South Downs National Park Authority

SHOREHAM CEMENT WORKS

Preliminary Ecological Appraisal

70089630-PEA
MARCH 2022

CONFIDENTIAL

South Downs National Park Authority

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EXECUTIVE SUMMARY

WSP was commissioned by the South Downs National Park Authority (SDNPA) to undertake a Preliminary Ecological Appraisal (PEA) of land at the Shoreham Cement Works (hereafter referred to as 'the Site') to support the preparation of the Shoreham Cement Works Area Action Plan (AAP) currently being prepared. SDNPA are considering four different developmental scenarios which aim to accommodate specific land uses within the Site. Development undertaken within the Site, as part of any potential scenario is hereafter collectively referend to as 'Potential Development'.

The PEA for the Potential Development comprises; a desk study search for baseline information on designated sites, habitats, and protected species; a UK Habitat Classification (UKHab) survey of the Site; a baseline Biodiversity Net Gain (BNG) assessment (Appendix D); and a constraints and opportunities exercise (Appendix E).

This Site is the location of a decommissioned cement works, situated in the centre of a chalk quarry. The Site has been divided into four specific areas based on location, Areas A-D, as well as the surrounding cliffs (Area E).

The Site is within the South Downs National Park, a statutory designated site. The National Park purposes are: To conserve and enhance the natural beauty, wildlife and cultural heritage of the area, and to promote opportunities for the understanding and enjoyment of the special qualities of the National Park by the public. The National Park Authority also has a duty when carrying out the purposes: to seek to foster the economic and social well-being of the local communities within the National Park. Statutory sites of national importance were identified within 2km, notably Beeding Hill to Newtimber Hill Site of Special Scientific Interest (SSSI) adjacent to the Site's northern boundary. In addition, six non-statutory Local Wildlife Sites (LWS) were identified within the desk study exercise with Old Errington Farm Valley & Road Cutting and River Adur Meadows LWS adjacent to the Site. Habitats of Principal Importance (HPI) were recorded in close proximity to the Site including: deciduous woodland, and lowland calcareous grassland. Additionally, the Site itself had been identified as Open Mosaic Habitat on Previously Development Land (OMH) within the open-source data used to complete the desk study. In order to maintain the nature conservation value of the designated sites and HPI close proximity to the Site, in line with national and local planning policy, it is recommended that additional assessments are undertaken for any Potential Development. In addition, it is recommended that good practice construction methods be built into the design and delivery of any Potential Development.

Habitats of various ecological value were recorded within the Site, including OMH, calcareous grasslands, woodland and cliff faces. Some of these habitat have been classed as HPI. Due to seasonal constraints, an assessment of the quality of these habitats within the Site was limited and as such a further botanical survey of these habitat has been recommended. In addition, due to the past history of the Site, its prevailing conditions and geographical location, areas of bare ground within the Site, with the correct management, have the potential to mature into habitat of high ecological value, this is notable for areas of cleared ground in Area D. It has been recommended that these habitats are protected and retained within any Potential Development. If retention is not possible then re-creation of lost habitats should be included within any landscaping design and be informed by a BNG assessment.

The Site is considered to have suitability for the following species: bats, badger, hazel dormouse, breeding birds (including peregrine falcon and black redstart), reptiles, amphibians (including great crested newt) and terrestrial invertebrates. Further surveys to determine the presence, likely absence and usage of the Site have been recommended for these species.

General preliminary avoidance, protection and mitigation measure have been provided in relation to any Potential Development. Recommendations for ecological enhancements to be considered as part of any Potential Development, in the context of local national planning policy, have also been included.

The baseline BNG assessment is detailed in Appendix D, and the constraints and opportunities exercise is outlined in Appendix E. If the opportunities identified are taken forward, they may result in benefits to the protected and notable species and habitats within the Site as well as benefits to the community and local economy.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.1.1. WSP Ltd was commissioned by South Downs National Park Authority (SDNPA) to undertake a Preliminary Ecological Appraisal (PEA) of land at the Shoreham Cement Works (hereafter referred to as 'the Site'), to support the preparation of the Shoreham Cement Works Area Action Plan (AAP). The AAP will sit alongside the recently adopted South Downs Local Plan (SDLP), which covers the plan period 2014-2033.

1.1.2. Shoreham Cement Works is allocated under Policy SD56 of the SDLP for an exemplar mixed use development, which delivers a substantially enhanced landscape and uses that are compatible with the purposes of the National Park.

1.1.3. The SDNPA is currently considering four development scenarios to be outlined within the AAP:

- Housing/Employment-led scenario 1;
- Housing/Employment-led scenario 2;
- Leisure-led scenario 3; and
- Appeal Scheme scenario 4.

1.1.4. These scenarios consider different levels of development and differing mixes of areas allocated to different land use categories. This PEA aims to provide the baseline ecological information with which to assess the ecological implication of these different scenarios. Any theoretical development undertaken within the Site, which may feed into any of the outlined development scenarios is hereafter referred to as the 'Potential Development'.

1.2 ECOLOGICAL BACKGROUND

1.2.1. The Site area covers 44ha and is centred at grid reference TQ202087, comprising a semi-derelict cement works, inactive chalk quarry, temporary inert recycling facility and a mix of temporary business uses. The Site is located about 5km north of Shoreham and 2km south of Upper Beeding.

1.2.2. Cement production began at the end of the 19th century with permission to extract chalk within the quarry being granted in 1946. Chalk extraction and cement production ceased in 1991. The whole Site is in single private ownership and the SDNPA is the sole Local Planning Authority (LPA).

1.2.3. For the purposes of the AAP, the Site has been divided into four main areas categorised according to location, historic use, and prevailing conditions. These areas are outlined as follows and identified in Figure 1:

- Area A – west of the A283, containing the former offices for the cement works, currently occupied by a variety of temporary industrial and storage uses. Linked by a tunnel under the A283 to Area B;
- Area B – immediately east of the A283, containing the large buildings of the former cement works;
- Area C – the exhausted chalk quarry area which is partly used to produce recycled aggregates; and
- Area D – the rear, elevated portion of chalk available for extraction.

1.2.4. In addition, the cliffs which are present across Areas B-C and dominate the landscape within the majority of the Site have been classed inclusively as Area E (Figure 1).

1.2.5. These five areas have been given the following descriptive names which are used interchangeably throughout the report.

- Area A – the Riverside
- Area B – The Cement Works
- Area C – The Bowl
- Area D – The Moonscape
- Area E – The Clifflands

1.2.6. The development scenarios under consideration will need to be achieved taking into consideration the varying constraints identified within each Area and further outlined within this assessment.

1.2.7. For the purposes of this assessment the area targeted for survey is inclusive of the Site.

1.2.8. A PEA and Preliminary Roost Assessment (PRA) for the Site was completed in 2018 (TEC, 2018), in relation to the completion of the AAP. This report identified the requirement of further surveys for the following ecological receptors:

- Hazel dormouse *Muscardinus avellanarius*;
- badger *Meles meles*;
- breeding bird (including peregrine *Falco peregrinus* and black redstart *Phoenicurus ochruros*);
- reptiles;
- bats;
- great crested newt (GCN) *Triturus cristatus* (Habitat Suitability and environmental DNA (eDNA) surveys);
- terrestrial invertebrates; and
- botany.

1.2.9. Due to the time which has elapsed since the completion of the PEA and PRA, an updated survey is required to provide a current picture of the ecological constraints and opportunities within the Site.

1.3 SCOPE OF REPORT

1.3.1. SDNPA commissioned WSP to complete a PEA of the Site in November 2021. The brief was:

- to complete a desk-based assessment of an appropriate study area around the Site, using online datasets and records sourced from the local records centre;
- to complete a habitat survey of the Site in line with standard methods, to identify and map the habitats present and to assess the potential of the habitats present to support protected species; and
- if necessary, to identify the need for avoidance, mitigation, compensation or enhancement measures and/or further ecological surveys.

1.3.2. In addition, WSP has also been commissioned by the SDNPA to undertake additional bat surveys (including bat activity surveys and a PRA of the cliff faces), a baseline Biodiversity Net Gain (BNG) assessment of the Site, and to produce an Ecological Constraints/Opportunities Plan for the Site.

1.3.3. The PRA of cliff faces was completed in February 2022 and the methods and results of this are provided within a separate report (WSP, 2022). The bat activity surveys will be completed during the

2022 bat active season and will be the subject of a separate report. The scope, methods and results of the baseline BNG assessment are provided within Appendix D of this report.

1.3.4. The Ecological Constraints and Opportunities exercise is currently based on the baseline information gathered as part of this PEA, the baseline BNG assessment and the PRA of cliff faces, and is presented in Appendix D. An Ecological Constraints and Opportunities Plan summarising the key points of the Constraints and Opportunities exercise is presented in Figure 6 and is expected to be subject to further iterations following the results of additional survey work.

1.4 RELEVANT LEGISLATION AND POLICY

1.4.1. The appraisal has been compiled with reference to the following relevant nature conservation legislation, planning policy and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in England. The context and applicability of each item is explained as appropriate in the relevant sections of the report and additional details on local planning policy are presented in Appendix A.

Legislation

- The Conservation of Habitats and Species Regulations 2017 (as amended) (Habitats Regulations);
- The Wildlife and Countryside Act 1981 (as amended) (WCA);
- Countryside Rights of Way Act 2000;
- The Natural Environment and Rural Communities (NERC) Act 2006 (England);
- The Protection of Badgers Act 1992;
- The Hedgerow Regulations 1997;
- The Wild Mammals (Protection) Act 1996;
- The National Parks and Access to the Countryside Act 1949;
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017; and
- Environment Act 2021.

Policy

- The UK Post-2010 Biodiversity Framework (2011-2020) (JNCC and DEFRA, 2012);
- Biodiversity 2020: A strategy for England's wildlife and ecosystem services (DEFRA, 2011);
- UK Biodiversity Action Plan (UKBAP)[1];
- The National Planning Policy Framework (NPPF) 2021 (Ministry of Housing Communities & Local Government, July 2021);
- South Downs Local Plan Adopted 2nd July 2019 (2014–33);
- South Downs Partnership Management Plan 2020 – 2025; and
- Sussex Biodiversity Action Plan.
- English National Parks and the Broads. UK Government Vision and Circular 2010 (DEFRA, 2010)

[1] The UK BAP has now been replaced by the UK Post-2010 Biodiversity Framework, however, it contains useful information on how to characterise important species assemblages and habitats which is still relevant.

2 METHODS

2.1 OVERVIEW

2.1.1. This PEA has been prepared with reference to current good practice guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM, 2017a, 2017b and 2018), and UK Habitat Classification (UKHAB) (Butcher *et al*., 2020a); and guidance contained in the British Standard - Code of Practice for Biodiversity and Development BS42020:2013 (British Standards Institute (2013).

2.1.2. This PEA is based on the following data sources:

- an ecological desk study;
- a habitat survey; and
- a protected/notable species assessment.

2.1.3. The PEA and PRA of the Site completed by TEC in 2018 (TEC, 2018) was reviewed to assist in survey planning and to identify notable alterations to condition of habitats within the Site, as well as the suitably of habitats within the Site to support protect and notable species.

2.2 DESK STUDY

2.2.1. The desk study was undertaken in January 2022 to review existing ecological baseline information available in the public domain and to obtain information held by relevant third parties. For the purpose of the desk study exercise, records were collated within various radii around the Site. This approach is consistent with current good practice guidance published by the CIEEM (2017a and 2017b). To provide the baseline data for the ecological desk study, the following information was requested from the Sussex Biodiversity Record Centre (SxBRC)[2]:

- records of legally protected and notable species within 2km of the Site; and
- records of non-statutory sites designated for nature conservation value within 2km of the Site.

2.2.2. Freely downloadable datasets (available from Natural England) were consulted for information regarding the presence of statutory designated habitats[3] within 2km of the Site. This search was extended to 10km for sites within the National Site Network (Special Areas of Conservation (SAC) and Special Protection Areas (SPA)) of European importance and internationally designated Ramsar sites. This included information on the impact risk zones (IRZ) for Sites of Special Scientific Interest (SSSIs) which were checked using Natural England's MAGIC mapping application (Defra, 2021).

[2]SxBRC has data-sharing agreements with many local wildlife recording groups and data-gathering organisations, this included Susses Ornithological Society, a full list of contributors can be found on the SxBRC website: https://sxbrc.org.uk/home/index.php.

[3] Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR).

2.2.3. Freely downloadable datasets (available from Natural England) were consulted for information regarding Habitats of Principal Importance (HPI)[4] within 2km and woodland listed on the Ancient Woodland Inventory[5].

2.2.4. In addition, open source 1:25,000 Ordnance Survey mapping was used to identify any mapped water bodies and watercourses within 500m of the Site.

2.2.5. The findings of the desk study have been incorporated within Section 3 of this report and are shown on Figures 2-4.

2.3 HABITAT SURVEY

2.3.1. A UKHab survey of the Site was carried out on 6 and 7 January 2022 in dry, cold and bright to overcast conditions. The survey covered the entire Site including boundary features, where dense vegetation did not prevent access or where proximity to cliff faces did not present a risk to the safety of surveyors. The UKHab survey was carried out by a Consultant Ecologist with extensive experience in the last five years of completing PEAs on a variety of sites including brownfield and greenfield sites.

2.3.2. Habitats were described and mapped following the Professional Version 1.1 of UKHab using the following documents:

- UK Habitat Classification User Manual (Butcher *et al*., 2020a) (hereafter the 'UKHab User Manual');
- UK Habitat Classification Field Key (UK Habitat Classification Working Group, 2020a);
- The UK Habitat Classification Habitat Definitions Version 1.1 (Butcher *et al*., 2020b); and
- UK Habitat Classification Basic Edition: Suggested Symbology for Maps (UK Habitat Classification Working Group, 2020b).

2.3.3. The UK Habitat Classification Working Group describes UKHab as "…*a unified and comprehensive approach to classifying habitats, designed to provide a robust technique for classifying and mapping British habitats*". The dominant plant species are recorded and habitats are classified according to their vegetation types.

2.3.4. The UKHab system comprises a principal hierarchy (the Primary Habitats) and non-hierarchical Secondary Codes. Primary Habitats include ecosystems (level 1), broad habitat types (level 2 and level 3), more defined habitats including HPI (level 4) and further defined habitats including Annex I habitats (level 5).

[4] Mapped locations of HPI are usually not available, but HPI aligns in the most part with UKBAP habitats. Inventories of UKBAP habitat have been prepared by a variety of organisations and at a national (Natural England priority habitat inventory) and local scale (e.g. by local records centres). In some instances these are primarily based on aerial photograph analysis rather than field survey.

[5] The ancient woodland inventory in England lists areas over two hectares in size which have been continuously wooded since at least 1600.

2.3.5. Secondary Codes are then used to provide more information on a habitat from the following categories:

- mosaic habitats;
- habitat complexities;
- origin of habitat;
- management;
- land use;
- environmental qualifiers;
- hydrological regime; and
- green infrastructure.

2.3.6. A single Primary Habitat is assigned to each polygon, line or point feature with generally a maximum of six Secondary Codes used. Habitats are described by the Primary Habitat first (e.g. w1h5 other woodland; mixed predominantly broadleaved) with Secondary Codes following (e.g. w1h5 36 57 other woodland; mixed predominantly broadleaved that is plantation with young trees - self set). Lowercase letters are used, with the levels 2 to 5 shown by the alphanumeric code and no commas are used between secondary codes as per the UKHab User Manual. For habitats of interest that were too small to map, point features were used with Primary Habitats and Secondary Codes where applicable. For this survey, where possible, level 5 Primary Habitat codes were used for habitats.

2.3.7. A plant species list has not been included within the appendices of this report due to the limitations of surveying for plants during the winter period and the unrepresentative nature of any plant list compiled during this period. Conspicuous species (those whose identifiable vegetation persists through the winter or those which have an evergreen habitat) recorded within the habitats are detailed where appropriate within the body of this report. The scientific names for plant species follow those in the New Flora of the British Isles (Stace, 2019). This data will be provided during an updated Habitat Condition Assessment survey of the Site to be undertaken during the appropriate survey period (April-September).

2.3.8. Habitats were marked using a mobile mapping application and were subsequently digitised using a Geographical Information System (GIS).

2.3.9. Any invasive plant species listed on Schedule 9 of the WCA 1981 (as amended) which were evident during the UKHab survey were also target noted. However, detailed mapping of such species; or a full survey of the Site for all invasive plant species is beyond the scope of this commission.

2.3.10. UKHab was chosen as the method to classify habitats on Site, so that the data gathered could subsequently be used in a Biodiversity Net Gain (BNG)[6] Assessment of the Site. BNG requires the calculation of biodiversity units on Site pre and post development.

2.3.11. Target notes were made to provide information on specific features of ecological interest (e.g. reptile sighting locations) or habitat features too small to be mapped. These are included in Appendix B.

[6] The Biodiversity Metric 3.0 calculation tool as well as supporting information can be accessed:http://publications.naturalengland.org.uk/publication/6049804846366720

2.4 PROTECTED SPECIES ASSESSMENT

2.4.1. The potential for the Site to support legally protected and notable species was assessed using the desk study results and combined with field observations during the habitat survey. The assessment of habitat suitability for protected and notable species was based on professional experience and judgement. This was supplemented by standard sources of guidance on habitat suitability assessment for key faunal groups including: birds (Gilbert et al, 1998 and Bibby et al, 2000), GCN (Gent and Gibson, 2003 and English Nature, 2001); reptiles (Froglife, 1999 and Gent and Gibson, 2003); bats (Collins, 2016 and Mitchell-Jones, 2004); badger (Harris *et a*l, 1991 and Roper, 2010); hazel dormouse (English Nature, 2006); and invertebrates (Drake et al, 2007 and Kirby, P, 2001).

2.5 NOTES AND LIMITATIONS

2.5.1. Every effort has been made to provide a comprehensive description of the Site however, the following specific limitations apply to this assessment:

- Ecological survey data is typically valid for up to 18 months unless otherwise specified or subsequently reviewed. This may be reduced if conditions are likely to change more quickly due to ecological processes or anticipated changes in management (CIEEM, 2019).
- Records held by local biological record centres and local recording groups are generally collected on a voluntary basis; therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in recording coverage.
- The survey was not completed during the optimal survey season for UKHab surveys, generally accepted to be from April-September (inclusive), associated with the typical spring and summer flowering periods. During the survey the plants species identified could not be considered representation of the species potentially within the habitats present on the Site due to this seasonal constraint. Accurate botanical identification is required to categorise habitats within the higher levels of the UKHab methodology. In addition, this limitation prevented an assessment of the condition of some habitats present, as is required when completing a BNG assessment. To provide complete and accurate habitat information for the Site, additional botanical surveys undertaken during the optimal survey season are required.
- The UKHab habitats reported here have been identified the habitat level representative of the field data present during the survey. Data gathered during the 2018 surveys, undertaken during the optimal survey period, has been used to provide guidance on habitat classification where appropriate.
- Despite the seasonal constraints of the survey, it is considered that sufficient information was gathered to enable an assessment of potential of habitat within the Site to support protected or notable species.
- A number of locations within the Site could not be accessed, due to the safety concerns regarding working close to edges or the base of the cliffs present. This includes vegetation bordering the elevated edge of the Site. In addition, woodland on the southern elevated edge of the Site was not accessed due to the unconfirmed access to land required to pass through in order to access the habitat. Aerial imagery, and previous survey data was used to inform the potential habitats were present in these areas. It is, therefore, considered that the broad UKhab types were accurately identified.
- The UKHab survey was carried out over the period of two consecutive days, as such only a selection of all species that occur within the Site will have been recorded. However, through use of desk study information to supplement site survey data, it is considered that an accurate

assessment of the potential for the Site to support protected species or those of conservation concern was possible.

- The extended UKHab map (Figure 5) has been reproduced from field notes and plans. Whilst this provides a sufficient level of detail to fulfil the requirements of a PEA, the maps are not intended to provide exact locations of key habitats.

3 RESULTS

3.1 DESIGNATED SITES

STATUTORY SITES

3.1.1. The desk study did not identify any statutory nature conservation sites of international importance within 10km of the Site.

3.1.2. The Site is located within the South Downs National Park which is a site of national importance for landscape conservation. The National Park Purposes are: To conserve and enhance the natural beauty, wildlife and cultural heritage of the area, and to promote opportunities for the understanding and enjoyment of the special qualities of the National park by the public. The National Park Authority also has a duty when carrying out the purposes: to seek to foster the economic and social well-being of the local communities within then National Park. There were a further three sites of national importance found within 2km of the Site, the closest of which is Beeding Hill to Newtimber Hill SSSI which abuts on to the Site's northern boundary. A description of statutory designated sites of national importance are detailed in Table 3-1. The locations of statutory designated sites are presented on Figure 2.

Table 3-1 - Statutory designated sites of national importance within 2km of the Site

Site Name	Designation	Size (ha)	Approximate distance (km) and orientation from Site	Description
South Downs	National Park	162,700.00	The Site is within the South Down National Park	A continuous strip of chalk grassland, scrub, mixed woodland and ancient yew *Taxus baccata* forest mosaic which stretches along the south coast between Winchester and Eastbourne, designated as a national park in 2010. The area of the South Downs National Park nearest the Site falls within the Landscape Character Area A2 (Adur to Ouse Open Downs) and is in a 'Intrinsic Rural Darkness' dark sky zone. National Parks are statutory sites designated under the National Parks and Access to Countryside Act 1949, as amended. The first purpose of the South Downs National Park includes conserving and enhancing wildlife.
Beeding Hill to Newtimber Hill	SSSI	320.96	Adjacent to the Site's northern boundary	Located within the South Downs National Park, an area of biological and geographical importance. Consisting mostly of unimproved chalk grassland, which is species rich, with up to 40 flowering plants per square metre.

Site Name	Designation	Size (ha)	Approximate distance (km) and orientation from Site	Description
Mill Hill	Local Nature Reserve (LNR)	13.49	1.25km south-east	Unimproved species rich chalk grassland, scrub, mature scrub and secondary woodland. One of the best butterfly sites in Sussex with over 29 species recorded. Chalk grassland is part of a Sussex habitat Action Plan and Mill Hill has over 160 recorded species of flowering plants and up to 30 recorded species per metre.
Adur Estuary	SSSI	60.26	1.15km south of Site	Significant areas of saltmarsh with intertidal mudflats which support a range of wading birds.

NON-STATUTORY SITES

3.1.3. The desk study identified six non-statutory nature conservation sites (referred to locally within Sussex as Local Wildlife Sites (LWSs)) within 2km of the Site, the closest which is Old Errington Farm Valley & Road Cutting situated directly adjacent to the south of the Site. Descriptions of these sites are detailed in Table 3-2.

Table 3-2 – Non-statutory designated sites within 2km of the Site

Site Name	Designation	Distance (km) and orientation from Site	Description
Old Errington Farm Valley & Road Cutting	LWS	Directly adjacent to the south of Area A	An area of rich grassland located within a shallow valley supporting diverse chalk grassland with species such as dropwort *Filipendula vulgaris* and round-headed rampion *Phyteuma tenerum*.
River Adur Meadows	LWS	Directly adjacent west of Area A	Located on the bank of the River Adur, meadow supporting rough grasslands, including Bulbous Foxtail *Alopecurus bulbosus* which is rare in West Sussex.
Mill Hill	LWS	1.0km south-east	Unimproved species rich chalk grassland, scrub, mature scrub and secondary woodland. One of the best butterfly sites in Sussex with over 29 species recorded. Chalk grassland is part of a Sussex habitat Action Plan and Mill Hill has over 160 recorded species of flowering plants and up to 30 recorded species per metre.

Site Name	Designation	Distance (km) and orientation from Site	Description
Truleigh Hill to Southwick Hill Chalk Grassland	LWS	1.6km east	Mosaic of chalk grassland rich with characteristic species such as yellow-wort *Blackstonia perfoliata* and hairy violet *Viola hirta*. The surrounding land is predominantly arable farmland.
Applesham Farm Bank	LWS	2.0km south-west	Unimproved chalk grassland with a species rich sward with species such as horseshoe vetch *Hippocrepis comosa.*
River Adur Water Meadows & Wyckham Wood	LWS	2.0km north	One of only a few woodlands on the River Adur floodplain, a small, ancient and semi-natural woodland of great importance due to its heronry with approximately 19 pairs nesting annually. Some importance to birds and dragonflies.

3.1.4. Sections of Designated Road Verge (DRV) have been identified directly adjacent to Site. In addition, three Local Geological Site (LGS) were identified within 2km of the Site. These sites are identified primarily for their geological interest and not their nature conservation value. The Shoreham Cement Works, Beeding is listed as a LGS, this designation is inclusive of the Site.

OTHER HABITATS OF CONSERVATION IMPORTANCE

3.1.5. Habitats of Principal Importance (HPI) were recorded within 2km of the Site during the desk study. In particular, parcels of lowland calcareous grassland HPI, deciduous woodland HPI and 'good quality semi-improved grassland'[7] were identified within the Site boundary and directly adjacent to the Site. Records of coastal and floodplain grazing marsh and mudflats were associated with the River Adur, running along the western boundary of Area A. A summary of HPI recorded within 2km of the Site is provided below in Table 3-3, and locations of HPI are presented on Figure 3.

Table 3-3 – HPI within 2km of the Site

HPI	Total area of all parcels within 2km (ha)
Coastal and Floodplain Grazing Marsh	204.26
Coastal Saltmarsh	3.94

[7] Good quality semi-improved grassland is not classified as HPI under Section 41 of the Natural Environment and Rural Communities Act 2006. However, this category comprises grasslands which have been historically identified as grasslands which are now listed as HPI (e.g. lowland meadows, lowland calcareous grassland, lowland dry acid grassland) but which have not been recently assessed.

HPI	Total area of all parcels within 2km (ha)
Deciduous Woodland	58.78
Good quality semi-improved grassland	599.73
Lowland Calcareous Grassland	125.03
Mudflats	8.16
Traditional Orchards	0.71

3.1.6. This dataset is limited as large extents of the Site have wrongly been identified as good quality semi-improved grassland, though the field survey did not identify any significant area of this habitat within the Site. Instead, the majority of the Site has been identified as 'open mosaic habitats on previously developed land' (OMH) following the habitat survey (as detailed in Section 3.2 below). This habitat classification is more appropriate given the historic use of the Site. OMH was recorded within the Site during the UKHab survey, the extent of which is detailed in Section 3.2.

3.1.7. Two parcels of ancient woodland were recorded within 2km of the Site, the closest parcel was approximately 0.5km to the south of the Site. The location of ancient woodland parcels is presented on Figure 3.

3.2 HABITAT SURVEY

OVERVIEW

3.2.1. To the west of the A283, Area A is dominated by hardstanding and a mix of used and disused industrial units. East of the A283, Area B is dominated by the derelict structures associated with the decommissioned cement works. Notably this includes a 42m chimney stack which is a prominent feature of the local landscape. Sections of secondary woodland were also present within this area growing on the steep slopes surrounding the Site. Area C contains areas currently used for the processing and storage of materials recycling. A mosaic of habitats had established in these areas including habitats dominated by moss and including ruderal vegetation and ephemeral pools. Area D showed signs of recent vegetation clearance and this large area was dominated by bare ground. Scattered scrub was present across the Site dominated by butterfly-bush *Buddleja davidii*. Large expanses of cliff faces surrounded the Site.

3.2.2. In total, 16 UKHab Primary Habitats were identified in the Site. They are mapped on Figure 5 and are listed in Table 3-4 along with areas in hectares . A description of the dominant and notable species, the composition and management of each habitat is provided below, and photographs are provided in Appendix C. The order of the habitat descriptions below reflects their ordering in the UKHab classification and does not reflect habitat importance.

Table 3-4 - UKHab Primary Habitat Areas

UKHab Primary Habitats	Area (ha)	Length (m)	% of Site Area*
g2 - Calcareous grassland	0.43	-	0.98/0.94

UKHab Primary Habitats	Area (ha)	Length (m)	% of Site Area*
g2a - Lowland calcareous grassland	0.28	-	0.63/0.6
g4 - Modified grassland	2.03	-	4.57/4.38
h3d - Bramble scrub	0.03	-	0.07/0.07
h3h - Mixed scrub	3.42	-	7.71/7.38
s1 - Inland rock	9.58/11.53*	-	21.59/24.89
u1 - Built-up areas and gardens	0.93	-	2.09/2
u1a - Open Mosaic Habitats on Previously Developed Land	3.02	-	6.81/6.52
u1b5 - Buildings	2.02	-	4.55/4.35
u1b6 - Other developed land	5.42	-	12.22/11.7
u1c - Artificial unvegetated, unsealed surface	14.32	-	32.28/30.92
u1d - Suburban/ mosaic of developed/ natural surface	0.05	-	0.12/0.11
w1g - Other woodland; broadleaved	1.24	-	2.79/2.68
w1g6 - Line of trees	0.05	461	0.1/0.1
w1h - Other woodland; mixed	1.55	-	3.49/3.35
Total	44.36/46.31*	461	0.98/0.94
*Inclusive of area of cliff face base UKHab mapping/inclusive of area of cliff face based on topographic data use in the Baseline Habitat Value assessment (Appendix D). See Appendix D for the detail methodology use to generate this value.			

G2 - CALCAREOUS GRASSLANDS

3.2.3. Areas of managed grassland were present to the front of the main cement works structure in Area B, with evidence of recent management (Photograph 1 in Appendix C). The seasonal constraints prevented a full and representative species list from being generated. From the prevailing conditions of the Site and previous survey information it is considered that these grassland sections represent managed calcareous grasslands.

3.2.4. In addition, small areas of grassland were present on the embankments and garden area connected with the residential property to the north of Area B and along the verge associated with the A283, sections of these verges have been identified as a DRV. These areas have been identified as g2 in

accordance with the prevailing conditions of the Site and previous survey information. To classify these areas of grassland further, recommendations for an additional botanical survey have been provided in Section 4 of this report.

G2A - LOWLAND CALCAREOUS GRASSLAND

3.2.5. Within the vegetation atop the cliff faces broadly in Areas C and D, sections of grassland vegetation persisted which are assumed to be g2a lowland calcareous grasslands. This habitat is assumed to be present within the habitat atop the cliff face where scrub had not encroached (Photograph 2 in Appendix C). From the areas which could be accessed safely, conspicuous tufts were recorded of upright brome *Bromopsis erecta,* a plant associated with calcareous grasslands. The full extent of this habitat could not be assessed due to access restrictions. To fully classify these areas of grassland to Level 5, additional botanical surveys are required during the optimal survey period as recommended in Section 4 of this report.

G4 – MODIFIED GRASSLAND

3.2.6. Small sections of this habitat were present within Area A, most of which were not managed and had a tall sward height with ruderal species present. Conspicuous species recoded within the habitat include mugwort *Artemisia vulgaris*, dock *Rumex sp*. and cock's-foot *Dactylis glomerata.* Scattered butterfly-bush had also started to colonise these areas (Photograph 3 in Appendix C).

3.2.7. A larger area of this habitat was located atop the cliff face at the far easterly extent of Area D, in the east of the Site. This area was heavily grazed by cattle.

W1G - OTHER WOODLAND; BROADLEAVED

3.2.8. Areas of secondary woodland were present within Area B. To the south of Area B, woodland bordered the base of the cliff and mature, planted specimens of European horse chestnut *Aesculus hippocastanum,* hybrid poplar *Populus sp*. and common beech *Fagus sylvatica* were present (Photograph 4 in Appendix C). As this section of habitat continued east, adjacent to the cliff face, immature to semi-mature sycamore *Acer pseudoplatanus* dominated, butterfly bush, wayfaring tree *Viburnum lantana* and wild privet *Ligustrum vulgare* were occasional in the shrub layer, with Wilson's honeysuckle *Lonicera nitid* rarely present. The understory was dominated by ivy *Hedera helix* with stinking iris *Iris foetidissima* occasionally present.

3.2.9. To the north of Area B, woodland was growing on the sloping ground and cliff faces with planted mature specimens of hybrid poplar surrounding the house and gardens (Photograph 5 in Appendix C). The densely wooded section to the north of this woodland parcel had semi-mature to immature frequent sycamore and occasional beech with occasional wild privet, hawthorn *Crataegus monogyna*, wayfaring tree and butterfly-bush within the shrub layer, and ivy and traveller's-joy *Clematis vitalba* growing throughout the complex. To the south of this parcel, upon the steeper ground, immature birch *Betula sp.* trees had established.

3.2.10. Woodland was also present in Area A, on sloped embankments that bordered the A283. These trees were semi-mature and included occasional sycamore, beech, ash *Fraxinus excelsior* and rarely occurring cypress *Cupressus sp*., hawthorn and butterfly-bush were present within the scrub layer, with traveller's-joy conspicuous within the vegetation complex.

W1G6 - LINE OF TREES

3.2.11. A treeline bordered the eastern boundary of Area A, this tree lines comprised immature and semi-mature poplar, sycamore, ash, oak, birch, beech and willow *Salix* sp. This line transitioned into a planted line of mature cypress at its southerly most extent.

W1H - OTHER WOODLAND; MIXED

3.2.12. Woodland atop the cliff face to the south of Area A was not fully accessed due to safety concerns, and so assessment of this habitat parcel was completed from the quarry floor and from the adjacent field to the south (Photograph 6 in Appendix C).

3.2.13. Trees were immature to semi-mature. The presence of Scots pine *Pinus sylvestris* within the woodland mix was conspicuous from the ground level assessment. The species recorded included occasional sycamore, ash, hawthorn, hazel and holm oak *Quercus ilex*. Dense bramble *Rubus fruticosus* was present across most of the shrub layer with bare ground occurring where the trees and shrub canopy had closed.

H3 – DENSESCRUB (BRAMBLE DOMINATED AND MIXED)

3.2.14. Sections of dense mixed scrub dominated the vegetation surrounding the quarry in Areas A, B, C and D, though access could not be fully gained for this habitat due to the safety constraints detailed in Section 2.5. The scrub included sections of hawthorn, blackthorn *Prunus spinosa*, wayfaring tree and semi-mature specimens of sycamore. In locations where the scrub complex was less dense, scattered gorse *Ulex europaeus* dominated.

3.2.15. Sections of mixed scrub were present to the front of the main cement works structure in Area B. This scrub comprised of butterfly-bush and bramble, in addition this section of habitat contained scattered trees including immature specimens of hornbeam *Carpinus betulus* and large mature cypress.

3.2.16. Within Area C, scattered scrub has been noted within other habitat classifications in addition to these areas, parcels of denser vegetation were identified, these parcels were dominated by bramble and butterfly-bush with the occasional immature birch tree present (Photograph 7 in Appendix C). There was also a section of bramble dominated scrub in Area A.

U1 – U1 BUILT-UP AREAS AND GARDENS

3.2.17. Within Areas A and B, ruderal and moss vegetation had begun to grow within sections of the infrastructure which are presumed to have been part of the landscaping. These areas had become unmanaged and had been used for storage. Deadheads of teasel *Dipsacus fullonum* and St John's wort *Hypericum* sp. were conspicuous as well as scattered butterfly-bush and bramble (Photograph 8 in Appendix C).

U1A - OPEN MOSAIC HABITATS ON PREVIOUSLY DEVELOPED LAND (OMH)

3.2.18. Sections of Area C fell within the UKHab classification of 'u1a - Open Mosaic Habitats on Previously Developed Land' hereafter referred to as OMH. Different habitats within these areas made up the mosaic including areas dominated by moss species; areas with extensive ruderal species cover; inundated vegetation including pendulous sedge *Carex pendula* and hard rush *Juncus inflexus*; ephemeral pools and areas of bare ground (Photograph 9 in Appendix C). This habitat is identified as a HPI under the Natural Environment and Rural Communities (NERC) Act 2006.

3.2.19. The establishment of this habitat has been facilitated by the Site's former use as a quarry. This habitat comprises early successional communities and as such habitats currently identified within other 'u' categories, specifically 'u1c - Artificial unvegetated, unsealed surface', have the potential to develop into this habitat. This is notable for the extent of u1c identified in Area D of the Site. Conversely, if poorly manged or subject to further quarrying activities, this habitat can be lost.

U1B6 – OTHER DEVELOPED LAND

3.2.20. Built infrastructure was present within Areas A and B, comprising access roads around the Site and some hardstanding areas were used for storage.

U1B5 – BUILDINGS

3.2.21. Numerous buildings were present within the Site, these were confined to Areas A and B. The majority of these buildings were associated with the operation of the decommissioned cement works. These structures were constructed from a variety of materials, the largest and most notable buildings were concrete built with asbestos cladding. Area A contained buildings used for a variety of commercial purposes. Most buildings in Area B were currently disused and in a poor state of repair with many missing windows, cladding sections, and roofing tiles (Photograph 10 in Appendix C).

U1C - ARTIFICIAL UNVEGETATED, UNSEALED SURFACE

3.2.22. Site activities have resulted in sections of the Site being cleared of colonising vegetation. Some of these areas are in active use, notably those in Area C. The majority of Area D comprises of an unsealed, unvegetated, chalk matrix (Photograph 11 in Appendix C). There was evidence that this area had been recently cleared of vegetation. As stated above, if these areas of u1c are appropriately manged there is potential for these be development in to OMH.

U1D - SUBURBAN/ MOSAIC OF DEVELOPED/ NATURAL SURFACE

3.2.23. This parcel comprises the gardens around a residential house to the north of Area B.

S1 - INLAND ROCK

3.2.24. The Site's history and current operations have left large expanses of chalk cliff faces, forming both conspicuous boundaries of the quarry areas as well as being present within the Site areas separating the Site into differing elevations (Photographs 12 and 13 in Appendix C). Cracks and crevices within the rock faces were recorded across this habitat.

3.2.25. On shallower ledges or where platforms were present vegetation had started to colonise. Individual conspicuous butterfly-bush was ubiquitous across the habitat, scatted gorse was noted on the northly-most face (in Areas C and D) and potential wall cotoneaster *Cotoneaster horizontalis* was present within cliffs to the west of Area B (TN2). Individual shrubs presumed to be juniper *Juniperus communis* were recorded at TN8 in Area D (Photograph 13 in Appendix C) .

3.2.26. Where cliff faces shallowed, loose chalk scree had gathered (Photograph 12 in Appendix C). Where vegetation was present this was dominated by scattered butterfly-bush and bramble, with immature birch trees also present.

3.2.27. Full assessment of the plant diversity for these habitats was not possible due access and seasonal constraints.

3.2.28. These habitats are a result of the industrial activities within the Site; however they are analogous to the UKHab classification of 'Plants in crevices in base-rich rocks (H8210)' and 'Base-rich scree (H8120)' respectively, both of which are naturally occurring Annex 1 habitats[8]. It is currently not considered that the habitats present within the Site reach these habitat classifications.

R1 - STANDING OPEN WATER AND CANALS

3.2.29. Areas of open water were present within the Site. Areas of standing water within Area C appeared ephemeral and were resultant of the current activities of the quarry. These habitats have been targeted noted as they were too small to present within Figure 5 (TN1, TN4, TN5, TN6, TN7 on Figure 5).

3.2.30. A single ornamental pond was present at the front of the main cement works buildings (TN1 and Photograph 14 in Appendix C). This was a concrete construction and part of the original landscape in the cement work site. Submerged and emergent vegetation was present including New Zealand pigmyweed *Crassula helmsii,* an invasive plant listed on Schedule 9 of the WCA, and water lily *Nymphaea* sp.

3.3 PROTECTED AND NOTABLE SPECIES ASSESSMENT

3.3.1. The potential for the Site to support legally protected species and notable species has been assessed using the results of the desk study and observations made during the survey of habitats within and immediately surrounding the Site. Desk study records have only been considered below if they are recent (from the last 10 years) and/or if they relate to species that may be supported by habitats at the Site. Habitats present within the Site are suitable for the following species; further consideration is given below to the likelihood for these species to be present within the Site:

- bats;
- badger;
- hazel dormouse;
- other mammals;
- birds;
- reptiles;
- amphibians; and
- terrestrial invertebrates.

3.3.2. The Site does not provide suitable habitat for other protected or notable species and other species, beyond those listed above, will not be considered further in this PEA.

BATS

3.3.3. Records of 12 distinct bat species were returned within 2km of the Site during the desk study, including serotine *Eptesicus serotinus,* noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus,* soprano pipistrelle *Pipistrellus pygmaeus*, Nathusius' pipistrelle *Pipistrellus nathusii*,

[8] Annex 1 Habitat means a habitat set out in Annex 1 to Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora

Bechstein's bat *Myotis bechsteinii*, brown long-eared *Plecotus auritus*, Daubenton's bat *Myotis daubentonii*, grey long-eared *Plecotus austriacus*, Natterer's bat *Myotis nattereri*, barbastelle *Barbastella barbastellus* and whiskered bat *Myotis mystacinus*. Additionally, several records were returned for bats which were not identified to species level, including four records of an unidentified *Pipistrellus* species, one record of a long-eared bat *Plecotus* species, one record of a *Myotis* species, three records of an unidentified whiskered/Brandt's bat and 29 bats unidentified to genus level.

3.3.4. Forty-two records of bat roosts were identified, and serotine and common pipistrelle roosts accounted for 32 of these records. The largest roost identified was a recording of 48 common pipistrelle classed as a maternity roost located approximately 1.8km south of the Site.

3.3.5. One record of a European Protected Species Licence for bats was recorded within 2km of the Site, case reference EPSM2013-5887. The licence covered common and soprano pipistrelle and serotine. No specific details are available for the type of roost which were to be affected.

3.3.6. The potential for the structures and cliff faces within the Site to support roosting bats has been identified in previous survey work (TEC, 2018), and surveys to update the assessment of the cliff faces have been commissioned (WSP, 2022). The structures and cliff faces provide roosting opportunities for typical crevice dwelling bats including serotine, common pipistrelle, soprano pipistrelle and *Plecotus* species. To date, a single long-eared bat roost has been recorded within the residential structure to the north of Area B (TEC, 2018).

3.3.7. Though the general elevation of the Site is lower than the fields immediately surrounding Areas B, C and D, the Site is still considered to be of value to local populations of commuting and foraging bats. In particular, areas of OMH in Area C, woodlands present in Area B and dense scrub throughout the Site are considered likely to support invertebrate populations suitable to provide a valuable foraging resource for bats.

3.3.8. Vegetation atop the cliffs, comprising dense scrub and grassland areas, may also provide a potential foraging resource as well as a potential commuting corridor around the Site and into the wider landscape. The river Adur, adjacent to Area A and the trees lining the eastern boundary of this section provides a suitable commuting corridor through the landscape to potential roosting and foraging sites. In addition, the quarry may provide a potential location for bat autumn swarming activity. The lack of illumination currently present within these vegetated areas of the Site increases the suitability of the Site to support commuting, foraging and roosting bats.

BADGER

3.3.9. Records of badgers are not routinely provided by SxBRC and as such these records were not obtained. The majority of the Site is suboptimal for badgers, no evidence of badgers was recorded during the field survey. However, the Site features areas of dense scrub, notably atop the cliff face surrounding the Site in Areas C and D, and areas of woodland on elevated embankments in Area B. These areas of habitat are subject to a low level of direct disturbance due to their location. In addition, there are avenues of connectivity between suitable sett creation habitats (e.g. arable field margins and woodland areas) within the wider landscape and the Site. Badgers are a widespread species as such there is potential for this species to be present within the Site.

HAZEL DORMOUSE

3.3.10. No records of dormouse were present within 2km of the Site. Suitable habitats to support hazel dormouse comprise the woodland to the north and south of Area B and the dense scrub atop the cliff face surrounding the Site. These areas of woodland and scrub are subject to a low level of human disturbance with shrub species that providesuitable foraging for hazel dormouse within these habitat areas.

3.3.11. Habitat connectivity is an important factor in maintaining stable populations of hazel dormouse. The suitable woodland and dense scrub habitats atop the cliff faces are connected to suitable dormouse habitat in the wider landscape through arable field hedgerows and the vegetated verges of the A283 to the south of the Site. As such, there is potential for this species to be present within the Site, but the distribution will be limited to the habitats outlined above.

OTHER MAMMALS

3.3.12. A total of 32 records of hedgehog *Erinaceus europaeus* were returned within 2km of the Site during the desk study. There were further mammal records returned within 2km of the Site including eight records of brown hare *Lepus europaeus*, four rabbit *Oryctolagus cuniculus*, one water vole *Arvicola amphibius* and four polecat *Mustela putorius*.

3.3.13. The densely vegetated boundaries surrounding the Site atop the cliff faces in Areas B, C and D, and the woodland sections in Area B, are considered suitable to support nesting, commuting and foraging hedgehog. The majority of the Site at lower elevations in Areas A, B, C and D is unsuitable as it is exposed and relativity unvegetated.

3.3.14. In recent years otter have returned to West Sussex after the poor water quality resulted in local extinction during the 1960s (SxBRC). Over the last 20 years signs of otter have appeared in most of the Sussex river catchments including the Adur. No records of otter were returned from the 2km Study Area. While the western boundary of Area A runs adjacent to the river Adur, no suitable couch creation habitat for otters is present within Area A. In addition, the boundary of the Site which runs adjacent to the river is also the location of a Public Right of Way which is in regular use. It is considered unlikely that otters are present within the Site or that otter would be affected by any Potential Development. This species is not considered further here.

3.3.15. The habitat within the Site is not suitable to support water vole, as no watercourses were present within the Site boundary. While the River Adur runs alongside Area A, habitat within Area A is considered to provide unsuitable terrestrial habitat for water vole. Therefore this species is not considered further here.

3.3.16. No other notable mammals' species were recorded within 2km of the Site during the desk study, and the Site is not considered to support suitable habitat for other protected or notable mammal species.

BIRDS

3.3.17. A total of 65 species of birds were recorded within the last 10 years within 2km of the Site. Of the species recorded:

- 14 are listed under Schedule 1 of the Wildlife and Countryside Act 1981, as amended (barn owl *Tyto alba*, black-tailed godwit *Limosa limosa*, Cetti's warbler *Cettia cetti*, crossbill *Loxia curvirostra*, firecrest *Regulus ignicapilla*, great northern diver *Gavia immer*, hobby *Falco*

subbuteo, kingfisher *Alcedo atthis*, merlin *Falco columbarius*, osprey *Pandion haliaetus*, quail *Coturnix coturnix*, red crossbill *Loxia curvirostra,* red kite *Milvus milvus* and ruff *Calidris pugnax*);

- 23 are listed as Species of Principal Importance (SPI) under Section 41 of the Natural Environment Communities Act 2006; and
- 65 are listed as a 'red' or 'amber' bird species of conservation concern as a result of declining populations.

3.3.18. Woodland and dense scrub habitat atop the cliffs in Areas B, C and D identified within the Site, as well as the scattered scrub and trees throughout the Site, are suitable to nesting for common and wide-spread species. Of note, a woodcock was recorded within scatted butterfly-bush scrub within Area C after it was flushed by surveyors during the UKHab survey.

3.3.19. In addition, the cliff faces, and the post-industrial structure of the cement works provides nesting opportunities for a number of more charismatic species, notably peregrine and black redstarts respectively. Both of these species are listed on Schedule 1 of the WCA. No recent records for these species were returned from the desk study records, but a single black redstart record was returned from within the Site dating from 1997. A peregrine falcon was recorded flying close to the cliff faces within Area D during the field survey and a presumed nesting location was recorded a cliff face in Area D (TN9). It is considered highly likely that the Site is being used by nesting birds, including those listed on schedule 1 of the WCA.

REPTILES

3.3.20. Common and widespread reptiles were recorded within 2km of the Site during the last 10 years. This included recorded seven records of slow worm *Anguis fragilis*, two records of grass snake *Natrix helvetica*, one record of adder *Vipera berus* and four records of common lizard *Zootoca vivipara*.

3.3.21. Habitat across the Site provided suitable, basking, shelter and foraging opportunities for common and widespread reptiles, but are somewhat limited in their potential to support reptiles due to their isolation within the wider landscape context (where the Site sits at a lower elevation than the surrounding suitable habitats). The habitats within the Site are not considered suitable for rare reptile species (Smooth snake *Coronella austriaca* and sand lizard *Lacerta agilis)*.

3.3.22. In particular, the OMH habitat within Area C provides suitability for a range of reptile behaviours due to its mix of habitat structure and potential rich invertebrate foraging resource. In addition, the vegetated margins of scrub in Areas C and D, and woodland in Area B are also suitable for reptiles. Area D is considered to be suboptimal due to its highly exposed nature, with minimal vegetation cover. The presence of reptiles within the Site will be affected by the differential shading across the Site throughout the day and across the seasons as a result of the surrounding cliff face. It is considered likely that the Site supports populations of common and widespread reptiles.

AMPHIBIANS

3.3.23. One record of smooth newt *Lissotriton vulgaris* and one record of a GCN were returned within 2km of the Site within the last 10 years. The record for GCN was dated from 2020 and was located approximately 1.6km north-west of the Site.

3.3.24. A single permanent waterbody was identified within the Site, TN1, an ornamental concrete-lined pond within a patch of grassland at the entrance of the Site in Area B. Vegetation was present in this pond and it provided a suitable habitat for breading amphibian species. In addition, various areas of

water which were assumed to be ephemeral were recorded within Area C (TN4, TN5, TN6,TN7). Some of these ephemeral pools had been formed through the recent excavations while others appeared to be more established. These habitat features provide suitability for breeding amphibian species.

3.3.25. Terrestrial habitat for amphibians is also present within the Site, notably the OMH within Area C as well as areas of dense scrub in Areas B, C and D, and woodland areas in Area B. In relation to GCN, though suitable breeding habitat is present within the Site, these are isolated from potential GCN populations in waterbodies identified within the wider landscape (see Figure 4). The River Adur and the A283 form potential barriers to the Site from the west and the step cliff face to the north, east and south may also provide barriers to movement to breading habitats within the Site. Despite this, the potential for an isolated population of GCN to be present within the Site cannot be discounted. As habitats within the Site continue to establish, the extent of suitable breeding and terrestrial habitat for amphibians may increase depending on management.

TERRESTRIAL INVERTEBRATES.

3.3.26. A total of 111 species of terrestrial invertebrates were recorded within 2km of the Site during the desk study in the last 10 years. Notable invertebrates recorded include hornet robberfly *Asilus crabroniformis* and 49 *Lepidotera* species which are all listed as SPI under Section 41 of the NERC Act 2006.

3.3.27. In addition to the species recorded during the desk study, the Site is situated in the South Downs Invertebrate Important Area (IIA) (Buglife, 2021). At present, only broad level IIAs have been defined based on areas known to support nationally significant invertebrate assemblages or single globally, European or nationally endangered species and therefore a detailed profile on the qualifying species and habitats is currently unavailable for the South Downs IIA. However, it is possible that the Site may support habitats suitable for the qualifying species of the South Downs IIA.

3.3.28. OMH is known to be a habitat which supports a wide diversity of invertebrate including notable species. The habitat is relatively extensive in Area C. Due to the Site location within the IIA and the extent of highly suitable OMH HPI, it is considered that the presence of notable invertebrates within the Site is highly probable.

PLANTS

3.3.29. Three notable plant species listed under Schedule 8 of the Wildlife and Countryside Act 1981, as amended, were returned during the desk study including bluebell *Hyacinthoides non-scripta*, meadow clary *Salvia pratensis* and lizard orchard *Himantoglossum hircinum*.

3.3.30. No notable plant species were recorded within the Site during the UKHab survey, as identification was limited due to access constraints regarding accessing habitat close to the cliff faces and the seasonal constraints of the survey. It is possible notable plant species may be present within the Site, particularly those associated with chalk grassland communities such as meadow clay and lizard orchard.

INVASIVE NON-NATIVE SPECIES

3.3.31. Invasive non-native species (INNS) listed on Schedule 9 of the Wildlife and Countryside Act 1981, as amended and recorded within 2km of the Site during the desk study include American mink *Neovision vision,* bar-headed goose *Answer indicus*, barnacle goose *Branta leucopsis*, Canada

goose *Branta canadensis*, Egyptian goose *Alopochen aegyptiaca*, European pond terrapin *Emys orbicularis*, lesser Canada goose *Branta canadensis parvipes*, Mandarin duck *Aix galericulata* as well as 10 flora INNS including giant hogweed *Heracleum mantegazzianum*, *Cotoneaster* species and Japanese Knotweed *Fallopia japonica*.

3.3.32. Two Schedule 9 INNS were recorded within the Site during the UKHab survey, including wall cotoneaster (TN2, TN3), and New Zealand pigmy weed (TN1). Identification of other INNS within the Site was limited due to the seasonal constraint of the survey. Identification of the full extent of INNS within the Site is beyond the scope of this survey.

4 DISCUSSION AND RECOMMENDATIONS

4.1 OVERVIEW

4.1.1. This section considers the potential for effects on designated sites, legally protected species, notable species, and notable habitats as a consequence of future development. Where further surveys or detailed assessment of potential effects are required in order to design suitable mitigation this is identified.

4.1.2. At this stage of the AAP development, full details of any future development have not been set out and as such consideration of impacts to protected sites, habitats and species will be somewhat generalised. The discussion and recommendations presented here assume all habitats present within the Site will be impacted.

4.2 STATUTORY DESIGNATED SITES

4.2.1. The Habitats Regulations provide strict protection to sites of European and/or international importance. This includes requiring projects or plans to be screened for likely significant effects upon SPA, SAC and candidate SACs (cSACs). Guidance also requires potential SPAs (pSPAs) and Ramsar sites be subject to the same assessment. No designated sites of international importance were present within the 10km Study Area of the Site. In addition, the SDNPA Local Plan HRA has previously screened out the 'Strategic Site Policy SD56: Shoreham Cement Works' in relation to its HRA implications, due to the distance of the Site from the international sites identified within this Local Plan HRA, as there were no impact pathways present.

4.2.2. However, it is understood that a Habitats Regulations Screening exercise for the AAP is ongoing, which is considering in particular the potential likely significant effects resulting from water neutrality on the Arun Valley SAC, SPA and Ramsar site (16.8km away from the Site), following consultation with Natural England. As the Site falls within the Sussex North Water Resource Zone, which is essential for maintaining the qualifying features of the Arun Valley SAC, SPA and Ramsar, it is likely that future development proposed for the Site must be screened for likely significant effects upon designated sites of international importance.

4.2.3. Two SSSI's were present within 2km of the Site, Adur Estuary SSSI and Beeding Hill to Newtimber Hill SSSI. SSSIs are subject to strict protection under the Wildlife and Countryside Act 1981 (as amended). This requires landowners to maintain these sites in favourable condition and works within these sites are managed by the appropriate national statutory body via the consent process. Certain operations within SSSIs require consent; these are specific to each SSSI.

4.2.4. Beeding Hill to Newtimber Hill abuts the Site's northern boundary. It is possible that potential development of the Site may directly impact on the nature conservation value of Beeding Hill to Newtimber Hill SSSI through construction phase impacts of dust and air pollution, and operational impacts of increased recreational pressures (depending on the type of development proposed for the Site).

4.2.5. In addition, any Potential Development may result in an indirect impact on the Adur Estuary SSSI through run-off pollution from construction activities in Area A, connected to the Adur Estuary SSSI through the hydrological pathway of the Adur river.

4.2.6. The Site is also within SSSI Impact Risk Zones and as such, consideration is advised based on the type of development proposed through planning applications to ensure impacts to any SSSI are minimised.

4.2.7. To comply with local planning policy Strategic Policy SD9: Biodiversity and Geodiversity in the SDNPA Local Plan, where a development is likely to have a significant effect on SSSIs then an Environmental Impact Assessment (EIA) will be required to access these impacts.

4.2.8. The Site is within 2km of one LNR, Mill Hill LNR situated 1.25km southeast of the Site. LNRs are national statutory sites designated under the National Parks and Access to Countryside Act 1949, and as such are a material consideration in local planning policy including Strategic Policy SD9: Biodiversity and Geodiversity in the SDNPA Local Plan, as detailed in Appendix A.

4.2.9. Increased recreation pressure as a result of the Potential Development may indirectly affect the nature conservation value of this LNR, but no further detrimental effects are expected on this LNR for the following reasons.

- It is not expected that any Potential Development will require land take within LNRs.
- Any Potential Development will be separated from the LNRs by a minimum distance of 1.25km, with no hydrological pathways, and therefore (depending on the scale and type of development) any dust, air or run-off pollution associated with the construction phase will be unlikely to impact these sites.

4.2.10. To comply with local planning policy Strategic Policy SD9: Biodiversity and Geodiversity in the SDNPA Local Plan, where a development is likely to have a significant effect on LNR then an Ecological Impact Assessment (EcIA) will be required to access these impacts.

4.2.11. The potential development of the Site is explicitly detailed in the SDNPA Local Plan 'Strategic Site Policy SD56: Shoreham Cement Works'. Development within the Site will have to comply with this policy and all other relevant policies as fully detailed in Appendix A. Furthermore, this report aims to provide the required ecological baseline to inform Potential Development strategies to be outlined within the AAP, with specific constraints, opportunities and recommendations relating to specific Areas of the Site set out in Appendix E. It is recommended that the further surveys set out in Table 4-2 below are also completed in advance of future development to inform design and appropriate mitigation.

4.2.12. As well as the requirements for further assessments detailed above, it is anticipated that any Potential Development will incorporate measures to remove or minimise impacts to statutory designated sites. This should include, but are not limited to, the identification and use of buffer zones during the construction process and a water and drainage management plan to manage water flows off the Site accounting for the presence of the River Adur running along the eastern boundary of Area A. Any water and drainage management should incorporate Sustainable Drainage Systems (SuDS) with their design in compliance with Development Management Policy SD50: Sustainable Drainage Systems in the SDNPA Local Plan.

4.3 NON-STATUTORY DESIGNATED SITES

4.3.1. The Site also falls within 2km of six non-statutory LWS and three LGS, with the Shoreham Cement Works itself also listed as an LGS. LWS and LGS are a material consideration in national and local planning policy including Strategic Policy SD9: Biodiversity and Geodiversity in the SDNPA Local Plan, as detailed in Appendix A.

4.3.2. Potential development of the Site may directly impact on the geological interest of the Shoreham Cement Works, Beeding LGS anddevelopment options will need to consider how the geological interest of the site can be conserved.

4.3.3. Increased recreational pressure as a result of the Potential Development may indirectly affect the nature and geological conservation value of all other identified LWS and LGS within 2km of the Site. In addition, Old Errington Farm Valley & Road Cutting and River Adur Meadows LWS are directly adjacent to the Site, with potential hydrological pathways, and therefore any dust, air or run-off pollution associated with the construction phase may to affect these sites.

4.3.4. It is considered unlikely that the Potential Development will further detrimentally affect the nature and geological conservation value of LWS and LGS outside of the Site, but within 2km of the Site, for the following reasons.

- Any Potential Development will not require land take within LWSs or LGS outside of the Site boundary.
- Any Potential Development will be separated from the LWSs and LGS by a minimum distance of 0.1km, with no hydrological pathways, and therefore any dust, air or run-off pollution associated with the construction phase will be unlikely to impact these sites.

4.3.5. To comply with local planning policy Strategic Policy SD9: Biodiversity and Geodiversity in the SDNPA Local Plan, where a development is likely to have a significant effect on LWS or LGS then EcIA will be required to access these impacts.

4.3.6. Section of designated road verge (DRV) have been identified directly adjacent to Site. Alteration to traffic flow adjacent to these road verges as a consequence of the any Proposed Development may impact on the designated value of this site.

4.3.7. As well as the requirements for further assessments detailed above, it is anticipated that any Potential Development will incorporate measures to remove or minimise impacts to non-statutory designated sites, notably the Shoreham Cement Works, Beeding LGS and Old Errington Farm Valley & Road Cutting and River Adur Meadows LWS. This should include measures to ensure the protection of the valuable geological features during any potential development within the Site and measure to minimised potential pollution impact on directly adjacent LWS.

4.4 HABITATS

4.4.1. Protected and notable habitats were identified within the Site including HPI habitat identified in accordance with Section 41 of the NERC Act 2006. In addition, habitats have been identified with potential to develop into protected and notable habitat depending on the future management of the Site. HPI within the Site includes the following.

- OMH has been identified within Area C. In addition, habitats currently of low ecological importance have been identified to have the potential to develop into OMH, this includes the large areas of currently bare ground within Area D;
- Small areas of lowland deciduous woodland to the north and south of Area B.
- Fragments of calcareous grassland across the Site in Areas B, C and D.

4.4.2. An additional botanical survey assessment of HPI habitat should be completed during the botanical survey period, to assess their quality and conditions.

4.4.3. Under Section 40 the NERC Act 2006, every public body (including planning authorities) must, 'in exercising its functions, have regard so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'. From a local perspective any proposed development should endeavour to protect and enhance important ecological habitats in accordance with Strategic Policy SD9: Biodiversity and Geodiversity in the SDNPA Local Plan.

4.4.4. HPI habitats within the Site should be retained as part of any Potential Development and should be protected during any construction activities with appropriate buffer distance being identified and adhered to. Where possible, enhancement of these habitats should be considered. Where retention of these habitats is not possible due to the requirement of any Potential Development then recreation of these habitats is recommended and should incorporated within any landscape design. The required quantity and quality of these re-created habitats to be established within the Site should be informed by a full Biodiversity Net Gain Assessment (detailed within Section 4.6), to comply with local and national planning policy.

4.4.5. In addition, it is understood that the Site falls outside of, but directly adjacent to, the South Downs Way Ahead Nature Improvement Area (NIA), a network of chalk grassland habitats within the South Downs National Park targeted for protection, restoration and enhancement. The parcels of chalk grassland HPI surrounding the Site are considered to form part of the South Downs Way Ahead NIA.

4.4.6. It is understood that development activities would be restricted to the Site, however construction activities associated with any proposed development may result in temporary detrimental impacts of dust and air pollution on HPI within proximity to the Site, notably the chalk grassland directly adjacent to site. To ensure compliance with local and national planning policy, good practice construction methods will need to be incorporated into the construction phase of any Potential Development.

4.5 PROTECTED AND NOTABLE SPECIES

4.5.1. The results of the desk study, UKHab survey and protected species assessment highlighted the potential presence of several protected species or species of conservation concern within the Site, or within the immediate surroundings of the Site. These include bats, badger, hazel dormouse, hedgehog, breeding birds, common amphibians (including great crested newt), reptiles and terrestrial invertebrates. The legal protection afforded to these species is outlined below and, where appropriate, the requirement for further survey and/ or mitigation measures is identified.

BATS

4.5.2. All species of bats recorded within the UK are protected from killing, injury and disturbance[9] and their roosts protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the Wildlife and Countryside Act 1981 (as amended) with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these. Activities that

[9] Disturbance is defined within the Habitats Regulations as that which is likely to impair a species ability to survive, breed or reproduce, hibernate or migrate or to significantly affect the local distribution or abundance of the species.

would otherwise constitute an offence under this legislation may be licensed by Natural England for certain purposes.

4.5.3. Certain species of bats, including the Bechstein's bat *Myotis bechsteinii*, noctule bat, brown long eared bat and soprano pipistrelle bat are also listed as Species of Principal Importance (SPI) for the conservation of biodiversity in England in accordance with Section 41 of the NERC 2006. Section 40 obliges public bodies (including local planning authorities) to have regard for the conservation of biodiversity (including SPI) when discharging their duties (including determining planning applications).

4.5.4. Demolition of buildings or structures within the Site to facilitate any Potential Development has the potential to result in the damage or destruction of a bat roost, and the killing or injury of roosting bats should they be present within the Site. This risk is also present in relation to potential work on the cliff faces within the Site. In addition, works which impact habitats within the Site may result in fragmentation and disturbance of foraging habitat.

4.5.5. A full assessment of the Site is required to identify other potential ways the Site may be being used by bats. Any new or temporary lighting also has the potential to disturb bats from using retained areas of habitat, includingretained roosting features in buildings or cliff face or retained foraging habitat. Recommendations for further survey of the Site with regards to roosting, commuting and foraging bats, in line with good practice guidance, are provided in Table 4-1. Recommendations for sensitive lighting regimes, to ensure compliance with legislation regarding disturbance of bats, are provided in Section 4.6.

BADGER

4.5.6. The Protection of Badgers Act 1992 makes it illegal to wilfully kill, injure or take any badger, or attempt to do so. It also makes it an offence to intentionally or recklessly damage, destroy or obstruct access to any part of a badger sett. Activities that would otherwise constitute an offence under this legislation may be licensed by Natural England for certain purposes.

4.5.7. No evidence of badgers was identified within the Site. However, a full inspection of the Site was limited due to access constraints. Given that badgers are a widespread species, and that suitable habitat is present within the Site, recommendations for further survey of badger within the Site and adjacent accessible areas have been provided in Table 4-1 below. Additional recommendations for good practice construction methods to ensure protection for commuting and foraging badgers are provided in Section 4.6.

HAZEL DORMICE

4.5.8. Hazel dormice are protected from killing, injury and disturbance[10] and their places of rest or shelter (occupied habitat) protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the Wildlife and Countryside Act 1981 (as amended) with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these.

[10] Disturbance is defined within the Habitats Regulations as that which is likely to impair a species ability to survive, breed or reproduce, hibernate or migrate or to significantly affect the local distribution or abundance of the species.

Activities that would otherwise constitute an offence under this legislation may be licensed by Natural England for certain purposes.

4.5.9. Hazel dormice are also listed as SPI in accordance with Section 41 of the NERC Act 2006. Public bodies have an obligation under Section 40 to have regard for these species when carrying out their functions.

4.5.10. The Site supports suitable nesting and foraging habitat for hazel dormouse. However, this is limited to the woodland areas and scrub vegetation atop the cliff faces. Vegetation clearance of suitable habitat may therefore result in the damage or destruction of nests, and the killing or injury of hazel dormouse, if present. Permanent removal of this habitat may also result in the fragmentation of suitable hazel dormouse habitat across the wider landscape. Suitable habitat should be retained in full as part of any proposed development. Where this cannot be assured, recommendations for further survey, to determine the presence or likely absence of hazel dormouse within the Site, are provided in Table 4-1 below.

BIRDS

4.5.11. The Habitat Regulations 2017 Part 1 Regulation 10(2) & (3) state that local authorities 'must take such steps in the exercise of their functions as they consider appropriate to contribute to…the preservation, maintenance and re-establishment of a sufficient diversity and area of habitat for wild birds in the UK including by means of the upkeep, management and creation of such habitat…'. The legislation continues to state that economic and recreation requirements must be taken into consideration in considering which measures are appropriate.

4.5.12. Under the Wildlife and Countryside Act 1981 (as amended) all wild birds are protected from killing and injury, and their nests and eggs protected from taking, damage and destruction whilst in use. Additional protection is extended to species listed under Schedule 1 of the Act, meaning it is also an offence to disturb these species at or near the nest, or whilst they have dependent young.

4.5.13. Vegetation clearance of trees, scrub and shrubs to facilitate any Potential Development may result in the damage or destruction of active bird nests. Recommendations for sensitively timed vegetation clearance are provided in Section 4.6, to ensure compliance with legislation regarding breeding birds.

4.5.14. In addition, demolition of the decommissioned cement works structures and any alteration to the cliff faces my result in the destruction and disturbance of birds listed on Schedule 1 of the WCA. This is true for black redstarts in relation to the cement works structures and peregrine falcon in relation to both the cement works structures and the cliff face. The presence of peregrine falcon within the Site was confirmed during the field survey. Further survey, to determine the presence or likely absence, and usage of the Site by these species is therefore recommended as set out in Table 4-1, to ensure compliance with legislation regarding Schedule 1 listed birds.

REPTILES

4.5.15. Native widespread reptile species (common or viviparous lizard, adder, grass snake and slow worm) are partially protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This includes protection from killing and injury.

4.5.16. All reptile species are also listed as SPI in accordance with Section 41 of the NERC Act 2006. Public bodies have an obligation under Section 40 to have regard for these species when carrying out their functions.

4.5.17. The Site supports suitable habitat for reptiles, including the OMH, dense scrub, patches of grassland and woodland edges. In addition, reptiles have been recorded in close proximity to the Site during the desk study. Therefore, habitat alteration in these areas has the potential to result in the killing or injury of reptiles, if present. Recommendations for further survey, to identify the presence or likely absence of a reptile population on Site, have therefore been provided in Table 4-1 below, to ensure compliance with legislation and planning policy regarding reptiles.

AMPHIBIANS

4.5.18. Great crested newts are protected from killing, injury and disturbance[11] and their places of rest or shelter (occupied habitat) protected from damage or destruction under the Habitats Regulations. Protection is also afforded under the Wildlife and Countryside Act 1981 (as amended) with respect to disturbance of individuals occupying places of rest or shelter and obstruction of access to these. Activities that would otherwise constitute an offence under this legislation may be licensed by Natural England for certain purposes.

4.5.19. Great crested newts and common toad *Bufo bufo* are also listed as SPI in accordance with Section 41 of the NERC Act 2006. Public bodies have an obligation under Section 40 to have regard for these species when carrying out their functions.

4.5.20. The presence of great crested newts within the Site is considered unlikely, however the potential for an isolated population to persist within the Site has been discussed above. It is therefore recommended that eDNA survey of waterbodies within the Site (TN1), other ephemeral waterbodies (TN4, TN5, TN6, TN7) and waterbodies within 500m and with connectivity to the Site is undertaken to identify the presence or likely absence of great created newts within or surrounding the Site

INVERTEBRATES

4.5.21. Many invertebrates identified during the desk study with the potential to be present on Site are listed as SPI in accordance with Section 41 of the NERC Act 2006. Public bodies have an obligation under Section 40 to have regard for these species when carrying out their functions.

4.5.22. OMH is typically associated with a diversity of invertebrate species, many of which are protected. To identify the potential presence of protected a notable invertebrate species within the Site, further invertebrate surveys are recommended.

4.6 FURTHER ASSESSMENT

4.6.1. It is understood that a Habitats Regulations Screening exercise is currently ongoing for the AAP. It is recommended that any potential future development is also screening for likely significant effects on designated sites, with particular consideration to the effects of water neutrality.

4.6.2. Potential ecological constraints for which further surveys are required to ensure legal and planning policy compliance are listed in Table 4.1.

[11] Disturbance is defined within the Habitats Regulations as that which is likely to impair a species ability to survive, breed or reproduce, hibernate or migrate or to significantly affect the local distribution or abundance of the species.

BIODIVERSITY NET GAIN

4.6.3. In addition to further surveys for protected species, it is also recommended that a Biodiversity Net Gain (BNG) assessment is undertaken on proposed future development within the Site. An assessment of the baseline habitat present within the Site has been commissioned as part of the current works and is detailed in Appendix D. The below information is included to provide the context to any subsequent BNG assessments for any Potential Development.

4.6.4. BNG is the end result of a process applied to development so that overall, there is a positive outcome for biodiversity. The BNG assessment applies the mitigation hierarchy by avoiding, mitigating, and as a last resort, compensating for any impacts of the proposed development scenarios on biodiversity.

4.6.5. The Environment Act 2021 mandates BNG for development in England, ensuring that the delivery of much needed infrastructure and housing is not at the expense of vital biodiversity.

4.6.6. In addition, the updated NPPF (2021) made clear the expectations for development to achieve biodiversity net gain, including references to net gains in biodiversity in the following sections:

- *'Planning policies and decisions should contribute to and enhance the natural and local environment by…(d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures'* (paragraph 174);
- *'To protect and enhance biodiversity and geodiversity, plans should:…(b) promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity'* (paragraph 179); and
- *'when determining planning applications, local planning authorities should apply the following principles: (a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused.'* (paragraph 180).

Table 4-1 - Key Ecological Constraints and Further Survey Requirements

Ecological Receptor	Potential Constraints	Further Survey Requirements	Seasonal Constraints
Habitats	Destruction and damage of HPI habitat within the Site	Phase 2 botanical surveys of HPI habitats within the Site, including OMH and lowland calcareous grassland. In addition, cliff faces should also be assessed for the botanical communities.	These surveys should be undertaken during the botanical survey period, April-September (inclusive). To provide a full and comprehensive understanding the habitats present and the botanical diversity they support, a consistent and replicable survey approach should be undertaken at intervals throughout this survey period.
Bats	Demolition, damage or alterations of building or cliff faces within the Site may result in the damage/destruction of a bat roost, and the killing or injury of bats, if present. Clearance or alteration of habitats may result in the loss or fragmentation of foraging habitat for bats using the Site.	**Roosting bats** Further assessment of buildings, structures, and cliff face within the Site. Due to the scale of the buildings, structures and cliff face which may require additional surveys in relation to roosting bats, bespoke survey methodology may need to be devised. **Bat activity within the Site** A bat activity survey should be undertaken to determine the use of the Site by bats. This would comprise the monthly deployment of static monitoring devices within areas of suitable habitat for five nights per month, to identify the bat assemblage across the Site.	**Roosting bats** Survey to identify the use of buildings, structures and cliff faces for roosting bats should be undertaken during the active season for bats (May to September). **Bat activity** Bat activity surveys are undertaken at monthly intervals within the active season for bats (May to September), extended into April and October where possible to capture hibernation emergence and swarming activity where present. These survey timings are in accordance with best practice guidance (Collins, 2016).
Badger	Site clearance and construction activities may result in the damage or	A badger survey should be undertaken to identify any evidence of badger activity across the Site. This survey would comprise a walkover of the	Whilst badger surveys can be conducted at any time of year, the periods February – April and September – November inclusive are considered to be optimal due

Ecological Receptor	Potential Constraints	Further Survey Requirements	Seasonal Constraints
	destruction of setts, should they be present within the areas of dense scrub vegetation or wooded embankments within or directly adjacent to the Site.	Site to search for setts and other evidence of badgers (e.g. latrines, footprints, mammal runs). Where possible, the survey area should be extended to include accessible areas of suitable habitat within 30m of the Site.	to increased badger activity and reduced vegetation cover during this time. A survey outside of the summer season would be required for this Site, given the extent of summer vegetation growth.
Hazel dormouse	Vegetation clearance of the dense scrub and woodland areas within the Site may result in the damage or destruction of nests, and the killing or injury of hazel dormouse, if present.	If habitat with the potential to support dormouse are to be disturbed or destroyed, then further surveys are required to determine the presence or likely absence of hazel dormouse from the Site. The survey would comprise the deployment of hazel dormouse nest tubes within areas of suitable habitat across the Site and a wider area (e.g. the adjacent allotments) where access allows. Nest tubes would be deployed in the spring and checked monthly or every two months for the presence or evidence of hazel dormouse. Nest tubes would be removed from the Site upon completion of the final survey in the autumn.	To ensure a robust survey effort in line with good practice guidance (Natural England, 2015 and English Nature, 2006), it is recommended that nest tubes are deployed in April and then checked monthly or every two months before collection in September.
Reptiles	Vegetation clearance of the dense scrub and grassland habitats within the Site may result in the killing or injury of reptiles, if present.	Further survey is required to determine the presence or likely absence of reptiles within the Site. The survey would comprise the deployment of artificial reptile refugia (metal corrugated tins or felt mats) in areas of suitable habitat across the Site, which would then be left *in situ* and checked on seven subsequent visits during appropriate weather conditions at a set time of day to maximise the probability of recording reptiles.	To ensure a robust survey effort in line with good practice guidance (Froglife, 1999), it is recommended that the reptile survey is undertaken between April and June inclusive, or during September in appropriate weather conditions.

Ecological Receptor	Potential Constraints	Further Survey Requirements	Seasonal Constraints
Breeding birds including peregrines and black redstarts	Loss or damage to vegetated areas, post-industrial structure and cliff faces within the Site could result in the destruction of bird nests, and the loss of suitable habitat for species of high conservation concern.	**Breeding Birds (general)** A breeding bird survey of the Site should be undertaken to determine the species assemblage present and to therefore inform further design and mitigation measures. The breeding bird survey would comprise a walked transect of the Site, repeated five times across the breeding bird season. At least one of the survey visits should include a crepuscular element (i.e. a dusk survey starting one hour before sunset and continuing for up to two hours afterwards), in order to capture potential barn owl activity across the Site. **Peregrine falcon and black redstart** Targeted survey for these species should be incorporated into the breeding bird survey detailed above and should conform to best practice guidance	The breeding bird surveys and surveys for specific target species should be conducted at regular intervals between late-March and mid-June.
Amphibians	Loss of waterbodies or areas of woodland, scrub and hedgerows may result in the killing or injury of great crested newt, and the loss of suitable habitat if present within the Site.	Further survey is required to determine if great crested newt is present within onsite or nearby aquatic habitat, and is therefore likely present within suitable terrestrial habitat on Site. Habitat suitability index (HSI) assessments should be undertaken for waterbodies (including ditches and ponds) within the Site and for ponds within 500m of the Site, to identify waterbodies with the potential to support great crested newt. This involves a survey visit of the waterbodies to collect contextual data which is used to inform	HSI surveys can be conducted at any time of year. eDNA surveys must be conducted between 15th April and 30th June in order to be considered valid by Natural England, if required to inform further mitigation (Biggs *et al*., 2014). If great crested newt are confirmed to be present, population estimate surveys may be required to inform any subsequent mitigation. If required, population estimate surveys should be undertaken over the course of six survey visits between March and June

Ecological Receptor	Potential Constraints	Further Survey Requirements	Seasonal Constraints
		the HSI calculation in accordance with standard methodology (ARG UK, 2010). Where suitable waterbodies are identified, these should be subject to a presence/likely absence survey using the environmental DNA (eDNA) technique. This involves the collection of water samples from each suitable waterbody, which are sent for laboratory analysis to detect the presence of great crested newt DNA. HSI and eDNA surveys can typically be conducted on the same survey visit.	inclusive, with at least three visits between mid-April and mid-May.
Invertebrates	Loss or damage of habitat within the Site, notably OMH, could result in the loss of notable species within the Site	Methodologies for the survey of invertebrates are numerous and dependant on the specific invertebrate community and species being targeted.	The timings and duration of survey are dependent on the specific invertebrate community and species being targeted.

4.7 PRELIMINARY AVOIDANCE, MITIGATION AND COMPENSATION MEASURES

4.7.1. To enable compliance with relevant legislation and planning policy, as described above within Section 4.1, 4.2 and 4.3 the following avoidance, mitigation and compensation measures should be designed into any proposed development. These will be refined following completion of further survey recommended in Table 4-1 above.

Table 4-2 - Avoidance, mitigation and compensation measures

Ecological receptor	Likely effects	Recommendations
Beeding Hill to Newtimber Hill SSSI (in close proximity to the Site) Adur Estuary SSSI (with potential hydrological pathway to the Site) South Downs National Park Non-statutory site (within and in close proximity to the Site) HPI Habitat within the Site HPI within close proximity to the Site	Construction of any proposed development within the Site may detrimentally affect the nature conservation value of HPI habitat within the Site. Construction activities within the Site may detrimentally affect the nature conservation value of the protected sites and HPI within close proximity to the Site through water, dust and air pollution.	HPI habitat within the Site should be retained and protected from damage during construction activities. Appropriate buffer zones should be established and maintained. If retention is not possible then re-creation of the HPI habitat should be included within the landscaping plan for any Potential Development. A BNG assessment should be used to inform the quantity and quality of the habitat to be re-creation should be informed by a BNG assessment. A water and drainage plan should be created for the Site to ensure wastewater flowing off the Site does not negatively impact on the river Adur, and subsequently flow into the Adur Estuary SSSI. This drainage plan should incorporate the principles of SuDS to provide environmental benefits as part of this essential infrastructure. It is recommended that good practice construction measures are adhered to throughout the construction phase. Such measures should ensure the following as outlined by the Environment Agency (2019) and the Construction Industry Research and Information Association (CIRIA, 2015): Measures must be taken to prevent dust and other emissions from construction affecting retained habitat within and beyond the Site (e.g. use of Heras fencing with dust sheeting, regular dampening of the works area).

Ecological receptor	Likely effects	Recommendations
		Chemicals and fuels should be stored in secure containers away from retained habitats within the Site. Spill kits must be available within the Site. Retained trees must be protected in accordance with BS5837. Noise and vibration must be controlled and kept to the minimum.
Commuting and Foraging Bats	Though not specifically considered during this report, any new temporary or permanent lighting may conflict with the status of the South Downs National Park as a Dark Sky Reserve, given the Site location within this designated site. Additionally, new temporary or permanent lighting may deter bats from using retained commuting or foraging habitat within or directly adjacent to the Site.	As the Site is currently unlit, any additional temporary or permanent lighting should be avoided wherever possible. Where this cannot be avoided, it is recommended that a sensitive lighting strategy is used to minimise any impacts to the nearby South Downs National Park and retained commuting and foraging habitat for bats. Any sensitive lighting strategy should be designed in adherence to best practice guidance with regards to bats (ILP, 2018) and with reference to the South Downs Dark Skies Technical Advice Note (South Downs National Park Authority, 2021). In particular: Any required lighting should adhere to the general lighting principles set out in Section 2 and industrial principles in Section 6.3.4 of the Technical Advice Note (South Downs National Park Authority, 2021). Wherever possible, consider the use of IDA 'Dark Sky Friendly Lighting' or similar luminaires as shown in Section 11 of the Technical Advice Note (South Downs National Park Authority, 2021). Installation of temporary or permanent lighting should be avoided wherever possible along retained or newly planted areas of vegetation, including retained off-Site boundary vegetation features.

Ecological receptor	Likely effects	Recommendations
		Where lighting cannot be avoided, light spill should be minimised using hoods, louvres, or other design features. Narrow spectrum light sources are used where possible to lower the range of bat species affected by lighting. Specifically, light sources should use warm, neutral colour temperatures below 2700k. Light sources which emit ultraviolet light are used to avoid attracting night-flying insects (which in turn may attract bats to the light). Additional recommendations with regards to roosting bats may be required following the recommended further roosting bat and bat activity surveys.
Bats Badger Hazel dormouse Amphibians Reptiles Hedgehog	Habitat clearance and construction activities have the potential to result in the killing or injury of protected and notable species which may be present within the Site.	It is recommended that habitats with suitability to support protected and notable species retained and where possible and incorporated into any Potential Development. Any structure to be built within the Site should not detrimentally impact on the usage of the cliff faces by roosing bats. Specific criteria required to ensure this impact is minimised will be informed by additional survey work. It is recommended that clearance of habitat suitable for protected and notable species be kept to a minimum to facilitate any Potential Development. Where habitat clearance is unavoidable, it is recommended that a Precautionary Method of Works (PMoW) is produced to minimise the risk of harm to protected and notable species. The PMoW is likely to include the following measures: Timing of habitat clearance to take place in September/October, to avoid the reptile/amphibian hibernation season and to avoid

Ecological receptor	Likely effects	Recommendations
		conflicts with the breeding bird season (detailed below). Vegetation clearance to be completed with hand tools instead of plant. Vegetation clearance to adhere to two-stage cut to enable any animals present to disperse naturally from the Site. Under this method, vegetation is initially cut to 300mm above ground level, left overnight and then cut to ground level on the following day. Any existing log, brash or rubble piles requiring removal should be dismantled by hand. Avoid leaving open trenches or excavations overnight into which animals could fall. If this is not possible, a means of egress should be provided (e.g. a plank). Additional mitigation measures, such as species translocation or works carried out under a Natural England licence, may be required following the results of the recommended further surveys for bats, badger, hazel dormouse, amphibians and reptiles.
Breeding birds	Habitat clearance or alteration during the breeding bird season (typically March to August inclusive) has the potential to result in the damage or destruction of active bird nests, if present.	As with the above ecological receptors, it is recommended that habitat destruction is kept to the minimum necessary to facilitate the any Potential Development. and that structures used by nesting birds, including cliff faces and derelict industry buildings be retained where possible and incorporated into any proposed development. Any structure to be built within the Site should not detrimentally impact on the usage of the cliff faces by nesting birds, specifically peregrine falcon. Specific criteria required to ensure this impact is minimised will be informed by additional survey work. It is recommended that any necessary vegetation clearance demolition works or works

Ecological receptor	Likely effects	Recommendations
		associated with the cliff faces are completed between September and February inclusive. Where conducting these works during the breeding bird season are unavoidable, it is recommended that works be undertaken under the supervision of an ecologist. Where bird nests are identified, these should be left in situ with an appropriate buffer or stand-off distance until the young have fledged the nest.
INNS	Vegetation clearance and habitat destruction has the potential to result in the spread of INNS plant species.	it is recommended that a Biosecurity Management Plan (BMP) is prepared to ensure an offence under the WCA is not committed. The plan should include: A detailed description of potential INNS presents within the Site and their location. An obligation of biosecurity measures required to be taken by contractors working within the Site e.g. cleaning of equipment and clothing. A detailed avenue of disposal for cleared INNS vegetation material.

4.8 ECOLOGY AND ENVIRONMENTAL STRATEGY

4.8.1. Any Potential Development within the Site may be completed in a phased manner over an extended period of time. To provide consistency in guidance for all contributors to develop within the Site it is recommended that an Ecology and Environmental Strategy is devised. This strategy would include the recommendations outlined above as well as more refined and specific guidance resultant from the additional survey findings and the chosen developmental scenario.

4.9 ECOLOGICAL ENHANCEMENT OPPORTUNITIES

4.9.1. The National Planning Policy Framework (NPPF) (2019) states an environmental objective '*to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy*.'

4.9.2. Strategic Policy SD9: Biodiversity and Geodiversity in the SDNPA Local Plan outline the polies for the protection and enhancement of biodiversity (Appendix A).

4.9.3. To encourage compliance with these planning policies, the following measures are recommended for inclusion within the Proposed Development; where possible:

- The Site could be the location of significant areas of habitat creation. Habitat creation should be appropriate to the condition of the Site and support the functioning of habitats already present within the Site or in the immediate landscape. The design, creation, management and monitoring of these habitats should detailed in a Landscape Management Plan or similar document.
- Establish new waterbodies within the Site, with the aim of improving waterbody networks within the Site and the wider landscape. Waterbodies should be naturally designed and incorporate native aquatic plants and bank side vegetation. These waterbodies will provide additional habitat for amphibian and invertebrates within the Site.
- Landscaping proposals should include areas of open grassland with sporadic shrub planting, to increase the suitability of the Site for basking reptiles whilst also providing shelter and foraging opportunities. Open grassy areas would also be of benefit to invertebrates previously recorded in the wider area. The shrub planting should include native fruit and berry-bearing species (e.g. hazel, holly, hawthorn and blackthorn), again, providing foraging opportunities for local birds and small mammals including dormouse.
- Bird boxes and bat boxes should be installed on retained mature trees within the Site, to provide additional bat roosting and bird nesting. In addition, opportunities for bat roosting and bird nesting could be incorporated into the design of structures to be built as part of any Potential Development. Where bat boxes are provided, these should be installed a minimum of 4m above the ground (to prevent predation) and on southerly, south-westerly or south-easterly aspects to ensure optimal temperature conditions. Bird boxes should be installed at a minimum of 4m on a northerly aspect.
- The Site is enhanced for terrestrial invertebrates. This can be achieved through the retention of brash and logs from any necessary vegetation clearance, to create deadwood piles. Additionally, invertebrate hotels could be purchased or constructed, and their location incorporated into the landscape plans to ensure optimal location for use by invertebrates and reduce the potential for vandalization.
- Green walls and biodiverse roofs could be incorporated into the design of the new structures as part of any Potential Development. This would enhance the biodiversity value of the proposed development providing additional habitat for invertebrates, including pollinators.
- Landscaping and management of any landscaping should incorporate good horticultural practice including the use of peat-free composts, mulches and soil conditioners, including native plants with local provenance and avoidance of the use of invasive species listed on Schedule 9 of the WCA.

4.9.4. Ecological enhancement opportunities considered by Site Area (e.g. Area A, Area B) are presented as part of the constraints and opportunities exercise in Appendix E.

5 CONCLUSIONS

5.1.1. The Site is located within the South Downs National Park, and adjacent to Beeding Hill to Newtimber Hill SSSI. Any development scenario or Potential Development will need to consider potential impacts to these designations.

5.1.2. HPI habitats have been identified within the Site, as well as habitat with the potential to develop into HPI. These include OMH, woodland and lowland chalk grassland. It is recommended that these habitats are retained, enhanced and potentially created further within the Site. In addition, habitats within the Site provide a potentially unique resource in relation to the extent of habitats of high ecological value currently present and potential future extent and value. Any Potential Development will need to consider these habitats and their incorporation and management within any development proposal.

5.1.3. Habitats within the site are suitable for a range of protected and notable species. These habitats are suitable to support roosting and foraging bats, badger, hazel dormouse, hedgehog, breeding birds (including peregrine falcon and black redstart), amphibians (including great crested newt), reptiles and terrestrial invertebrates. Further survey has been recommended for bats, badger, hazel dormouse, breeding birds, great crested newts, reptiles and invertebrates. Where habitat clearance is likely to be unavoidable, initial recommendations have been made for anticipated precautionary working methods and sensitively timed works, which (subsequent to the results of surveys) would be required.

5.1.4. Appendix D details the baseline BNG assessment. A theoretical constraints and opportunity exercise has been undertaken which aimed at identifying ways of maximising the ecological potential of the Site (see Appendix E). The opportunities identified may result in benefit to the protected and notable species and habitats within the Site as well as benefits to the community and local economy.

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7 FIGURES

Figure 1- Site Location Plan

Figure 2 - National Statutory Designated Site within 2km of the Site

Figure 3 – Habitats of Principal Importance and Ancient Woodland within 2km of the Site

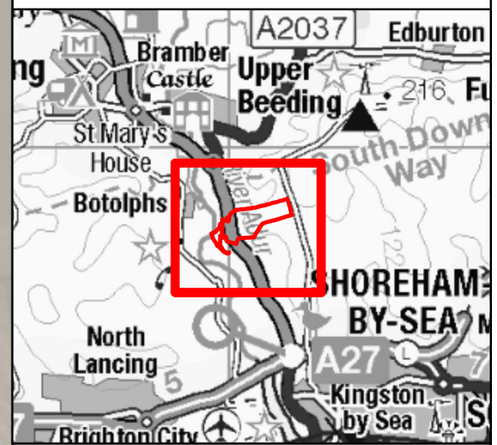
Figure 4 – Waterbodies within 500m of the Site

Figure 5 – Habitat Survey

Figure 6 - Constraints and Opportunities Plan

Key

Shoreham Cement Works



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Project: Shoreham Cement Works

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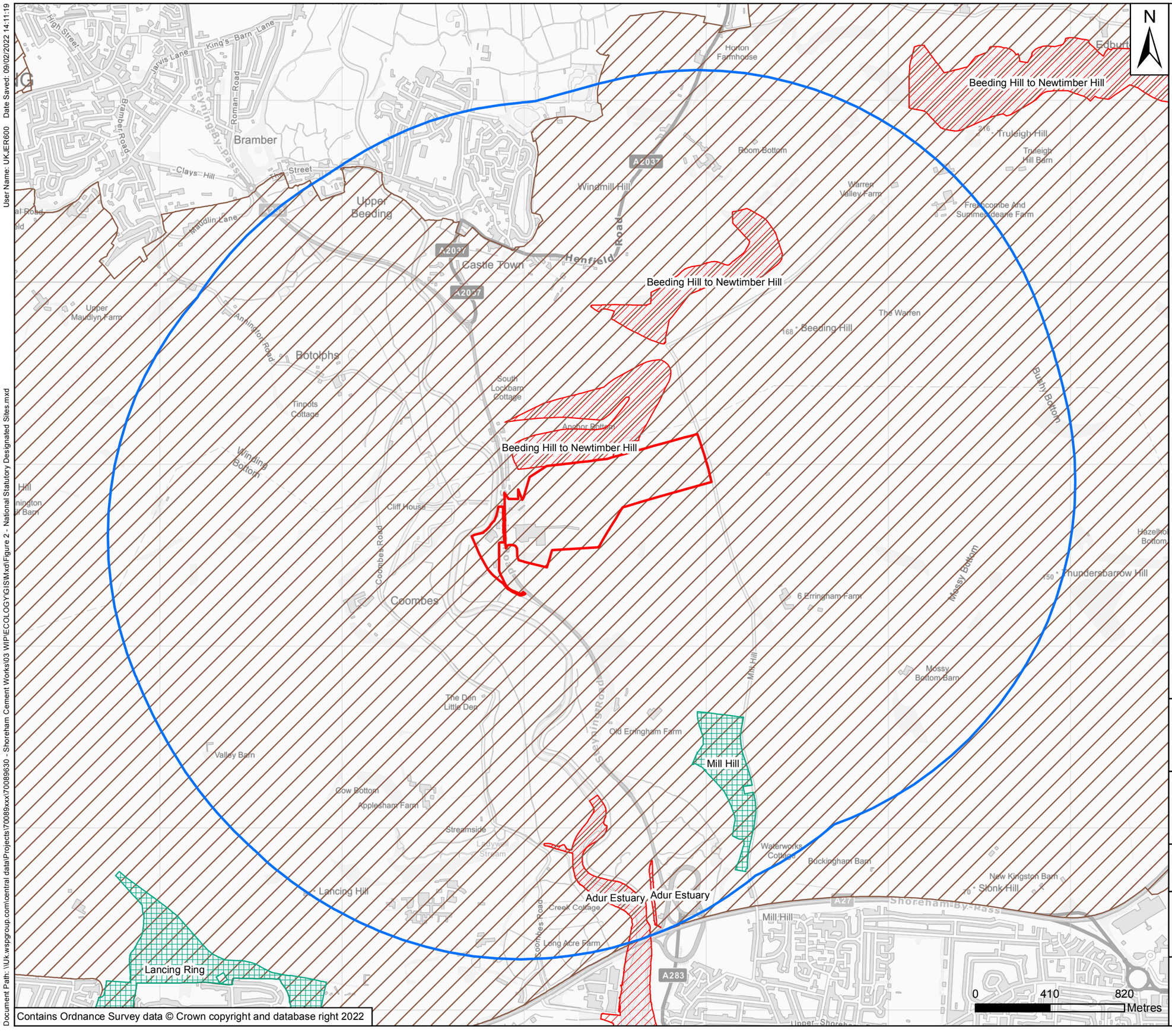

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Project: Shoreham Cement Works

Title: National Statutory Designated Sites within 2km of the Site

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Approved: OP

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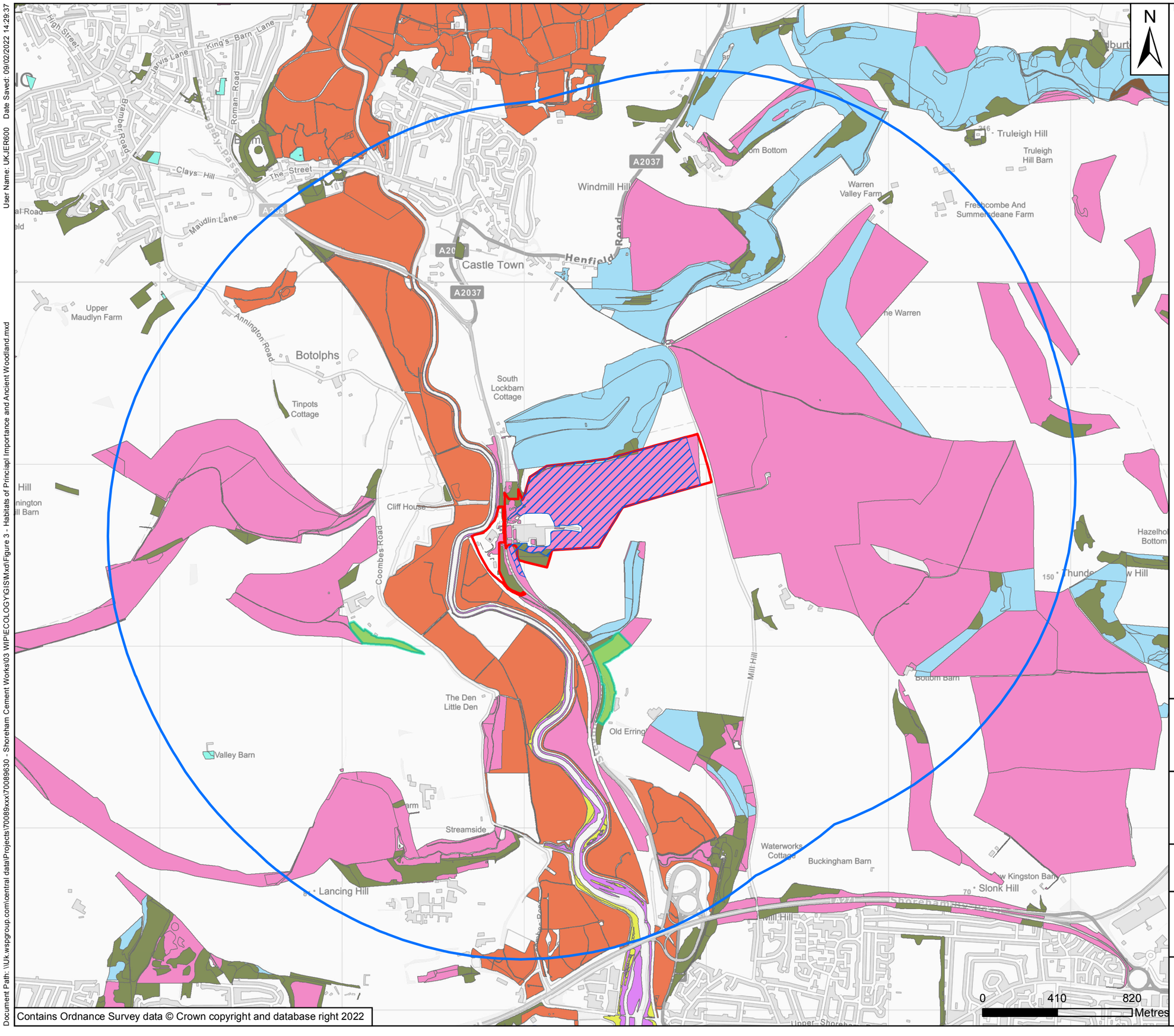

Key

- Shoreham Cement Works
- 2km Buffer
- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Deciduous woodland
- Good quality semi-improved grassland
- Lowland calcareous grassland
- Lowland meadows
- Mudflats
- Traditional orchard
- Open Mosaic Habitat © Natural England
- Ancient Woodland Inventory (Eng)

wsp

Client: South Downs National Park Authority

Project: Shoreham Cement Works

Title: Habitats of Principal Importance and Ancient Woodland within 2km of the Site

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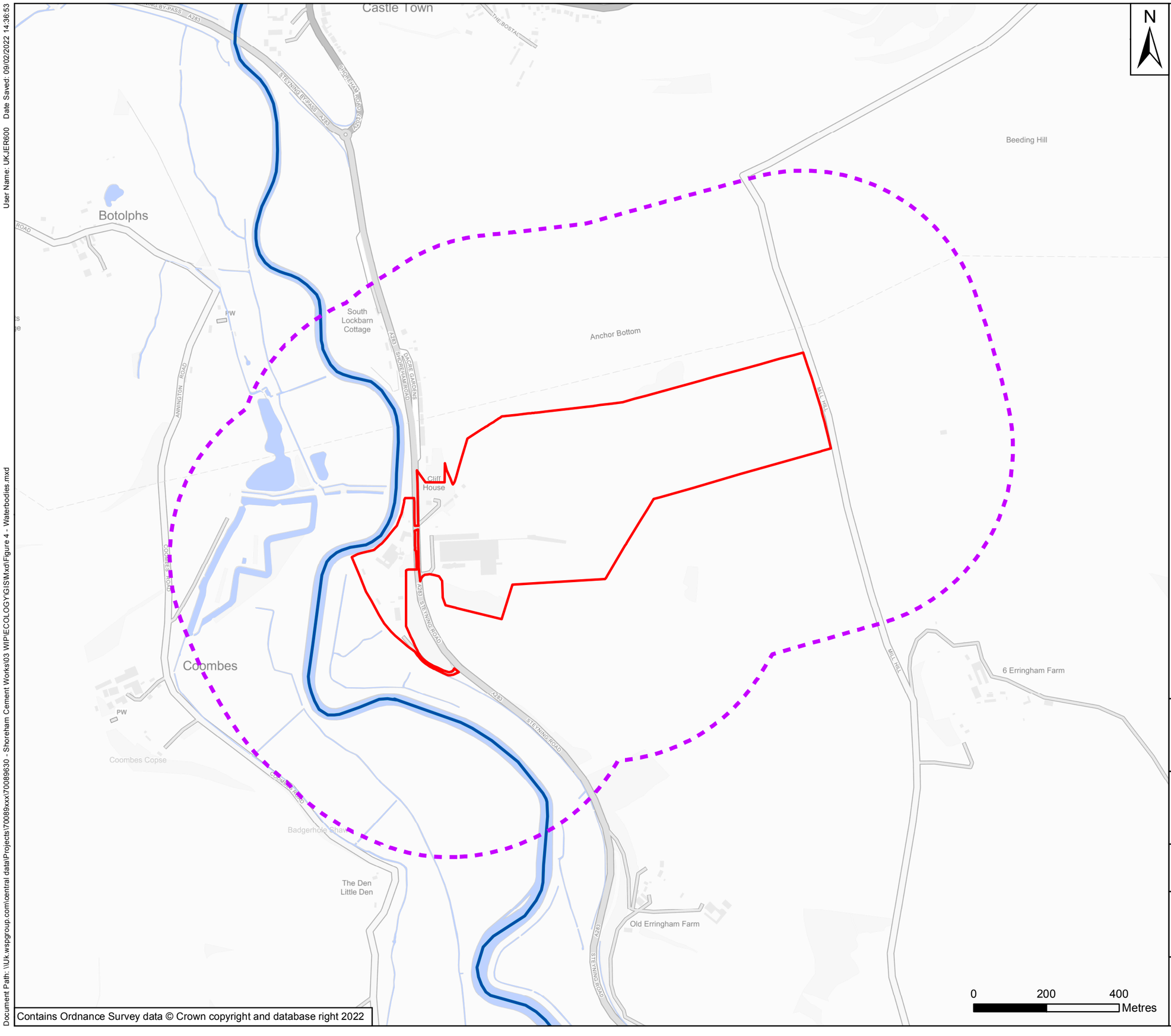
Document Path: \\Uk.wspgroup.com\central data\Projects\70089xxx\70089630 - Shoreham Cement Works\03 WIP\ECOLOGY\GIS\Mxd\Figure 4 - Waterbodies.mxd



N

Key

- Shoreham Cement Works
- 500m Buffer
- Statutory Main Rivers (Eng) (<250k)
- Water

0 200 400 Metres

wsp

Client: South Downs National Park Authority

Project: Shoreham Cement Works

Title: Waterbodies within 2km of the Site

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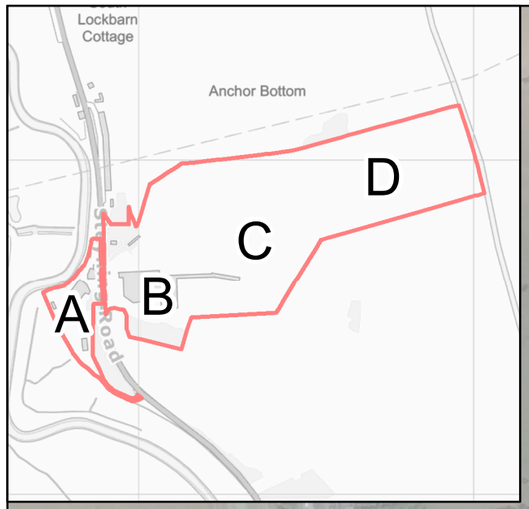

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Key

Shoreham Cement Works

UKHAB Classification

- g2 - calcareous grassland
- g2a - lowland calcareous grassland
- g4 - modified grassland
- h3d - dense scrub, bramble
- h3h - dense scrub, mixed
- s1 - inland rock
- u1 - built-up areas and gardens
- u1a - open mosaic habitats on previously developed land
- u1b5 - buildings
- u1b6 - other developed land
- u1c - artificial unvegetated unsealed surface
- u1d - suburban mosaic of developed/natural surfaces
- w1g - other woodland, broadleaved
- w1g6 - line of trees
- w1h - other woodland, mixed
- Target Note

0 90 180 Metres

Client: South Downs National Park Authority

Project: Shoreham Cement Works

Title: UKHab Survey Map

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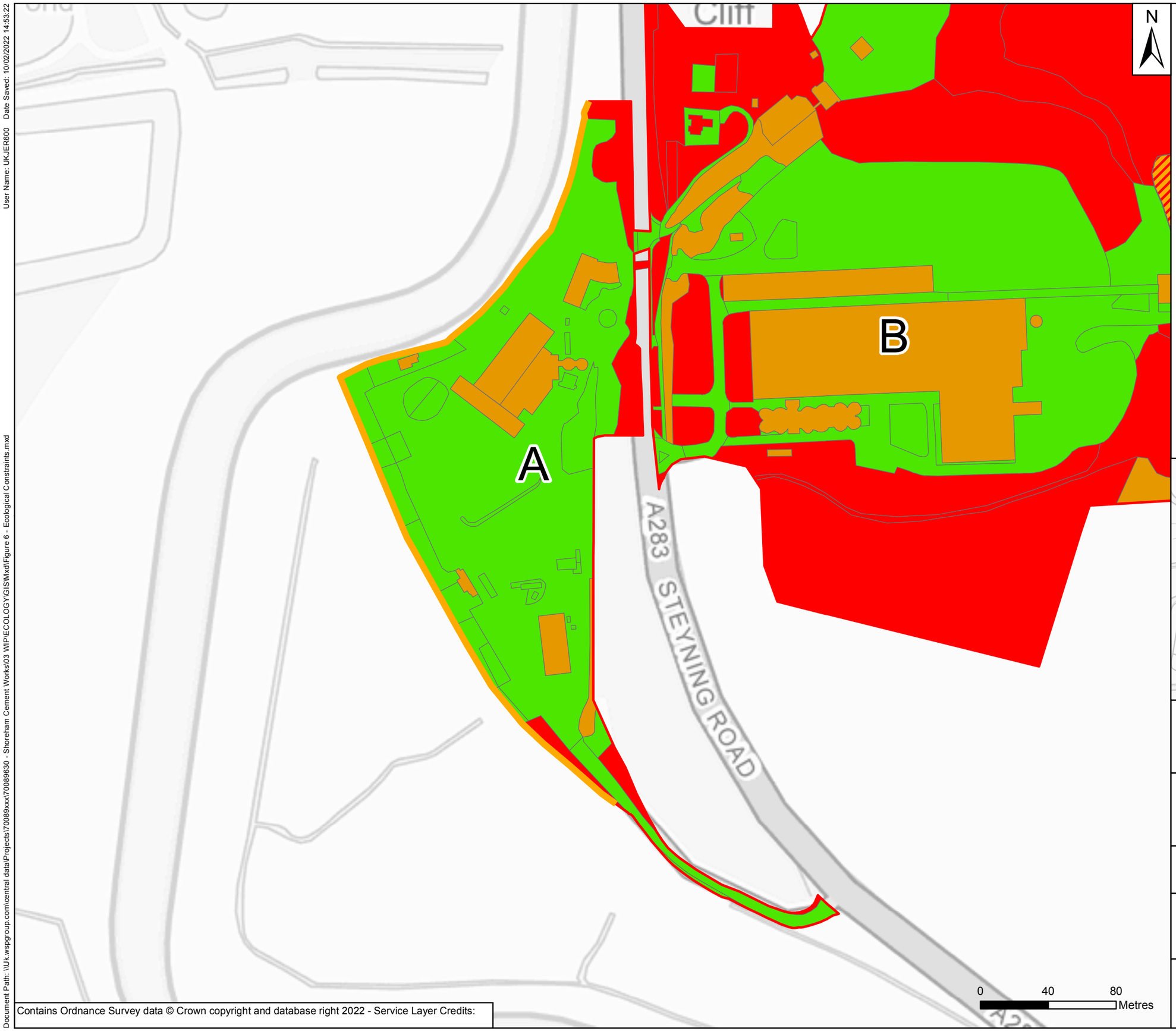
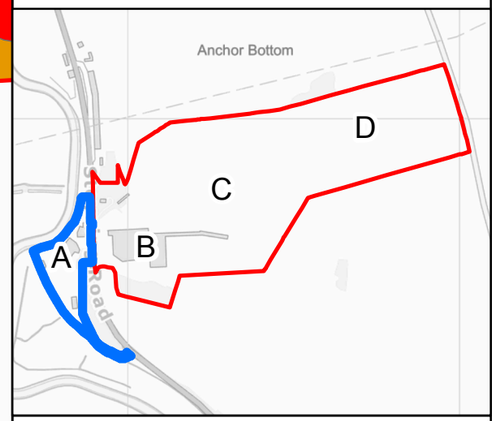


Key

Shoreham Cement Works

Ecological Constrints

- Habitat Recommended for Retention/Enhancement as a Priority
- Habitat to be Retained/Enhanced Where Possible
- Habitat to be Retained/Enhanced Where Possible and with Opportunities for Habitat Creation
- Low Quality Habitat of Limited Value and Suitability



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Project: Shoreham Cement Works

Title: Ecological Constraints Map
Page 1 of 4

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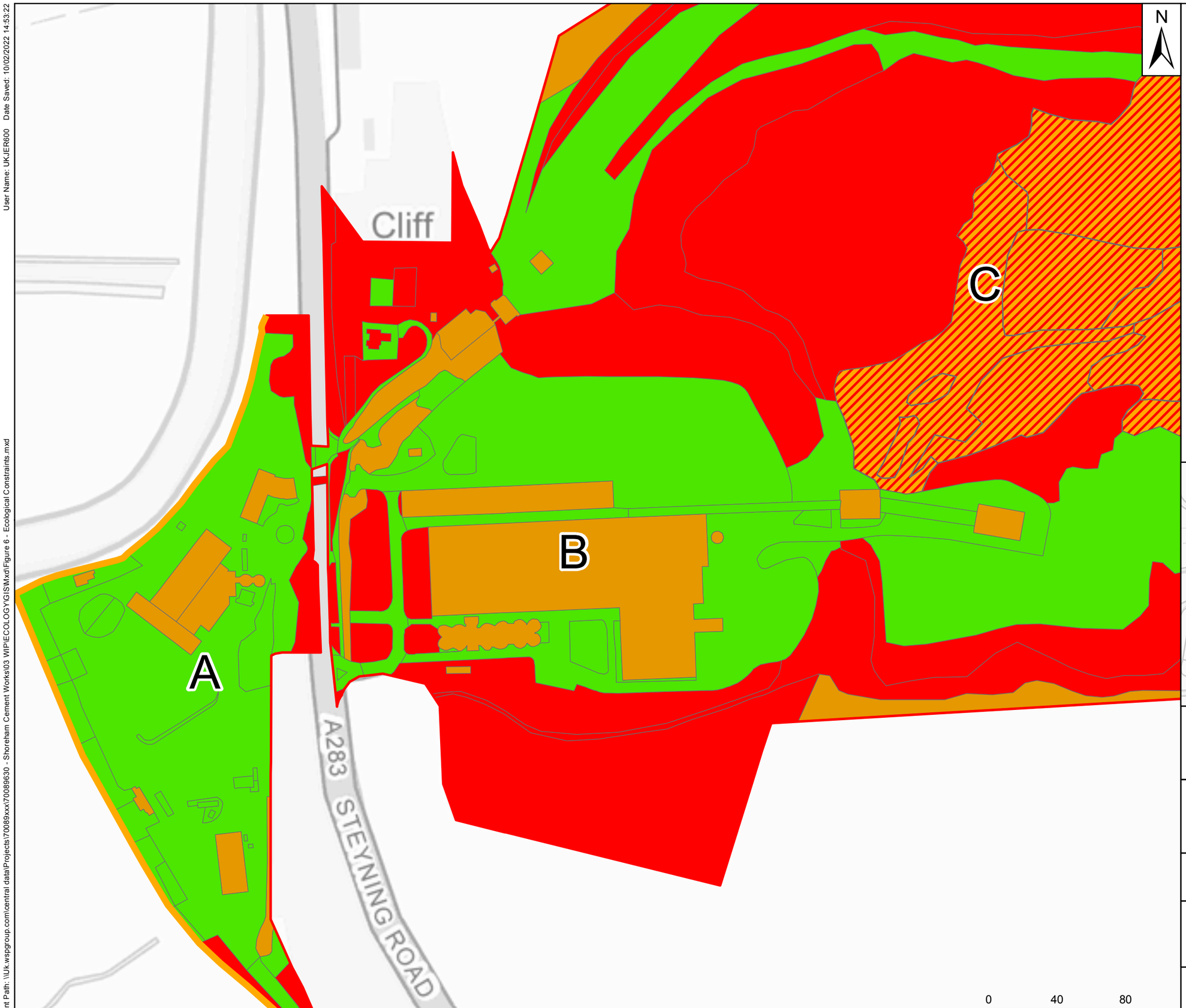

Key

Shoreham Cement Works

Ecological Constrints

- Habitat Recommended for Retention/Enhancement as a Priority
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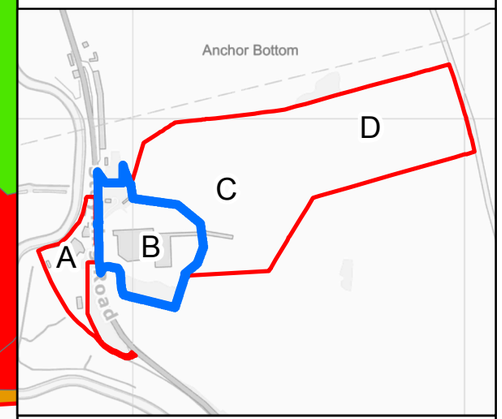
- Low Quality Habitat of Limited Value and Suitability



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Project: Shoreham Cement Works

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Page 2 of 4

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Key

Shoreham Cement Works

Ecological Constrints

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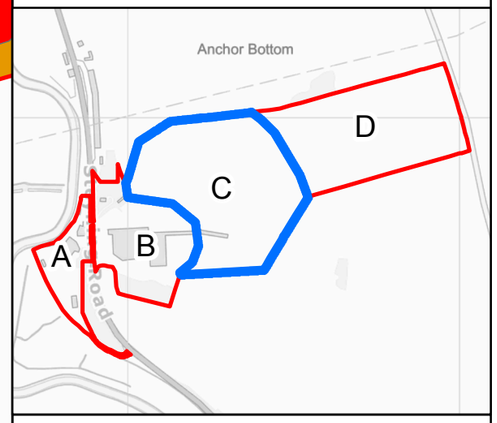

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South Downs National Park Authority

Project:

Shoreham Cement Works

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Ecological Constraints Map
Page 3 of 4

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0 40 80 Metres

Anchor Bottom

MILL HILL

D

N

Key

Shoreham Cement Works

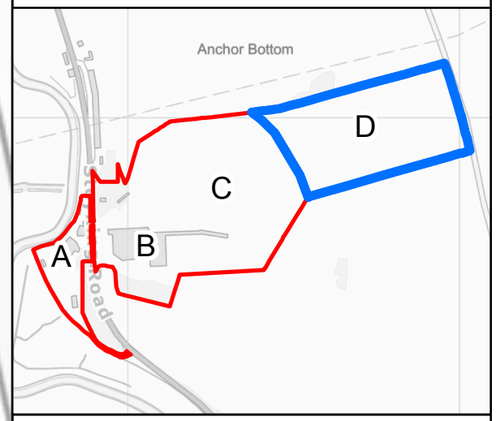
Ecological Constrints

Habitat Recommended for Retention/Enhancement as a Priority

Habitat to be Retained/Enhanced Where Possible

Habitat to be Retained/Enhanced Where Possible and with Opportunities for Habitat Creation

Low Quality Habitat of Limited Value and Suitability



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Project: Shoreham Cement Works

Title: Ecological Constraints Map
Page 4 of 4

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Appendix A

RELEVANT LEGISLATION AND POLICY

Local Planning Policy

SOUTH DOWNS NATIONAL PARK LOCAL PLAN (SDNPA 2019)

The following Polies of the South Downs Location Plan are relevant for this assessment

Core Policy SD2: Ecosystem Services

1. *Development proposals will be permitted where they have an overall positive impact on the ability of the natural environment to contribute goods and services. This will be achieved through the use of high quality design, and by delivering all opportunities to:*
   a) *Sustainably manage land and water environments;*
   b) *Protect and provide more, better and joined up natural habitats;*
   c) *Conserve water resources and improve water quality;*
   d) *Manage and mitigate the risk of flooding;*
   e) *Improve the National Park's resilience to, and mitigation of, climate change;*
   f) *Increase the ability to store carbon through new planting or other means;*
   g) *Conserve and enhance soils;*
   h) *Support the sustainable production and use of food, forestry and raw materials;*
   i) *Reduce levels of pollution;*
   j) *Improve opportunities for peoples' health and wellbeing; and*
   k) *Provide opportunities for access to the natural and cultural resources which contribute to the special qualities.*
2. *Development proposals must be supported by a statement that sets out how the development proposal impacts, both positively and negatively, on ecosystem services.*

Strategic Policy SD4: Landscape Character

1. *Development proposals will only be permitted where they conserve and enhance landscape character by demonstrating that:*
   a) *They are informed by landscape character, reflecting the context and type of landscape in which the development is located;*
   b) *The design, layout and scale of proposals conserve and enhance existing landscape and seascape character features which contribute to the distinctive character, pattern and evolution of the landscape;*
   c) *They will safeguard the experiential and amenity qualities of the landscape; and*
   d) *Where planting is considered appropriate, it is consistent with local character, enhances biodiversity, contributes to the delivery of GI and uses native species, unless there are appropriate and justified reasons to select non-native species.*
2. *Where development proposals are within designed landscapes, or the setting of designed landscapes, (including historic parkscapes and those on the Historic England Register of Historic Parks and Gardens) they should be based on a demonstrable understanding of the design principles of the landscape and should be complementary to it.*
3. *The settlement pattern and individual identity of settlements and the integrity of predominantly open and undeveloped land between settlements will not be undermined.*
4. *Green and blue corridors will be safeguarded. Development proposals should identify and take opportunities to create and connect green and blue corridors.*
5. *The restoration of landscapes where features have been lost or degraded will be supported where it contributes positively to landscape character*

Strategic Policy SD5: Design

1. *Development proposals will only be permitted where they adopt a landscape led approach and respect the local character, through sensitive and high quality design that makes a positive contribution to the overall character and appearance of the area. The following design principles should be adopted as appropriate:*
   a) *Integrate with, respect and sympathetically complement the landscape character by ensuring development proposals are demonstrably informed by an assessment of the landscape context;*
   b) *Achieve effective and high quality routes for people and wildlife, taking opportunities to connect GI;*
   c) *Contribute to local distinctiveness and sense of place through its relationship to adjoining buildings, spaces and landscape features, including historic settlement pattern;*
   d) *Create high-quality, clearly defined public and private spaces within the public realm;*
   e) *Incorporate hard and soft landscape treatment which takes opportunities to connect to the wider landscape, enhances GI, and is consistent with local character;*
   f) *Utilise architectural design which is appropriate and sympathetic to its setting in terms of height, massing, density, roof form, materials, night and day visibility, elevational and, where relevant, vernacular detailing;*
   g) *Provide high quality, secure, accessible, and where possible, integrated storage for general and recycling waste, heating fuel, and transport related equipment;*
   h) *Provide high quality outdoor amenity space appropriate to the needs of its occupiers or users;*
   i) *Ensure development proposals are durable, sustainable and adaptable over time, and provide sufficient internal space to meet the needs of a range of users;*
   j) *Give regard to improving safety and perceptions of safety, and be inclusive and accessible for all; and*
   k) *Have regard to avoiding harmful impact upon, or from, any surrounding uses and amenities.*

Strategic Policy SD9: Biodiversity and Geodiversity

1) *Development proposals will be permitted where they conserve and enhance biodiversity and geodiversity, giving particular regard to ecological networks and areas with high potential for priority habitat restoration or creation. Prior to determination, up-to-date ecological information should be provided which demonstrates that development proposals:*
   a) *Retain, protect and enhance features of biodiversity and geological interest (including supporting habitat and commuting routes through the site and taking due account of any use by migratory species) and ensure appropriate and long-term management of those features;*
   b) *Identify and incorporate opportunities for net gains in biodiversity;*
   c) *Contribute to the restoration and enhancement of existing habitats, the creation of wildlife habitats and the creation of linkages between sites to create and enhance local and regional ecological networks;*
   d) *Protect and support recovery of rare, notable and priority species;*
   e) *Seek to eradicate or control any invasive non-native species present on site;*
   f) *Contribute to the protection, management and enhancement of biodiversity and geodiversity, for example by supporting the delivery of GI and Biodiversity Action Plan targets and enhance Biodiversity Opportunity Areas (BOA); and*
   g) *Comply with the mitigation hierarchy as set out in national policy.*
2) *The following hierarchy of site designation will apply in the consideration of development proposals:*

a) *Internationally Protected Sites, as shown on the Policies Map (SPAs, SACs and Ramsar Sites, or candidate and formally proposed versions of these designations):*
   i) *Development proposals with the potential to impact on one or more international sites(s) will be subject to a HRA to determine the potential for likely significant effects. Where likely significant effects may occur, development proposals will be subject to Appropriate Assessment*
   ii) *Development proposals that will result in any adverse effect on the integrity of any international site will be refused unless it can be demonstrated that: there are no alternatives to the proposal; there are imperative reasons of overriding public interest why the proposal should nonetheless proceed; and adequate compensatory provision is secured.*
b) *Nationally Protected Sites SSSI, NNRs, MCZ as shown on the Policies Map:*
   i) *Development proposals considered likely to have a significant effect on nationally protected sites will be required to assess the impact by means of an EIA*
   ii) *Development proposals should avoid impacts on these nationally protected sites. Development proposals where any adverse effect on the site's notified special interest features is likely and which cannot be either avoided or adequately mitigated will be refused, unless the benefits of the development, at this site clearly outweigh the likely impact to the notified features of the site and any broader impacts on the network of nationally protected sites*
c) *Irreplaceable Habitats (including ancient woodland as shown on the Policies Map, and veteran trees): Development proposals which result in the loss or deterioration of irreplaceable habitats, including ancient woodland and veteran trees will be refused unless there are wholly exceptional reasons and a suitable compensation strategy exists*
d) *Locally Protected Sites (Sites of Nature Conservation Importance (SNCI)/Local Wildlife Sites (LWS)/Sites of Importance for Nature Conservation (SINC), Local Nature Reserves (LNR and Local Geodiversity Sites (LGS)) as shown on the Policies Map:*
   i) *Development proposals considered likely to have a significant effect on local sites will be required to assess the impact by means of an Ecological Impact Assessment (EcIA)*
   ii) *Development proposals that will result in any adverse effect on the integrity of any local site which cannot be either avoided or adequately mitigated will be refused, unless exceptional circumstances outweighing the adverse effects are clearly demonstrated*
e) *Outside of designated sites*
   i) *Development proposals should identify and incorporate opportunities to conserve, restore and recreate priority habitats and ecological networks. Development proposals should take opportunities to contribute and deliver on the aims and objectives of the relevant biodiversity strategies where possible.*

Policy SD11: Trees, Woodland and Hedgerows

1. *Development proposals will be permitted where they conserve and enhance trees, hedgerows and woodlands.*
2. *Development proposals that affect trees, hedgerows and woodland must demonstrate that they have been informed by a full site survey, including an Ecological Survey, Arboricultural Method Statement and associated Tree Protection Plan, and include a management plan.*
3. *The removal of protected trees, groups of trees woodland or hedgerows will only be permitted in exceptional circumstances and in accordance with the relevant legislation, policy and good practice recommendations. Where protected trees are subject to felling, a replacement of an appropriate number, species and size in an appropriate location will be required.*

4. *Development proposals must provide adequate protection zones and buffers around hedgerows and other woodland and trees to prevent damage to root systems and taking account of future growth. A minimum buffer of 15 metres will be required between the development and ancient woodland or veteran trees.*
5. *A proposed loss or damage of non-protected trees, woodland or hedgerows should be avoided, and if demonstrated as being unavoidable, appropriate replacement or compensation will be required.*
6. *Development proposals must demonstrate that appropriate protection measures are in place prior to any work on site throughout the development process as part of a comprehensive landscaping plan, and that suitable opportunities for the restoration, enhancement or planting of trees, woodland, and hedgerows are identified and incorporated.*
7. *Opportunities should be identified and incorporated for planting of new trees, woodlands and hedgerows. New planting should be suitable for the site conditions, use native species and be informed by and contribute to local character, and enhance or create new habitat linkages.*

Strategic Policy SD17: Protection of the Water Environment

1. *Development proposals that affect groundwater, surface water features, and watercourse corridors will not be permitted unless they conserve and enhance the following:*
    a. *Water quality and quantity, and help achieve requirements of the European Water Framework Directive, or its replacement;*
    b. *Ability of groundwater, surface water features and watercourse corridors to function by natural processes throughout seasonal variations, within the immediate vicinity, and both upstream and downstream of the site of the proposal; and*
    c. *Specifically for surface water features and watercourse corridors:*
        i. *Biodiversity;*
        ii. *Historic significance;*
        iii. *Character, appearance, and setting;*
        iv. *Public access to and along the waterway for recreational opportunities; and*
        v. *Ability for maintenance of the watercourse, including for flood risk management purposes.*
2. *Development within Groundwater Source Protection Zones (SPZs) will only be permitted provided that there is no adverse impact on the quality of the groundwater source, and provided there is no risk to its ability to maintain a water supply.*
3. *Development proposals must incorporate measures to eliminate risk of pollution to groundwater, surface water and watercourse corridor features which would harm their ecological and/or chemical status.*
4. *Development proposals for the provision of agricultural reservoirs that aid demand management, water efficiency and water storage will be permitted where they are compatible with the National Park purposes.*

Strategic Policy SD45: Green Infrastructure

1. *Development proposals will be permitted where they demonstrate that they:*
    a. *Maintain or enhance GI assets, GI links and the overall GI network; and*
    b. *Provide new GI, or improvements to existing green assets and green linkages, which are integrated into the development design, that meets the needs of communities both within and beyond the site's boundaries.*
2. *GI proposals must contribute to multifunctional landscapes which:*
    a. *Strengthen connectivity and resilience of ecological networks;*

b. *Incorporate GI measures that are appropriate to the type and context of the development proposal as part of an overall landscape design;*
c. *Maximise opportunities to mitigate, adapt and improve resilience to climate change;*
d. *Maximise opportunities for cycling and walking, including multi user routes and, where possible, facilitate circular routes; and*
e. *Support health and wellbeing and improve opportunities for understanding and enjoyment of the National Park and its special qualities.*

3. *Development proposals that will harm the GI network must incorporate measures that sufficiently mitigate or offset their effects.*
4. *Where appropriate, the Authority will seek to secure via planning condition or legal agreement provision for the future management and/or maintenance of GI.*

Strategic Policy SD48: Climate Change and Sustainable Use of Resources

1. *The Authority will encourage all new development to incorporate sustainable design features, as appropriate to the scale and type of development.*
2. *All development proposals will be required to achieve the minimum standards as set out below unless it can be demonstrated that doing so is not technically feasible or would make the scheme unviable:*

Residential:

i. *Energy efficiency: 19% carbon dioxide reduction improvement against Part L (2013) through the energy efficiency of the building and;*
ii. *Water: Total mains consumption of no more than 110 litres per person per day.*

Non-residential and Multi-residential:

i. *Major: Building Research Establishment Environmental Assessment Method (BREEAM) Excellent*

3. *All development proposals, including retrofitting, will be required to demonstrate, proportionately, how the development addresses climate change mitigation and adaptation through the on-site use of zero and/or low carbon technologies, sustainable design and construction, and low carbon materials.*
4. *Major development proposals should also include an energy assessment to demonstrate how carbon dioxide emissions are to be minimised on-site.*

Development Management Policy SD50: Sustainable Drainage Systems

1. *Development proposals will be permitted where they ensure that there is no net increase in surface water run-off, taking account of climate change.*
2. *Proposals for major development* will be permitted where they provide suitable sustainable drainage systems, unless it is demonstrated to be inappropriate. All other development proposals must give priority to the use of suitable sustainable drainage systems where required by the LLFA.*
3. *SuDS, where feasible, must support the provision of open space, public amenity areas and enhancing biodiversity and other public benefits as appropriate.*
4. *Where SuDS are provided, arrangements must be put in place for their whole life management and maintenance.*

** . Major development as defined in the Town and Country Planning (Development Procedure) (England) Order 2015.*

Development Management Policy SD54: Pollution and Air Quality

1. *Development proposals will be permitted provided that levels of air, noise, vibration, light, water, odour or other pollutants do not have a significant negative affect on people and the natural environment now or in the foreseeable future, taking into account cumulative impacts and any mitigation.*
2. *Development proposals that by virtue of their location, nature or scale could impact on an existing AQMA, as shown on the Policies Map, will be required to:*
    a. *Have regard to any relevant Air Quality Action Plan (AQAP) and to seek improvements in air quality through implementation of measures in the AQAP; and*
    b. *Provide mitigation measures where the development and/or associated traffic would adversely affect any declared AQMA.*
3. *Development proposals will be required to provide mitigation measures where the development and/or its associated traffic could lead to a declaration of a new or extended AQMA.*
4. *Development proposals will be permitted where they follow best practice methods to reduce levels of dust and other pollutants arising during a development from demolition through to completion.*

Strategic Site Policy SD56: Shoreham Cement Works

1. *Shoreham Cement Works, as identified on the Policies Map, is an area of significant opportunity for an exemplar sustainable mixed use development, which delivers a substantially enhanced landscape and uses that are compatible with the purposes of the National Park. To help achieve this the National Park Authority will prepare an AAP with the overall aims of:*
    a. *Enhancing the visual impact of the site from both the nearby and distant public viewpoints;*
    b. *Conserving, enhancing and providing opportunities for understanding the biodiversity, geodiversity, historic significance and cultural heritage of the site;*
    c. *Ensuring the delivery of ecosystems services; and*
    d. *Ensuring that the design of any development is of the highest quality and appropriate to its setting within a national park.*
2. *The National Park Authority would support development proposals for the following land uses where it is demonstrated they deliver the environmentally led restoration of the site:*
    a. *Sustainable tourism/visitor based recreation activities and leisure development directly related to the understanding and enjoyment of the National Park;*
    b. *B2 and B8 business uses to support the local economy, with a focus on environmentally sustainable activities, supporting local communities and providing opportunities for entrepreneurship; and*
    c. *Further types of development, including new homes, including affordable homes and/or Class B1 office development, where necessary to enable redevelopment of the allocation site as whole. Such types of development should be subordinate to the overall mix of uses proposed. Provided that the proposals can clearly demonstrate how they would deliver the key considerations set out in Part 1 of this policy; and*
    d. *Improve accessibility and help to create sustainable patterns of travel;*
    e. *Provide renewable energy generation to serve any development on the site;*
    f. *Provide realistic proposals for the relocation of existing employment and storage uses that are not appropriate to a National Park setting; and*

g. *Ensure that any adverse impacts (either alone or in combination) are avoided, or, if unavoidable, minimised through mitigation with any residual impacts being compensated for.*

3. *The National Park Authority will resist more development than is necessary to secure and deliver the environmentally led restoration of the site.*
4. *The National Park Authority wants to see a comprehensive redevelopment of the whole site consistent with the AAP. However, if any planning applications come forward separately and prior to the adoption of the AAP, then they would have to clearly demonstrate how the proposals would accord with the key considerations set out above.*

Appendix B

TARGET NOTES

- TN1: Pond within grassland, New Zealand pygmyweed, an invasive plant species listed on Schedule 9 of the WCA, is present.
- TN2: Wall cotoneaster, an invasive plant species listed on Schedule 9 of the WCA.
- TN3: Wall cotoneaster, an invasive plant species listed on Schedule 9 of the WCA.
- TN4: Ephemeral pools of water part of habitat mosaic.
- TN5: Ephemeral pool a result of earth movement in the area.
- TN6: Ephemeral pool, result of recent excavations.
- TN7: Ephemeral pool of water.
- TN8: Two young trees on cliff face, potentially juniper but requires verification.
- TN9: A pair of peregrine falcon recorded flying from ledge, presumed nesting location.

Appendix C

PHOTOGRAPHS

Table C-1 – Photographs

 **Photograph 1 – g2 - calcareous grassland - in front of the main cement works structure.**	 **Photograph 2 – potential g2a - lowland calcareous grasslands - atop the cliff.**
 **Photograph 3 – g4 - modified grasslands - in Area A.**	 **Photograph 4 – w1g – other woodland; broadleaved - at base of cliff in Area B.**
 **Photograph 5 - Photograph 4 – w1g – other woodland; broadleaved - to the north of Area B.**	 **Photograph 6 – w1h – other woodland; mixed - atop cliff to the south of Area B.**

 **Photograph 7 – h3h – mixed scrub - within Area B.**	 **Photograph 8 – u1 –built-up areas and gardens - with ruderal and scattered scrub in Areas A and B.**
 **Photograph 9 - u1a - open mosaic habitats on previously developed land – Area C.**	 **Photograph 10 – u1b5 – buildings – cement works structure in Area B.**
 **Photograph 11 – u1c – artificial unvegetated, unsealed surface – Area D.**	 **Photograph 12 – s1 – inland rock – cliffs and scree within Area C.**

 **Photograph 13 – s1 – inland rock – cliff face with potential juniper (TN8) presents in Area D.**	 **Photograph 14 – r1 - standing open water and canals – TN1 ornamental pond in Area A.**

Appendix D

BASELINE HABITAT VALUE ASSESSMENT

Appendix E - Baseline Habitat value assessment - Biodiversity Net Gain

DATE:	23 February 2022	**CONFIDENTIALITY:**	Public
SUBJECT:	Baseline Habitat Value Assessment - Biodiversity Net Gain		
PROJECT:	Shoreham Cement Works	**AUTHOR:**	Joel Rowlands
CHECKED:	Joe Franklin	**APPROVED:**	Owen Peat

INTRODUCTION

WSP UK Ltd. was commissioned by South Downs National Park Authority (SDNPA) to calculate the Baseline Habitat Value (BHV) of habitats present within the Shoreham Cement Works Site, Upper Beeding, West Sussex hereafter referred to as 'the Site'.

This BHV assessment will inform the Area Action Plan (AAP) currently being drafted by the SDNPA and provides a baseline for subsequent Biodiversity Net Gain (BNG) assessment of any potential development within the Site. Within this assessment, any future potential development within the Site will be referred to collectively as 'Potential Development'.

The Site area covers 44ha and is centred at grid reference TQ202087, comprising a semi-derelict cement works, inactive chalk quarry, temporary inert recycling facility and buildings and works areas accommodating a mix of business uses. The Site is located approximately 5km north of Shoreham and 2km south of Upper Beeding.

A UK Habitat Classification survey (UKHab) of the Site was undertaken on 6 and 7 January 2022, the results of which are detailed within the main body of the Preliminary Ecological Appraisal (PEA) report. The timing of this survey limited the botanical information that could be gathered during the survey.

This BHV has been produced to detail the current baseline habitat value of the Site, in terms of biodiversity units calculated using the Natural England Biodiversity Metric 3.0. A full BNG assessment is recommended for any Potential Development within the Site to support any future planning applications.

It is understood that this BHV assessment will inform the AAP. This report summarises the methods used, and assumptions applied to generate the BHV outcomes, as well as giving a summary of the results alongside recommended actions. This BHV assessment has been compiled with reference to the following relevant nature conservation legislation, planning policy and the UK Biodiversity Framework from which the protection of sites, habitats and species is derived in England including:

- Environment Act 2021 (Her Majesty's Stationery Office (HMSO), 2021);
- UK Government's 25 Year Environmental Plan (Department for Environment, Farming and Rural Affairs (DEFRA), 2018)[1];
- Biodiversity 2020: A Strategy for England's Wildlife and Ecosystem Services (DEFRA, 2011);[2]

[1] **DEFRA (2018).** 25 Year Environmental Plan. Available https://www.gov.uk/government/publications/25-year-environment-plan (Accessed: February 2022)

[2] **DEFRA (2011).** A Strategy for England's Wildlife and Ecosystem Services. Available: https://www.gov.uk/government/publications/biodiversity-2020-a-strategy-for-england-s-wildlife-and-ecosystem-services (Accessed: February 2022)

- National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, (MHCLG), 2021)[3];
- The Natural Environment and Rural Communities (NERC) Act (HMSO, 2006)[4];

METHODOLOGY AND ASSUMPTIONS

The BHV assessment was undertaken following industry best practice methodologies[5] and used the Natural England Biodiversity Metric 3.0 (hereafter referred to as the 'Biodiversity Metric') for the calculations, supported by the technical supplement[6] and user guide[7]. Further detail can be found on the Natural England website[8].

ArcMap version 10.8.1 was used to map the baseline habitats (see Figure 5). UKHab survey data, OS MasterMap data and aerial base maps were used to inform the baseline habitat areas.

The BHV assessment was informed by the following sources and approaches.

- A Preliminary Ecological Appraisal (PEA) and UKHab survey of the Site that was undertaken in 2021 by WSP. The UKHab survey was carried out by a surveyor with extensive experience in the last five years of completing habitat surveys on a variety of sites including brownfield and greenfield sites. Habitats were described and mapped in accordance with the UK Habitat Classification Manual[9], Field Key[10] and definitions[11].
- A condition assessment undertaken alongside the habitat survey using the Biodiversity Metric 3.0 condition assessment[12].
- Extensive areas of vertical cliff face are present within the Site. A bespoke approach was devised to account for these areas of habitat within this assessment. An estimate of the area of cliff face habitat was made as follows:
  - The location of cliff face within the Site were informed by field survey observations, topographic surveys[13] and aerial imagery.
  - The cliff faces were sectioned into lengths according to their location, aspect, and height profile. For ease of reference, the cliff sections were the same as those used in the Preliminary Roost Assessment (PRA) of cliff faces within the Site, reported separately[14].

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[3] **MHCLG (2021)** National Planning Policy Framework (NPPF) Available: https://www.gov.uk/government/publications/national-planning-policy-framework--2 (Accessed: February 2022)

[4] **HMSO (2006).** Natural Environment and Rural Communities Act. HMSO, Norwich. Available: https://www.legislation.gov.uk/ukpga/2006/16/pdfs/ukpga_20060016_en.pdf (Accessed: February 2022)

[5] **CIEEM, IEMA & CIRIA (2016).** Biodiversity Net Gain: Good Practice Principles for Development; and CIEEM, IEMA & CIRIA (2019). Biodiversity Net Gain. Good Practice Principles for Development. A Practical Guide. Available: https://www.iema.net/assets/newbuild/documents/IEMA%20Biodiversity%20Net%20Gain.pdf (Accessed: February 2022)
CIEEM, CIRIA & IEMA (2019). Biodiversity Net Gain: Good practice principles for development. A practical guide. Available: https://cieem.net/wp-content/uploads/2019/02/C776a-Biodiversity-net-gain.-Good-practice-principles-for-development.-A-practical-guide-web.pdf (Accessed: February 2022)

[6] **Panks S, White N, Newsome A, Potter J, Heydon M, Mayhew E, Alvarez M, Russell T, Scott SJ, Heaver M, Scott SH, Treweek J, Butcher B and Stone D (2021)** Biodiversity metric 3.0: Auditing and accounting for biodiversity – User Guide. Natural England. Available: http://publications.naturalengland.org.uk/file/6449751093673984 (Accessed: January 2022)

[7] **Panks S, White N, Newsome A, Potter J, Heydon M, Mayhew E, Alvarez M, Russell T, Scott SJ, Heaver M, Scott SH, Treweek J, Butcher B and Stone D (2021)** Biodiversity metric 3.0: Auditing and accounting for biodiversity – Technical Supplement. Available: http://publications.naturalengland.org.uk/file/4739529476145152 (Accessed: February 2022)
Natrual England (2021), The Biodiversity Metric 3.0 (JP039)8 http://publications.naturalengland.org.uk/publication/6049804846366720 (accessed February 2022)

[9] **Butcher B, Carey P, Edmonds R, Norton L and Treweek J (2020a)** The UK Habitat Classification User Manual Version 1.1. Available: https://ukhab.org/ (Accessed: January 2022)

[10] **UK Habitat Classification Working Group (2020)** UK Habitat Classification Field Key. Available: https://ukhab.org/ (Accessed: February 2022)

[11] **Butcher B, Carey P, Edmonds R, Norton L and Treweek J (2020**) The UK Habitat Classification Habitat Definitions Version 1.1.

[12] Taken from the BNG Metric 3.0 -Technical Supplement. Available: http://publications.naturalengland.org.uk/file/6101399382523904 (Accessed: February 2022)

13 Topography Survey data provided 18/02/2021. Document reference - Combined Survey 2017 B.

[14] WSP (2022) Shoreham Cement Works: Preliminary Roost Assessment of Cliffs.

- The height of each cliff section was estimated by averaging five height measurements taken along the length of each cliff section using topographic information provided.
- The area of each cliff face was calculated by multiplying the length by height for each cliff section.
- The original areas of the cliff sections, calculated during the UKHab survey mapping, were removed from the area calculations.
- The total area of cliff face, calculated using the above method, were added to the area calculations for the Site.

LIMITATIONS AND ASSUMPTIONS

The following limitations and assumptions have been applied when using the above methodology:

- It is important to recognise that the quantification of biodiversity is one of a number of factors to be considered when assessing the impact of any Potential Development on biodiversity. This BHV assessment and any subsequent BNG assessment does not and will not cover potential impacts of any Potential Development on protected species and designated sites. These are covered within the main body of this PEA report.
- In the Biodiversity Metric, distinctiveness for the baseline habitats are pre-assigned for each habitat based upon the UKHab system classification assigned.
- The methodology used to estimate the cliff face area within the Site (described above) has resulted in the total area of the Site being approximately 46ha, which is greater than the 44ha represented by the two-dimensional Site boundary of the Shoreham Cement Works.
- A condition assessment of approximately 15ha of habitat and 0.48km of treeline within the Site could not be fully completed due to the timings of the surveys and the constraint this posed on plant identification and other seasonal-dependant condition criteria. Habitats for which a full condition assessment could not be completed are as follows:
  - All woodland (UKHab categories w1f, w1g and w1h) within the Site, including Area A and Area B.
  - All calcareous grassland (g2 and g2a) within the Site, including Area B and Area C.
  - Other inland rock and scree (s1, cliff faces only) in Areas B, C and D.
  - Open Mosaic Habitats on Previously Developed Land (OMH, u1a) in Area C.
  - Tree lines (w1g6) along the western boundary of Area A.
- To account for the above limitation in the short-term, two BHV have been calculated. One assuming the condition of these habitats is poor, and one assuming the condition of these habitats is good. This method provides a range of possible BHV for the Site, as there are a number of variables within the Biodiversity Metric depending on the true condition of the habitats which could not be fully assessed. As this assessment has produced a range of BHV, the results section includes a range of two values (i.e. values will be presented as 'poor-good' in the results section). A full condition assessment will be completed for the relevant habitats during the appropriate survey period (indicatively April – September 2022) and their actual condition included within an update to this BHV assessment.
- There were no rivers within the baseline, therefore watercourse units were not assessed and are not discussed further within this assessment.
- A single waterbody and four ephemeral pools were identified during the UKHab survey. These habitats were too small to include within this assessment (i.e. they did not cover enough area to calculate a value within the Biodiversity Metric). This ecological importance of these habitats has been accounted for within the main body of the PEA report.

- Non-native planted coniferous trees were present within the Site. These included leylandii *Cupressus* × *leylandii* to the west of Area B, and a single monkey puzzle *Araucaria araucana* tree within Area A. These trees have not been specifically accounted for within the current assessment, habitat occupying the understory at these locations has been included within the metric calculations.
- The Site is allocated within the Local Plan and has been identified for development. However, the habitats within the Site have not been specifically identified in the Local Plan, strategy or policy and therefore a low strategic significance score was assigned when using the Biodiversity Metric.
- This BHV assessment is the best-fit model which describes the value of habitat within the Site within the confines of the data available at the time of the assessment and accounting for the limitations and assumption detailed here.

RESULTS

The results of the BHV assessment for Area-based Habitat Units (AHU) and Hedgerow Units (HeU) are summarised in Table 1 below. For more detailed results please refer to the Biodiversity Metric calculation spreadsheets provided alongside this report.

Table 1: Summary of Results

Biodiversity Unit Type		Habitat Condition[15]	Baseline Habitat Value – Poor condition scenario (Biodiversity units)	Baseline Habitat Value – Good condition scenario (Biodiversity units)
Area-based Habitat Units (AHU)	**Total AHU**	**N/A**	**144.88**	**276.18**
	Mixed scrub	Good	25.88	25.88
	Lowland calcareous grassland	Good/Poor	1.67	5.00
	Mixed scrub	Moderate	2.33	2.33
	Modified grassland	Good/Poor	0.87	2.60
	Open Mosaic Habitat	Good/Poor	18.13	54.38
	Other inland rock/scree	Good/Poor	33.84	101.52
	Broadleaved woodland	Good/Poor	4.96	14.87
	Mixed woodland	Good/Poor	6.20	18.60
	Ruderal/ephemeral	Moderate	0.12	0.12
	Bramble scrub	Poor	0.13	0.13

[15] Habitat condition is provided where this was able to be fully assessed on Site. Where this could not be fully assessed, a condition of 'Good/Poor' is assigned to indicate that these are the particular habitats under assessment in the Good and Poor condition scenarios.

Biodiversity Unit Type		Habitat Condition[15]	Baseline Habitat Value – Poor condition scenario (Biodiversity units)	Baseline Habitat Value – Good condition scenario (Biodiversity units)
	Mixed scrub	Poor	3.89	3.89
	Modified grassland	Poor	4.06	4.06
	Other inland rock/scree	Poor	12.27	12.27
	Ruderal/ephemeral	Poor	1.77	1.77
	Vacant/derelict land	Poor	28.75	28.75
	Developed land; sealed surface	N/A	0.00	0.00
Hedgerow Units (HeU)	Line of Trees	Good/Poor	0.92	2.76

Overall, the current BHV for the Area-based habitats present within the Site is estimated to range between 144.86 - 276.18 biodiversity units, depending on the condition of the habitat present which were not fully assessed. Similarly, the BHV for hedgerow habitats (provided by the treelines bordering the eastern extent of Area A) ranges from 0.92 - 2.76 biodiversity units.

In combination, the habitats categorised as other inland rock and scree, a medium distinctiveness habitat under the Biodiversity Metric, account for 32-41% of the total AHU values. These included all areas of cliff faces within the Site as well as areas in proximity to the cliff faces with shallower gradient, not identified as a cliff face during the field survey. Areas of scrub atop the cliff face, classified as good in condition, accounted for 12-18% of the AHU.

Two high distinctiveness habitats (OMH and lowland calcareous grassland) were identified within the Site. OMH accounted for 9-18% of the AHU despite only accounting for 7% of the total habitat area. Lowland calcareous grassland only occupied a small area of habitat and accounted for 1-2% of the AHU.

Areas identified as vacant/derelict land/bare ground, including the large expanse of bare ground in Areas D, made up 31% of the total habitat areas. Despite the low distinctiveness of the habitat, this accounted for 20-10%-20% of the AHU. Woodland within the Site comprises 8-12% of the AHU as they only account for a small percentage of the total habitat areas.

FURTHER ASSESSMENT AND RECOMMENDATIONS

Any Potential Development will need to account for presence, location and condition of habitat within the Site.

Recommended next steps are as follows.

- **Further BNG assessments** should be undertaken. This BHV assessment has provided a baseline biodiversity value from which subsequent BNG assessments can be completed. This baseline value (pre-development) can be compared with a post-development biodiversity value based on the proposed landscape masterplan of any Potential Development and a net change in the value of

biodiversity units can be calculated. This element is used in conjunction with qualitative information relating to the BNG good practice principles to produce a BNG assessment outcome.

- **Additional botanical surveys** of the Site are required to accurately assess the conditions of the habitats present. These botanical surveys should take place during the flowering period April-September. For habitat of high distinctiveness, OMH and lowland calcareous grasslands, multiple visits should be undertaken through the survey season to ensure a representative species composition is recorded.
- **Identify the location of habitats to be retained and enhanced** in order to maximise the biodiversity units within Site. This assessment has identified the value of habitats and their location within the Site. These areas are consistent with the habitat areas identified for retention/enhancement within the constraints and opportunities exercise (outlined in Appendix E). The full extent of these areas and potential management plan to maximise these habitats values will be informed by additional botanical survey work. Any habitat management plan for Potential Development within the Site will need to meet the CIEEM BNG good practice principles[5], and apply the mitigation hierarchy (avoidance, mitigation, compensation).
- **Identify potential areas for habitat creation** within the Site. The extensive area of vacant/derelict land/bare ground (a low distinctiveness habitat), totalling approximate 14.40ha, within the Site provides opportunities for habitat creation as part of the landscape masterplan for any proposed development. Potential habitat creation within the Site will be informed by subsequent botanical survey work. Specific habitats to be targeted for creation could include lowland calcareous grasslands and expansion to the OMH. However, some bare earth habitat could be retained to provide habitat for invertebrate species such as solitary bees.
- **Additional ecosystem services assessment** can be undertaken to identify the wider environmental benefits (e.g. carbon sequestration or recreational value) provided by the baseline habitats present within the Site and identify potential to maximise the ecosystem service provision by any proposed landscape masterplan.

Appendix E

CONSTRAINTS AND OPPORTUNITIES EXERCISE

8 CONSTRAINTS AND OPPORTUNITIES EXCERCISE

8.1 OVERVIEW

8.1.1. This Appendix seeks to identify the potential constraints and opportunities present within the different identified Areas of the Site (Areas A, B, C and D), in addition to providing recommendations specific to each Area in relation to the identified constraints and opportunities.

8.1.2. An overview commentary of the Site in the context of the wider landscape is provided initially, before exploring the constraints and opportunities by Site Area.

8.1.3. Relevant constraints, opportunities and recommendations have been produced by drawing together information from the following sources listed below.

- Baseline information regarding designated sites, habitats and protected and notable species presented within the main body of this PEA report.
- The baseline biodiversity habitat value assessment presented in Appendix D of this report.
- The Preliminary Roost Assessment (PRA) of cliff faces, the methods and results of which are presented in a separate report (WSP, 2022).

8.1.4. In addition to the text below, the results of the ecological constraints and opportunities exercise are broadly summarised within the Ecological Constraints and Opportunities Plan in Figure 6 of this PEA report.

8.1.5. It is likely that additional constraints, opportunities, and recommendations for separate Areas of the Site will be identified following the results of further survey recommended within the main body of the PEA report. The summary presented below should therefore be considered as an interim assessment based on the currently understanding of the Site baseline.

8.2 SITE CONTEXT IN THE WIDER LANDSCAPE

Baseline Summary

8.2.1. The Site to the east of the A283 comprises a mosaic of artificial and natural habitats, sitting at a lower elevation than the surrounding arable fields. Vegetated margins recorded around the top of the cliffs, (including strips of woodland, dense scrub and grassland) contribute to a wider vegetated corridor running along the southern road embankment of the A283, as well as linking to additional ecological corridors (e.g. field margin hedgerows) to the north and south of the Site. Such corridors are likely to be of use to hazel dormouse, badgers, reptiles, amphibians and commuting bats which may be present within the Site and the wider locale. The River Adur, directly adjacent to parts of Area A in the west of the Site, also provides valuable commuting and foraging opportunities for bats, in addition to foraging opportunities for some species of reptile (e.g. grass snake) and more general habitat suitability for aquatic species.

8.2.2. The Site itself sits within the South Downs National Park, and is listed as a Local Geological Site. Beeding Hill to Newtimber Hill SSSI directly abuts the northern boundary of the Site, and the Adur Estuary SSSI which lies to the south is considered to be connected to the Site to the west of the A283 through hydrological pathways.

Additional statutory and non-statutory designated sites have also been identified within 10km of the Site. Areas of HPI habitat, including those associated with designated sites and those as standalone parcels, are also present in close proximity to the Site, including areas of lowland calcareous grassland HPI, deciduous woodland HPI and coastal and floodplain grazing marsh. The areas of lowland calcareous grassland HPI are understood to form part of the South Downs Way Ahead NIA.

Constraints

8.2.3. The following constraints from potential future development at the Site have been identified in relation to the baseline information above on the wider Site context.

- Construction activities associated with any potential future development of the Site have the potential to detrimentally affect the nature conservation value of the surrounding areas of the South Downs National Park, adjacent HPI parcels (including those which form part of the South Downs Way Ahead NIA), and Beeding Hill to Newtimber Hill SSSI through dust and air pollution.
- Construction activities also have the potential to result in run-off pollution, with detrimental effects on the Adur Estuary SSSI downstream of the Site and HPI parcels in close proximity to the Site.
- Any new temporary or permanent lighting associated with the construction or operation of any future development has the potential to detrimentally affect the nature conservation value of the South Downs National Park through illumination of a currently largely unlit site. Any new lighting scheme may also deter commuting and foraging bats from using habitats around the top of the cliffs as part of existing commuting corridors.
- Future residential or leisure-led developments have the potential to result in increased visitor pressures on the nature conservation value of statutory and non-statutory designated sites within the wider locale.

Opportunities

8.2.4. The following opportunities from potential future development at the Site have been identified in relation to the baseline information above on the wider Site context.

- Landscaping masterplans for future development within the Site present the opportunity to provide new calcareous grassland planting. As well as suiting the natural character of the wider locale within the South Downs National Park, new calcareous grassland planting would also provide the opportunity create new connections and ecological pathways associated with the South Downs Way Ahead NIA, with particular benefits for local flora, invertebrates and reptile populations.
- Depending on the type of development, specific areas of the Site could be managed as a nature reserve through the retention of existing habitats and the creation of new habitats. For example, if an area of the Site supporting open mosaic habitat, enhanced with adjacent planting of chalk grassland, was managed as a nature reserve, this could provide local residents with an opportunity to explore biodiverse and locally characteristic habitats without adding additional recreational pressures to existing statutory and non-statutory designated sites within the wider locale. Such a nature reserve could also have educational functions for local community and school groups.

Recommendations

8.2.5. The following recommendations in relation to the baseline information about the wider Site context have been identified.

- Any future development proposed at the Site should undergo screening for likely significant effects on designated sites of international importance in accordance with the Habitats Regulations 2017. Such a screening assessment should have regard to the findings of the ongoing screening assessment for the AAP.
- Due to the risks of dust, air and run-off pollution resulting during construction, Natural England should be consulted regarding potential effects on the nature conservation from any potential future development, once designs have been determined.
- Any future development at the Site should seek to minimise construction impacts to retained parcels of HPI and designated sites within close proximity of the Site.
- Any future development at the Site should include a lighting strategy which is sensitive to the Site's location within the South Downs National Park in addition to ecological receptors, particularly commuting and foraging bats.
- Any future development should seek to incorporate retention and enhancement of chalk grassland habitat which is important to the local character of the South Downs National Park. Wherever possible, opportunities for additional chalk grassland planting should be incorporated within landscaping designs to increase ecological corridors within the wider landscape.

8.3 AREA A – THE RIVERSIDE

Baseline Summary

8.3.1. Area A lies in the east of the Site, separated from the rest of the Site by the A283. Habitats present within Area A generally comprise those of limited ecological value, including hard standing (u1b6) with some ruderal vegetation (u1) and commercial buildings (U1b5). Small, isolated parcels of more valuable habitat persist around the buildings and hardstanding, including areas of broadleaved woodland (w1g) and dense scrub (h3) along the verge adjoining the A283, and scattered areas of unmanaged modified grassland (G4). A line of trees (w1g6) forms the western Site boundary, where it borders the River Adur and fields. No cliff faces are present within Area A.

8.3.2. Due to the habitats present, the baseline value of this Area is somewhat limited. However, the following observations on suitability for protected and notable species have been identified:

- Buildings within Area A have been identified as having low suitability to support roosting bats (TEC, 2018).
- The tree line along the western boundary is likely to provide a valuable commuting corridor for local bat populations, particularly given its adjacency to the foraging resource along the River Adur and connectivity to vegetated commuting lines to the south of the Site.
- Common bird species may utilise the areas of woodland, scrub and treelines within Area for nesting during the breeding season.

Constraints

8.3.3. The following constraints from potential future development at Area A within the Site have been identified.

- Demolition of buildings with bat roosting suitability in Area A may result in the damage or destruction of a bat roost, and the killing or injury of bats, should bats be present within these buildings.
- Removal or illumination of the treeline along the western boundary, and woodland areas along the A283 may deter commuting and foraging bats from moving across the wider landscape, resulting in indirect habitat fragmentation.
- Clearance of woodland and scrub habitat during the breeding bird season may result in the damage or destruction of active bird nests, in contravention of national legislation.
- Any clearance of woodland and scrub habitat (considered to have 'medium' distinctiveness under the Defra Biodiversity Metric 3.0) within Area A will require replacement planting of the same broad habitats (or habitats with a higher distinctiveness) to maximise the potential for a biodiversity net gain to be achieved. Similarly, removal of the line of trees will require replacement planting of a habitat with the same distinctiveness (low) or better.
- Construction activities and development in Area A have the particular risk of resulting in run-off pollution into the River Adur adjacent, which in turn flows into the Adur Estuary SSSI to the south of the Site.

Opportunities

8.3.4. The following opportunities relating to potential future development within Area A have been identified.

- The existing low value of habitats and extent of hardstanding within Area A presents the opportunity for large gains in biodiversity through planting.
- In particular, increased areas of Area A could be given over to further woodland and scrub planting to strengthen the corridor of this habitat running along the A283.
- Alternatively, provision of marsh habitat (particularly where the Site adjoins the River Adur) would increase the Site connectivity to the ecological network of the River Adur and likely contribute to an increased extent of flood plain and coastal grazing marsh HPI which currently falls in close proximity to Area A (see Figure 4).

Recommendations

8.3.5. The following recommendations in relation to Area A within the Site have been identified.

- Where buildings within Area A cannot be retained as part of future development, these should be subject to further survey to determine the presence or likely absence of roosting bats. Depending on the results of such further survey, development designs should incorporate appropriate mitigation with regards to roosting bats, which may include demolition under licence from Natural England and provision of alternative roosting features.
- Future development within Area A should seek to retain areas of woodland, scrub and treelines wherever possible as part of landscaping designs, to ensure continued habitat suitability for a range of species within the wider locale.

- A BNG assessment should be completed for any finalised development designs to ensure that appropriate replacement planting is determined for areas of valuable habitat which cannot be retained.
- Recommended replacement and enhancement planting within Area A could comprise woodland, scrub and marsh habitats to increase connectivity of surrounding off-site habitats.
- Any development within Area A should be subject to a sensitive lighting strategy which seeks to avoid illumination of the retained vegetated corridors (including the River Adur offsite, the line of trees and the woodland areas). Such a lighting strategy should be designed in accordance with best practice guidance.
- A water and drainage strategy, incorporating SuDS, should be produced for any future development at the Site, with particular regard for the proximity of Area A to the River Adur. Such a strategy should also include measures to minimise the risk of run-off pollution during construction activities.

8.4 AREA B – THE CEMENT WORKS

Baseline Summary

8.4.1. Area B to the east of the A283 comprises the area of active cement works, with regular passage of heavy-goods vehicles and construction plant throughout, surrounded on the north and south aspects by sheer chalk cliff faces (s1). At lower elevations, hardstanding (u1b6 and u1) and buildings (u1b5) are the dominant feature, though areas of calcareous grassland (g2) and dense scrub (h3) are present towards the Site entrance from the A283. Broadleaved woodland (w1g) is present surrounding a residential property associated with the Site in the north of Area B, and along the base of the cliffs in the south. An expanse of young mixed woodland was recorded atop the southern cliffs.

8.4.2. A small ornamental pond was noted (TN1) in the calcareous grassland near the Site entrance. In addition, wall cotoneaster, listed as an invasive species on Schedule 9 of the Wildlife and Countryside Act 1981, was identified growing on the cliff faces in the north of Area B.

8.4.3. Based on the habitats present, the following observations on suitability for protected and notable species have been identified.

- The residential building in the north of Area B has been confirmed as supporting a long-eared bat roost due to the presence of bat droppings within the loft. Additionally, other buildings within Area B have been assessed has having low suitability to support roosting bats (TEC, 2018).
- The northern cliff face of Area B is considered to have low suitability to support roosting bats, while the cliff faces along the southern extent of Area B are considered to have moderate suitability to support roosting bats (WSP, 2022).
- The ornamental pond has the potential to support an isolated population of great crested newt (in addition to other amphibians).
- Badgers and hazel dormice may utilise areas of woodland and dense scrub along the top of the cliffs.
- Isolated populations of reptiles may persist in areas of calcareous grassland.

Constraints

8.4.4. The following constraints from potential future development at Area B within the Site have been identified.

- Demolition of the residential property in the north of Area B will result in the destruction of a known bat roost, and may result in the killing or injury of roosting bats, in contravention of national legislation regarding bats. Similarly, demolition of buildings and alteration of cliff faces with bat roosting suitability may also result in damage or destruction of a bat roost and killing or injury of roosting bats, if present.
- Illumination of retained buildings, cliff faces and areas of vegetation atop the cliff faces could deter roosting bats from emerging from roosts, and deter commuting and foraging bats from using established ecological corridors.
- Clearance of woodland and scrub areas to facilitate development may result in killing or injury to badgers and hazel dormice (if present), and damage or destruction of nesting birds depending on the time of year. Clearance of areas of calcareous grassland may result in killing or injury to reptiles, if present.
- Any clearance of woodland and scrub habitat (considered to have 'medium' distinctiveness under the Defra Biodiversity Metric 3.0) within Area B will require replacement planting of the same broad habitats (or habitats with a higher distinctiveness) to maximise the potential for a biodiversity net gain to be achieved. Removal of the calcareous grassland will require replacement planting of the same habitat.
- The loss of the ornamental pond within Area B may contribute to the loss of breeding habitat for great crested newt and other amphibians, if present.
- If left unmanaged, wall cotoneaster within Area B may spread throughout the Site and the wider locale, to the detriment of native local flora.

Opportunities

8.4.5. The following opportunities relating to potential future development within Area B have been identified.

- Increased areas of Area B could be given over to further woodland and scrub planting, to link up the northern and southern parcels of these habitats.
- Landscape proposals could focus on the retention, enhancement, and expansion of calcareous grassland habitat within Area B, to create an attractive Site entrance characteristic of the local area, which also extends the provision of calcareous grassland HPI within the immediate surroundings of the Site.
- The characteristic chimney column within the Site could be retained to provide a prominent nesting feature for peregrine falcon and black redstart. Alternatively, new buildings within the Site could incorporate tower and ledge elements to provide suitable habitat for peregrine falcon and black redstart.
- Additional water features (e.g. wildlife ponds) could be provided within Area B (particularly in landscaped areas such as calcareous grassland and woodland) to increase the suitability of Area B to support larger populations of amphibians.

Recommendations

8.4.6. The following recommendations in relation to Area B within the Site have been identified.

- The residential building in the north of Area B should be retained where possible to avoid the loss of an identified bat roost. Where this structure cannot be retained, a licence from Natural England should be sought prior to demolition, and appropriate mitigation and compensation measures put in place to ensure the favourable conservation status of bats is maintained.
- Where the remaining buildings within Area B cannot be retained as part of future development, these should be subject to further survey to determine the presence or likely absence of roosting bats. Depending on the results of such further survey, development designs should incorporate appropriate mitigation with regards to roosting bats, which may include demolition under licence from Natural England and provision of alternative roosting features.
- Future development within Area B should seek to retain the cliff faces, areas of woodland, scrub and calcareous grassland wherever possible as part of landscaping designs, to ensure continued habitat suitability for a range of species within the wider locale.
- A BNG assessment should be completed for any finalised development designs to ensure that appropriate replacement planting is determined for areas of valuable habitat which cannot be retained.
- Recommended replacement and enhancement planting within Area B could comprise woodland, scrub and calcareous grassland habitats to increase connectivity of surrounding off-site habitats.
- Any development within Area B should be subject to a sensitive lighting strategy which seeks to avoid illumination of the retained cliff faces, confirmed bat roosts and woodland vegetation. Such a lighting strategy should be designed in accordance with best practice guidance.
- Further survey for great crested newt, hazel dormouse, badger and reptiles should be completed in advance of future development so that these species can be appropriately accounted for within development designs and mitigation.

8.5 AREA C – THE BOWL

Baseline Summary

8.5.1. Area C comprises the exhausted chalk quarry area which is partly in current use, and partly unmanaged. Sheer chalk cliffs (s1) line the boundaries of Area C, which are topped by sections of dense scrub (h3) and calcareous grassland (g2a). Additional parcels of dense scrub are colonising the quarried ground level areas. Of note is an expanse of open mosaic habitat (u1a) which has formed in the north of the lower elevation of Area C and is currently unmanaged.

8.5.2. Active excavation and landscaping activities within Area C have resulted in a number of ephemeral pools forming (TN4-TN7). Invasive wall cotoneaster has also been noted on the cliff faces in the north-east of Area C (TN3).

8.5.3. Based on the habitats present, the following observations on suitability for protected and notable species have been identified:

- The lower cliff face with a south-western aspect is considered to have high bat roosting suitability, while additional cliff faces in the north of Area C are considered to have moderate roosting suitability. Cliff faces in the south of Area C have been assigned a low suitability to support roosting bats (WSP, 2022).

- The open mosaic habitat present is likely to support a range of protected and notable invertebrate species, and may also support reptile populations, breeding birds, and foraging bats.
- Badgers, hazel dormice and commuting bats may utilise areas of dense scrub along the top of the cliffs.

Constraints

8.5.4. The following constraints from potential future development at Area C within the Site have been identified.

- Alteration of cliff faces with bat roosting suitability may result in damage or destruction of a bat roost and killing or injury of roosting bats, if present.
- Illumination of retained cliff faces and areas of vegetation atop the cliff faces could deter roosting bats from emerging from roosts, and deter commuting and foraging bats from using established ecological corridors.
- Clearance of scrub areas atop the cliff faces to facilitate development may result in killing or injury to badgers and hazel dormice (if present), and damage or destruction of nesting birds depending on the time of year. Clearance of areas of open mosaic habitat may result in damage or destruction to active bird nests, and may contribute to a loss of valuable habitat for protected and notable invertebrate species.
- Any clearance of open mosaic habitat (considered to have 'high' distinctiveness under the Defra Biodiversity Metric 3.0) within Area C will require replacement planting of the same habitat to maximise the potential for a biodiversity net gain to be achieved. Removal of scrub habitat (considered to have 'medium' distinctiveness) within Area C will require replacement planting of the same broad habitats (or habitats with a higher distinctiveness).
- If left unmanaged, wall cotoneaster within Area C may spread throughout the Site and the wider locale, to the detriment of native local flora.

Opportunities

8.5.5. The following opportunities relating to potential future development within Area C have been identified.

- Area C currently supports approximately 3ha of open mosaic habitat in the north of the Area, as a result of low management following the cessation of quarrying activities. It is considered that the adjacent parcels of artificial unvegetated unsealed surface (u1c) could be secured for the open mosaic habitat to extend into. Alternatively, parcels of u1c could also be given over to chalk grassland planting to increase the general mosaic of habitats within Area C and to ensure it reflects the local character of the South Downs National Park. Provision of either additional open mosaic habitat or chalk grassland would increase habitat suitability for notable invertebrate species and reptiles, in addition to providing further foraging opportunities for local bat populations.
- The situation of the existing open mosaic habitat extent, in close proximity to the cliff face identified with high bat roosting suitability (WSP, 2022) represents a valuable opportunity to enhance the existing habitat provision for bats. Extending and enhancing the open mosaic habitat in Area C will contribute to buffering high suitability cliffs from development, should this be targeted more towards Areas A and B, as well as providing increased foraging opportunities. This effect would be

further improved if open mosaic habitat was extended into the higher elevations in the north of Area C.

- Existing pools of water within Area C are ephemeral. Creation of permanent water features (e.g. wildlife ponds) within Area C would further increase the suitability of the Site for amphibians and aquatic invertebrates. Creating such water features within areas of retained or newly created sections of open mosaic habitat or chalk grassland will further benefit the biodiversity of the Site.

Recommendations

8.5.6. The following recommendations in relation to Area C within the Site have been identified.

- Future development within Area C should seek to retain and enhance the cliff faces and areas of scrub wherever possible as part of landscaping designs, to ensure continued habitat suitability for a range of species within the wider locale.
- A BNG assessment should be completed for any finalised development designs to ensure that appropriate replacement planting is determined for areas of valuable habitat which cannot be retained.
- Wherever possible, landscaping in Area C should seek to extend the existing open mosaic habitat to increase the extent of this valuable priority habitat, as well as to buffer other habitats of value (e.g. the high suitability cliff faces) from development. If possible, the open mosaic habitat should be complimented by adjacent planting of calcareous grassland and wildlife ponds.
- Any development within Area C should be subject to a sensitive lighting strategy which seeks to avoid illumination of the retained cliff face and retained open mosaic habitat. Such a lighting strategy should be designed in accordance with best practice guidance.
- Further survey for terrestrial invertebrates should be completed in advance of future development so that these species can be appropriately accounted for within development designs and mitigation.

8.6 AREA D – THE MOONSCAPE

Baseline Summary

8.6.1. Area D, set back and raised from the remainder of the Site, predominantly comprises tiered bare rock with steep chalk cliffs. Minimal vegetation is present at ground level in Area D, though dense scrub, grazed modified grassland and calcareous grassland were recorded atop the cliffs. Due to its location, Area D is subject to minimal disturbance from ongoing Site activities.

8.6.2. Based on the habitats present, the following observations on suitability for protected and notable species have been identified.

- Nesting peregrine falcon have been observed using ledges on the cliff faces at the eastern extent of Area D (TN9).
- Cliff faces with northern and eastern aspects within Area D are considered to have moderate roosting suitability for bats, while the cliff face with the southern aspect is considered to have low suitability (WSP, 2022).
- Badgers, hazel dormice and reptiles may utilise areas of dense scrub and grassland along the top of the cliffs.

Constraints

8.6.3. The following constraints from potential future development at Area D within the Site have been identified.

- Alteration of cliff faces with bat roosting suitability may also result in damage or destruction of a bat roost and killing or injury of roosting bats, if present.
- Alteration or loss of cliff faces may also result in the damage or disturbance of peregrine falcon nests.
- Illumination of retained cliff faces and areas of vegetation atop the cliff faces could deter roosting bats and nesting peregrine falcon, and deter commuting and foraging bats from using established ecological corridors.
- Clearance of scrub and grassland areas to facilitate development may result in killing or injury to badgers, reptiles and hazel dormice (if present), and damage or destruction of nesting birds depending on the time of year.
- Any clearance of scrub habitat (considered to have 'medium' distinctiveness under the Defra Biodiversity Metric 3.0) within Area D will require replacement planting of the same broad habitats (or habitats with a higher distinctiveness) to maximise the potential for a biodiversity net gain to be achieved. Removal of the calcareous grassland will require replacement planting of the same habitat.

Opportunities

8.6.4. The following opportunities relating to potential future development within Area D have been identified.

- The elevation and position of Area D provides a unique opportunity for habitat creation which could be suitably buffered from development across the remaining lower Areas of the Site. If the whole of Area D were made available for use as a local nature reserve, this could provide recreational and educational benefits (with regards to unique habitats) to local communities while also reducing visitor pressures to designated sites within the wider locale.
- In particular, targeted habitat creation within Area D could comprise a continuation of open mosaic habitat from Area C, calcareous grassland to fit with the local character of the wider landscape, and wildlife ponds. Such habitat creation would likely contribute to the buffering of the nesting peregrine falcon, as well as providing additional foraging and shelter resources for reptiles and bats.
- Due to the size of Area D, habitat creation could also include targeted benefits for invertebrates, including the provision of land banks for mining bees, and specific planting mixes to encourage use by notable invertebrates associated with calcareous grassland or open mosaic habitat.
- The existing cliffs could further be enhanced for nesting peregrine falcon through the provision of more ledges, but this should only be encouraged where specific development is not proposed for Area D, to minimise disturbance.
- Given the potential presence of juniper on the cliff faces in Area D, efforts could be made to further encourage the spread of native plant communities on the cliff faces in this Area, which could function as natural 'green walls' as part of landscaping designs.

Recommendations

8.6.5. The following recommendations in relation to Area D within the Site have been identified.

- Future development within Area D should seek to retain and enhance the cliff faces wherever possible as part of landscaping designs, to ensure continued habitat suitability for nesting peregrine falcon and roosting bats.
- A BNG assessment should be completed for any finalised development designs to ensure that appropriate replacement planting is determined for areas of valuable habitat which cannot be retained. Such an assessment could also be used to consider the suitability of the cliff faces themselves as an area to secure biodiversity net gain.
- Wherever possible, landscaping in Area D should seek to extend the existing open mosaic habitat as a corridor from Area C. If possible, the open mosaic habitat should be complimented by adjacent planting of calcareous grassland and wildlife ponds.
- Any development within Area D should be subject to a sensitive lighting strategy which seeks to avoid illumination of the retained cliff faces. Such a lighting strategy should be designed in accordance with best practice guidance.

SCENARIO AND ECOLOGICAL RECEPTOR SPECIFIC CONSTRAINT AND OPPORTUNITIES

This section of the appendix seeks to identify the potential constraints and opportunities present to different ecological receptors in relation to the development scenarios outlined in Section 1.1.3. The process of identifying constraints and opportunities for the potential development scenarios has been considered from two perspectives:

- Table 9-1 below identifies the constraints and opportunities provided by different land uses within the scenarios; and
- Table 9-2 considers the constraints and opportunities in relation to the individual ecological receptors present or potentially present within the Site, to be further informed by additional survey work.

8.6.6. To ensure that the aims of the development scenarios are meet in relation the provisioning of specific land uses, and that opportunities for ecological enhancements are achieved, will require a concerted effort, negotiation and potential compromise. This is notable in relation any potential recreation pressures as will be outlined below.

Table 8-1 – Land Use Types Constraints and Opportunities

Land use type	Constraints	Opportunities
Residential	Residential development would increase the recreational impact upon the protected designated sites surrounding the Site. Recreational impacts may affect the retained habitat within the Site, if these habitats are managed for public access and not for the purposes of habitat conservation. An increase in recreational pressure may also increase the level of human disturbance, decreasing the suitability of habitats within and surrounding the Site to continue supporting population of protected a notable species. Residential development may result in increased domestic pet populations in proximity to ecologically valuable habitats within the Site, and negatively affect populations of protected and notable species within retained habitats within the Site.	If the development scenario considers habitat enhancement and creation and the appropriate management of these habitats within the Site, a residential development in close proximity to these locations would benefit from access to an area of interesting natural habitat. Access to these habitats and potential interaction with protected and notable species can provided educational opportunities. If the areas of enhanced and created habitats within the Site were to be manged as a nature reserve then enthusiastic and engaged residents may provide a valuable volunteer recourse to help further manage the enhanced and created habitats, educate others visiting the Site and contribute to a greater understanding and appreciation for the natural environment within the local community.
Leisure	Leisure development would increase the recreational impact upon the protected sites surrounding the Site. Recreational impact may affect the retained habitat within the Site, if these habitats are managed for public access and not for the purposes of habitat conservation. An increase in recreational pressure may also increase the level of human disturbance, decreasing the suitability of habitats within and surrounding the Site to continue supporting populations of protected a notable species. Leisure premises which have extended opening hours may impact on the level of disturbance experienced by retained habitats throughout the day and night.	If the development scenario considers habitat enhancement and creation and the appropriate management of these habitats within the Site, users of the leisure facilities would benefit from access to these natural habitats, and potential interaction with notable and protected species. Leisure developments could be tailored to include the access to the natural habitats within their remit. The proximity of leisure development to areas of natural habitat may increase their appeal. The presence of these enhanced and created high value ecological habitats provide the opportunity for creation of a nature reserve within the Site. This has the potential to provided education opportunities for users of the leisure facilities.
Commercial	Commercial development may increase the disturbance experienced by retained habitat with the Site. The temporal impact of this disturbance	If the development scenario considers habitat enhancement and creation and the appropriate management of these habitats within the Site,

Land use type	Constraints	Opportunities
	will depend on the type of commercial organisation using the Site.	potential business in search of commercial premises may preferentially choose to operate within the Shoreham Site.

Table 8-2 - Ecological Receptors Constraints and Opportunities

Features	Constraints	Opportunities
Habitats	Development scenarios may directly and indirectly negatively affect habitats of high ecological value within the Site either through their destruction or disturbance. The destruction or disturbance of these habitats will result in the immediate loss of biodiversity value provided by these habitats. The loss of potential future biodiversity value provided by habitats within the Site as they mature under natural successional processes	Development scenarios have the potential to safeguard and enhance the habitat present within the Site. Retention and protection from disturbance of habitats of high ecological value, including OMP, chalk cliff faces, calcareous grassland and woodland present within the Site. Upon completion of additional Phase 2 surveys, appropriate management can be devised to ensure habitats present within the Site can be enhanced to maximise their ecological value. The specific management requirements would be informed by further botanical surveys but may include, the introduction of specific plant species, alteration to the spatial structures of the habitat present and removal of undesirable species. Development scenarios could accommodate the creation of new habitat within the Site, the large expanse of unvegetated, unsealed surface present in Area D may be suitable for significant and notable habitat creation. However, additional areas of habitat creation could in incorporated within the areas of the Site where development may be targeted. The specific habitat which could be created will be informed by Phase 2 botanical surveys. The creation of significant areas of habitat, appropriate to the condition of the Site will increase the biodiversity value of the Site. A qualitative measure of this value could be accounted for through a BNG assessment for Potential Development which accommodates habitat creation. Scenarios which accommodate habitat, retention, enhancement, and creation should devise a strategy to protect

Features	Constraints	Opportunities
		these habitats from the impact resultant from the construction phase of any Potential Development and the potential recreational pressures resulting from any of the proposed development scenarios. Protection of these habitats should aim to ensure that the condition and quality of these habitats are maximised. The aims of protecting these habitats from recreational impacts will need to be weighed against the benefits which may result from providing public access to these habitats. It is anticipated that a solution that would bring about protection of habitats and the values associated with accessing these habitats can be met.
Protected and Notable Species	Loss of the Site's suitability to support protected and notable species. Constraints associated with specific species are outlined below.	Retention, enhancement, and creation of habitats within the Site will have subsequent benefits on the suitability of the Site to support protected and notable species. However, additional opportunities may be present for specific species or species groups.
Bats	Loss of identified bat roosts within the Site. Loss of future roosting opportunities within the Site. Alteration to habitats within the Site, with resulting loss of potential foraging resource. Alteration to the spatial structure of the Site may impact on bat usage of the Site. Depending on how bats use the Site, this may impact on the population of bat species at wider landscape, for example if the site plays a role in social dynamic of a variety of bat species. This potential constraint will be informed by additional bat assessments. Disturbance within the Site, reducing the suitability of the Site's habitats for use by bats.	Incorporating identified bat roosts into the Potential Development will ensure that the roosts can continue to function. Ensuring the roosting features within structures or habitats (chalk cliff faces) are preserved and their function not negatively affected by any proposed development scenario. Potential to enhance the roosting opportunities within the Site should be considered. This may include the installation of bat boxes within any Potential Development or the design of bespoke structures appropriate for summer/transitional roosts, maternity roosts or hibernation roosts. The specifics of these roosting structures would be informed by additional bat roost and bat activity surveys. If roosting bats are identified within the cliffs, this may provide additional opportunities to investigate ways of enhancing this habitat's use by roosting bats. For example, the creation of roosting features within the rock faces. Habitats within the Site which have been identified as suitable to support foraging and community bats should be

Features	Constraints	Opportunities
		retained and further enhanced, specifically the treeline bordering the western boundary of Area A. Habitat enhancement and creation could incorporate structures which would facilitate the commuting of bats across the landscapes within the Site. This could include linear habitat features such as hedgerows. Further, habitats which are being considered for enhancement and creation could ensure they also provided a rich invertebrate resource for foraging bats. A lighting plan which would minimise the negative effect on bats potentially using the Site could be devised. This lighting strategy will also be compliant with the South Downs National Park Dark Sky's policy.
Birds	Loss of potential nesting opportunities for Schedule 1 bird species including peregrine falcon and black redstart. Disturbance within the Site reducing the suitability of the Site's habitats by a variety of nesting bird species	If black redstart is present within the Site, the large expanses of the roof structures within the Site would act as significant nesting resource for this species. Incorporation of the existing roof structures within any Potential Development would help conserve this resource. Nesting locations and opportunities with both retained structures or the cliff face for peregrine falcon should be created or further enhanced. Habitat enhancement and creation within the Site should ensure that they are able to support a foraging resource of these species. New development could provide additional nesting resource of these species, or additional nesting resource for a range of bird species, this could be incorporated into the building or landscape design.
Reptiles	Loss of suitable reptile habitat within the Site	Suitable reptile habitat within the Site could be retained and enhanced. Habitats to be enhanced and created could incorporate reptile-specific habitat within their design which are appropriate for the Site context, as well as incorporating existing habitat features used by reptiles (if present within the Site). In addition, these habitats could be manged in a 'reptile friendly' manner. The habitat selected

Features	Constraints	Opportunities
		for creation within the Site should provide rich foraging resource for reptiles. Reptile hibernacula as well as other habitat features which support reptile species such as grass snake egg laying areas could be incorporated in to created and enhanced habitats.
Amphibians	Loss of suitable terrestrial and aquatic habitats for amphibians within the Site.	Existing ponds and waterbodies within the Site could be retained and enhanced. This could include the planting of additional native aquatic plant species with the waterbodies, removal and control of invasive plant species, notably New Zealand pigmy weed. Further enhancement of terrestrial habitat surrounding ponds and waterbodies for amphibian species is also recommended. Waterbodies should be incorporated to the areas of habitat enhancement and creation. Ephemeral pools are a potential feature of OMH, establishment of waterbodies within areas of this habitat would be consistent with future management plans. Landscaping associated with any Potential Development should incorporate waterbodies and aquatic habitat within their designs. These habitat features may be incorporated into any SuDS drainage strategy required for any Potential Development.
Invertebrate	Loss of suitable habitat for invertebrates within the Site.	Retention of habitats identified for suitability for invertebrate assemblage. The creation of habitats within the Site should provide suitability for a diverse invertebrate assemblage through the selection of plant species used and the creation of a spatially diverse environment, including the establishment of aquatic habitats. Inclusion of features within enhanced and created habitats which support invertebrate populations, including the establishment of deadwood, bee banks and bug hotels. These features could also be incorporated into the landscape design of any Potential Development.

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