habitat for bats.

9.266 Standard mitigation techniques will be implemented to avoid potential effects to species during construction and to avoid other potential impacts such as run off and lighting. Species interests will also be incorporated into the long term management objectives for the site.

9.267 The site provides the opportunity to ensure the long term management of land for nature conservation and will provide the opportunity for the enjoyment of areas of wildlife. Sensitive development of the site clearly provides an opportunity to meet key objectives of the Churnet Valley Masterplan.

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