DESIGNATED SITES ASSESSMENT

GLAN Y MOR, BARKERS WELL LANE, CLARACH BAY, ABERYSTWYTH, SY23 3DT

ON BEHALF OF

ALLENS CARAVANS LTD

REFERENCE: ZEL_231

DATE: April 2022

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Report Data	
Report Title	Designated Sites Assessment
Report Reference	ZEL_231
Client	Allens Caravans Ltd
Development Site	Glan Y Mor, Barkers Well Lane, Clarach Bay, Aberystwyth, SY23 3DT
Surveyor	E. Seaton BSc (Hons) MCIEEM
Author	E. Seaton BSc (Hons) MCIEEM

Rev	Report	Author	Date Issued
V1	Designated Sites Assessment	E. Seaton BSc (Hons) MCIEEM	12 April 2022

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1.0 INTRODUCTION

Background to the Development

1.1 Zebra Ecology Ltd was commissioned by Allens Caravans Ltd to undertake a Designated Sites Assessment for a new clubhouse water-source heat-pump proposed at Glan Y Mor, Barkers Well Lane, Clarach Bay, Aberystwyth (centred on Ordnance Survey grid reference SN 586 841).

Figure 1: showing approximate location of proposed clubhouse and discharge / abstraction points of the water-source heat-pump

Water-source Heat-pump Specification

1.2 Four ducts will be installed under the road from new clubhouse:

- 2 x 63mm to pull water to clubhouse. There are 2 water pipes to pull water because one serves as a backup, so there will only ever be one working at a time.
- 1 x 90mm returning water to river
- 1 x 100mm duct to house electric cable for pumps

1.3 During heating of the building in winter months:

- Water will be returned approx. 1.5°C lower
- Maximum water abstraction rate of 300m^3 per day

1.4 When cooling of the building in summer months:

- Water returned at approx. 1.5°C higher
- Maximum water abstraction rate of 80m^3 per day

Report Objectives

The objectives of the report are to:

- Assess whether the proposed abstraction and discharge could have an impact on any of the features in nearby designated sites:
    - Craigyfulfran & Clarach SSSI
    - Borth-Clarach SSSI
    - Lleyn Peninsula & the Sarnau SAC

2.0 CRAIGYFULFRAN AND CLARACH SSSI

Reason for designation

2.1 The Craigyfulfran section of the site is of special interest on two counts:

- *'The site is the type locality for the Aberystwyth Grits, of Llandovery age. These rocks consist of a sequence of greywacke-mudstone rhythms with the latter lithology predominant. Greywacke units are thinner here than on more southerly sections of the Grits, indicating a greater distance from the source area for these turbidite-generated sediments. Soft-sediment deformation structures and hexagonal feeding-burrow systems assigned to the ichnogenus Palaeodictyon are common. These features, in combinations with fold and faults, make this a good teaching site.*

- *The Aberystwyth Grits in the cliffs and foreshore here show complex structural features of special geological interest. These Silurian rocks were later subjected to intense and repeated compression during the Caledonian mountain building episode (orogeny). As a result of this compression the rock layers became contorted by complex folds and cut by numerous fractures. Exposures at Craigyfulfran provide unique examples of small-scale folds cut by an early cleavage (closely spaced parallel fractures), both of which apparently formed before the main fold and cleavage sets recognised throughout the region. These exposures also provide numerous small examples of slip surfaces developed parallel to the rock layers, an important element of the complex process by which the rocks distorted during the orogenic compression. This is an important locality for study of the effects of the Caledonian Orogeny in this region. '*

2.2 The Clarach section is of special interest for its uninterrupted sedimentary record from the start of the Late-glacial period to the present day. Study of the lithostratigraphy, pollen and diatoms in association with radiocarbon dating have provided records of environmental and sea-level changes.

2.3 Features of biological interest are also present including rare native plant species such as fenugreek, narrow-leaved everlasting pea, yellow-juiced poppy and dwarf mallow. Honeycomb worm reefs can be found along the shoreline and there are a number of species of cliff-nesting birds.

2.4 The field behind the beach at Clarach contains saltmarsh and species-rich ditches and bankside vegetation where water voles are present.

Table 1: Potential Impacts upon Features of Interest at Craigyfulfan and Clarach SSSI

Main Features of Interest	Sensitivities / Threats	Impacts of Water Heat Source Pump
Geology	Accessibility Access is required for researchers and students to study the cliffs. Access will be maintained providing existing regimes of coastal erosion and sediment transport are preserved.	No impacts identified upon accessibility
	Integrity of cliffs and foreshore Coastal defences (e.g. sea walls) could lead to concealment of cliff faces and geological structures.	No impacts identified upon integrity of cliffs / foreshore
	Maintenance of coastal processes Coastal processes prevent build-up of materials from the base of the sea-cliffs.	No impacts identified upon coastal processes.
Native rare plants	Recreational pressure Sensitive to trampling, picking etc.	No impacts identified upon native rare plants
Honeycomb worm reefs	Recreational pressure The reefs are sensitive to trampling.	No additional recreational pressure anticipated.
	Coastal protection Any coastal protection that could move sand patterns could adversely affect the honeycomb worm reefs.	No impacts / changes to coastal protection identified.
	Pollution The reefs are sensitive to pollution from both land and sea such as oil spills, slurry leaks, slurry leaks and fertiliser run-off.	No impacts identified in association with pollution.
Cliff-nesting birds	Disturbance Human related e.g. rock climbers, landslides etc.	No impacts identified in association with increased disturbance.
	Feeding habitat Short grassland and bare ground provide important feeding areas for chough.	No impacts upon feeding grounds for chough
	Grazing Grazing of livestock maintains a short sward with invertebrates associated with cattle/horse providing an important food source.	No impacts identified upon existing grazing regimes.

Water vole	<u>Legal Protection</u> Protected under the Wildlife and Countryside Act 1981. It is an offence to intentionally: • kill, injure or take them • possess or control them (alive or dead) It is also an offence to intentionally or recklessly: • damage or destroy a structure or place used for shelter or protection • disturb them in a place used for shelter or protection • obstruct access to a place used for shelter or protection	**Impacts unknown. Further water vole survey work required to determine presence / absence and any impacts in association with installing the heat-source water-pump.**

3.0 BORTH-CLARACH SSSI

Reason for designation

3.1 The site extends from Upper Borth in the north to Clarach Bay in the south. It is of special interest for both its geological and biological features:

Geological

3.2 *'The cliffs and foreshore at the northern end of Clarach Bay consist of sandstones and shales of the Aberystwyth Grits Formation, formed during the Silurian Period of geological history. In late Silurian to early Devonian times, the rocks were subjected to intense and repeated compression and distortion during the Caledonian mountain building episode (orogeny), producing a complex pattern of folds and fractures.*

3.3 *The exposures at Glan-y-mor demonstrate these structures with particular clarity. The rocks at this locality lie within a broad arch-shaped fold (anticline) cut by a set of regularly spaced fractures (cleavage).*

3.4 *Early folds, pre-dating the main episode of fold and cleavage formation, and late folds that distort the cleavage are also well displayed. These features are of importance in understanding the sequence of events and processes that characterize the Caledonian Orogeny in this region.'*

Biological

3.5 *'The moderately exposed shore is predominately underlain by bedrock with occasional patches of boulders or sand, backed along its length by a barren shingle ridge and cliffs. Small pebbles and sand are quite mobile along the site resulting in high levels of scour. This is clearly reflected in the composition and abundance of species.*

3.6 *The scour-tolerant red alga Rhodomela confervoides, for example, is abundant in areas of the lower shore whilst high levels of suspended sand are a requirement of the well-developed reefs of the honeycomb worm Sabellaria alveolata which is of special interest.*

3.7 *The honeycomb worm forms extensive golden brown honeycomb-like hummocks on the bedrock platforms and cobbles on the site. These reefs are found from the mid shore down to the very lower shore. Such extensive honeycomb worm reefs on bedrock are unusual in Wales. The structure of the honeycomb reefs creates a maze of interstices which provide shelter for crustacea, molluscs and worms, further increasing the species diversity of the site.*

3.8 *Above the shingle ridge, the cliffs support sparse patches of the orange lichen Caloplaca species and the black tar lichen Verrucaria maura. Sea caves towards Clarach Bay contain the encrusting red alga Hildenbrandia rubra and patches of the velvety red alga Rhodothamniella floridula Audouinella floridula.* Occasional areas of the green *ephemeral algae Ulothrix flacca and Urospora species are present on freshwater-influenced rock.*

3.9 *The rock platform displays a fine zonation of animal and algal communities, particularly in the northern part of the site. Directly below the shingle, there are extensive areas of acorn barnacles Semibalanus balanoides, Chthamalus species and the common limpet Patella*

vulgata. In areas of mixed substrata, littorinid molluscs, such as the edible winkle Littorina littorea, are also common.

3.10 *Small patches of sheltered bedrock at either end of the site support knotted wrack Ascophyllum nodosum. Below the barnacle and limpet zone there are large areas of the edible mussel Mytilus edulis, occasionally covered with brown and green algae. Surge gulleys are commonly incised through the bedrock across the site. These gulleys support a healthy population of the honeycomb worm, often amongst bladderwrack Fucus vesiculosus or serrated wrack F. serratus.*

3.11 *On the lower shore, the sides of some gullies support a shaded overhang community of bryozoans, sea squirts and sponges. There are many shallow rock pools along the length of the site, dominated on the upper shore by green algae such as gut weed Enteromorpha species and Cladophora species.*

3.12 *Farther seawards, pools are characterised by coralline algae such as Corallina officinalis and pink encrusting Corallinaceae. These pools support a diverse range of typical red algae such as the red algae Ceramium species, Phyllophora pseudoceranoides and Irish moss Chondrus crispus and grazing molluscs such as the purple topshell Gibbula umbilicalis. Deeper rockpools typically contain more wracks and kelps such as oarweed Laminaria digitata and the sugar kelp L. saccharina.*

3.13 *Towards the centre of the site, the upper part of Sarn Cynfelin, a linear reef of cobbles and boulders, is largely barren with occasional small gammarid shrimps and juvenile sugar kelp at its seaward end. The extreme lower shore just south of Sarn Cynfelin is characterised by serrated wrack with a rich red algal understorey. Occasional red algal turfs are dominated by dense Mastocarpus stellatus. Below this, in places, are found sugar kelp and oarweed.*

3.14 *Occasional patches of clean sand support amphipods and polychaetes such as the lug worm Arenicola marina and the white rag worm Nephtys cirrosa.*

3.15 *The hard-rock cliffs, together with locally developed embayments of reworked boulder clay and head, are prone to instability and erosion. The vegetation reflects this instability, varied substrate and exposure with areas of gorse scrub, bracken and small patches of heath amongst maritime grassland.*

3.16 *Along with other coastal breeding birds, a number of pairs of chough nest in crevices or recesses in the cliffs and high numbers also use the site for roosting. Areas of scree and short and sparse vegetation on thin soils and along paths provide important feeding areas where they can probe for invertebrates and they also feed amongst debris along the tideline. A large cormorant roost is also present.'*

Table 2: Potential Impacts upon Features of Interest at Borth Clarach SSSI

Main Features of Interest	Sensitivities / threats	Impacts of Water Heat Source Pump
Geology	Accessibility Access is required for researchers and students to study the cliffs. Access will be maintained providing existing regimes of coastal erosion and sediment transport are preserved.	No impacts identified upon accessibility
	Integrity of cliffs and foreshore Coastal defences (e.g. sea walls) could lead to concealment of cliff faces and geological structures	No impacts identified upon integrity of cliffs / foreshore
	Maintenance of coastal processes Coastal processes prevent build-up of materials from the base of the sea-cliffs.	No impacts identified upon coastal processes.
Chough	Breeding and roosting sites Sheltered crevices and recesses on the cliff face are used for breeding and roosting choughs and are particularly sensitive to disturbance from March to July and at dusk during the autumn and winter months.	No impacts identified upon chough breeding / roosting sites.
	Feeding habitat Short grassland and bare ground provide important feeding areas for chough.	No impacts identified upon chough feeding habitats.
	Grazing Grazing of livestock maintains a short sward with invertebrates associated with cattle/horse providing an important food source.	No impacts identified upon existing grazing regimes.
Honeycomb worm reefs	Recreational pressure The reefs are sensitive to trampling.	No additional recreational pressure anticipated.
	Coastal protection Any coastal protection that could move sand patterns could adversely affect the honeycomb worm reefs.	No impacts / changes to coastal protection identified.
	Pollution The reefs are sensitive to pollution from both land and sea such as oil spills, slurry leaks, slurry leaks and fertiliser run-off.	No impacts identified in association with pollution.

4.0 LLEYN PENINSULA AND THE SARNAU SAC

Reasons for designation

4.1 The SAC encompasses sea, coast and estuary that support a range of marine habitats and wildlife. Differences in rock and sediment type, aspect, sediment movement, exposure to tidal currents and wave action, water clarity and salinity together with biological and food chain interactions have created a wide range of habitats and associated communities of marine plant and animal species, some of which are unique in Wales.

4.2 The site has been designated as a SAC due to the presence nine marine habitat types and associated wildlife. The qualifying features are shown in Table 3:

4.3 Table 4 sets out the screening matrix (taken from European Commission, 2001) used to assess the proposed installation of the heat-source water-pump under the Conservation of Habitats and Species Regulations 2017 to establish whether it is likely to have a significant effect on the European sites.

Table 3: Qualifying Features at Lleyn Peninsula and the Sarnau SAC

European Site	Site Characterisation
Lleyn Peninsula and the Sarnau (SAC) **SAC EU Code:** UK0013117	**Qualifying Features** **Annex I Habitats (primary reasons for selection):** **1110** Sandbanks slightly covered by water all the time **1130** Estuaries **1150** Coastal lagoons **1160** Large shallow inlets and bays **1170** Reefs **Annex I Habitats (qualifying habitats but not primary reason for selection):** **1140** mudflats and sandflats not covered by water **1310** Salicornia and other annuals coloniszing mud and sand **1330** Atlantic salt meadows (*Glauco-Puccinellietalia martitimae*) **8330** Submerged or partiallu submerged sea caves **Annex II Species (primary reason for selection):** not applicable **Annex II Species (qualifying species but not primary reason for selection):** **1349** Bottlenose dolphin **1355** Otter **1364** Grey seal

Table 4: Screening Matrix for the Natura 2000 site near Glan Y Mor.

Assessment Criteria	
Describe the individual elements of the project likely to give rise to impacts on the Natura 2000 sites.	The proposed installation of a water-source heat-pump does not result in any work that would cause a direct loss of SAC Site habitat or otherwise result in indirect impacts upon the integrity or functionality of the nearby Natura 2000 site.
Describe any likely direct, indirect or secondary impacts of the project on the Natura 2000 site by virtue of: • Size and scale • Land-take • Distance from the Natura 2000 site or key features of the site • Resource requirements • Emissions • Excavation requirements • Transportation requirements • Duration of construction, operation, *etc*. • Other	**None.** Small-scale proposals not resulting in any land-take from the SAC. No direct or secondary impacts identified in relation to emissions, excavation / transportation requirements or duration of construction.
Describe any likely changes to the site arising as a results of: • Reduction of habitat areas • Disturbance to key species • Habitat or species fragmentation • Reduction in species density • Changes in key indicators of conservation value • Climate change	**None**. No reduction in habitat areas or disturbance to key species. Works very small-scale, will not result in habitat / species fragmentation or reduction in species density.
Describe any likely impacts on the Natura 2000 site as a whole in terms of: • Interference with the key relationships that define the structure of the sites. • Interference with key relationships that define the function of the site.	**None have been identified.**
Provide indicators of significance as a result of the identification of effects set out above in terms of: • Loss • Fragmentation • Disruption • Disturbance • Change to key elements of the sites	**Not applicable.**
Describe from the above those elements of the project or plan, or combination of elements, where the above	**No significant effects have been identified.**

impacts are likely to be significant or where the scale or magnitude of impacts if not known.	

5.0 CONCLUSION

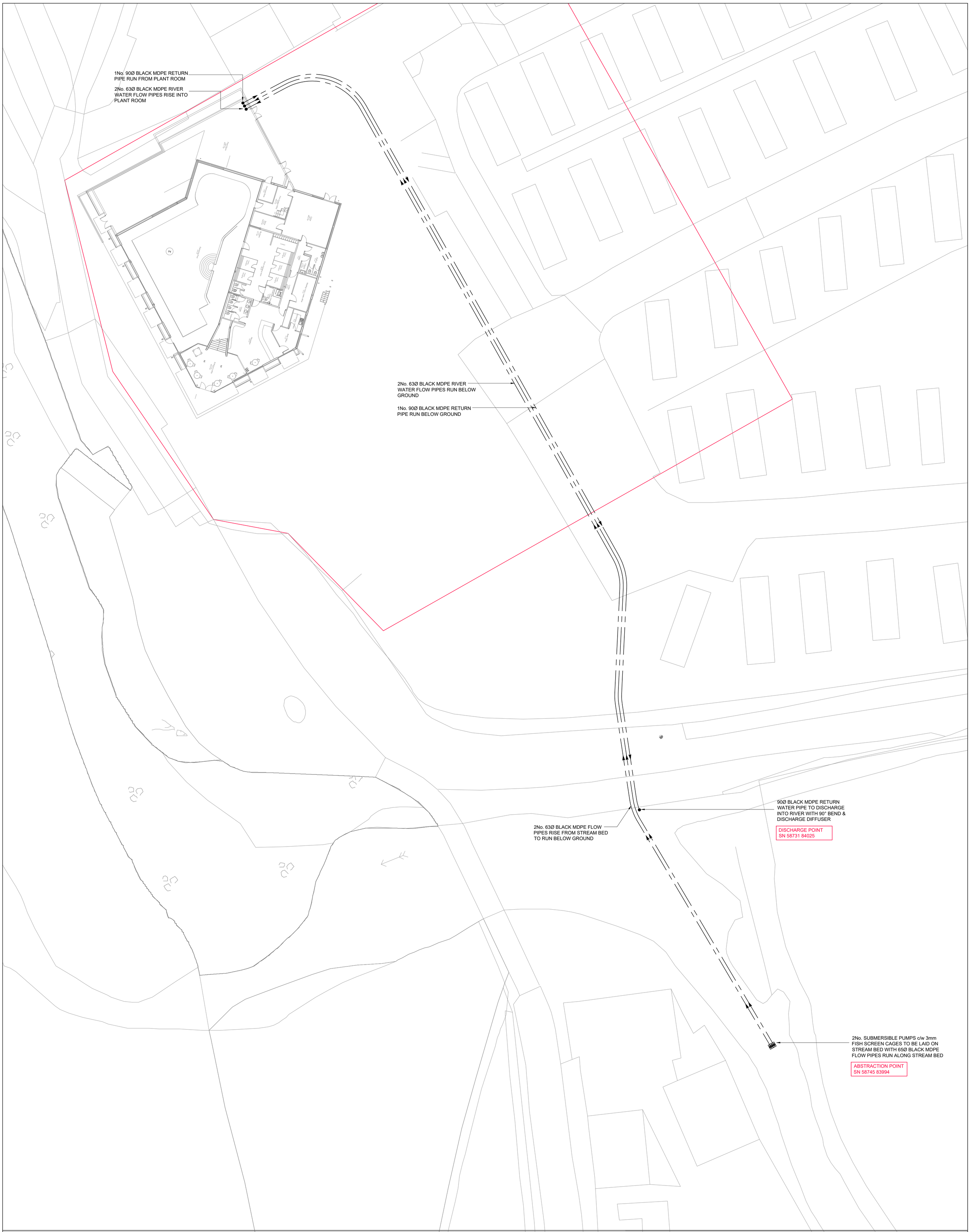
5.1 Water voles reported to be present within the species-rich ditches and bankside vegetation of Craigyfulfran and Clarach SSSI (location of proposed heat-source water-pump). Therefore, further habitat assessment and field survey will be required to determine any impacts and direct suitable mitigation (if required) for this protected species.

5.2 Water presence vole / absence surveys can be completed between mid-April – June and July – September (inclusive). Two surveys are typically required, each undertaken during these time periods with a minimum two-month gap between surveys.

5.3 No impacts have been identified on any other features of interest or qualifying features in association with Craigyfulfran and Clarach SSSI, Borth-Clarach SSSI or Lleyn Peninsula & the Sarnau SAC.

APPENDIX A

Glan Y Mor Site Plan



General Notes

This drawing is the copyright of JBR Consulting Limited and shall not be copied or reproduced without permission.

Unless stated otherwise all dimensions are in millimetres.

This drawing is not a working drawing and where scales an dimensions are indicated they are for information and shall be checked by the Contractor against site measurements prior to commencement of any works.

This drawing shall be read read along side the project specification and all other associated contract documents. All materials and workmanship shall conform to the relevant British and European Standards, Specifications and Codes of Practice applicable at the time.

Project

GLAN-Y-MOR LEISURE CENTRE

Client

GLAN-Y-MOR LEISURE CENTRE

Title

MECHANICAL SERVICES
PROPOSED RIVER WATER ABSTRACTION & DISCHARGE PIPEWORK ROUTES

Rev	Date	Description	By
P1	10/09/21	Preliminary Issue	RT

Amendments

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Drawing Status: PRELIMINARY

Designed by	Checked by	Project No
DP	DP	JBR21015
Drawn by: JK	Date: SEPT-21	
Scales: 1:250 @ A1 / nts @ A3		

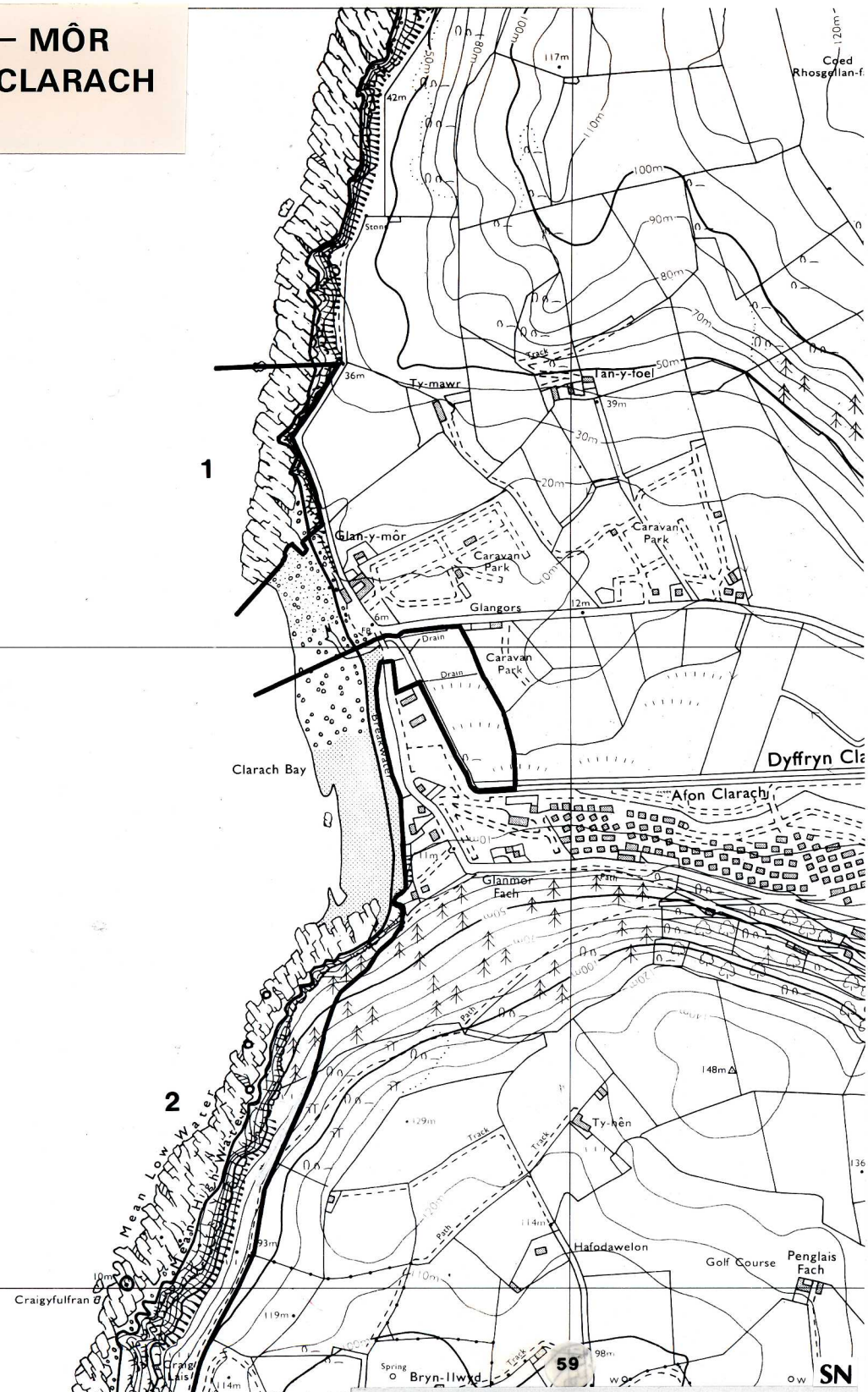
Drawing Number: JBR/21015/M/011

Revision: P1

APPENDIX B

Designated Sites Location Plans

1. CREIGIAU GLAN –Y – MÔR
2. CRAIGYFULFRAN & CLARACH
Ceredigion – DYFED



CYNGOR CEFN GWLAD CYMRU	COUNTRYSIDE COUNCIL FOR WALES
Ffin So.Dd.Ga *S.S.S.I. boundary*	Hysbyswyd am y tro cyntaf *First notified* 1 27/9/88 2 1/1/54
Arwynebedd /*Area* 1 2.8 ha 2 25.0 ha	Hysbyswyd yr adolygiad diwethaf *Last revision notified* 1 27/9/88 2 27/9/88
Graddfa/*Scale* 1:10,000	Cadarnhad *Confirmation* 1 15/6/89 2 15/6/89

SYLWER. Mae ffin atfor y SoDdGa yn dilyn Marc Distyll Cymedrig ac mae'n debygol o newid.
NOTE. SSSI seaward boundary follows Mean Low Water Mark and is liable to change.

G/N

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

BORTH - CLARACH

Ceredigion **Map 1 of 2**

	Ffin SDdGA **SSSI boundary**
1:10000	Graddfa **Scale**
85.8 ha	Arwynebedd (tua) **Area (approx)**
27/09/88	Hysbyswyd am y tro cyntaf **First notified**
25/03/02	Hysbysiad o ehangiad **Notification of enlargement**
16/12/02	Cadarnhad **Confirmation**

Nodyn: Mae'r holl ffin yn dilyn llinellau'r marciau penllanw neu llanw astronomaidd isaf ac mae'r ddau yn gallu newid.

Note: Where site boundary follows mean high water mark or lowest astronomical tide, both are liable to change.

SRDB Code: WXW

Cyngor Cefn Gwlad Cymru
Countryside Council for Wales

BORTH - CLARACH

Ceredigion **Map 2 of 2**

	Ffin SDdGA **SSSI boundary**
1:10000	Graddfa **Scale**
85.8 ha	Arwynebedd (tua) **Area (approx)**
27/09/88	Hysbyswyd am y tro cyntaf **First notified**
25/03/02	Hysbysiad o ehangiad **Notification of enlargement**
16/12/02	Cadarnhad **Confirmation**

Nodyn: Mae'r holl ffin yn dilyn llinellau'r marciau penllanw neu llanw astronomaidd isaf ac mae'r ddau yn gallu newid.

Note: Where site boundary follows mean high water mark or lowest astronomical tide, both are liable to change.

SRDB Code: 32WXW

Pen Llyn a'r Sarnau (PLAS)

Mudflats and Sandflats
- Definite
- Potential

Sandbanks
- Definite
- Potential

Reefs
- Point Sample Locations
- Definite
- Potential

Large Shallows Inlets and Bays (LSIB)

Estuaries

Sea Caves

Lagoons

Atlantic Salt Meadow (ASM)

Saliconrnia

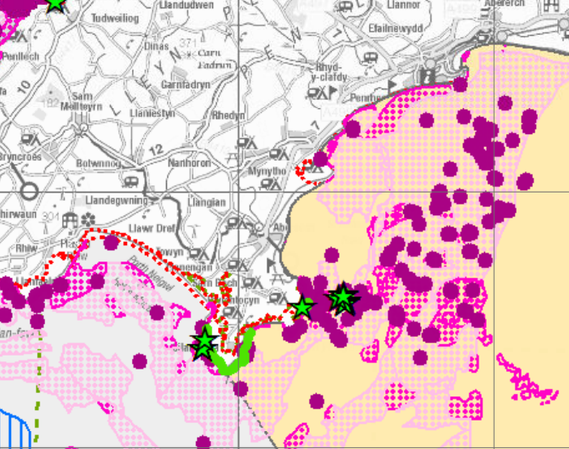
Marine Sites of Special Scientific Interest (SSSI)

Special Protection Areas (SPA)

Special Areas of Conservation (SAC)

190000 200000 210000 220000 230000 240000 250000 260000 270000 280000

340000 330000 320000 310000 300000 290000 280000



Cyfoeth Naturiol Cymru
Natural Resources Wales

01.252.5 5 7.5 Km

1:240,000

Graddfa /Scale

Mae graddfa'r map yn cywir pan argraffu yn A3

The scale of this map is only correct when printed out at A3

Produced by: Carto, NRW

Date: 01/07/2020

Coordinate System: British National Grid

APPENDIX C

Legislation

Water voles

Water voles are protected in the UK under the Conservation of Habitats and Species Regulations, 2017 and Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This legislation makes it an offence to:

- Intentionally kill, take or injure a water vole;
- Possess or control any live or dead water vole, or any part or derivative (not including water voles bred in captivity under licence);
- Intentionally or recklessly damage, destroy or block access to a water voles place of shelter or protection (on purpose or by not taking enough care);
- Intentionally or recklessly disturb a water vole whilst it is occupying a structure or place which it uses for shelter or protection (on purpose or by not taking enough care).

APPENDIX D

Qualifications and Experience

Zebra Ecology Ltd is Registered Practice of the Chartered Institute of Ecology and Environmental Management (CIEEM). A comprehensive range of ecological services are offered including Preliminary Ecological Appraisal (PEA), Ecological Impact Assessment (EcIA), Habitat Regulations Assessment (HRA), Biodiversity Impact Assessment (BIA) and European Protected Species (EPS) Surveys / Licensing.

The practice works closely work closely with clients to achieve their aspirations alongside securing the best outcomes for the environment. With wildlife legislation and policy as its basis; commercial awareness, pragmatism and defensible advice is combined to form Zebra Ecology's approach.

As well as offering a wide range of ecological services, Zebra Ecology forms part of Zebra Group offering an in-house collaborative approach in conjunction with Zebra Architects, Zebra Landscape Architects, Zebra Trees and Zebra Land and Development.

Emma Seaton BSc (Hons) MCIEEM

Emma holds a BSc (Hons) degree in Biology from the University of Sheffield and has since gained a postgraduate certificate in Ecological Consultancy. Her ecological experience includes Preliminary Ecological Appraisals, Ecological Impact Assessments (EcIA), surveying for notable / European Protected Species, mitigation / licensing advice and providing Continued Professional Development (CPD) sessions for developers on Biodiversity Net Gain. She has held Natural England survey licences for bats (Class 2), great crested newts and white-clawed crayfish since 2015. She is also a Registered Consultant under the Bat Mitigation Class Licence (BMCL) licence. Emma is a Full member of the Chartered Institute of Ecology and Environmental Management.