



CLEVE HILL SOLAR PARK

ENVIRONMENTAL STATEMENT
VOLUME 4 - TECHNICAL APPENDIX A8.2b
HABITAT SUITABILITY INDEX (HSI) ASSESSMENT AND ENVIRONMENTAL
DNA SURVEY

November 2018
Revision A

Document Reference: 6.4.8.2.2
APFP Regulation: 5(2)(a)

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HABITAT SUITABILITY INDEX (HSI) ASSESSMENT AND ENVIRONMENTAL DNA SURVEY

CLEVE HILL SOLAR PARK

FOR
CLEVE HILL SOLAR PARK LTD

NOVEMBER 2018

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Date of Issue:	6 th November 2018
Version:	1.2

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1 INTRODUCTION AND BACKGROUND

Arcus Consultancy Services (Arcus) was commissioned by Cleve Hill Solar Park Ltd (the Applicant) to undertake environmental DNA (eDNA) surveys for great crested newt, (GCN) (*Triturus cristatus*) in relation to an application for Cleve Hill Solar Park ('the Development') on Land at Cleve Hill, Kent ('the Site').

Previous Habitat Suitability Index (HSI) assessments and subsequent recommended presence/absence GCN surveys of seven waterbodies within 500 m of the Site were completed in April to June 2015 by Aecom¹. Where GCN presence was identified, further population surveys were completed. GCN were observed within three of these water bodies located outside of the Site boundary, all of which had a small population size class (1-10 individuals). No GCN were recorded in any of the water bodies present within the Site.

In order to update the baseline data collected during the 2015 surveys, it was identified that a revised HSI of these waterbodies, as well as an eDNA survey would be required. The aim of these update surveys were to establish whether there had been any temporal changes to the quality of the previously surveyed waterbodies, or the spatial distribution of GCN within them.

Consequently, Arcus was commissioned to undertake an eDNA survey and habitat suitability index (HSI) assessment to determine the presence or likely absence of GCN and the potential effects of the Development.

This report describes the methods and results of the eDNA survey and HSI assessment, and provides an overview of the potential constraints to the Development.

2 LEGISLATION

GCN are a European protected species, which is afforded legal protection under the Conservation of Habitats and Species Regulations 2017. This species is protected from intentional or reckless killing, injury or taking, and intentional or reckless disturbance of GCN whilst occupying a 'place used for shelter or protection' is prohibited, as is the destruction of these places.

3 METHODS

3.1 Habitat Suitability Index (HSI) Assessment

All waterbodies within 500 m of the Development were identified from OS 1:10,000 maps and aerial photographs. GCN may utilise suitable terrestrial habitat up to 500 m from their natal or breeding waterbodies and, therefore, if they are present in any of the waterbodies in the survey area or surrounds, GCN could be present within suitable terrestrial habitat within the survey area.

Ten waterbodies were identified during a review of maps and aerial imagery; however, two were scoped out of further survey. One waterbody was found to be over the size suitable for assessment (previously identified as Waterbody 5 by Aecom) and the other waterbody was not available for assessment and survey, due to land owner access restrictions (Waterbody 8).

Following standard methods for Habitat Suitability Index (HSI) assessment², an HSI assessment of eight offsite waterbodies was undertaken on the 23rd and 24th April 2018. The HSI field scores were inserted into a table to calculate a score for each waterbody,

¹ Cleve Farm – Amphibian Survey Report. Aecom (March 2016).

² ARG UK (2010). ARG UK Advice Note 5: Great Crested Newt Habitat Suitability Index. Amphibian and Reptile Groups of the United Kingdom.

with suitability for great crested newts assessed on the following scale (see Table 3.1 below):

Table 3.1: Waterbody Suitability

HSI Score	Waterbody Suitability
< 0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
> 0.8	Excellent

Following this assessment, all eight waterbodies were selected for eDNA testing, with the results detailed in Section 4.

3.2 Environmental DNA Testing

Water samples were taken from eight waterbodies within 500 m of the Site in accordance with Natural England's approved method³ following completion of HSI assessments on the 23rd and 24th April 2018. A total of 20 water samples were taken from each waterbody at regular intervals, using the sterile sample kit provided by the Food and Environment Research Association (FERA). The samples for each waterbody were subsequently mixed, with 15 ml dispensed into six separate sample tubs. This resulted in a total of six samples for each waterbody. The sample kits were stored in the refrigerator until their return to FERA.

4 RESULTS

The numbering and location of waterbodies subject to eDNA surveys and HSI assessments reflect those identified within the earlier Aecom great crested newt report¹, where a plan showing the location of these waterbodies can be found.

4.1 Habitat Suitability Index (HSI) Assessment

The eight waterbodies were assessed to be of between poor to excellent suitability to support GCN. Full HSI assessments for each waterbody can be found in Appendix 1, with photographs of each waterbody seen in Appendix 2.

A summary of results of the HSI and descriptions of each waterbody are shown in Table 4.1 overleaf.

³ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. *Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (Triturus cristatus) environmental DNA*. Freshwater Habitats Trust, Oxford.

Table 4.1: Waterbody descriptions and HSI result.

Waterbody No.	Grid Reference	HSI Score	Description
1	TR 051640	0.86 – Excellent	Balancing pond.
2	TR 048640	0.86 – Excellent	Balancing pond.
3	TR 053637	0.86 – Excellent	Farm pond.
4	TR 053641	0.61 – Average	Scrapes and hollows.
5	TR 043629	0.73 – Good	Garden pond.
6	TR 042631	0.83 – Excellent	Historic overgrown reservoir.
7	TR 050635	0.34 – Poor	Overgrown farm pond
8	TR 038628	–	No Access
9	TR 038631	0.61 – Average	Newly created ditch fed pond.
10	TR 043634	–	Waterbody over suitable assessment size (previously Waterbody 5)

4.2 Environmental DNA

The results of the eDNA analysis indicate that eDNA for GCN was detected in four of the ten waterbodies, and was absent in the other four waterbodies. Results of the sample analysis can be seen in Table 4.2.

Table 4.2: Results of eDNA analysis.

Waterbody No.	FERA Kit Number	Detection of GCN
1	S18 – 003585	Negative
2	S18 – 003580	Positive
3	S18 – 003579	Positive
4	S18 – 003586	Positive
5	S18 – 003583	Negative
6	S18 – 003582	Negative
7	S18 – 003581	Positive
9	S18 – 003584	Negative

5 EVALUATION

5.1 GCN Distribution, population and temporal comparison

The eDNA testing confirmed that GCN were still present in waterbodies within 500 m of the Site, with suitability of waterbodies for GCN remaining broadly similar to that found within the 2015 HSI surveys. This indicated that aquatic habitats had remained largely unchanged over this time period.

The results indicated that Waterbody 1 no longer had GCN present at the time of the eDNA survey, when compared to earlier survey results from 2015, but that Waterbody 2 and Waterbody 7 contained GCN. Whilst Waterbody 7 was found to be dry during the 2015 surveys, it was found to be overgrown and of poor suitability for GCN during the latest survey. Waterbody 2 was a balancing pond, which was connected to the existing London Array substation and was approximately 40 m from the proposed substation footprint.

The 2015 and 2018 HSI assessment results were broadly similar, eDNA analysis confirmed GCN presence, and aquatic and terrestrial habitats largely remained unchanged in the intervening period between 2015 and 2018. Given the above, it can be inferred that (with all known parameters being equal), the GCN population (found in waterbodies within 500m of the Site) is largely stable and likely to contain a similar small population size class estimate to that found in 2015.

5.2 Predicted Impacts on GCN

The Development will not lead to the loss of any waterbodies suitable for GCN within the Site or outwith it. There is no hydrological link from the Development to the nearest waterbody, Waterbody 2 located to the south of the substation footprint, and as such there will be no indirect impact upon this waterbody. Waterbodies 3, 4 and 7 are sufficiently separated by distance from the substation construction footprint, or other areas of the Development where there is the breaking of ground (e.g. excavations, new track construction etc.) and therefore impacts on these waterbodies from the Development are not envisaged.

Waterbody 2, which identified the presence of GCN through eDNA analysis and is located circa 40 m from the substation construction footprint, will not be directly affected by the proposed works. However, small areas of moderately suitable terrestrial habitat (scrub and grassland) for this species, was found in close vicinity to this pond. Whilst terrestrial habitat between this waterbody and the proposed substation construction footprint and solar panel infrastructure was recorded, it was assessed to be of mostly of low or negligible quality. Some of the low or negligible quality onsite habitat however may be affected on a temporary and permanent basis by the Development. The terrestrial habitats between the substation construction footprint and Waterbody 2 are fragmented by the presence of a hard-core farm access track.

GCN are a mobile species and are known to travel freely within suitable terrestrial habitat and between waterbodies and are however unlikely to be obstructed by minor habitat fragmentation. The extent and detail of the Development is established, with minimal breaking of ground under solar panels proposed and no obstruction to commuting or foraging GCN envisaged.

The extent of the substation footprint is 11 Hectares (ha), with all this area subject to the breaking of ground and presenting a risk of harm to amphibian's including GCN. As a result of extensive activity in this area of the Site, there is the potential for an impact on the favourable conservation status of great crested newts from the Development.

5.3 Rapid Risk Assessment

The GCN population in Waterbody 2 was inferred to be small, and the terrestrial habitats within the substation construction footprint appear to be relatively poor in comparison to those found immediately surrounding this waterbody and further offsite to the south. As the breaking of ground within 500 m of Waterbody 2 is proposed to be extensive however, it was thought likely that the works will require an application for a European Protected Species Mitigation (EPSM) licence from Natural England.

To determine the likelihood of this approach being required, a 'rapid risk assessment' was undertaken for the Development using Natural England's assessment tool⁴, which produced a result of '*Red – Offence Highly Likely*'. A breakdown of this rapid risk assessment can be seen in Table 5.1.

Table 5.1: Rapid Risk Assessment Table.

Component	Likely effect (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	0.5 - 1 ha lost or damaged	0.7
Land 100-250m from any breeding pond(s)	1 - 5 ha lost or damaged	0.4
Land >250m from any breeding pond(s)	5 - 10 ha lost or damaged	0.3
Individual great crested newts	No effect	0
		Maximum:
Rapid risk assessment result:		RED: OFFENCE HIGHLY LIKELY

The survey results suggests that the GCN population within the Site and surrounding area is small, but given the size of the substation construction footprint, the likelihood of individual newts being present within the substation construction area is likely.

The rapid risk assessment calculations are based on the presumption that there is a breeding GCN population within Waterbody 2. However, breeding GCN were confirmed in Waterbody 3 during the 2015 surveys, and it is a reasonable assumption that any suitable waterbodies (including Waterbody 2) within the landscape have the potential to support a breeding GCN population.

5.4 Loss / Damage to Breeding Pond

The Development will not lead to the loss of a breeding pond or suitable aquatic habitat for GCN. There is no hydrological link from the Site to the nearest waterbody, Waterbody 2 located circa 40 m to the south, and as such there will be no indirect impact upon this waterbody.

5.5 Loss of Foraging Habitat

The Site covers an area of circa 492 ha and comprises predominantly low or negligible quality terrestrial amphibian habitat, with much of this habitat either being maintained or enhanced after construction activity has ceased. As such, the loss or temporary disturbance of the habitats within it are not considered significant.

5.6 Disruption to Dispersal and Migration

The proposed construction footprint of the substation is located approximately 40 m from the nearest known GCN record. However, the presence of habitat suitable for GCN remains unchanged, and the Development does not present a barrier to dispersal or potential for population fragmentation.

⁴ Natural England mitigation licence template (wmla142_tcm-4103), (www.gov.uk – accessed 17th May 2018)

5.7 Long-Term Impacts

No long term adverse impacts for GCN are anticipated, with connectivity to both on and off Site terrestrial and aquatic habitats continuing post-construction and connectivity to waterbodies maintained in the landscape.

6 RECOMMENDATIONS

6.1 Population Surveys

There is a likely requirement to complete population surveys of waterbodies 1 to 4 in order to support a Natural England licence application. Waterbodies 1 to 4 are closest to the substation construction footprint, where most of the breaking of ground will take place, and have either been identified during the 2015 or 2018 survey as containing GCN. Other waterbodies within the near landscape either do not contain GCN or are significantly separated (over 250m) from the Development and are not expected to be impacted. Further survey of these other waterbodies are therefore not considered necessary in order to support a Natural England derogation licence.

6.2 Licencing

The Development, including construction of the proposed substation, will require a European Protected Species Mitigation (EPSM) licence application from Natural England prior to commencement of works. This will enable works activities to commence that would otherwise lead to an offence being committed under the Conservation of Habitats and Species Regulations 2017.

6.3 Letters of No Impediment

Following the Planning Inspectorate's scoping opinion response⁵, there is a requirement to seek a 'Letter of No Impediment' (LoNI) from Natural England prior to a planning determination. Given the findings of the rapid risk assessment summarised in Section 5, and building on the licencing requirement highlighted in Section 6.2, Natural England will be consulted and a draft method statement as well as a provisional derogation licence application will be submitted to them. This is in order for them to assess the suitability of the licence application, to agree with the approach in principle, such that licencing requirements do not become an impediment to the Development. Once a licencing approach is agreed it is expected that a LoNI will be issued by Natural England.

6.4 Ecological Enhancement

National planning policy⁶ recommends that all developments incorporate ecological enhancement where possible, therefore consideration should be given to maintaining and enhancing habitats on site.

The creation of new connecting onsite vegetation to the retained habitats as part of 'embedded' mitigation will enhance the Site for amphibians. Providing new terrestrial habitats on Site, will improve habitat suitability for sheltering and foraging amphibians and provide greater habitat connectivity to the wider landscape. The planting of trees, connected native species hedgerows and species rich grassland habitat will provide higher quality terrestrial foraging and sheltering habitats that are favoured by GCN, and also provides habitat for other wildlife, such as hedgehogs, badgers, and hazel dormouse that would not otherwise be available.

⁵ SCOPING OPINION: Proposed Cleve Hill Solar Park. Case Reference: EN010085. January 2018

⁶ National Planning Policy Framework (NPPF) 2012

APPENDIX 1: HSI ASSESSMENTS RESULTS FOR EACH WATERBODY

Appendix Table 1: Habitat Suitability Index (HSI) –Scores Waterbody 1

Suitability Indices (SI)	SI No	Score
Location	S1	1
Pond Area	S2	1
Pond Drying	S3	0.9
Water Quality	S4	1
Shade	S5	1
Fowl	S6	1
Fish	S7	1
Waterbodies	S8	0.84
Terrestrial	S9	0.33
Macrophytes	S10	0.9
Score HSI		0.86
Waterbody Suitability		Excellent

Appendix Table 2: Habitat Suitability Index (HSI) –Scores Waterbody 2

Location	S1	1
Pond Area	S2	1
Pond Drying	S3	0.9
Water Quality	S4	1
Shade	S5	1
Fowl	S6	1
Fish	S7	1
Waterbodies	S8	0.84
Terrestrial	S9	0.33
Macrophytes	S10	0.7
Score HSI		0.84
Waterbody Suitability		Excellent

Appendix Table 3: Habitat Suitability Index (HSI) –Scores Waterbody 3

Location	S1	1
Pond Area	S2	1
Pond Drying	S3	0.9
Water Quality	S4	1
Shade	S5	1
Fowl	S6	0.67
Fish	S7	0.67
Waterbodies	S8	0.65
Terrestrial	S9	1
Macrophytes	S10	0.9
Score HSI		0.87
Waterbody Suitability		Excellent

Appendix Table 4: Habitat Suitability Index (HSI) – Scores Waterbody 4

Location	S1	1
Pond Area	S2	0.9
Pond Drying	S3	0.1
Water Quality	S4	0.67
Shade	S5	1
Fowl	S6	1
Fish	S7	1
Waterbodies	S8	0.7
Terrestrial	S9	0.33
Macrophytes	S10	0.5
Score HSI		0.61
Waterbody Suitability		Average

Appendix Table 5: Habitat Suitability Index (HSI) – Scores Waterbody 5

Location	S1	1
Pond Area	S2	0.2
Pond Drying	S3	0.9
Water Quality	S4	1
Shade	S5	1
Fowl	S6	1
Fish	S7	0.67
Waterbodies	S8	0.65
Terrestrial	S9	1
Macrophytes	S10	0.55
Score HSI		0.73
Waterbody Suitability		Good

Appendix Table 6: Habitat Suitability Index (HSI) – Scores Waterbody 6

Location	S1	1
Pond Area	S2	0.8
Pond Drying	S3	1
Water Quality	S4	1
Shade	S5	1
Fowl	S6	0.67
Fish	S7	0.67
Waterbodies	S8	0.65
Terrestrial	S9	1
Macrophytes	S10	0.7
Score HSI		0.83
Waterbody Suitability		Excellent



Appendix Table 7: Habitat Suitability Index (HSI) – Scores Waterbody 7

Location	S1	1
Pond Area	S2	0.1
Pond Drying	S3	0.5
Water Quality	S4	0.01
Shade	S5	0.2
Fowl	S6	1
Fish	S7	1
Waterbodies	S8	0.65
Terrestrial	S9	1
Macrophytes	S10	0.3
Score HSI		0.34
Waterbody Suitability		Poor

Appendix Table 8: Habitat Suitability Index (HSI) – Scores Waterbody 9

Location	S1	1
Pond Area	S2	0.1
Pond Drying	S3	0.5
Water Quality	S4	0.67
Shade	S5	1
Fowl	S6	1
Fish	S7	1
Waterbodies	S8	0.65
Terrestrial	S9	1
Macrophytes	S10	0.85
Score HSI		0.67
Waterbody Suitability		Average

APPENDIX 2: WATERBODY PHOTOGRAPHS

	
Photograph 1: Waterbody 1	Photograph 2: Waterbody 2
	
Photograph 3: Waterbody 5	Photograph 4: Waterbody 6
	
Photograph 5: Waterbody 7	Photograph 6: Waterbody 9