ENVIRONMENTAL IMPACT ASSESSMENT

SCOPING REPORT

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TABLE OF CONTENTS

1 INTRODUCTION 1

1.1 Background 1

1.2 The Applicant 1

1.3 Consenting Regime 1

1.4 Purpose of the Scoping Report 2

2 PROJECT DESCRIPTION 3

2.1 The Development Site 3

2.2 Iterative Design and Rochdale Envelope 3

2.3 The Development Proposal 4

2.3.1 Solar PV Modules 4

2.3.2 Module Mounting Structures 5

2.3.3 Inverters 6

2.3.4 Transformers 7

2.3.5 Onsite Cabling 8

2.3.6 Fencing and Security Measures 8

2.3.7 Access Tracks 9

2.3.8 Energy Storage Facility 9

2.3.9 Development Substation and Control Building 9

2.3.10 Electricity Export Connection to National Grid 9

2.4 Construction 9

2.4.1 Construction Traffic Management 10

2.4.2 Temporary Construction Compounds 10

2.4.3 Temporary Roadways 10

2.4.4 Site Reinstatement and Habitat Creation 10

2.5 Operation 10

2.6 Decommissioning 10

3 THE LEGISLATIVE AND PLANNING FRAMEWORK 11

3.1 Introduction 11

3.2 National Policy Statements 11

3.2.1 Overarching National Policy Statement for Energy (EN-1) 11

3.2.2 National Policy Statement on Renewable Energy Infrastructure (EN-3) 12

3.2.3 National Planning Policy Statement for Electricity Networks (EN-5) 13

3.3 National Planning Policy Framework 13

3.4 Development Plan - Bearing Fruits 2031: The Swale Borough Local Plan 14

3.5 Other Relevant Material Planning Considerations 17

4 ENVIRONMENTAL IMPACT ASSESSMENT 19
4.1 EIA Process and Methodology 19
4.1.1 Baseline Description 19
4.1.2 Prediction of Likely Effects 20
4.1.3 Assessment of Likely Effects 20
4.1.4 Mitigation 21
4.1.5 Residual Effects 21
4.1.6 Cumulative Effect Assessment 21
4.2 Site Selection and Consideration of Alternatives 22
4.3 Structure of the Environmental Statement 22

5 LANDSCAPE AND VISUAL IMPACT ASSESSMENT 24
5.1 Introduction 24
5.2 Preliminary Baseline Conditions 24
5.2.1 National Landscape Character 24
5.2.2 Regional Landscape Character 25
5.2.3 Local Landscape Character 25
5.2.4 Landscape Planning Designations 26
5.2.5 Local Landscape Designations 26
5.2.6 Undesignated Landscapes 27
5.2.7 Visual Amenity 27
5.3 Likely Environmental Effects 27
5.4 Assessment Methodology 28
5.4.1 Relevant Legislation and Guidelines 28
5.4.2 Proposed Surveys/Site Visits 29
5.4.3 Zone of Theoretical Visibility 30
5.4.4 Baseline 31
5.4.5 General Approach 31
5.4.6 Assessment of Sensitivity 32
5.4.7 Assessment of Magnitude of Change 34
5.4.8 Significance of Effects 35
5.4.9 Viewpoints and Visualisations 37
5.5 Assessment of Cumulative Effects 39

6 ECOLOGY 40
6.1 Introduction 40
6.2 Preliminary Baseline Conditions 40
6.2.1 Designated Sites 40
6.2.2 Surveys/Site Visit Findings 41
6.3 Likely Environmental Effects 44
6.4 Assessment Methodology 45

6.4.1 Relevant Legislation and Guidelines 45
6.4.2 Proposed Desk-based Assessment 46
6.4.3 General Approach 46
6.4.4 Determining Value 46
6.4.5 Identifying Effects and Determining Magnitude 47
6.4.6 Determining Significance 48
6.5 Assessment of Cumulative Effects 48

7 ORNITHOLOGY 49
7.1 Introduction 49
7.2 Preliminary Baseline Conditions 49
7.2.1 Desk Based Assessment 49
7.2.2 Baseline Surveys 49
7.3 Likely Environmental Effects 50
7.4 Assessment Methodology 51
7.4.1 Relevant Legislation and Guidelines 51
7.4.2 Survey Methodology 51
7.5 Assessment of Cumulative Effects 55

8 HYDROLOGY, HYDROGEOLOGY, FLOOD RISK AND GROUND CONDITIONS 56
8.1 Introduction 56
8.2 Preliminary Baseline Conditions 56
8.3 Likely Environmental Effects 57
8.4 Assessment Methodology 57
8.4.1 Relevant Legislation and Guidelines 57
8.4.2 Proposed Desk Based Assessment 58
8.4.3 Proposed Surveys/Site Visits 58
8.4.4 EIA Methodology 58
8.4.5 Significance Criteria 61
8.4.6 Flood Risk Assessment Methodology 62
8.5 Assessment of Cumulative Effects 62

9 CULTURAL HERITAGE AND ARCHAEOLOGY 63
9.1 Introduction 63
9.2 Preliminary Baseline Conditions 63
9.2.1 Desk Based Assessment 63
9.3 Likely Environmental Effects 64
9.4 Assessment Methodology 65
9.4.1 Relevant Legislation and Guidelines 65
9.4.2 Proposed Surveys/Site Visits 65
9.4.3 EIA Approach 65

9.4.4 Assessment of Effects Methodology 66
9.4.5 Significance Criteria 66
9.5 Assessment of Cumulative Effects 68

10 NOISE AND VIBRATION 70
10.1 Introduction 70
10.2 Preliminary Baseline Conditions 70
10.3 Likely Environmental Effects 70
10.4 Assessment Methodology 70
10.4.1 Relevant Legislation and Guidelines 70
10.4.2 Proposed Desk Based Assessment 71
10.4.3 Proposed Surveys/Site Visits 72
10.4.4 Assessment of Construction Noise 72
10.4.5 Assessment of Operational Noise 72
10.4.6 Assessment of Decommissioning Noise 73
10.5 Assessment of Cumulative Effects 73

11 SOCIO-ECONOMICS, TOURISM, RECREATION AND LAND-USE 74
11.1 Socio-economics and Tourism 74
11.1.1 Introduction 74
11.1.2 Preliminary Baseline Conditions 74
11.1.3 Likely Environmental Effects 76
11.1.4 Assessment Methodology 78
11.1.5 Assessment of Cumulative Effects 80
11.2 Recreation 80
11.2.1 Introduction 80
11.2.2 Preliminary Baseline Conditions 80
11.2.3 Likely Environmental Effects 81
11.2.4 Assessment Methodology 81
11.2.5 Assessment of Cumulative Effects 81
11.3 Land-use 81
11.3.1 Introduction 81
11.3.2 Preliminary Baseline Conditions 82
11.3.3 Likely Environmental Effects 82
11.3.4 Assessment Methodology 82
11.3.5 Assessment of Cumulative Effects 82

12 ACCESS AND TRAFFIC 83
12.1 Introduction 83
12.2 Preliminary Baseline Conditions 83
12.3 Likely Environmental Effects 83

12.4 Assessment Methodology 84
12.4.1 Relevant Legislation and Guidelines 84
12.4.2 Proposed Desk Based Assessment 84
12.4.3 Proposed Surveys/Site Visits 84
12.4.4 EIA Methodology 84
12.4.5 Construction Traffic Management Plan 85
12.4.6 Assessment of Cumulative Effects 85

13 MISCELLANEOUS ISSUES 87
13.1 Glint and Glare 87
13.1.1 Introduction 87
13.1.2 Preliminary Environmental Effects 87
13.1.3 Assessment Methodology 87
13.2 Human Health 88
13.2.1 Electric, Magnetic and Electromagnetic Fields 88
13.3 Telecommunications, Television Reception and Utilities 89
13.4 Waste 89
13.5 Air Quality 90

14 CLIMATE CHANGE IMPACT ASSESSMENT 91

15 INTERACTION AND ACCUMULATION OF EFFECTS 92

APPENDIX A: FIGURES

Figure 1 Site Location
Figure 2 Proposed Development Layout
Figure 5.1 Landscape Character
Figure 5.2 Landscape Designations
Figure 6 Ecology and Ornithology Designations
Figure 8 Flood Risk Maps
Figure 9 Cultural Heritage Features
Figure 12 Site Access Route

1 INTRODUCTION

1.1 Background

1. Cleve Hill Solar Park Ltd ('the Applicant') has commissioned this Scoping Report relating to the Environmental Impact Assessment (EIA) of Cleve Hill Solar Park, a proposed solar photovoltaic (PV) electricity generating and storage facility with an export capacity of greater than 50 megawatts (MW) on land approximately 2 km north-east of Faversham and 5 km west of Whitstable on the north Kent coast ('the Development').
2. The site location is shown in Figure 1 – Site Location, in Appendix A.
3. The Applicant wishes to confirm under Regulation 8(1)(b) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') that an Environmental Statement (ES) will be provided in respect of the application for consent for this Development.
4. This Scoping Report forms a formal request for a Scoping Opinion under Regulation 10(1) of the EIA Regulations.

1.2 The Applicant

5. Cleve Hill Solar Park Ltd is a joint venture formed by two solar industry specialists: Hive Energy Ltd and Wirsol Energy Ltd.
6. Founded in 2010, Hive Energy has established itself as the second largest developer of solar parks in the UK, responsible for the installation of 300 MW of generating capacity across the country.
7. Wirsol is a highly experienced solar park developer, constructor and operator across the UK and Australia. Wirsol has built and operates 24 solar parks across the UK.

1.3 Consenting Regime

8. The Development falls within the definition of a 'nationally significant infrastructure project' (NSIP) under Section 14(1)(a) and 15(2) of the Planning Act 2008 ('the Act') as the construction of a generating station with a capacity of more than 50 MW.
9. The EIA requirement for NSIP developments is transposed into law through the EIA Regulations. The EIA Regulations specify which developments are required to undergo EIA and schemes relevant to the NSIP planning process are listed under either of 'Schedule 1' or 'Schedule 2'. Those developments listed in Schedule 1 must be subject to EIA, while developments listed in 'Schedule 2' must only be subjected to EIA if they are considered *'likely to have significant effects on the environment by virtue of factors such as its nature, size or location'*[1]. The criteria on which this judgement must be made are set out in Schedule 3.
10. The Development is a 'Schedule 2' development under Part 3(a) of the EIA Regulations as it constitutes *'Industrial installations for the production of electricity, steam and hot water'*.
11. Whilst EIA is not compulsory for Schedule 2 developments, an ES will be provided in respect of the Development.
12. Following the completion of the surveys, assessments and consultation processes outlined in this Scoping Report, an application for a Development Consent Order (DCO) will be made to the Secretary of State (SoS) for determination in accordance with the Act. The DCO application will be accompanied by an ES that sets out the methods and findings of a full EIA undertaken in line with the EIA Regulations.

[1] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, Reg. 3

1.4 Purpose of the Scoping Report

13. The EIA Regulations state at regulation 10(3) that a request for a Scoping Opinion should contain:

    "(a) a plan sufficient to identify the land;

    (b) a description of the proposed development, including its location and technical capacity;

    (c) an explanation of the likely significant effects of the development on the environment; and

    (d) such other information or representations as the person making the request may wish to provide or make."

14. The guidance highlighted in Planning Inspectorate Advice Note 7 *Environmental Impact Assessment: Screening, and Scoping and Preliminary Environmental Information* has also been taken into account in the preparation of this Scoping Report.

15. Accordingly, this Scoping Report presents:

    - A plan sufficient to identify the land - the site location figure (Figure 1);
    - A description of the Development (section 2) and technical capacity (section 2); and
    - An explanation of the likely significant effects of the Development on the environment (the *Likely Environmental Effects* sub-section of technical sections 5 to 14 of this Scoping Report).

16. This Scoping Report has also been prepared with a view to inviting early consultation comments on the approach to the EIA and the content of the Environmental Statement (ES). It provides information on the key issues anticipated and outlines the methodologies proposed for the various technical assessments.

17. This Scoping Report outlines issues perceived to be not significant, which, in the opinion of the authors, do not require formal assessment as part of the EIA. These issues are proposed to be "scoped out" of the EIA and where this is proposed it is made clear in this report.

18. Comments received in response to this Scoping Report will inform the evolution of the site design, the EIA methodology and the Development programme, and how responses have been addressed will be reported in the Consultation chapter and other relevant technical chapters of the ES.

2 PROJECT DESCRIPTION

2.1 The Development Site

19. The wider area surrounding the Development site, aside from the Swale channel to the north, is generally agricultural land, interspersed by hamlets, villages and towns. The closest settlement is the village of Graveney, located approximately 600 m to the south-east.

20. The Development site boundary shown on Figures 1 and 2 covers a total area of approximately 407 hectares. The majority of the land within the Development site is currently used for intensive arable farming on lower grade agricultural land, predominantly classified as Agricultural Land Classification Sub-grade 3b.

21. The Development site is bordered to the north by a strip of land lying either side of a sea wall that separates it from the Swale channel; to the west by the tidal Faversham Creek; to the east by Seasalter Road; and to the south by isolated rural properties, farmsteads and a large complex of commercial polytunnels and greenhouses.

22. Topographically, the Development site is generally flat and low lying with elevations ranging from sea level to approximately 10 m above ordnance datum (AOD). The land drains via channels that cross the Development site from north to south at regular intervals.

23. The Development site boundary also includes land associated with the existing Cleve Hill Substation, which forms the point of electrical connection between London Array Offshore Wind Farm and the National Grid electricity transmission network. The Development proposes to utilise this same point of connection to the National Grid.

24. Access to the Development is still under review but at this early stage it is proposed to utilise the existing access road from Seasalter Road to the Cleve Hill Substation for the construction and operational phase access point to the Development site.

25. An unsurfaced access track runs through the Development site from the Cleve Hill Substation access road northwards, towards the coast, before turning west and running parallel to the sea wall then turning back south to the hamlet of Nagden, adjacent to Faversham Creek.

26. Public footpaths cross the Development site at three locations. One passes from Nagden northwards towards the sea wall, another crosses south-west to north-east across the south-eastern part of the Development site and then further to the north it crosses the existing access road to Cleve Hill Substation close to the junction with Seasalter Road.

2.2 Iterative Design and Rochdale Envelope

27. The Development design will evolve throughout the EIA process. An iterative design process will be utilised, whereby site specific constraints and design criteria will be added to the site layout to guide the location of the Development infrastructure. If necessary, parts of the Development site may not be developed on in order to avoid, reduce or remove significant adverse effects.

28. The iterative design process will take account of comments made during consultation, including in response to this Scoping Report. The ES will describe how the design of the Development has been influenced by such comments.

29. In order to maintain flexibility in the Development design, it is the Applicant's intention to use the 'Rochdale Envelope' approach within parameter ranges which will be defined in the Project Description chapter of the ES. These parameters will be considered in detail by technical authors in the ES to ensure the realistic worst case effects of the Development are assessed for each potential receptor. This is of particular importance to maintain flexibility due to the rapid pace of change in solar PV and battery storage technology.

2.3 The Development Proposal

30. Solar PV and energy storage technologies are rapidly evolving. As a result, the project parameters are required to maintain the flexibility to allow the latest technology to be utilised at the time of construction.

31. The Development is likely to include the following infrastructure:

- Solar PV modules;
- PV module mounting structures;
- Inverters;
- Transformers;
- Onsite cabling;
- Fencing and security measures;
- Access tracks; and
- An electrical compound comprising:
  - An energy storage facility (expected to be formed of batteries storing electrical energy);
  - A substation and control building; and
  - Equipment facilitating electrical connection to the National Grid infrastructure.

32. During the construction phase, one or more temporary construction compound(s) will be required as well as temporary roadways to facilitate access to all parts of the Development site.

33. In areas around the arrays and on other parts of the Development site, opportunities for landscaping, biodiversity enhancements and habitat management will be explored.

Diagram 2.1 Components of a typical solar PV development

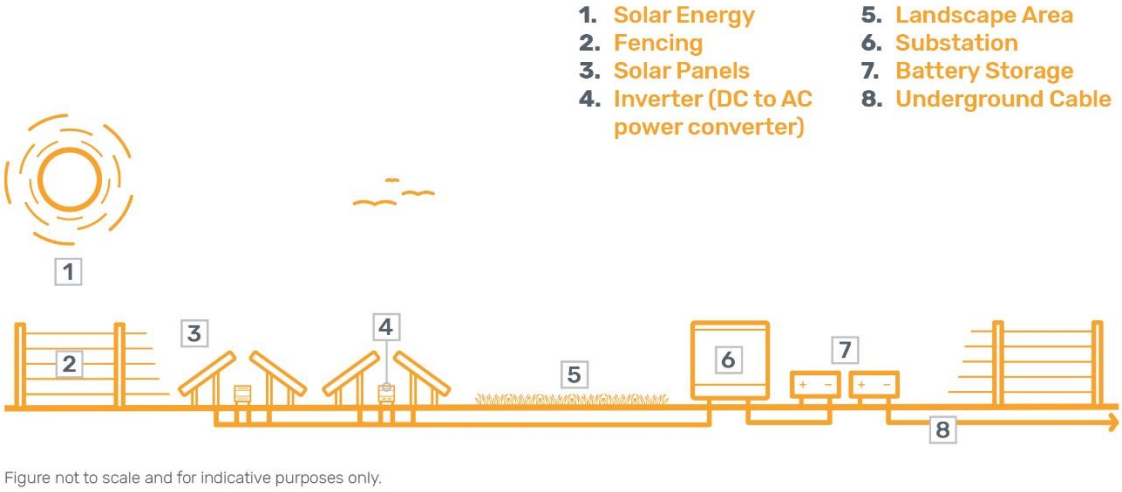

Figure not to scale and for indicative purposes only.

2.3.1 Solar PV Modules

34. Solar PV modules convert sunlight into electrical current (as direct current (DC)). Individual modules are typically 2 m long and 1 m wide and typically consist of a series of poly-crystalline cells which make up each panel (60 or 72 cells per panel). The module frame is typically built from anodised aluminium.

35. Each module could have a DC generating capacity of between 250 and 400 watts (W), or more depending on advances in technology.

36. The number of modules required at the Development will be highly dependent upon the iterative layout design process, however the initial indicative layout shown on Figure 2 could include over 1 million modules.

37. The modules are fixed to a mounting structure in groups known as "strings". The Development proposes to utilise strings that are oriented towards the east and west, rather than orientated towards the south which is more commonly seen on existing UK solar parks. The modules are expected to be angled towards the east and west at a slope of 5 to 20 degrees from horizontal. An east/west orientation allows more modules to be utilised onsite, increasing the electrical generating potential and overall energy yield of the Development.
38. The number of modules which will make up each string is not yet known. Various factors will help to inform the number and arrangement of modules in each string, and it is likely some flexibility will be required due to accommodate future technology developments.

Photo 1a Indicative solar PV module arrangement

Photo 1b Indicative Solar PV module arrangement

2.3.2 Module Mounting Structures

39. Each string of modules will be mounted on a rack supported by galvanised steel poles driven into the ground. Various mounting structures are available however driven poles are currently expected to be the most likely foundation solution. Between each east/west string

of panels there could be an average separation distance of approximately 0 to 2.5 m for construction and maintenance. The 'ridge' of each pair of strings could also include a separation distance of approximately 0 to 1 m.

40. The modules are likely to be mounted on structures with a clearance above ground level (agl) of approximately 0.8 m and an upper height of approximately 2.5 to 4.5 m agl. These dimensions are indicative at this stage as the final elevations of the strings will be influenced by various design factors such as detailed flood risk modelling and local topography.

Photo 2 Example mounting structures

2.3.3 Inverters

41. Inverters are required to convert the DC electricity collected by the PV modules into alternating current (AC) which allows the electricity generated to be exported to the National Grid. Inverters are sized to deal with the level of voltage which is output from the strings of PV modules.

42. It is currently expected that string inverters will be utilised on the Development, *e.g.*, for every 10 or 12 PV modules (rather than fewer, larger, centralised inverters). String inverters are small enough to be mounted on the underside of the modules and are therefore of lower visual impact, and are not shown on layout plans.

Photo 3 Example string inverters

43. If centralised inverters are used, these would be stand-alone units, and could be sited at regular intervals amongst the PV modules.

2.3.4 Transformers

44. Transformers are required to control the voltage of the electricity generated across the Development site before it reaches the Development substation. Transformer cabins are therefore likely to be located across the Development site area at regular intervals.

45. The approximate dimensions of the transformer cabins could be 3 m x 7 m x 4 m. Transformer cabins are typically externally finished in keeping with the prevailing surrounding environment, often utilising a green painted finish.

Photo 4 Example transformer cabin

2.3.5 Onsite Cabling

46. Onsite electrical cabling is required to connect the PV modules to inverters, and the inverters to the transformers onsite. Higher rated cables are then required between the transformers and the Development substation, and between the Development substation and the energy storage facility onsite. Large 400 kV cables are then likely to be required to export all of the electricity produced by the Development to the existing National Grid substation at Cleve Hill.

47. Cabling between PV modules and the string inverters will typically be required to be above ground level, fixed to the mounting structure, unless centralised inverters are used, in which case cabling would be underground. Other cables between the transformers and the Development substation will be underground wherever possible.

48. The existing above-ground powerlines onsite are not proposed to be altered by the Development.

49. Data cables will also be installed, typically alongside electrical cables in order to allow for the monitoring of the Development during operation, such as the collection of solar data from pyranometers.

2.3.6 Fencing and Security Measures

50. A fence will enclose the operational areas of the Development. The fence is likely to be a 'deer fence' of approximately 1.8 to 2.5 m in height. Pole mounted internal facing closed circuit television (CCTV) systems are also likely to be deployed around the perimeter of the operational areas of the Development.

Photo 5 – Example fencing and CCTV camera

51. It is likely that lighting on sensors for security purposes will be deployed around the electrical infrastructure area shown on Figure 2 and potentially at any other pieces of critical infrastructure. No areas of the Development are proposed to be continuously lit.

2.3.7 Access Tracks

52. Access to the Development is under review but the existing access road from Seasalter Road to the Cleve Hill Substation is expected to be the main site access point for construction and operation of the Development. A spur off this road before the existing substation will allow access to the wider Development site via the new Development substation as shown on Figure 2.

53. Beyond the new Development substation, a stone access track is likely to be constructed as a spine road through the Development site, with a width of up to approximately 6 m. Access to the majority of strings during operation will be via grassed tracks, and a smaller number of stone tracks to be accessed from the spine road, as shown on Figure 2.

2.3.8 Energy Storage Facility

54. It is proposed to include an energy storage facility as part of the electrical infrastructure related to the Development. This is likely to comprise a battery array which will be located adjacent to the Development substation either in individual containers, or housed within a larger building or buildings.

2.3.9 Development Substation and Control Building

55. The Development substation will consist of electrical infrastructure such as the transformers, switchgear and metering equipment required to facilitate the export of electricity from the Development to the National Grid. The Development substation is also expected to include a control building which will include office space and welfare facilities as well as operational monitoring and maintenance equipment. The Development substation compound could cover an area of up to 215 m x 155 m, and the control building approximately 20 x 20 x 6 m but these dimensions are highly dependent on the findings of further work.

2.3.10 Electricity Export Connection to National Grid

56. The electricity generated by the Development is expected to be exported via a connection from the Development substation to the National Grid Electricity Transmission (NGET) substation located within the existing Cleve Hill Substation.

2.4 Construction

57. The construction phase of the Development is currently anticipated to last approximately 6 to 18 months but will be dependent on the final design and the findings of the access and traffic assessment. The types of construction activities that may be required include (not necessarily in order):

- Site preparation:
  - Import of construction materials, plant and equipment to site;
  - The establishment of a construction compound;
  - Upgrading of existing site tracks and construction of new tracks;
  - The upgrade or construction of crossing points (bridges / culverts) over drainage ditches; and
  - Marking out the location of the Development infrastructure.
- Solar park construction:
  - Import of Development components to site;
  - Erection of module mounting structures;
  - Mounting of modules;
  - Installation of electric cabling;
  - Installation of transformer cabins; and

  - Construction of onsite electrical infrastructure to facilitate the export of generated electricity.
- Testing and commissioning.
- Site reinstatement and habitat creation.

2.4.1 Construction Traffic Management

58. A Construction Traffic Management Plan (CTMP) will be developed as part of the EIA which will guide the delivery of materials and staff onto the Development site during the construction phase. The CTMP will be available for comment as part of the consultation process to ensure that the comments of local residents and stakeholders are taken into account in its development.

2.4.2 Temporary Construction Compounds

59. The main temporary construction compound will likely be established close to the Development site entrance. Smaller temporary compounds may be located across the Development site during construction due to the size of the Development site.

2.4.3 Temporary Roadways

60. Depending on conditions during construction, temporary roadways (*e.g.*, plastic matting) may be utilised to access parts of the Development site.

2.4.4 Site Reinstatement and Habitat Creation

61. Following construction, a programme of site reinstatement and habitat creation will commence. A Biodiversity and Landscape Management Plan will be submitted as part of the EIA, and this document will set out the proposals for how the land will be managed throughout the operational phase, following the completion of construction.

2.5 Operation

62. During the operational phase, activity on the Development site will be minimal and would be restricted principally to vegetation management, equipment maintenance and servicing, replacement of any components that fail, and monitoring to ensure the continued effective operation of the Development.

2.6 Decommissioning

63. When the operational phase ends, the Development will require decommissioning. All PV modules, mounting poles, cabling, inverters and transformers would be removed from the Development site and recycled or disposed of in accordance with good practice and market conditions at that time. The future of the substation and control building would be agreed with the local planning authority prior to commencement of decommissioning. A Decommissioning Plan, to include timescales and transportation methods, would be agreed in advance with the Local Planning Authority.

64. Decommissioning is expected to take between 6 and 12 months.

65. The effects of decommissioning are often similar to, or of a lesser magnitude than, construction effects and will be considered where possible in the relevant sections of the ES. However, there can be a high degree of uncertainty regarding decommissioning as engineering approaches and technologies evolve over the operational life of the Development.

3 THE LEGISLATIVE AND PLANNING FRAMEWORK

3.1 Introduction

66. The ES will include a chapter setting out the legislative and planning framework. A summary of that framework at the time of writing this Scoping Report is provided in this section.

67. Under the Act the Development constitutes an NSIP. The Development falls under the NSIP consenting regime because it consists of:

- "*the construction or extension of a generating station*" (Section 14 (1)(a) of the Act); and
- "*its capacity is more than 50 megawatts*" (Section 15 (2) of the Act).

68. Section 105 of the Act states the Secretary of State must have regard, as the decision maker to an application for an order granting development consent where a national policy statement (NPS) does not exist for the development, to any Local Impact Report and to any other matters which relate to and are important to the decision. This may include a variety of national planning and local planning documents, including NPSs.

69. Although there is no NPS which provides specific policy in relation to solar PV and energy storage development, in previous applications where no NPS applies, the Secretary of State has applied relevant NPSs as if the NPS governed the development in question[2]. Therefore, three NPS have provisions relevant to the Development, in the opinion of the authors, have been identified. The provisions of the NPS considered relevant by the authors are outlined below, together with other considerations relevant to the planning framework.

3.2 National Policy Statements

3.2.1 Overarching National Policy Statement for Energy (EN-1)

70. The overarching NPS for Energy (EN-1)[3] was adopted in July 2011 and sets out the overall national energy policy for delivering major energy infrastructure.

71. Part 2 of the statement sets out the Central Government policy context for major energy infrastructure. It comprises the need to meet legally binding targets to cut greenhouse gas emissions; transition to a low carbon economy; decarbonise the power sector; reform the electricity market; secure energy supplies; replace outdated energy infrastructure; and widen objectives of sustainable development.

72. Paragraph 3.2.3 sets out more detail around the importance that Central Government attaches to the need for new energy infrastructure and to its energy policy, including combating climate change, by stating that:

> *"The Government considers that, without significant amounts of large-scale energy infrastructure, the objectives of its energy and climate change policy cannot be fulfilled."*

73. Paragraph 3.3.2 then states clearly that new generating capacity, because of the need to ensure energy security, is a key objective of Government energy policy:

> *"The Government needs to ensure sufficient electricity generating capacity is available to meet maximum peak demand, with a safety margin or spare capacity to accommodate unexpectedly high demand and to mitigate risks such as unexpectedly high demand and to mitigate risks such as unexpected plant closures and extreme weather events"*

[2] See decisions on Triton Knoll Electrical System Order 2017, Tidal Lagoon (Swansea Bay) Order 2015, and Glyn Rhonwy Pumped Storage Generating Station Order 2017.

[3] Department of Energy and Climate Change, July 2011, " National Policy Statement for Energy (EN-1)", Available on line at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf [Accessed on 31/10/2017]

74. The benefits of an energy mix in ensuring a secure energy supply are also recognised in that the characteristics of different types of electricity generation, including renewable energy and other technologies, can complement each other.

75. Part 4 sets out a number of assessment principles against which applications are to be decided, including the presumption to grant consent for applications for energy NSIPs, and the need to balance potential benefits against potential adverse impacts.

76. Paragraphs 4.2.2 and 4.2.3 provide national policy on what an ES for a NSIP project should contain:

> *"To consider the potential effects, including benefits, of a proposal for a project, the IPC* [now the Planning Inspectorate] *will find it helpful if the applicant sets out information on the likely significant social and economic effects of the development, and shows how any likely significant negative effects would be avoided or mitigated. This information could include matters such as employment, equality, community cohesion and well-being.*
>
> *For the purposes of this NPS and the technology-specific NPSs the ES should cover the environmental, social and economic effects arising from pre-construction, construction, operation and decommissioning of the project."*

77. Paragraph 4.2.4 then sets out how the assessment of the ES by the decision maker should be carried out:

> *"When considering a proposal the IPC should satisfy itself that likely significant effects, including any significant residual effects taking account of any proposed mitigation measures or any adverse effects of those measures, have been adequately assessed. In doing so the IPC should also examine whether the assessment distinguishes between the project stages and identifies any mitigation measures at those stages. The IPC should request further information where necessary to ensure compliance with the EIA Directive."*

78. Part 5 then sets out guidance on generic impacts for the Applicant's assessment and decision-making on the application. These impacts concern air quality and emissions; biodiversity; aviation; coastal change; dust and various other pollution control related matters; flood risk; historic environment; landscape and visual; land use; noise and vibration; socio-economics; traffic and transport; waste; and water quality and resources.

79. Where these generic impacts are relevant to the Development, the proposed approach to the EIA is set out in the relevant technical section of this Scoping Report.

3.2.2 National Policy Statement on Renewable Energy Infrastructure (EN-3)

80. The National Policy Statement on Renewable Energy Infrastructure (EN-3)[4] was adopted in July 2011 and provides national planning policy in respect of renewable energy infrastructure.

81. Paragraph 1.1.1 of EN-3 underlines the importance of the generation of electricity from renewable sources by stating:

> *"Electricity generation from renewable sources of energy is an important element in the Government's transition to a low-carbon economy. There are ambitious renewable energy targets in place and a significant increase in generation from large-scale renewable energy infrastructure is necessary".*

82. Whilst EN-3 provides assessment and technology-specific information on certain renewable energy technologies, comprising biomass/waste, offshore wind and onshore wind, this does not include solar PV development.

[4] Department of Energy and Climate Change, July 2011, " National Policy Statement for Renewable Energy Infrastructure (EN-3)", Available on line at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/47856/1940-nps-renewable-energy-en3.pdf [Accessed on 31/10/2017]

3.2.3 National Planning Policy Statement for Electricity Networks (EN-5)

83. The National Policy Statement on Electricity Networks Infrastructure (EN-5)[5] was adopted in July 2011. Whilst EN-5 principally covers above ground electricity lines of 132 kV, paragraph 1.8.2 confirms that EN-5 will also be relevant if the electricity network constitutes an associated development for which consent is sought, such as a generating station. EN-5 is therefore relevant to the Development, as a grid connection is proposed.

84. Part 2 of EN-5 sets out a number of assessment and technology specific matters. Paragraph 2.2.2 points out that the location of electricity networks will often be determined by the particular generating station and the existing electricity network. Part 2 sets out particular generic impacts concerning biodiversity and geological conservation, landscape and visual, noise and vibration, and electric and magnetic field effects.

85. Where these generic impacts are relevant to the Development, the proposed approach under the ES to address the technical matter is set out in the relevant technical section of this Scoping Report.

3.3 National Planning Policy Framework

86. The National Planning Policy Framework[6] ("the NPPF") was published on 27th March 2012 and is a material consideration in planning decisions. Whilst the NPPF does not contain any specific policies for NSIP development, paragraph 3 of the NPPF states that, as well as the NPSs, NSIPs are to be determined in accordance with:

> *"any other matters that are considered both important and relevant (which may include the National Planning Policy Framework)."*

87. The NPPF sets out that the purpose of the planning system is to contribute to the achievement of sustainable development, identifying that sustainable development consists of economic, social and environmental roles. There are number of specific instances under the NPPF where this presumption does not apply, including as set out by paragraph 119, where development requires Appropriate Assessment under the Birds or Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna ("the Habitats Directive").

88. Paragraph 17 of the NPPF applies a number of core planning principles that are to underpin planning decision making, including as is specifically relevant to renewable energy development:

> *"support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change, and encourage the reuse of existing resources, including conversion of existing buildings, and encourage the use of renewable resources (for example, by the development of renewable energy)".*

89. Whilst the Local Planning Authorities (LPAs) are not the determining authority, paragraph 97 of the NPPF sets out that in order to increase the use and supply of renewable energy LPAs need to recognise the responsibility of all communities to contribute to energy generation from renewable sources. Paragraph 98 then makes it clear that LPAs should not require applicants to demonstrate the overall need for renewable energy.

90. The NPPF also provides guidance on a number of environmental matters; where these matters are relevant to the Development, the proposed approach to the EIA to address the technical matter is set out in the relevant technical section of this Scoping Report. The ES Planning Chapter will describe all relevant matters contained within the NPPF.

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[5] Department of Energy and Climate Change, July 2011, " National Policy Statement for Electricity Networks Infrastructure (EN-5)", Available on line at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/47858/1942-national-policy-statement-electricity-networks.pdf [Accessed on 24/10/2017]

[6] Department of Communities and Local Government, March 2012, "National Planning Policy Framework" Available online at http://www.communities.gov.uk/documents/planningandbuilding/pdf/2116950.pdf [Accessed on 24/10/2017]

91. The NPPF also provides guidance on the weight to be given to policies in existing plans and emerging plans. Paragraph 215 states that beyond the 12 month period after the NPPF was introduced, that the weight to be given to relevant policies in existing plans will depend on their degree of consistency with the NPPF. Paragraph 216 states the weight to be given to relevant policies in emerging plans will depend on the stage of preparation of the plan, the extent to which there are unresolved objections and the degree of consistency with the NPPF.

3.4 Development Plan - Bearing Fruits 2031: The Swale Borough Local Plan

92. The Development Plan does not carry the same weight under the Act in respect of decision making on NSIP as it does with the determination of planning applications that are made to LPAs under the Town and Country Planning Act 1990. The NPSs are the primary consideration for NSIP applications. Nevertheless, the Development Plan is still a matter which can be considered important for the consideration of NSIP application.

93. The relevant Development Plan comprises of the 'Bearing Fruits 2031: The Swale Borough Local Plan' ('the Local Plan')[7], and the related Swale Proposals Map ('the Proposals Map') adopted on 26th July 2017 published by Swale Borough Council. The Kent Minerals and Waste Local Plan also forms part of the Development Plan, although contains no relevant 'Saved' policies.

94. The Local Plan contains the following policies of most relevance, based on the proposed land-use of the Development and designations on the Proposals Map:

95. Policy ST 1 Delivering Sustainable Development in Swale sets out that all development proposals will, as appropriate:

- Build strong competitive economy by meeting identified needs for inward investment on suitable sites and meet the need of under-represented sectors;
- Accord with the Local Plan settlement strategy;
- Meet the challenge of Climate Change, flooding and coastal change through:
  - The use of sustainable design and construction, the expansion of renewable energy, the efficient use of natural resources and the management of emissions;
  - The management and expansion of green infrastructure; and
  - Applying planning policies to manage flood risk and coastal change.
- Conserve and enhance the natural environment by applying international, national and local planning policy for designated areas, achieving net gain of biodiversity, and avoiding significant harm to biodiversity or when possible, adequately mitigating it or compensating for it off-site, at identified Biodiversity Opportunity Areas.
- Conserve and enhance the historic environment by applying national and local policy through the identification, assessment and integration of development with the importance, form and character of heritage assets.

96. **CP 7 Conserving and Enhancing the Natural Environment – Providing for Green Infrastructure** sets out a number of principles that proposed developments should adhere to and they should, as appropriate:

- Recognise and value ecosystems for the wider services they provide, such as for food, water, flood mitigation, disease control, recreation, health and well-being;
- Protect the integrity of the existing green infrastructure networks;
- Ensure that no adverse effect occurs on the integrity of a SAC, SPA or Ramsar Site;
- Contribute to the objectives of the Nature Partnerships and Nature Improvement Areas in Kent;

[7] Swale Borough Council (2017) *Bearing Fruits 2031: The Swale Borough Local Plan.* [online] Available at: http://services.swale.gov.uk/meetings/documents/s7987/FULL%20COUNCIL%2026%20JULY%20Local%20Plan%20Item%20Appdx%201%20Bearing%20Fruits%202031%20The%20Swale%20Borough%20Local%20Plan.pdf [Accessed on 23/10/2017]

- Make an enhancement of biodiversity and landscape; and
- Promote the expansion of Swale's natural assets and green infrastructure, within new and existing developments by delivering a high standard of design quality, contribute to the conservation of and management of historic landscapes, archaeological and built heritage assets, take account of flood risk, and include opportunities to 'green' proposed and developed areas.

97. **CP 8 Conserving and Enhancing the Historic Environment** advises that development should sustain and enhance the significance of designated and non-designated heritage assets to sustain the historic environment whilst creating sense of place and identity for all areas. Development proposals should also:

- Accord with national planning policy relating to heritage matters and any Council heritage strategy;
- Respond to the integrity, form and character of settlements and historic landscapes;
- Respect the integrity of heritage assets, whilst meeting the challenges of a low carbon future; and
- Promote the enjoyment of heritage assets through education, accessibility, interpretation and improved access.

98. **Policy DM 14 General Development Criteria** sets out key principles which new development should conform to. Where appropriate development should:

- Accord with the relevant development plan policy and supplementary guidance unless material considerations indicate otherwise;
- Respond to constraints and opportunities arising from Climate Change;
- Conserve and enhance the natural, built and historic environment;
- Be of appropriate scale, design and appearance taking into consideration the local landscape and amenity; and
- Achieve safe access.

99. **Policy DM 20 Renewable and Low Carbon Energy** states that development of renewable and low carbon energy sources will be permitted where all impacts and methods to avoid or mitigate harm from these impacts have been fully analysed and addressed; Further, the policy advises that priority will be given to proposals which incorporate renewable, decentralised energy as integral to new commercial or residential schemes. Where schemes are to be developed in agricultural land, it should be demonstrated that poorer quality land is used in preference to higher quality, and options are explored for continued agriculture use; landscape, visual and heritage impacts as well as impacts on geology, soils and flood-risk, including cumulative impacts are minimised and mitigated. Applications should also demonstrate evidence of local community involvement and/or leadership; where a temporary planning consent is sought, detailed proposals for the restoration of the Development site should be set out as part of any application.

100. **Policy DM 21 Water, Flooding and Drainage** – When considering the water-related, flooding and drainage implications of a development, the proposals should avoid flood risk areas and areas where the development would increase flood risk elsewhere. Proposals should provide specific flood risk assessments as required and protect water quality, including safeguarding groundwater source.

101. **Policy DM 22 The Coast** states that development proposals near the coast will be granted consent where:

- Proposals account for protection, enhancement or management as appropriate of biodiversity, landscape, seascape and coastal processes; and
- Proposals enable wildlife to adapt to the effects of climate change, contributing towards the Local Plan's Natural Assets and Green Infrastructure Plan provided by Policy CP8.

102. **Policy DM 23 Coastal Change Management** – Proposals within the Coastal Change Management Area (CCMA) will be granted consent where it can be demonstrated that:

- Proposals will not result in increased risk to life, nor a significant increase in risk to property;
- The proposal is comprising essential infrastructure;

103. **Policy DM 24 Conserving and Enhancing Valued Landscapes** – Within the boundaries of designated landscape areas such as Areas of High Landscape Value (Kent and Swale Level) planning permission will be granted subject to the:

- Conservation and enhancement of the landscape being demonstrated; and
- Avoidance, minimisation and mitigation of adverse landscape impacts as appropriate, and when significant adverse impacts remain, the social and economic benefits of the proposal significantly outweigh harm to the landscape value.

104. For all landscapes the scale, layout, build and landscape design of the development should be informed by landscape and visual impact assessment.

105. **Policy DM 26 Rural Lanes** states that planning permission will not be granted for development that would significantly harm the character of rural lanes. Development proposals should have regard to their landscape, amenity, biodiversity and historic and archaeologic importance.

106. **Policy DM 28 Biodiversity and Geological Conservation** – Development proposals should conserve, enhance and extend biodiversity, provide net gains in biodiversity where possible, minimise any adverse impacts and compensate where impacts cannot be mitigated. Internationally designated sites will be subject to the highest level of protection and permission will only be granted where there are no less ecologically damaging alternatives, there are imperative reasons of overriding public interest and damage can be fully compensated. Within nationally designated sites development will only be permitted where it is not likely to have negative effect on the designated site or its interests. Within locally designated sites, development likely to have an adverse effect will be permitted only where damage can be avoided or mitigated.

107. Development proposals at all other sites should:

- Apply national planning policy in respect of the preservation, restoration and re-creation of the habitats, species and targets in the UK and local Biodiversity Action Plans and Biodiversity Strategies;
- Be accompanied by appropriate surveys undertaken to clarify constraints or requirements that apply to development, especially where development sites are used by species or contain habitats; and
- Provide compensatory measures when significant harm cannot be avoided through consideration of alternative sites or adequate mitigation provided on-site or in the immediate locality.

108. **Policy DM 30 Enabling Development for Landscape and Biodiversity Enhancement** states that proposals that contravene planning policies for the protection of the countryside will be permitted where:

- The proposal is of outstanding design, layout and landscaping that benefits the existing landscape and biodiversity;
- The proposal contributes to targets set out in the UK, Kent and Swale Biodiversity Action Plans and Strategies; and
- It is demonstrated that after any dis-benefits have been minimised and mitigated, the overall landscape and biodiversity benefits outweigh the harm to other public interests and policies.

109. **Policy DM 31 Agricultural Land** advises that development on agricultural land will only be permitted when there is an overriding need that cannot be met on land within the built-up area boundaries.

110. The Local Plan also contains a number of other policies related to general development management criteria and associated environmental considerations. The ES Planning Chapter will set out all relevant Local Plan policies.

3.5 Other Relevant Material Planning Considerations

111. The other relevant material considerations are as follows, in brief summary:

- **Energy Policy -** The UK is subject to the following legally binding targets in respect of reduction of carbon emissions and use of renewable energy:
  - Climate Change Act 2008[8] (as amended) sets a legally binding target to reduce UK carbon emissions by 80% by 2050 and at least 34% by 2020, against a 1990 baseline; and
  - Renewable Energy Directive 2009/28/EC[9] sets targets for Member States in respect of the use of energy from renewable resources. The UK's obligation is 15% of energy consumption from renewable energy resources by 2020.

112. The European Council 2030 Climate and Energy Framework[10] has set a further target of at least a 40% reduction in greenhouse gas emissions by 2030. The target is binding and all Member States are required to participate in this effort to further combat climate.

113. The UK Solar PV Strategy Part One: Roadmap to a Brighter Future (2013)[11] and Part Two: Roadmap to a Brighter Future (2014)[12] set out the role of solar development to increase the use of renewable energy. These is a recognition in these documents that agricultural land will be used for solar development and that biodiversity benefits can arise, if developments are well planned.

114. The Annual Energy Statement (2014)[13] ("the AES") provides the most recent update from Central Government on progress against energy policy. The AES recognises the significant level of investment and employment which has resulted from renewable energy development, and that investment and employment is likely to reach into the supply chain in all parts of the UK

115. **Swale Borough Council Swale Landscape Character and Biodiversity Appraisal Supplementary Planning Document (September 2011)**[14] ("the SPD") contains guidelines that seek to ensure development contributes to the restoration, creation, reinforcement and conservation, as appropriate, of the landscape. The SPD is based on an assessment of landscape character and biodiversity opportunity networks and areas. The

[8] Climate Change Act 2008 as amended by the Climate Change Act 2008 (2020 Target, Credit Limit and Definitions) Order 2009

[9] Directive 2009/28/EC (Renewable Energy)

[10] European Council, 24 October 2014, Conclusions on 2030 Climate and Energy Policy Framework, Available on line at http://data.consilium.europa.eu/doc/document/ST-169-2014-INIT/en/pdf [Accessed on 24/10/2017].

[11] Department of Energy and Climate Change, October 2013, "UK Solar PV Strategy Part 1: Roadmap to a Brighter Future", Available online at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/249277/UK_Solar_PV_Strategy_Part_1_Roadmap_to_a_Brighter_Future_08.10.pdf [Accessed on 24/10/2017]

[12] Department of Energy and Climate Change, April 2014, "UK Solar PV Strategy Part 2: Delivering a Brighter Future" , Available on line at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/302049/uk_solar_pv_strategy_part_2.pdf [Accessed on 24/10/2017]

[13] Department of Energy and Climate Change, October 2014, "Annual Energy Statement 2014" Available on line at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/371388/43586_Cm_8945_print_ready.pdf [Accessed on 24/10/2017]

[14] Swale Borough Council, September 2011, "Swale Landscape Character and Biodiversity Appraisal Supplementary Planning Document", Available on line at: http://www.swale.gov.uk/examination-document-library/ [Accessed on 24/10/2017]

Development site is identified in the Graveney Marshes Landscape Character Area ("the LCA"). The associated guidelines for the LCA seek opportunities to restore and extend coastal grazing marsh, wetland and habitat. Figure 5.1 shows the landscape designation in relation to the Development site boundary.

116. **The National Planning Practice Guidance**[15] ("the PPG") was launched by Central Government as a planning practice guidance web based resource. The PPG is part of Central Government's intention to reform and simplify the planning system. The PPG contains a specific section on renewable and low carbon energy. Paragraph 001 confirms, in line with the NPPF, that:

> *"Planning has an important role in the delivery of new renewable and low carbon energy infrastructure in locations where the local environmental impact is acceptable."*

117. Paragraph 013 goes onto identify particular planning considerations for large scale solar ground mounted solar photovoltaic farms. These include encouraging large scale solar farms on previously developed and non-agricultural land; where a proposal includes greenfield land, whether the proposed use of any agricultural land has been shown to be necessary and poorer quality land has been used in preference to higher quality land; and the proposal allows for continued agricultural use where applicable and/or encourages biodiversity improvements around arrays.

118. Paragraph 013 also identifies that planning conditions should be used to ensure land restoration, and the need to consider impacts from glint and glare, security, conservation of heritage assets, landscape and visual impacts and energy generating potential, as further considerations.

119. **Swale Borough Council, Renewable Energy Planning Guidance** Note 2 The Development of Large Scale (>50 kW Solar Arrays) (July 2014)[16] provides a planning advice note that sets out a variety of planning application considerations, including advice on the assessment of the impact on agricultural land and provides case studies. This document, although it advises that it will guide decision makers when determining applications, has not been through public consultation and does not have the status of SPD.

120. The ES Planning Chapter will set out all relevant material considerations.

[15] Department of Communities and Local Government, Updated 18 06 2015, "Guidance Renewable and Low Carbon Energy". Available online at: http://planningguidance.planningportal.gov.uk/blog/guidance/renewable-and-low-carbon-energy/ [Accessed on 24/10/2017]

[16] Swale Borough Council, July 2014, " Renewable Energy Planning Guidance Note 2 The Development of Large Scale (>50kw) Solar Arrays", Available on line at http://archive.swale.gov.uk/assets/Planning-General/Planning-Policy/Evidence-Base/VERSION-3-SWALE-LARGE-SCALE-SOLAR-PV-PDF-July-2014.pdf [Accessed on 24/10/2017]

4 ENVIRONMENTAL IMPACT ASSESSMENT

4.1 EIA Process and Methodology

121. Each of the technical assessments will follow a systematic approach, with the principal steps being:

- Description of baseline conditions;
- Prediction of likely effects including cumulative effects;
- Assessment of likely effects;
- Identification of appropriate mitigation measures, including design changes; and
- Assessment of residual (likely) environmental effects.

122. Each technical chapter will be broadly structured as follows and where this differs it will be stated in the relevant section of this Scoping Report:

- Introduction;
- Assessment methodology and significance criteria;
- Baseline conditions;
- Development design mitigation;
- Assessment of likely effects;
- Mitigation measures and residual effects;
- Cumulative effects assessment;
- Summary of likely effects; and
- Statement of significance.

123. The EIA assessment will be based on a number of related activities, as follows:

- Consultation with statutory and non-statutory consultees throughout the DCO application process;
- Consideration of relevant local, regional and national planning policies, guidelines and legislation relevant to EIA;
- Consideration of technical standards for the development of significance criteria;
- Review of secondary information, previous environmental studies and publicly-available information and databases;
- Physical surveys and monitoring;
- Desk-top studies;
- Computer modelling;
- Reference to current legislation and guidance; and
- Expert opinion.

4.1.1 Baseline Description

124. In order to evaluate the likely environmental effects, information relating to the existing environmental conditions will be collected through field and desktop research. These are known as the baseline conditions. The baseline also extends into the future (the future baseline), although predictions of this can involve potentially large uncertainties. As a result, in most cases the future baseline is assumed to remain unchanged throughout the operation of the Development. Where this is not the case, this is stated.

125. The baseline will be used to assess the sensitivity of receptors on and near the Development site and what changes may take place during the construction, operation and decommissioning of the Development and the effects, if any, that these changes may have on these receptors.

126. Within each technical assessment, the methods of data collection will be discussed with the relevant consultees. Data will also collected from public records and other archive sources and where appropriate, field surveys will be carried out (in some cases these surveys have already begun). The timing of the work and the study areas proposed are outlined within each assessment section.

4.1.2 Prediction of Likely Effects

127. The prediction of likely effects covers the three phases of the Development: construction (including pre-construction), operation and decommissioning. During each phase different environmental effects are likely to arise.

128. Each technical assessment covers:

- Direct and indirect effects;
- Short, medium and long term effects;
- Permanent and temporary effects;
- Likelihood of an effect occurring (*i.e.*, very likely, likely, or unlikely); and
- Cumulative effects.

129. Following identification of likely environmental effects, changes to baseline conditions will be predicted, allowing an assessment of the environmental impact of these changes.

4.1.3 Assessment of Likely Effects

130. The likely effect that the Development may have on each environmental receptor would be influenced by a combination of the sensitivity or importance of the receptor and the predicted magnitude of change from the baseline conditions (either beneficial or adverse).

131. The magnitude of change from the baseline state is defined as high, medium, low, negligible or no change and can be beneficial or adverse. The definition of magnitude varies by technical discipline as described in the technical sections of this Scoping Report.

132. Environmental sensitivity (or importance) may be categorised by a multitude of factors, such as threat to rare or endangered species; transformation of natural landscapes or changes to soil quality and land-use. The initial assessment, consultation and scoping phases identify these factors along with the implications of the predicted changes. Unless stated otherwise in each technical chapter, the sensitivity or importance of each identified receptor is defined as high, medium, low or negligible.

133. The overall significance of a potential likely environmental effect is determined by the interaction of the above two factors (*i.e.*, sensitivity/importance and predicted magnitude of change from the baseline). In order to evaluate the likely environmental effects, the assessment criteria used are identified and justified within each technical chapter in line with the definitions described above, unless otherwise stated (*e.g.*, the definition of what constitutes a receptor of 'high' sensitivity).

134. Table 4.1 summarises, in the form of a matrix, the generic format by which the significance of a likely effect is determined within each technical chapter. Effects that would be significant in terms of the EIA Regulations are shaded in Table 4.1 and highlighted in bold.

Table 4.1 Generic matrix of determining the significance of likely effects

Degree of Alteration / **Sensitivity of receptor**	**Negligible**	**Low**	**Medium**	**High**
Negligible	Negligible	Negligible	Negligible	Negligible
Low	Negligible	Minor	Minor	**Moderate**
Medium	Negligible	Minor	**Moderate**	**Major**
High	Negligible	**Moderate**	**Major**	**Major**

135. For the purposes of EIA, the significance of an effect is generally assessed as being either:

- Negligible – no detectable or material change to a location, environment or species;

- Minor – a detectable but non-material change to a location, environment or species;
- Moderate – a material, but non-fundamental change to a location, environment or species; or
- Major – a fundamental change to a location, environment or species.

136. Given this methodology, it follows that, regardless of a receptor's importance or sensitivity, there can be no significant effect when the magnitude of change is negligible. Similarly, there can be no significant effect where the importance or sensitivity of the receptor is negligible, regardless of the magnitude of change.

137. Some assessments may deviate from this methodology and, where this is the case, this is stated within the relevant section of this Scoping Report. It is also important that professional judgement can be applied in concluding on the significance of effects to allow for receptors and impacts which fall between definitions of magnitude and sensitivity or do not fit into a rigid matrix based approach.

4.1.4 Mitigation

138. Where applicable, each technical chapter will propose measures to avoid, prevent or reduce and if possible, offset any likely significant adverse effects identified. These are termed mitigation measures which are designed to reduce or if possible, eliminate, significant adverse effects. Such measures may include the consideration of alternatives; physical design evolutions such as movement or reduction in scale; and operational and management measures.

139. This strategy of avoidance, prevention, reduction and offsetting is a hierarchical one which seeks:

- First to avoid likely effects;
- Then to reduce those which remain; and
- Lastly, where no other measures are possible, to propose compensatory measures.

4.1.4.1 Embedded Mitigation

140. Where possible, mitigation measures will be embedded into the overall design strategy rather than "added on" to the proposals. By being flexible with the design, the project design will respond to the findings of consultation and EIA work, and mitigate accordingly, as the Development progresses.

4.1.5 Residual Effects

141. The assessment process will conclude with an examination of residual effects after mitigation has been applied, *i.e.*, the overall predicted (likely) effects of the Development.

4.1.6 Cumulative Effect Assessment

142. In accordance with the EIA Regulations, the ES will also give consideration to 'cumulative effects'. By definition, these are effects that result from incremental changes caused by past, present or reasonably foreseeable future actions together with the Development. For the cumulative assessment, two types of effect will be considered:

- The combined effect of individual effects, for example noise, airborne dust or traffic on a single receptor; and
- The combined effects of several developments that may on an individual basis be insignificant but, cumulatively, have a significant effect, such as landscape and visual effects of many solar developments.

143. The former will be included in a separate ES chapter, Interaction and Accumulation of Effects.

144. The latter will be dealt with within each technical chapter and the intended scope of each cumulative assessment is set out in the relevant technical sections of this Scoping Report.

Unless otherwise agreed, developments whose applications for consent have not yet been submitted at the time of finalising the ES are unlikely to be included in the cumulative assessments given the large degree of uncertainties over the likelihood of an application being submitted and the final design.

145. The range of potential cumulative impacts is also defined in the technical sections of this Scoping Report, and generally covers an area within which receptors could potentially be subject to cumulative effects, usually this is no more than twice the range of assessment for the Development in isolation.

4.2 Site Selection and Consideration of Alternatives

146. Schedule 4, Paragraph 2 of the EIA Regulations sets out the information for inclusion in the ES as follows:

> *'A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.'*

147. The ES will therefore include a detailed section presenting the reasonable alternatives considered by the Applicant in respect of the location of the Development, its scale and design and the implications of a "do nothing" scenario.

4.3 Structure of the Environmental Statement

148. The proposed structure for the ES is set out in Table 4.2.

Table 4.2 Proposed structure of the Environmental Statement

Non-Technical Summary	
Chapter 1	Introduction
Chapter 2	Environmental Impact Assessment
Chapter 3	Consultation
Chapter 4	Site Selection and Consideration of Alternatives
Chapter 5	Project Description and Development Design
Chapter 6	Legislative and Planning Policy Context
Chapter 7	Landscape and Visual Impact Assessment
Chapter 8	Ecology
Chapter 9	Ornithology
Chapter 10	Hydrology, Hydrogeology, Flood Risk and Ground Conditions
Chapter 11	Cultural Heritage and Archaeology
Chapter 12	Noise
Chapter 13	Socio-Economics, Tourism, Recreation and Land-use
Chapter 14	Access and Traffic
Chapter 15	Climate Change
Chapter 16	Miscellaneous Issues, including glint and glare, human health, telecoms and waste
Chapter 17	Interaction and Accumulation of Effects
Supporting Figures and Drawings	
Technical Appendices (*e.g.*, baseline survey reports)	

5 LANDSCAPE AND VISUAL IMPACT ASSESSMENT

5.1 Introduction

149. The landscape and visual impact assessment (LVIA) chapter of the ES will assess the likely impact of the Development upon the landscape, and upon views and visual amenity. This section identifies the likely significant environmental effects, sets out the proposed approach that will be taken to the LVIA, and provides a summary of baseline information that is currently available.

5.2 Preliminary Baseline Conditions

150. The Development site is located within the county of Kent (Kent County Council) and the district of Swale (Swale Borough Council) on the south side of the Thames Estuary opposite the Isle of Sheppey. The site also lies in close proximity to the boundary of the district of Canterbury (Canterbury City Council). The land on which the Development site is located consists of agricultural land (reclaimed salt marsh) that is protected from inundation by a sea wall. This land is referred to as series of three historic marshes: Nagden Marshes, Graveney Marshes and Cleve Marshes. These have been drained and now consist of a large open agricultural landscape. The topography is low lying, at approximately 1 m Above Ordnance Datum (AOD), and level with very little variation in topography across the Development site. The land is divided into predominantly large, open fields with field boundaries delineated by ditches or rough grassland.

151. The Development site has a relatively remote, windswept character with open views across it and a relatively sparse population in the immediate surrounding area. Indeed the character is incongruous with the surrounding landscapes due to the scale of its land-use, and its simplicity. The site is also traversed by a line of large lattice pylons running in an east/west orientation from the Cleve Hill substation.

5.2.1 National Landscape Character

152. Landscape character at the Development site is described at a national level in National Character Area (NCA) Profile 81 Greater Thames Estuary. The Greater Thames Estuary NCA covers a very large area that fringes the River Thames Estuary extending from Herne Bay in the south-east to Central London in the west and Harwich in the north-east. The NCA Profile describes the following key characteristics:

- *"Predominantly flat, low-lying coastal landscape where extensive open spaces are dominated by the sky, and the pervasive presence of water and numerous coastal estuaries extend the maritime influence far inland;*
- *Strong feelings of remoteness and wilderness persist on extensive salt marshes, mudflats and reclaimed farmed marshland;*
- *Some of the least settled parts of the English coast with numerous small villages and hamlets on higher ground and marsh edges reflecting medieval patterns and the coastal economy;*
- *Highly urbanised areas within London and on marsh edges subject to chaotic activity of various major developments including ports, waste disposal, marine dredging, housing regeneration, mineral extraction and prominent power stations plus numerous other industry related activities."*

5.2.2 Regional Landscape Character

153. Landscape character is described at regional level in the Landscape Assessment of Kent (October 2004)[17]. Figure 5.1 shows the landscape character areas relative to the Development site boundary. The Development site is located in the Eastern Swale Marshes Character Area[18] which is described as having the following characteristic features:

- *"Remote, wild and exposed;*
- *Broad skies. Pervasive influence of sea and sky. Creeks, diches, sea walls. Grazing marsh, wild birds and grazing animals;*
- *Creekside townscape and waterside buildings; and*
- *Poorly managed fences. Intrusion of power lines."*

154. Part of the Development also lies within the Eastern Fruit Belt Character Area[19] (south-west and south-east of the Development site) which is described as having the following characteristic features:

- *"Rural character, sense of remoteness and privacy.*
- *Enclosed and diverse.*
- *Strong woodland blocks.*
- *Orchards and hops, shelterbelts. Large pockets of open farmland. Undulating landform."*

5.2.3 Local Landscape Character

155. At a local level landscape character is described in the Swale Landscape Character and Biodiversity Appraisal (SLCBA (Supplementary Planning Document September 2011)). The Development site is predominantly located in the Graveney Marshes Landscape Character Area[20], the key characteristics of which include:

- *"Large open area of alluvial marshland;*
- *Large scale arable fields divided by long straight drainage ditches;*
- *Typical features ditches, sea wall, estuarine saltmarsh, sand and mudflats; and*
- *Atmospheric and tranquil landscape with large open and often dramatic skies."*

156. The SLCBA describes landscape condition within the seawall as being poorer condition than that on the outside of the sea wall which is in good condition. The reason for its poor condition lies in the intensive agricultural land use that has produced a featureless monoculture extending over a large area. In addition the high voltage transmission line on large lattice pylons that cross from east to west introduces large scale vertical structures into a landscape with a predominantly horizontal emphasis.

157. Inherent sensitivity of the landscape to development in general is considered to be moderate; however the SLCBA does not assess sensitivity of the landscape to ground mounted solar PV development.

158. Part of the Development also lies within two further Landscape Character areas: Graveney Arable Farmlands; and Graveney Grazing Lands.

159. The key characteristics of Graveney Arable Farmlands Landscape Character Area include:

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[17] KCC (2004). The Landscape Assessment of Kent. Available at: https://www.kent.gov.uk/about-the-council/strategies-and-policies/environment-waste-and-planning-policies/countryside-policies-and-reports/kents-landscape-assessment [accessed 01/12/2017]

[18] SBC (2011) Swale Landscape Character and Biodiversity Appraisal SPD. Available at: http://www.swale.gov.uk/assets/Planning-General/Planning-Policy/Landscape-Character-Appraisal-Final-Sept-2011/Marshland-Landscape-Types-reduced-size.pdf [accessed 01/12/2017]

[19] Ibid.

[20] SBC (2011) Swale Landscape Character and Biodiversity Appraisal SPD. Available at: http://www.swale.gov.uk/assets/Planning-General/Planning-Policy/Landscape-Character-Appraisal-Final-Sept-2011/Introduction-reduced-size.pdf [accessed 01/12/2017]

- *"Gently undulating landscape, with localised higher ground;*
- *Complex geology of fertile well drained drift soils, heavy clay and brick earth;*
- *Mixed field pattern of large and small-scale;*
- *Open arable farmland with isolated mature orchards and soft fruit;*
- *Rural fringe activities such as horse pasture;*
- *Many internal field boundaries lost;*
- *Fragmented mature hedgerows along lanes supplemented with post and wire;*
- *Train line, B roads and narrow country lanes; and*
- *Views enclosed by vegetation and built development, but wide from within fields and where hedgerows are fragmented."*

160. The condition of the landscape is described in the SLCBA as "poor" and overall sensitivity to development in general is considered to be moderate; however the SLCBA does not assess sensitivity of the landscape to ground mounted solar PV development.

161. The key characteristics of Graveney Grazing Lands Landscape Character Area include:

- *"Gently undulating landscape, with localised higher ground*
- *Complex geology of fertile well drained drift soils, heavy clay and brickearth*
- *Mixed field pattern of large and small-scale*
- *Open arable farmland with isolated mature orchards and soft fruit*
- *Rural fringe activities such as horse pasture*
- *Many internal field boundaries lost*
- *Fragmented mature hedgerows along lanes supplemented with post and wire*
- *Train line, B roads and narrow country lanes*
- *Views enclosed by vegetation and built development, but wide from within fields and where hedgerows fragmented".*

162. The condition of the landscape is described in the SLCBA as "poor" and overall sensitivity to development in general is considered to be moderate; however the SLCBA does not assess sensitivity of the landscape to ground mounted solar PV development.

5.2.4 Landscape Planning Designations

163. The Kent Downs Area of Outstanding Natural Beauty (AONB) is located approximately 4 km to the south of the Development site.

164. Mount Ephraim Registered Park and Garden (RPG) lies 3.8 km to the south-east of the Development site.

165. The locations of the above designations are shown on Figure 5.2 in Appendix A.

5.2.5 Local Landscape Designations

166. The Development site lies within an 'Area of High Landscape Value - Kent Level'[21] within The Swale Borough Council Local Plan.

167. Other local designations include:

- South Bank of The Swale Local Nature Reserve lies adjacent to the north of the Development;
- Oare Marshes Local Nature Reserve lies approximately 400 m km to the west of the Development;
- The Swale National Nature Reserve lies approximately 1.6 km to the north of the Development; and
- Seasalter Levels Local Nature Reserve lies approximately 2 km to the east of the Development.

[21] Bearing Fruits 2031: The Swale Borough Local Plan, Full Council Item, 26th July 2017 and Technical Paper No.6

168. The locations of the above designations are shown on Figure 5.1 in Appendix A.

5.2.6 Undesignated Landscapes

169. The Oare Gunpowder Works Country Park lies approximately 1.95 km to the south-west of the Development site.

170. Victory Wood Countryside Park lies approximately 3.5 km to the south-east of the Development and contains an elevated viewpoint looking towards the Development.

171. Leysdown Coastal Park lies 4.8 km to the north of the Development site.

5.2.7 Visual Amenity

172. The nearest settlement is the village of Graveney which lies approximately 600 m to the south-east of the Development site. The outskirts of the town of Faversham lie within 2 km to the south-west and the village of Oare lies 1.3 km to the west-south-west. The closest rural residential properties are at Nagden to the south-west of the Development site. These properties lie within 50 m of the Development site boundary. The seascape to the north of the Development provides a visual focal point in the landscape forming a strong character area between the Development and the Isle of Sheppey; together with the distinct character of Faversham Creek.

173. National Cycle Network (NCN) Route 1 passes 50 m to the south-west of the Development site at its closest point and passes along Sandbanks Road running north-west to south-east.

174. The Saxon Shore Way Long Distance Trail (LDT (ZR484)) runs parallel to the western and northern boundaries of the Development site at a distance of less than 50 m.

175. A Public Right of Way (PRoW) (ZR485) crosses the western part of the Development site from south to north. A second PRoW (ZR486) runs from Nagden in the west to Graveney in the east passing within 50 m of the Development site to the south. A third PRoW (ZR488, ZR692 and CW90) runs from Seasalter Road to the east of Cleve Hill Farm south-west to The Old Vicarage to the west of Graveney passing through the eastern part of the Development site.

176. The A299 passes 2.3 km to the south-east of the Development site and a network of minor roads runs to the south and east connecting hamlets and villages with Faversham and Whitstable.

5.3 Likely Environmental Effects

177. It is proposed that the LVIA study area will extend to a 5 km radius from the Development with a core study area of 2 km. The LVIA will assess the likely effects on landscape character within this 5 km radius and upon the North Downs AONB located to the south of the Development. 5 km has been chosen as it is considered that beyond this distance, even with good visibility, the Development would be barely perceptible in the composite landscape due to the local landscape context and the nature of the Development.

178. The core study area is based on anticipated visibility of the Development which is limited to 2 km due to the anticipated low height of the Development, the sea wall which surrounds a large section of the Development site, existing topography and intervening built form and vegetation. The assessment within the core study area will focus in greater detail on the effects on local landscape designations and key visual receptors, as due to the proximity to the Development they are more likely to have views or be impacted upon in some way.

179. The Development has the potential to affect the following landscape and visual resources during construction and operation, and the significance of impacts on these will be assessed and reported in the ES:

- Physical features and elements of the landscape within the Development site (alteration and / or removal);
- Landscape character of the Development site and the surrounding area up to a radius of 5 km;
- Landscapes designated for their special qualities or scenic beauty up to a radius of 5 km from the Development site; and
- The visual amenity of people in the surrounding area up to a radius of 2 km from the Development site.

180. The Development has the potential to affect landscape and visual resources during each Development phase: construction, operation and decommissioning.

5.4 Assessment Methodology

5.4.1 Relevant Legislation and Guidelines

181. The LVIA will be undertaken in accordance with, or be informed by the following sources of guidance:

- Institute of Environmental Management and Assessment and Landscape Institute, 2013, Guidelines for Landscape and Visual Impact Assessment, 3rd Edition;
- The Landscape Institute (2013), GLVIA3 Statement of Clarification 1/1322
- Landscape Institute (2011) Advice Note 01/11 Photography and Photomontage in Landscape and Visual Impact Assessment23;
- SNH and The Countryside Agency (2002) Landscape Character Assessment Guidance for Scotland and England24;
- Natural England, 2014, An Approach to Landscape Character Assessment;
- SNH (February 2017) Visual Representation of Wind Farms- Version 2.2[25]; and
- SNH Cumulative Assessment guidance 'SNH (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments'[26].

182. The list above is not exhaustive and the LVIA will be also be informed by aerial photography, maps and local publications.

183. Section 3 of this Scoping Report sets out the planning policy context for the Development. The LVIA will also be informed by the following publications and information regarding landscape and visual resources of the area within which the Development site is located:

- Natural England, 2013, National Character Area (NCA) Profile 81 Greater Thames Estuary;
- Natural England, 2012, NCA Profile 113 North Kent Basin;
- Natural England, 2013, NCA Profile 119 North Downs;
- Kent County Council, 2004, The Landscape Assessment of Kent;
- Kent County Council, Kent Landscape Information System, available online at http://www.kent.gov.uk/;

[22] The Landscape Institute (2015) GLVIA3 – Statements of Clarification [Online] Available at: https://www.landscapeinstitute.org/technical-resource/glvia3-clarifications/ (Accessed 16/11/17)
[23] Landscape Institute (2011) Photography and photomontage in LVIA [Online] Available at: https://www.landscapeinstitute.org/PDF/Contribute/LIPhotographyAdviceNote01-11.pdf (Accessed 16/11/17)
[24] SNH (2022) Landscape Character Assessment Guidance for Scotland and England [Online] Available at: http://www.snh.org.uk/pdfs/publications/LCA/LCA.pdf (Accessed 16/11/17)
[25] SNH (2017) Visual Representation of Wind Farm Guidance [Online] Available at: https://www.snh.scot/sites/default/files/2017-07/A2203860%20-%20Visual%20representation%20of%20wind%20farms%20-%20Guidance%20-%20Feb%202017.pdf (Accessed 16/11/17)
[26] SNH (2012) Assessing the Cumulative Impact of Onshore Wind Energy Developments [Online] Available at: https://tethys.pnnl.gov/sites/default/files/publications/SNH-2012-CumulativeOnshoreWind.pdf (Accessed 16/11/17)

- Swale Borough Council, 2011, Swale Landscape Character and Biodiversity Appraisal Supplementary Planning Document (SPD);
- Swale Borough Council, 2014, Renewable Energy Planning Guidance Note 2;
- Swale Borough Council, 2011, Planting on New Development: a Guide for Developers;
- Kent Downs Area of Outstanding Natural Beauty (AONB) Renewable Energy Position Statement;
- Swale Landscape Assessment Recommended Amendments to Landscape Designations
- Chris Blandford Associates, 2005, Thames Gateway Historic Environment Characterisation Project;
- Canterbury Landscape Character and Biodiversity Appraisal – Draft (August 2012)
- The Register of Historic Parks and Gardens of Special Historic Interest in England;
- SUSTRANS.org.uk;
- Ordnance Survey (OS) mapping at 1:25,000 scale; and
- Aerial photography.

184. The LVIA will be undertaken in accordance with Guidelines for Landscape and Visual Impact Assessment (GLVIA 3)[27]. The two components of LVIA referred to throughout the report are based on the following definitions:

- **Landscape**
  - `**1. assessment of landscape effects**: assessing effects on the landscape as a resource in its own right';[28]
- **Visual**
  - **'2. assessment of visual effects**: assessing effects on specific views and on the general visual amenity experienced by people.'[29]

185. LVIA considers through a defined and methodical approach the sensitivity of the landscape and visual resource, the magnitude of change on the resource as a result of the Development, and the significance of the effect based on a combination of sensitivity and magnitude of change. To do this the LVIA uses a structured methodology that combines both objective assessment and subjective assessment (or professional judgement).

186. LVIA enables an iterative design process to be undertaken, which allows for changes to be made to the layout; together with mitigation which ultimately results in any adverse impacts of the proposed development on landscape and visual resources being removed, reduced or mitigated.

187. The methodology consists broadly of three stages: baseline appraisal (including field work), production of visualisations and assessment of effects including cumulative effects.

5.4.2 Proposed Surveys/Site Visits

188. Following the desk based assessment fieldwork will be undertaken. Fieldwork will be undertaken at two key stages during the EIA and augmented by additional fieldwork if necessary. The two key stages are:

- During preparation of the baseline section of the LVIA chapter of the ES; and
- During the assessment of effects stage of the EIA.

189. The baseline fieldwork will be undertaken on a worst case basis, between October and March when there are no leaves on hedges and trees and hence the Development site will be

[27] Landscape Institute and Institute of Environmental Management and Assessment, 2013, *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition, Routledge, London.

[28] Landscape Institute and Institute of Environmental Management and Assessment, 2013, *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition, Routledge, London. Paragraph. 2.21, page 21.

[29] Ibid. 28.

more visible than in spring and summer when there is greater vegetation cover. The key activities during baseline fieldwork will be:

- To augment the published descriptions of landscape character with fieldwork observations;
- To undertake an assessment of the quality or condition of baseline landscape and visual resources;
- To identify any significant features and elements in the landscape such as woodland or hedges that will screen the Development and thereby verify or refine the ZTV;
- To visit each viewpoint location identified during the desk study and to microsite each viewpoint location in accordance with good practice guidance and obtain accurate coordinates using GPS;
- To undertake photography using a digital SLR camera at each viewpoint location;
- To visit each residential property within 1 km of the Development site to identify the potential for views of the Development;
- To identify landscape features and elements that may be altered or removed as a result of the Development; and
- To provide information to the design team that can be used to inform the design of the Development and to develop ideas for mitigation / enhancement.

190. The baseline fieldwork will also allow the study area to be refined and therefore the focus of the assessment stage of the LVIA.

191. Fieldwork during the assessment stage of the EIA will be undertaken during spring and summer and will include the following activities:

- Assessment of effects of the Development on landscape resources including features and elements;
- Assessment of effects on roads and National Cycle Network (NCN) routes;
- Assessment of effects on Public Rights of Way (PRoW) and Long Distance Trails (LDT) by walking sections of each route;
- Assessment of effects at each viewpoint using draft visualisations of the Proposed Development for certain viewpoints; and
- Refinement of proposed mitigation by development of a landscape planting scheme.

192. In addition to the above, an assessment of effects on residential properties within 1 km of the Development site will be undertaken. The process and findings of this work will be reported separately from the LVIA in a standalone Residential Visual Amenity Assessment report to be reported in a technical appendix to the LVIA.

5.4.3 Zone of Theoretical Visibility

193. Following identification of the landscape components which define the landscape character of the study area and outline the landscape and visual receptors the LVIA will be informed by a Zone of Theoretical Visibility (ZTV) diagram. ZTVs are computer generated from a digital terrain model of the study area with a 3-dimensional model of the Development incorporated. They illustrate the theoretical visibility of the Development throughout the study area based on the average eye height (1.6 m) of an adult person.

194. ZTVs do have a number of limitations that need to be borne in mind when considering the theoretical visibility illustrated. Firstly, they do not take account of screening elements such as buildings, vegetation and local landform which can substantially reduce visibility. Secondly, ZTVs do not take account of the decreasing size of the Development with increased distance as a proportion of the view, and the reduction in effect arising from this. Notwithstanding these limitations, ZTVs are currently the best tool for predicting the likely visibility of the Development and may be used to inform viewpoint selection and to refine the scope of the LVIA.

195. Arcus has developed additional methodology to supplement the "bare earth ZTV" which enables a more accurate representation of viewpoint assessment and a greater understanding of the visual baseline. The ZTV has been refined using the topographic survey of the site, LiDAR and DTM data, and stereo-photography modelling of trees, to enable a better understanding of the likely visual footprint of the Development. This will still represent theoretical visibility and will be considered in line with fieldwork to ground truth the findings of the data. A full methodology for how the ZTVs presented in the assessment have been produced will be included within the LVIA.

5.4.4 Baseline

196. The primary stage of the LVIA will establish a landscape and visual baseline by undertaking a detailed desk study, fieldwork, and analysis of findings. These items will be undertaken in line with GLVIA3 to create a detailed record of the existing landscape and visual context of both the site and surrounding landscape within the study area.

197. The landscape baseline will form a detailed understanding of the landscape within the study area. This includes gathering data on the landscape character and how this varies through the study area; together with its geographic extent; history (in conjunction with the cultural heritage assessment); and how it is experienced and valued.

198. The visual baseline will establish the area where the Development can be seen, who can see it, the places where those who see it will be affected and the nature of views and visual amenity.

199. Together the established baselines will provide an understanding of the components of the landscape and visual resource that may be impacted upon by the Development, which include the identification of key receptors and including an assessment of viewpoints which represent such receptors. The baseline will be of sufficient detail to enable a well-informed assessment of the likely significant effects on the baseline conditions from the Development at key stages (construction, operation and decommissioning).

200. The desk based assessment will involve the following key activities:

- Familiarisation with the landscape and visual resources of the area within which the Proposed Development will be located;
- Identification of landscape and visual resources likely to be significantly affected by the Proposed Development;
- Preparation of a ZTV map;
- Identification of the location of viewpoints, informed by the ZTV, that will be used to inform the assessment of effects of both landscape and visual resources; and
- Identification of a suitable Study Area for the impact assessment stage of the LVIA.

201. The desk based assessment will begin with a review of legislation, policy and guidance including published landscape character assessments of the area and its wider context. The output of the review will be an understanding of the baseline environment within which the Development site is located and will form the basis of LVIA fieldwork.

202. Viewpoints identified through consultation and during desk studies will be ground-truthed through fieldwork and their positions fixed prior to photography being undertaken. Landscape character areas will be reviewed during fieldwork and the descriptions contained in the published landscape character assessment will be augmented where necessary. Landscape and visual receptors will also be assessed to ensure they are accurately represented through desk based assessment.

5.4.5 General Approach

203. The LVIA will then assess the sensitivity of the landscape and visual baseline. This section of the LVIA will be undertaken in consultation with statutory consultees and local

interest groups and alongside other technical studies, principally ecology and cultural heritage, to provide an integrated approach and to enable a holistic response to the design process.

204. The LVIA will assess the effects of the Development upon landscape receptors *i.e.*,:

"…the constituent elements of the landscape, its specific aesthetic or perceptual qualities and the character of the landscape"[30],

205. and visual receptors *i.e.*,:

"…the people who will be affected by changes in views or visual amenity at different places." [31]

206. To do this the LVIA uses a structured method that combines both objective assessment and subjective assessment (professional judgement). This methodology has been developed with strong reference to GLVIA 3[32] and through considerable experience of LVIA on other similar sites.

207. The methodology as set out below has also been influenced by the other sources of guidance and information identified in Section 5.4.1.

5.4.6 Assessment of Sensitivity

208. The sensitivity of receptors is assessed through consideration of their susceptibility to change and their value.

209. For landscape receptors, susceptibility to change concerns their ability to absorb change brought about by the Development. Value concerns the importance of the landscape resource as evidenced by the presence of landscape designations, local perception and professional judgement. Undesignated landscapes may be of community value primarily as a recreational resource but also as local nature reserves. Table 5.1 sets out the sensitivity rating and criteria to be used in the EIA, which results from a combination of susceptibility and value.

Table 5.1 Landscape sensitivity criteria

Sensitivity evaluation	Description of criterion
High	Landform scale is small or the LCT covers a small area. The predominant pattern is varied, intricate and small scale comprising many different elements. The landscape condition is very good evidenced by high consistency in landscape character and intactness of elements and features. The landscape has a remote and relatively undeveloped character. Views are enclosed or channelled or elevated and panoramic and visual receptors are distributed consistently throughout the LCT.
Medium	Landform scale is small to medium and the LCT covers a wide area. The pattern of the landscape is irregular and varies with landform. Landscape condition is good as evidenced by intactness of elements and features and consistency of character throughout the LCT. The landscape is easily accessible and has some development. Views are partly enclosed with long distance views from more elevated areas.
Low	Landform scale is medium to large and the LCT covers a large area. The landscape pattern is large and regular or uniform comprising few elements and there is a lack of enclosure. Landscape condition is poor

[30] Landscape Institute and Institute of Environmental Management and Assessment, 2013, *Guidelines for Landscape and Visual Impact Assessment*, 3rd Edition, Routledge, London. Paragraph. 3.21, page 36.
[31] Ibid.
[32] Ibid.

Sensitivity evaluation	Description of criterion
	or badly managed. There is frequent or large scale development including road and rail infrastructure. Views are short, medium and long distance and strongly influenced by development.

210. The susceptibility of visual receptors to changes in views depends upon:

- *"The occupation or activity of people experiencing the view at particular locations; and*
- *The extent to which their attention or interest may therefore be focussed on the views and the visual amenity they experience at particular locations."*[33]

211. Views from particular locations may also be valued as indicated by reference to them in guidebooks, tourist maps or the provision of facilities for their enjoyment such as picnic sites, view indicators or interpretive material. Views may also be valued in attachment to cultural heritage assets or monuments in the landscape.

212. Table 5.2 sets out the general criteria used to evaluate sensitivity of visual receptors assessed in the LVIA with justification for each evaluation given.

Table 5.2 Visual sensitivity criteria

Sensitivity evaluation	Description of visual receptor	Justification for evaluation
High	Residents at home.	Residents at home are static receptors with fixed views from their property. Views are likely to be important to the enjoyment of the residential location.
	People engaged in outdoor recreation such as walking or cycling.	The attention of people undertaking such activities is likely to be focussed on the landscape and views.
	Visitors to picnic sites and tourist viewpoints.	The attention of people at such locations is likely to be focussed on the landscape and views.
	Visitors to heritage assets or other visitor attractions	These receptors are included where the surrounding area is important to the enjoyment of the asset or attraction.
Medium	Motorists using 'B' and 'C' class roads and unclassified roads and tracks. Roads sign-posted tourist routes.	Motorists of such roads are more likely to be residents of the area and likely to use these roads frequently. Tourist routes are more likely to be used by visitors to enjoy the scenic qualities of an area.
	People engaged in outdoor sports such as golf, football, rugby *etc*.	Attention is more likely to be focussed on participation in the activity than the surrounding landscape and views.
Low	People at their place of work	These receptors will be focussed on work activities irrespective of whether they are outdoors or indoors.
	Motorists using motorways, dual carriageways, and 'A' class roads	While such roads may be used as more frequently than lesser roads and by greater numbers of people, drivers will be focussed upon driving as opposed to the enjoyment of landscape and views.

[33] Ibid. 1. Paragraph 6.32

5.4.7 Assessment of Magnitude of Change

213. The magnitude of change to landscape receptors is assessed in terms of the following:

- The size or scale of change including the extent to which existing features and elements will be lost and the degree to which aesthetic or perceptual aspects of landscape character are affected;
- The geographical extent over which effects will occur; and
- The duration and reversibility of effects[34].

214. Table 5.3 sets out the criteria used to assess the magnitude of landscape effects. Not all aspects of a criterion need to be met for an evaluation to be given.

Table 5.3 Magnitude of landscape change criteria

Magnitude evaluation	Description of criterion
High	Loss or irreparable damage to landscape features and elements over a wide area and / or of key importance to the character of the baseline. Aesthetic and / or perceptual aspects of landscape character are affected such that the Proposed Development becomes a key additional aspect and competes with other aspects. The change to aesthetic / perceptual aspects occurs across a large geographical area and / or proportion of the landscape receptor. The effects are of long duration and / or irreversible.
Medium	Landscape features and elements of importance to the character of the baseline are lost over a limited area and can be partly restored or replaced. Aesthetic and / or perceptual attributes of landscape character are affected to the extent that the Proposed Development becomes a noticeable new feature but does not compete with other aspects. The change to aesthetic / perceptual aspects occurs across a moderate geographical area and / or proportion of the landscape receptor. The effects are of medium to long duration and reversible.
Low	Landscape features and elements of importance to the character of the baseline are lost over a very limited area and can be wholly restored or replaced. Aesthetic and / or perceptual attributes of landscape character are affected although the Proposed Development is a minor new feature. The change to aesthetic / perceptual aspects occurs across a small geographical area and / or proportion of the landscape receptor. The effects are of short to medium duration and reversible.
Negligible	No landscape features and elements of importance to the character of the baseline are lost. There is a barely discernible change to aesthetic and / or perceptual attributes of landscape character and such changes occurs across a very limited geographical area and / or proportion of the landscape receptor. The effects are of short duration and reversible.

215. The magnitude of change to visual receptors is assessed in terms of the following:

- *"The scale of the change in the view with respect to the loss or addition of features in the view and changes in its composition, including the proportion of the view occupied by the development;*

[34] Ibid. 1.

- *The degree of contrast or integration of any new features or changes in the landscape with existing or remaining landscape elements and characteristics in terms of form, scale and mass, line, height, colour and texture; and*
- *The nature of the view of the development, in terms of the relative amount of time over which it will be experienced and whether views will be full, partial or glimpses."*[35]

216. Table 5.4 sets out the criteria used to assess the magnitude of visual change. Not all aspects of a criterion need to be met for an evaluation to be given.

Table 5.4 Magnitude of visual change criteria

Magnitude evaluation	Description of criterion
High	The size and scale of the Development are such that it alters the view composition and becomes the principal feature of views and / or occupies a large proportion of the field of view. The Development does not integrate with existing features in the view. The Development will be visible to stationary and moving receptors for long periods of time over short distances. All of the Development or a large proportion of it will be visible.
Medium	The size and scale of the Development are such that it alters the view composition. It does not become the principal feature of views but is a noticeable new feature and / or occupies a moderate proportion of the field of view. The Development has some association or integrates to a degree with existing features in the view. The Development will be visible to stationary and moving receptors for long periods of time over short to moderate distances. A medium to large proportion of the Development will be visible over short to medium distances or there will be partial views over short distances.
Low	The Development is a new feature in the view but has a limited effect on view composition. It occupies a small proportion of the field of view and is visible in the context of panoramic or large scale vistas. The Development has some association or integrates with existing features in the view. The Development will be visible to stationary receptors for long periods of time over long distances and moving receptors for short or moderate periods of time over long distances. There will be partial or full views of the Development over long distances or there will be glimpsed views over moderate distances.
Negligible	The Development is a distant and minor feature in the view with very limited or no effect on view composition. The Development integrates with existing features in the view. The Development will be visible to stationary receptors for long periods of time over long distances and moving receptors for short periods of time over long distances. There will be partial or glimpsed views of the Development over long distances.

5.4.8 Significance of Effects

217. The overall effect of the Development on a particular receptor is considered through a combination of the sensitivity and magnitude of change to that receptor and a judgement is

[35] Ibid. 1. Para. 6.39.

made on whether or not the overall effect is significant. The matrix presented in Table 4.1 is used as a guide to significance of effects with assessment and conclusions drawn from the baseline and professional judgement. A significant effect on a particular receptor does not necessarily indicate that the overall effect of the Development is unacceptable.

218. The nature of effect refers to whether the landscape and visual effects of the Development are positive, neutral or negative. This is dependent on a number of criteria which vary between physical effects, effects on landscape character and effects on views. Effects are classified as positive, neutral or negative according to the following definitions:

- **Positive** effects contribute to the landscape and visual resource through the enhancement of desirable characteristics or the introduction of new, positive attributes. The removal of undesirable existing elements or characteristics can also be beneficial, as can their replacement with more appropriate components;
- **Neutral** effects occur where the Development neither contributes to nor detracts from the landscape and visual resource or where the effects are so limited that the change is hardly noticeable. A change to the landscape and visual resource is not considered to be adverse simply because it constitutes an alteration to the existing situation; and
- **Negative** effects are those that detract from or weaken the landscape and visual resource through the introduction of elements that contrast in a detrimental way with the existing characteristics of the landscape and visual resource, or through the removal of elements that are key in its positive characterisation.

219. Effects on landscape receptors are more likely to be significant where the following criteria are met:

- Major loss or irreversible negative effects over an extensive area on elements and/or aesthetic and perceptual attributes that are key to the character of nationally valued landscapes;
- Loss of mature or diverse landscape elements, features, characteristics, aesthetic or perceptual qualities;
- Effects on rare, distinctive, particularly representative landscape character; and
- Extensive loss of lower-value elements, features, characteristics, aesthetic or perceptual qualities.

220. Effects are likely not to be significant where the following criteria are met:

- Loss of new, uniform, homogenous elements, features, characteristics or qualities;
- Effects on areas in poorer condition or of degraded character; and
- Effects on lower value landscapes.

221. Significant effects on visual receptors are more likely where the following criteria are met:

- The Development results in large scale changes which introduce new or discordant elements into the view rather than the introduction of small features similar to those already present within the view;
- Effects on views from recognised and important viewpoints or amenity routes; and
- Large numbers of people are affected or the landscape in which people are located is of the highest sensitivity or scenic quality.

222. The LVIA will describe the overall effects on receptors and explain the justification to each assessment. For each assessed effect, conclusion will be drawn on whether the effect is significant or not and whether such significance is positive or negative.

5.4.9 Viewpoints and Visualisations

223. Viewpoint selection will follow good practice guidance and in particular paragraphs 6.18 to 6.20 of GLVIA3. The viewpoints chosen will be used to aid the description of effects on both landscape and visual resources.

224. 15 proposed viewpoints for the LVIA are included in Table 5.5 and shown on Figure 5.1. Consultation responses will inform the final viewpoint selection and also any cumulative developments that will be assessed in the LVIA.

Table 5.5 Proposed LVIA viewpoints

No.	Viewpoint Title	Receptor Represented by the Viewpoint	Distance to the Development Site Boundary
1	Saxon Shore Way, Nagden	Walkers	10 m
2	Saxon Shore Way, Nagden Marshes	Walkers	40 m
3	Saxon Shore Way, Cleve Marshes	Walkers	60 m
4	PRoW Northeast of Site	Walkers	500 m
5	NCN route 1, Faversham Road	Motorists Users of NCN route 1 Walkers	500 m
6	PRoW at Graveney Hill	Walkers	0.0 m
7	PRoW ZR488	Walkers	60 m
8	Graveney. PRoW near Church of All Saints	Walkers	500 m
9	Victory Wood Viewpoint	Walkers	4.4 km
10	PRoW ZR486 Near Warm House	Walkers, Residents, Place of Work	170 m
11	Faversham. Church Road	Residents	1.46 km
12	PRoW. Shipwright Arms	Walkers. Users of Public House	210 m
13	Oare Marshes Nature Reserve	Walkers. Users of Nature Hide	430 m
14	Isle of Harty. Church of St. Thomas The Apostle	Residents. Users of The Church	1.86 km
15	PRoW. Swale National Nature Reserve	Walkers. Users of Nature Hide	2.4 km

225. Baseline photographic panoramas will be produced for each viewpoint to illustrate the nature of existing views in the direction of the Development. A baseline photographic survey will be undertaken using a digital SLR camera in accordance with current good practice guidance[36] and informed by the principles contained in guidance for wind energy development[37].

226. It is proposed that, for eight of the viewpoints, computer rendered images (photomontages) will be prepared. These will show the Development superimposed on to the baseline photographic view to more accurately convey the appearance of the Development in the view.

[36]Landscape Institute, 2011, *Photography and photomontage in landscape and visual impact assessment*.

[37] Scottish Natural Heritage, 2014, *Visualisation Representation of Wind Farms*.

5.5 Assessment of Cumulative Effects

227. The Cumulative LVIA (CLVIA) will assess the cumulative effects of the Development in combination with other development. A search will be undertaken using publicly available online data sources and information on planning authority planning portals of all cumulative sites within a 10 km radius of the Development site (twice the radius as for the Development in isolation) and all developments likely to impact landscape and visual receptors will be considered. The search will include:

- Existing, constructed and/or operational development;
- Development under construction;
- Consented but not yet constructed development;
- Development for which a valid planning application has been submitted; and
- Development which has been refused planning permission and which is subject of an Appeal.

228. The assessment of effects will consider two scenarios:

- Scenario 1 whereby the effects of the addition of the Development to all operational and consented development within the study area is assessed. Scenario 1 assumes that all consented development will be built; and
- Scenario 2 whereby the effects of the addition of the Development to all operational and consented development and development for which there is a valid planning application within the Study Area is assessed. Scenario 2 assumes that all consented development will be built and development in planning will be consented and built.

229. The CLVIA will consider the following types of cumulative effect on landscape and visual receptors:

- In combination effects whereby the Development is present within the same landscape character area as cumulative sites or is seen in the same field of view as other developments;
- In succession effects whereby the Development is present in a different landscape character area to cumulative sites or where it is only visible with cumulative developments from a viewpoint by moving one's head; and
- Sequential effects whereby the Development is visible in addition to one or more cumulative developments along a transport or recreational route.

6 ECOLOGY

6.1 Introduction

230. The ecology chapter of the ES will assess the likely impact of the Development upon ecological resources within and surrounding the Development site. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available. This excludes ornithological receptors which are addressed separately in section 7 of this Scoping Report.

6.2 Preliminary Baseline Conditions

6.2.1 Designated Sites

231. A review of the Multi-Agency Geographic Information for the Countryside (MAGIC) website[38] has identified statutory designated sites of nature conservation value within 5 km of the Development, which may have the potential to be affected by the Development, as summarised in Table 6.1 and presented in Figure 6. Statutory designed sites of ornithological value are addressed in section 7 of this report and shown in Figure 6. Information about non-statutory designated sites (*e.g.*, Local Wildlife Sites) will be requested from the Kent and Medway Biological Records Centre.

Table 6.1 Statutory designated sites within 5 km of the Development site

Site Name	Status	Distance and Direction from Development	Description
The Swale	SSSI/Ramsar/ SPA	Adjacent to the north, east and west	Complex of estuarine habitats (mudflats, saltmarsh and grazing marsh) supporting internationally notable assemblages of invertebrates, higher plants, and birds.
South Bank of the Swale	LNR	Adjacent to the north and west	
The Swale Estuary	MCZ	c. 10 m to the west and generally 70-100 m to the north	The intertidal and subtidal marine aspects of the Swale are encompassed in the MCZ, a highly biodiverse area that is an important spawning and nursery ground for many fish species and home to numerous marine invertebrates.
Oare Marshes	LNR	300 m to the west	Traditional grazing marsh in Kent with reedbed and saltmarsh dissected by freshwater and brackish dykes. Internationally important reserve for migratory, overwintering and breeding wetland birds. The saltmarsh supports a unique set of plants tolerant of the salty conditions including golden samphire, sea lavender, sea purslane, sea clover and thrift. Freshwater dykes contain frogbit, reedmace and water plantain. Common seals are often seen in the Swale.
The Swale	NNR	1.4 km to the north	Coast and grazing marsh habitats supporting significant populations of waterbirds.
Seasalter Levels	LNR	1.5 km to the east	Part of the North Kent coast freshwater grazing marsh, it is also a valuable wetland site for wintering and migratory wildfowl

[38] www.magic.gov.uk

Site Name	Status	Distance and Direction from Development	Description
			and wading birds, including wigeon, teal, redshank and lapwing.
Foxes Cross Bottom	LNR	3.5 km to the east	A mosaic of neutral grassland with scrub, native broadleaved woodland and other valuable habitats such as ponds, wet ditches and hedgerows. In the summer many warblers and nightingales nest in the scrub.
Ellenden Woods	SSSI	3.6 km to the east	Coincident with part of the Blean Complex SAC, notified for its ancient woodland habitat supporting diverse flora, invertebrate and breeding bird community.
Blean Complex	SAC	3.6 km to the east	Ancient woodland, specifically the Annex 1 habitat: Sub-Atlantic and medio-European oak or oak-hornbeam forests of the Carpinion betuli.
Elmley	NNR	3.8 km to the north-west	Wide expanse of grazing marsh, divided by ditches and frequent shallow surface flooding which that home to large numbers of wintering wildfowl and breeding waders.
Blean Woods	NNR	4.4 km to the south-east	Part of the largest ancient woodland in southern Britain, supporting diverse flora, invertebrate and bird populations.
Church Woods Blean	SSSI	4.4 km to the south-east	Coincident with part of the Blean Complex SAC, notified for its ancient woodland habitat supporting diverse flora, invertebrate and breeding bird community.

SSSI: Site of Special Scientific Interest
Ramsar: Wetland site of international importance, designated under the 1971 Ramsar Convention
LNR: Local Nature Reserve
MCZ: Marine Conservation Zone
NNR: National Nature Reserve
SAC: Special Area of Conservation

6.2.2 Surveys/Site Visit Findings

232. A range of surveys has been completed to provide an ecological baseline against which to assess the effects of the Development and to help guide future management of the Development site.

6.2.2.1 Extended Phase 1 Habitat Survey

233. An extended Phase 1 habitat survey of the Development site was undertaken during August 2015. Habitats within the Development site were classified according to the standard Phase 1 survey methods[39]. In addition, the Development site was assessed for its potential to support protected and/or notable species. The extent of habitats present was plotted in the field on an appropriately scaled map and target notes produced describing the habitats and species.

234. The Development site is dominated by arable fields with crops such as wheat, barley and beans grown in rotation. The fields are large and extensive. Intersecting the fields are drainage ditches with common reed dominant in many. Each ditch is associated by wide,

[39] JNCC (2010) *Handbook for Phase 1 habitat survey – A technique for environmental audit'.* JNCC

rough grassland margins along their length. Other habitats include a small reedbed in the south where a ditch widens, and areas of bare ground for storing agricultural machines. A variety of other habitats occur adjacent to the Development site boundary such as extensive reedbed along the northern boundary and residential properties and other farming activities along the southern boundary.

235. Habitats will change as a result of the Development, offering opportunities to manage some areas around the solar panels to enhance floristic diversity within the Development site.

6.2.2.2 Terrestrial and Aquatic Invertebrates

236. Aquatic and terrestrial invertebrate surveys were undertaken during August and September 2015. For aquatic invertebrates, hand and net searches were conducted in the field drainage ditches. Net surveys consisted of sampling using a 1 mm mesh size, searching various habitat types. Hand searches targeted areas of rocks, logs and floating debris. Specimens were identified to species level where possible and appropriate.

237. Terrestrial invertebrates were located and collected by general methods using sweep net, beating tray and a stout trowel. Flowers, leaf surfaces, rocks, bare ground, logs and tree trunks were examined by visual searching. Others were found by finger-tip grubbing in loose soil and plant roots. Specimens that could not be identified on site were retained for microscope verification.

238. A total of 172 invertebrate species was found during the survey, which is a relatively low number across such a large area. Although most of the species found are common and widespread, a number of unusual or uncommon species were also recorded. These are mostly species with particular associations with coastal grazing meadows, brackish ditches, saltmarsh and boggy fenland. Several scarce and unusual water insects, including water beetles (*Agabus conspersus*, *Rhantus frontalis* and *Ochthebius marinus*) and boatmen bugs (*Corixa affinis*), occurred in the water filled ditches. The diversity of the terrestrial and aquatic invertebrates of the Development site was concentrated in the field margins, ditches and dykes bordering the arable fields.

239. The change in habitats as a result of the Development will offer opportunities to manage habitats around the solar panels in a way that may enhance the diversity and abundance of terrestrial invertebrate species.

6.2.2.3 Amphibians

240. Great crested newt (*Triturus cristatus*) and amphibian surveys were undertaken between April and June 2015. A suite of six surveys were conducted to assess the presence of amphibians including great crested newt within suitable waterbodies located within 500 m of the Development site in line with best practice[40]. A minimum of three survey methods were used during each survey visit, namely bottle trapping, torching, egg searching and netting.

241. Great crested newts were observed within three waterbodies located outside of the Development site all of which had a small population size class (1-10 individuals). Two waterbodies are within 100 m of the Development site boundary and are associated with the electricity substation at Cleve Hill. A third waterbody is in the grounds of a farm 280 m from the Development site.

242. No great crested newts were recorded in any of the water-bodies present within the Development site. Amphibians recorded from within the Development site included a single observation of a smooth newt (*Lissotriton helveticus*), together with occasional common frog (*Rana temporaria*) and marsh frog (*Pelophylax ridibundus*).

[40] English Nature (2001) *Great Crested Newt Mitigation Guidelines*. English Nature.

6.2.2.4 Reptiles

243. Surveys were conducted following standard best practice guidelines[41][42], with a total of 413 artificial refugia placed at the Development site during early September 2015. Refugia, including corrugate metal tins and roofing felt cut into approximate 1 m² squares, were laid flush to the ground within suitable habitat, in order to attract reptiles to bask on or shelter under these refugia. A period of 10 days was allowed in order for the refugia to settle and reptiles to become habituated to them. Following this period, survey visits were conducted on a total of seven occasions between late September and mid October 2015.

244. In addition to the artificial refugia, a watching brief was maintained during the course of other ecology surveys, including the identification of reptile habitats such as suitable hibernacula sites.

245. Based on the surveys, the Development site is considered to support a good population of common lizard and a low population of grass snake using the ditch habitats within the Development site. The relatively low numbers of individuals for such a large site is likely to be a result of the land management operations including intensive arable farming and also a heavily managed drainage network.

6.2.2.5 Bats

246. The Development site is considered to be of low value to bats due to its open, exposed, coastal aspect and lack of available roosting features, and the survey approach was designed on this basis with reference to best practice guidelines[43]. Three bat activity survey visits were undertaken between June and September 2015, with one visit comprising both dusk and pre-dawn surveys. Each survey visit comprised three transects designed to include potential flight paths and foraging areas within the Development site. Six static detectors were also left in-situ for a minimum of four nights per session in June/July, August and September 2015.

247. From the results of both the activity surveys and the static detectors, it is concluded that the Development site offers foraging and commuting habitat used by at least nine species of bat. This includes high numbers of common pipistrelle (*Pipistrellus pipistrellus*) and soprano pipistrelle (*Pipistrellus pygmaeus*) and moderate numbers of noctule (*Nyctalus noctula*) and serotine bat (*Eptesicus serotinus*). Low numbers of Myotis bats (considered most likely to be Daubenton's bat (*Myotis daubentonii*)), Leisler's bat (*Nyctalus leisleri*), brown long-eared bat (*Plecotus auritus*) and Nathusius' pipistrelle (*Pipistrellus nathusii*) were also recorded.

248. The most frequently recorded species during transect surveys has been soprano pipistrelle, recorded foraging across the Development site and in particular above the ditch network and adjacent Faversham Creek. Common pipistrelle and noctule registrations were spread across the Development site, with serotine registrations concentrated in the north-east and associated with the cattle grazed pasture and northern margin. Within the west of the Development site (arable fields, predominantly broad bean crop at the time of survey) foraging activity was closely associated with the ditch network, with bats commuting along the creek and ditch network to forage along the Swale to the north. Within the east of the Development site, bat activity was also associated with the ditch network and the Swale to the north, but also extended further into the pasture field margins adjacent to the east of the Development site.

249. The change in habitats as a result of the Development will offer opportunities to manage habitats around the solar panels in a way that may improve conditions for foraging bats.

[41] Froglife (1999). Reptile Survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation; Froglife Advice Sheet 10. Froglife, Halesworth.

[42] Gent, T & Gibson, S. (2003). Herpetofauna Workers' Manual. JNCC, Peterborough.

[43] Hundt, L. (ed.) (2012) *Bat Surveys: Good practice Guidelines* (2nd Edition). Bat Conservation Trust. Valid at time of survey.

6.2.2.6 Badgers

250. A badger survey was undertaken on 16th and 20th May 2014 in line with best practice guidelines[44]. The Development site was also re-checked for signs of badger activity during the Phase 1 Habitat Survey in August 2015. A suitably experienced ecologist systematically walked the Development site, looking for badger setts and associated activity signs (*e.g.*, latrines/dung pits, prints).

251. During the survey visits, no setts or signs of badgers were observed within or were visible adjacent to the Development site. During the Phase 1 Habitat survey undertaken in 2015, no signs of badger were observed.

6.2.2.7 Water Vole

252. Water vole surveys were undertaken in line with best practice guidance[45] in September 2015. This consisted of identifying the extent and distribution of water vole activity through targeted searches of the banks of the network of ditches for field signs indicating recent activity (*e.g.*, feeding stations, latrines, footprints) as well as signs of past and potentially present activity (*e.g.*, burrows). All suitable watercourses within Development site were examined in detail for evidence of water vole activity. Any incidental records of otter were recorded.

253. In total 22 ditches were surveyed for water vole within the Development site boundary. Generally, current water vole activity is abundant and widespread across the Development site within suitable habitat. Water vole activity was recorded from 10 ditches. Other species recorded throughout the ditch network included bank vole (*Clethrionomys glareolus*) and brown rat (*Rattus norvegicus*). No evidence of otter was recorded.

254. The survey results will be used to inform the design of the Development in a way to minimise effects on water vole and pre-construction surveys will be undertaken within three months of commencement to ensure that water voles will not be harmed during the installation of the Development.

6.3 Likely Environmental Effects

255. Ecological studies have been completed in full, and an appraisal of the Development site, experience of the local area and survey results show that a number of sensitive ecological features may be present, including:

- Habitats – the ditches and field margins are not floristically important but provide valuable habitats for faunal species within the wider, intensively managed arable fields;
- Amphibians – three off-site ponds with low populations of great crested newts;
- Invertebrates – several scarce and unusual water insects occurred in the water-filled ditches;
- Riparian mammals – many watercourses supporting water voles; and
- Bats – the network of drainage ditches and field margins offer suitable foraging habitat for bats.

256. The scale and location of the Development will limit likely ecological effects since most infrastructure will be located within arable land – a habitat of limited ecological value. The key types of impact on the above receptors include:

- Loss of, and disturbance to, terrestrial habitats due to land take by the infrastructure;
- Loss of habitat important for the maintenance of species' conservation statuses;

[44] Harris, S., Cresswell, P. & Jeffries, D. (1991) *Surveying for Badgers'.* Mammal Society.

[45] Strachan, R., Moorhouse, T. and Gelling, M. 3rd Edition (2011) *Water vole Conservation Handbook.* The Wildlife Conservation Research Unit, University of Oxford. Valid at the time of survey.

- Direct disturbance of, and harm to, animals, including the displacement of species from the proximity of the Development; and
- Potential legal offences, even when significant adverse ecological effects are unlikely.

6.4 Assessment Methodology

257. The approach taken to the assessment of ecological and ornithological effects will follow the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland[46]. These guidelines set out the process for assessment through the following stages:

- Describing the ecological baseline through survey and desk study;
- Identifying and evaluating 'Important Ecological Features ' (IEFs);
- Identifying and characterising the likely effects on IEFs;
- Determining the significance of effects in the absence of mitigation;
- Describing mitigation, compensation and/or enhancement measures associated with the development and assessing residual significance; and
- Identification of monitoring requirements.

258. The Ecology ES chapter will form the ecological assessment. The ES chapter will be supported by Technical Appendices detailing the desk study results, consultation, survey methodologies and results (including figures, tables, photographs, maps, and appendices). Where necessary, the chapter and Technical Appendices will be supported by Confidential Annexes containing sensitive information that should not be presented in the public domain in order to prevent harm to protected species.

259. The chapter will include measures to mitigate likely adverse effects, either by sensitive design or applied techniques, and will outline measures to enhance biodiversity, as well as the requirement for associated monitoring and adaptive management. A standalone Biodiversity and Landscape Management Plan (BLMP) will be submitted with the ES to summarise the proposed approach to land management within the Development site, including mitigation and enhancement measures as necessary.

6.4.1 Relevant Legislation and Guidelines

260. Section 3 of this Scoping Report sets out the planning policy context for the Development. The ecological assessment will be carried out in accordance with the requirements set out in the following legislation and guidelines:

- The Habitats Directive;
- The Conservation of Habitats and Species Regulations 2010 ("the Habitats Regulations");
- Wildlife and Countryside Act 1981 (as amended);
- Natural Environment and Rural Communities Act (NERC) 2006;
- National Planning Policy Framework (2012);
- UK Post-2010 Biodiversity Framework, which supersedes and subsumes the UK Biodiversity Action Plan (UK BAP);
- Kent [Local] Biodiversity Acton Plan (LBAP);
- CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom (2016)[47]; and
- Natural England (NE) guidance on solar power[48].

[46] CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester

[47] CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester

[48] Natural England (2011) *Solar Parks: Maximising Environmental Benefits*. Natural England Technical Note TIN101.

261. Other guidance that is specific to individual receptors or assessment methods will be used, and referenced, where appropriate.

6.4.2 Proposed Desk-based Assessment

262. A desk based assessment will be conducted to gather any relevant, pre-existing information relating to the Development site. Good EIA practice includes identification of any statutory and non-statutory designated sites of nature conservation interest within a potential zone of influence of the Development, as well as collation of historical species records in the area.

263. These records will inform on-going survey efforts and provide a historical and regional context for the assessment. In the first instance, records of notable and protected species will be obtained from the Kent and Medway Biological Records Centre and National Biodiversity Network. In light of initial requests and survey results, further information and data requests will be made to other sources, such as specialist species recorders.

6.4.3 General Approach

264. The assessment methodology has been developed with reference to the CIEEM Guidelines for Ecological Impact Assessment in the United Kingdom and from considerable experience of EcIA relating to similar developments throughout the UK.

6.4.4 Determining Value

265. The baseline conditions will be examined and IEFs identified based on their conservation status and the local populations observed. The nature conservation value of the ecological interests is defined according to Table 6.2.

Table 6.2 Approach to determining value of ecological receptors

Level of Value	**Examples**
International and European	An internationally designated site (*e.g.*, SAC) or site meeting criteria for international designations. This includes candidate SACs.
	Species present in internationally important numbers (*e.g.*, >1% of biogeographic populations).
National	A nationally designated site SSSI, or a NNR, or sites meeting the criteria for national designation.
	Species present in nationally important numbers (*e.g.*, >1% UK population).
	Cited species that are connected to SSSI or NNR.
	Large areas of priority habitats listed on Annex 1 of the Habitats Directive and smaller areas of such habitats that are essential to maintain the viability of that ecological resource.
Regional	Species present in regionally important numbers (*e.g.*, >1% regional population).
	Sites designated as Local Nature Reserves (LNRs), Local Wildlife Sites (LWS), or equivalents.
Metropolitan, County, vice-county or other local authority-wide area	Sites designated as LNRs, LWS, or equivalents that may be designated according to criteria at the local authority level.
Local	Other species of conservation interest, *e.g.*, UKBAP/LBAP species that contribute to the local community.
	Sites falling below criteria for selection as LWS.

Level of Value	Examples
	Areas of semi-natural woodland smaller than 0.25 ha.
	Areas of habitat or species considered to appreciably enrich the ecological resource within the local context.
Less than local	Usually widespread and common habitats and species. Receptors falling below local value are not considered in detail in the assessment process unless they have policy implications for the Development, *e.g.*, legally protected species.

6.4.5 Identifying Effects and Determining Magnitude

266. An effect is defined as a change in distribution or status of a receptor as a result of the Development and can be adverse, neutral or positive. In assessing the magnitude of likely effects, the identified effect will be characterised according to the sensitivity of the receptor and the potential for recovery from temporary adverse conditions, taking into account the fact that different sources of change can result in reversible, permanent or temporary effects, that different effects have different probabilities of occurring, and that some changes may be positive (beneficial). The criteria that will be used in the assessment for describing the overall magnitude of a likely effect are summarised in Table 6.3.

Table 6.3 Effect Magnitude

Effect Magnitude	Description
High Negative	High effects may include those that result in large-scale, long-term or permanent, usually irreversible changes in a receptor, and likely to change its ecological integrity. These effects are likely to result in overall changes in the conservation status of a habitat or species population at the location(s) under consideration. In terms of extent they will typically affect more than 20% of the area of a habitat receptor, or lead to the loss of more than 20% of a defined population in the case of a species receptor.
Medium Negative	Medium effects may include moderate-scale permanent changes in a receptor, or larger-scale temporary changes, which may in some circumstances be considered to change the integrity of a receptor. This may mean that there are temporary changes in the conservation status of a habitat or population at the location(s) under consideration, but these are usually reversible and unlikely to be long-term. In terms of extent they will typically affect between 5% and 20% of the area of a habitat receptor, or lead to the loss of between 5% and 20% of a defined population in the case of a species receptor.
Low Negative	Low effects may include those that are small in magnitude, result in small-scale temporary changes and where integrity is not affected, and are typically reversible. These effects are unlikely to result in overall changes in the conservation status of a habitat or species population at the location(s) under consideration, but it does not exclude the possibility that mitigation or compensation will be required. In terms of extent they will typically affect between 1% and 5% of the area of a habitat receptor, or lead to the loss of between 1% and 5% of a defined population in the case of a species receptor.
Neutral / Negligible	There is no perceptible change in the ecological receptor. As a guide, less than 1% of the population or area is predicted to be affected.
Positive	The changes in the ecological receptor are considered to be beneficial.

267. In the case of designated sites with quantified populations, magnitude will be assessed against the size of the cited population and/or the most recently reported population size in the common standards monitoring (CSM) cycle. Effects on populations outside designated sites will be assessed within an appropriate geographical scale, typically either at a national scale, or at the regional scale.

6.4.6 Determining Significance

268. In accordance with the CIEEM guidelines, a significant effect, in ecological terms, is defined as 'an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features".

269. The term 'integrity' is used in accordance with the definition adopted for designated sites, as the *"…coherence of ecological structure and function…that enables it to sustain the habitat, complex of habitats and/or levels of populations of species for which it was classified"*. For non-designated sites/species this can be amended to *"the coherence of ecological structure and function, that enables it [in this case, the area being considered; e.g., region] to maintain the levels of populations of species in its/their pre-development condition"*. Maintaining integrity therefore refers to the maintenance of the conservation status of a habitat or species population at a specific location or geographical scale.

270. The approach adopted will aim to determine whether an effect is significant or not significant on the basis of a discussion of the variables that characterise it. The significance of an effect is linked to the geographical scale at which the receptor is valued, but does not necessarily depend on the value of the receptor or its legal protection.

6.5 Assessment of Cumulative Effects

271. The purpose of a cumulative effect assessment is to identify effects that might not be significant on their own, but become significant when considered in combination with effects from other plans or developments. A search radius of 10 km from the Development site boundary will be applied for the cumulative effects assessment and all developments likely to impact ecological receptors will be considered. This area of search is twice the area of search for designated sites considered in the assessment of effects of the Development in isolation.

7 ORNITHOLOGY

7.1 Introduction

272. The ornithology chapter of the ES will assess the likely impact of the Development upon birds within and surrounding the Development site. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available.

273. The Royal Society for the Protection of Birds (RSPB) (2014)[49] considers climate change to be the greatest threat to birds, wildlife and people worldwide and therefore strongly supports the use of renewable energy to reduce the UK's greenhouse gas emissions. They advise that solar farms can be of potential concern in sensitive locations, although careful planning and project development can help to avoid impacts on key habitats for birds. Natural England (2011)[50] state that solar energy, in common with other forms of renewable and low carbon energy sources is a valuable part of the UKs energy future and that solar parks should avoid sites of high wildlife value, in particular, designated sites such as Sites of Special Scientific Interest (SSSIs), Special Protection Areas (SPAs), and Special Areas of Conservation (SACs). They state that any development proposed on land within or adjacent to designated sites is likely to have an adverse effect on the environmental features for which they were designated, in particular during the construction phase.

7.2 Preliminary Baseline Conditions

7.2.1 Desk Based Assessment

274. Section 6.2.1 provides details of statutory designated sites with the potential to be affected by the Development within 5 km of the site, which are displayed on Figure 6. Information about non-statutory designated sites of ornithological value (*e.g.*, Local Wildlife Sites) will be requested from the Kent and Medway Biological Records Centre.

275. The Development site is immediately adjacent to The Swale SPA/Ramsar/SSSI. There are also three Kent Wildlife Trust (KWT) Reserves adjacent or in close proximity to the site: Oare Marshes, Oare Meadow and South Swale Reserves, and the RSPB's Seasalter Levels Reserve is also nearby, all of which are protected for their bird interest and are encompassed within the SPA/Ramsar/SSSI boundary.

276. Key to the assessment process will be the collation of historical ornithological records through a desk study and consultations. In addition to general historical records of breeding and non-breeding birds within the local area obtained from the Kent and Medway Biological Records Centre, Wetland Bird Survey (WeBS) core count and low-tide count data will be obtained for the Swale estuary where considered relevant to provide a context within which the assessment of effects on birds associated with The Swale SPA/Ramsar/SSSI can be carried out.

277. Consultations with Natural England commenced in December 2016 to identify key receptors and to discuss the scope of the baseline surveys and assessment. Consultation has also been initiated with the RSPB and Kent Wildlife Trust.

7.2.2 Baseline Surveys

278. Preliminary analyses of the baseline survey have been carried out to identify key species that use the Development site or are located within the Development's zone of influence. These will form the basis for identification of the important ecological features to be considered in the ornithological assessment. They include:

[49] Royal Society for the Protection of Birds (RSPB) (2014). Solar Energy RSPB Policy Briefing. December 2014.

[50] Natural England (2011). Solar Parks: Maximising Environmental Benefits. Natural England Technical Note TIN101.

- Breeding birds – a diverse assemblage of breeding (territory-holding) birds, including 14 species of conservation concern (Annex 1, Schedule 1, Red and Amber listed species): marsh harrier, oystercatcher, lapwing, cuckoo, bearded tit, skylark, Cetti's warbler, song thrush, dunnock, house sparrow, yellow wagtail, meadow pipit, linnet and reed bunting. Other non-territory holding species of conservation concern that were observed included five qualifying interest species of the SPA/Ramsar designation: gadwall, teal, oystercatcher, ringed plover, and black-tailed godwit. Peregrine and barn owl are also likely to nest near the Development site.
- Wintering birds – wintering wildfowl and waders were numerous in the intertidal parts of the survey area, with frequent records of some species observed using the fields within the Development site for foraging and loafing/roosting. Qualifying interest species of the Swale SPA that have been frequently seen within the Development site include brent goose, golden plover and lapwing; dunlin and curlew have also used the Development site occasionally. Other wintering farmland birds, such as meadow pipit, skylark and starling, were also frequently observed within the arable fields of the Development site.
- Flight Activity – a small number of marsh harriers were very frequently seen foraging across much of the Development site throughout the year, with high concentrations of activity along the drainage ditch network and the strip of reedbed and grazing marsh between the Development site and the sea wall.

7.3 Likely Environmental Effects

279. A process of consultation has already been commenced with Natural England and will be extended to other key consultees, including the RSPB and Kent Wildlife Trust.

280. The key ornithological issues to be addressed in detail in the assessment are the potential for direct and indirect effects on breeding and non-breeding bird populations and the habitats on which they depend (*e.g.*, direct habitat loss, habitat fragmentation and/or modification, and disturbance/displacement during construction, maintenance and operation). These include 'wider countryside' species, particularly those of conservation concern, as well as species that are qualifying interests of the designated sites in close proximity to the Development site.

281. In relation to the SPA/Ramsar designation, the assessment will consider carefully the direct effects of disturbance to breeding and non-breeding birds within the designated site, as well as the indirect effects of modification of functionally-linked land that birds use within the Development site that is outside the SPA/Ramsar site. The ES will include a shadow Habitats Regulations Appraisal (HRA) to assist the competent authority in conducting the Appropriate Assessment that will be required prior to determination of the DCO application.

282. Through the consultation process with Natural England, the preliminary assessment has identified the following 'main component species' within the important non-breeding waterbird assemblage for which the SPA/Ramsar is designated:

- European white-fronted goose
- Dark-bellied brent goose
- Shelduck
- Wigeon
- Teal
- Pintail
- Shoveler
- Little egret
- Avocet
- Oystercatcher
- Grey plover
- Golden plover

- Lapwing
- Curlew
- Black-tailed godwit*
- Bar-tailed godwit
- Knot
- Ruff
- Sanderling
- Dunlin
- Green sandpiper
- Greenshank

283. Similarly, in relation to the breeding bird qualification of the SPA/Ramsar, the SPA populations of most typical grazing marsh species present within the site (*e.g.*, reed bunting) are probably not dependent on the habitats within the site for their ecological functioning, and therefore, are not functionally linked. However, surveys have demonstrated that marsh harrier, a breeding bird assemblage species of the SPA/Ramsar, frequently used the site for foraging and is therefore functionally linked to the Development site.

284. The Development is unlikely to have substantive effects on the qualifying interests of sites beyond 5 km.

7.4 Assessment Methodology

7.4.1 Relevant Legislation and Guidelines

285. Section 3 of this Scoping Report sets out the planning policy context for the Development. The ornithological assessment will be carried out in accordance with the requirements set out in the following legislation and guidelines:

- Council Directive 2009/147/EC on the Conservation of Wild Birds ("the Birds Directive");
- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Flora and Fauna ("the Habitats Directive");
- The Habitats Regulations;
- Wildlife and Countryside Act 1981 (as amended);
- NERC 2006;
- National Planning Policy Framework (2012);
- UK Post-2010 Biodiversity Framework, which supersedes and subsumes the UK Biodiversity Action Plan (UK BAP);
- Kent [Local] Biodiversity Acton Plan (LBAP);
- Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the United Kingdom (2016)[51];
- Royal Society for the Protection of Birds (RSPB) guidance on solar power[49]; and
- Natural England (NE) guidance on solar power[50].

286. Other guidance that is specific to individual receptors or assessment methods will be used, and referenced, where appropriate.

7.4.2 Survey Methodology

287. A series of baseline bird surveys have been undertaken to provide a thorough assessment of the numbers, diversity and spatial distribution of bird species within and adjacent to the Development site.

288. Baseline bird surveys were undertaken between January 2014 and June 2015. The survey area for all surveys included the entire site and some adjacent areas. Some surveys

[51] CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester.

were stratified to cover both high and low tide periods. Further baseline bird surveys were undertaken between September 2015 and October 2016 inclusive; these covered the site and majority of 500 m buffer area around the site where accessible or visible from the site boundary (Walkover Survey Area 'WSA'). Ongoing wintering bird surveys focussing on use of the site and adjacent habitats by SPA species are underway in winter 2017/18 and will be completed in April 2018.

7.4.2.1 Breeding Bird Surveys

289. Breeding Bird Surveys (BBS) were undertaken in 2014, 2015 and 2016 using an adapted version of the Common Bird Census (CBC) Methodology[52] with the aim of estimating the breeding bird populations and spatial distribution within the site and immediate surrounds:

- 2014: four BBS visits between May and July 2014.
- 2015: four BBS visits between April and June 2015.
- 2016: four BBS visits between April and June 2016.

290. During each survey, a transect route was followed which covered all major areas of habitat within and adjacent to the site. Due to the size of the BBS area, some visits were completed over two consecutive days, with the east and west sections of the site surveyed separately during visits lasting up to 4.5 hours. BBS visits were not scheduled to coincide with the tidal cycle.

7.4.2.2 Breeding Raptor and Owl Surveys

291. Breeding barn owl surveys were undertaken in 2015 following the methodology described by Gilbert, *et al*. (1998)[53]. Four barn owl survey visits were made between April and June 2015, combining vantage point watches and walked transects. Each survey started shortly before dusk and lasted up to 1.5 hours after sunset.

292. Further Breeding Raptor and Owl Surveys were undertaken between April and August 2016 in the wider area (excluding land on the Isle of Sheppey to the north of the Swale Estuary) up to 2 km surrounding the site. The aim of these surveys was to establish whether any raptors of conservation concern were breeding within or close to the site based on looking for evidence of breeding/territory holding, as described in Hardey *et al.* (2013)[54]. The surveys were carried out during six visits using a series of short VP-style watches to give coverage of all accessible suitable areas for breeding raptors and owls. Surveys focussed on marsh harrier and other Annex 1 (Birds Directive) or Schedule 1 (WCA) listed species, although observations of common raptor species: buzzard, sparrowhawk and kestrel were also recorded.

293. No further breeding bird surveys will be carried out prior to the application.

7.4.2.3 Wintering and Passage Bird Surveys

294. Winter and Passage Bird Surveys were carried out following an adaptation of the British Trust for Ornithology's (BTO) Wetland Bird Survey methodology[55] for the wetland areas and the BTO's Winter Farmland Bird Survey methodology[56] for the farmland areas. Nine winter survey visits were made between January and March 2014 for the 2013/14 winter season and 12 winter survey visits between November 2014 and February 2015 for the 2014/15 winter season. In each month surveyed, three separate surveys were undertaken:

[52] Marchant, J. (1983) *Common Birds Census Instructions*. British Trust for Ornithology, Thetford.

[53] Gilbert, G., Gibbons, D.W., Evans, J. (1998) *Bird Monitoring Methods*. RSPB, Sandy.

[54] Hardey, J., Crick, H.Q.P., Wernham, C.V., Riley, H.T., Etheridge, B. and Thompson, D.B.A. (2013) Raptors: a Field Guide to Surveys and Monitoring. 3rd Edition. Stationery Office. Edinburgh.

[55] https://www.bto.org/volunteer-surveys/webs

[56] Gillings, S., et.al (2008) BTO Research Report No. 494. *Winter Farmland Bird Survey*. BTO, Thetford.

- Low tide counts of birds immediately adjacent to the site on the Swale, Faversham Creek and Graveney Marshes and birds within fields in the site adjacent to the Swale: these counts were undertaken one hour either side of low tide;
- High tide counts of birds immediately adjacent to the site on the Swale, Faversham Creek and Graveney Marshes and birds within fields in the site adjacent to the Swale: these counts were undertaken one hour either side of high tide; and
- Winter Farmland Bird Survey of all areas and habitats within the site and immediately adjacent habitats.

295. In addition, three Passage Bird Survey visits were undertaken in October 2014 broadly following the BTO's Winter Farmland Bird Survey Methodology[57], with a focus on recording passage and migratory birds using the site and adjacent habitats.

296. High and Low Tide Walkover Surveys were undertaken between November 2015 and April 2016. A total of nine High Tide Walkovers and eight Low Tide Walkovers were carried out covering the Walkover Survey Area. Surveys times were stratified to cover various stages of the tidal cycle including both high and low tide periods and periods of rising and falling water immediately before/after these times. The High and Low Tide Walkover Surveys represent the equivalent of the Farmland Bird Surveys undertaken in the two previous winter seasons.

297. Intertidal Walkover Surveys were undertaken between November 2015 and April 2016, following a transect route along the sea wall. The primary aim of these surveys was to establish the bird interest and spatial distribution within intertidal areas surrounding the site during the non-breeding season, but fields within the site were also viewed to record species associated with the SPA. A total of 16 Intertidal Walkover Surveys were carried out and timing was stratified to cover various stages of the tidal cycle including both high and low tide periods and periods of rising and falling water immediately before/after these times. These surveys represent the equivalent of the High and Low Tide Surveys conducted in the two previous winter seasons.

298. Four Passage Bird Survey visits were undertaken between September and October 2015. These walkover surveys covering the WSA encompassed both intertidal areas and fields and ditches within the site. These surveys represent the equivalent of the Passage Bird Surveys conducted during in 2015.

7.4.2.4 Nocturnal Surveys

299. In addition to the diurnal walkover surveys, monthly nocturnal surveys were undertaken between December 2015 and March 2016, totalling four survey visits. The aim of these surveys was to establish the use of the fields within the WSA by feeding and roosting birds during the night. Observations were made using a combination of binoculars, night-vision optics, and a powerful spotlight. Care was taken to minimise disturbance and avoid the possibility of double-recording birds as they moved around the WSA. All nocturnal surveys were scheduled to coincide with the period over high tide, when the bird usage within the site was considered likely to be highest.

7.4.2.5 Flight Activity Surveys

300. Flight Activity Surveys were undertaken between November 2015 and October 2016 to provide further information on the flight activity and bird movements around the site of key target species, particularly marsh harrier. The surveys were carried out using an adapted version of the methodology described by Scottish National Heritage (2014)[58] for onshore

[57] CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

[58] Scottish Natural Heritage (SNH) (2014) *Recommended bird survey methods to inform impact assessment of onshore wind farms*. SNH. May 2014.

wind farms. Two Vantage Point (VP) locations were selected to provide excellent visual coverage of the Flight Activity Survey (FAS) Area. A total of 89 hours of observation were made from each VP across the 12-month survey period.

301. The primary focus of the surveys was marsh harrier although flight details were recorded for all target species, which included; all swans, all geese, all ducks, all herons, all raptors and owls listed on Annex 1 (Birds Directive) or Schedule 1 (WCA), all waders, Mediterranean gull, all terns, and raven. Secondary species included all other raptors and owls and selected gulls and passerines in noteworthy numbers. The height of flights was recorded using three flight height bands, designed to allow separation of birds utilising the area (*e.g.*, for hunting/foraging or as a roost site) from those transiting over.

302. No further flight activity surveys will be carried out prior to the application.

7.4.2.6 Summary of Surveys

303. Table 7.1 provides a monthly breakdown of the survey visits for each type of survey across the whole baseline survey period.

Table 7.1: Number of survey visits; monthly survey summary 2014-2016

		2014												2015										2016								
Survey		**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**
Breeding Bird Survey						2	1	1									1	1	2										1	2	1				
Breeding Raptor/Owl Survey																	1	1	2										1	2	1	1	1		
Winter/Passage Bird Survey (walkovers)		3	3	3							3	3	3	3	3							1	3	4	8	8	6	4	3						
Nocturnal Bird Survey																									1	1	1	1							
Flight Activity Survey (hours)	VP 1																							6	12	12	8	1	6	13	7	6	6	6	6
	VP 2																							6	12	12	6	3	6	13	7	6	6	6	6

304. Table 7.2 provides a monthly breakdown of the winter/passage period bird surveys proposed for the 2017/18 non-breeding season.

Table 7.2: Number of scheduled survey visits; monthly survey summary in winter 2017/18

	2017				2018			
Survey	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**
Winter/Passage Bird Survey (walkovers)	2	4	4	4	4	4	4	2

305. The process for the ornithological assessment will follow the same principles of identification of important ecological features, characterisation of effects and determining significance as defined in the ecological assessment (section 6.4**Error! Reference source ot found.**). Information from the above survey work will be analysed and collated into a technical report detailing the baseline conditions at the site. The baseline report will include,

as appropriate, data appendices, figures and confidential annexes. The assessment of likely effects on birds will follow guidelines published by the CIEEM (2006)[59]. and will take into account the considerations of national legislation and planning policy and the aims of the European Habitats Directive. The assessment will include proposals for the avoidance and mitigation of likely adverse effects and will consider enhancement measures for birds. Likely cumulative effects with other nearby developments will also be addressed (section 7.5).

306. Of primary consideration for the ornithological assessment relating to the Development is the potential for impacts on the qualifying interest features of The Swale SPA and Ramsar site. Under the terms of the Habitats Regulations, which transpose the requirements of the European Habitats and Birds Directives into English Law, any project likely to have a significant effect on a European site must be subject to an Appropriate Assessment of its implications for the European site in view of its Conservation Objectives. This process is generally termed a HRA, which will be a necessary part of the assessment.

7.5 Assessment of Cumulative Effects

307. The purpose of a cumulative effect assessment is to identify effects that might not be significant on their own, but become significant when considered in combination with effects from other developments. A search radius of 10 km from the Development site (twice the area of search used to identify designations relevant to the Development in isolation) will be applied for the cumulative effects assessment and all developments likely to impact birds will be considered. In addition, as an integral part of the HRA, in-combination effects on the qualifying interests of the Swale SPA/Ramsar will be undertaken for all plans or projects within 10 km of the designated site. The detailed scope of the cumulative assessment will be discussed and agreed with consultees.

[59] CIEEM (2016) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

8 HYDROLOGY, HYDROGEOLOGY, FLOOD RISK AND GROUND CONDITIONS

8.1 Introduction

308. The hydrology, hydrogeology, flood risk and ground conditions chapter of the ES will assess the likely impact of the Development upon the hydrological environment within and surrounding the Development site. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available.

8.2 Preliminary Baseline Conditions

309. The Development site is currently in agricultural use and predominantly consists of several large open fields separated by large man-made field drains.

310. The Development is located within an area classed as having a high risk of flooding (Flood Zone 3a) but does benefit from coastal flood defences, in the form of raised embankments and a concrete sea wall. A Flood Risk Assessment compliant with the requirements of the NPPF will be undertaken to assess flood risk (see Figure 8).

311. The Development lies outside groundwater Source Protection Zones and Drinking Water Protection areas.

312. No historic or active landfill sites exist within the Development site.

313. The Environment Agency (EA) has been consulted and Flood Hazard Mapping and coastal flooding depths requested. The EA confirmed that they do not hold Flood Hazard Mapping for the area adjacent to the Development, but have been able to provide predicted coastal flood heights for the Development site area and it is shown to be defended from the 1 in 1,000 year tidal flooding event. Historical flood mapping shows that the Development site did not flood to any depth during the historic tidal flooding events of 1953 and 1978.

314. EA data shows that the flood defences to the north of the Development site have a condition rating of fair and good, whist other communication with the EA[60] indicates that the flood defences have a residual design life of 20 years, in the absence of maintenance.

315. Figure 7.13 of the North Kent Coastal Modelling Volume 2 - Isle of Grain, Medway, Swale up to and including Whitstable[61] illustrates that the modelled results for the 1 in 200 and 1 in 1,000 year tidal events predict some wave overtopping to occur at Graveney Marshes but the extent is minimal and follows the line of the coast.

316. A pre-development meeting was held with the EA in September 2017 to discuss flood risk at the Development site and the appropriate scope of works to support a planning application for the Development. In the absence of Flood Hazard Mapping, the EA agreed that the coastal flood model which informed the North Kent Coastal Modelling Volume 2 - Isle of Grain, Medway, Swale up to and including Whitstable should be re-run to include a breach scenario for the 1 in 200 year tidal event plus appropriate uplifts for climate change. The flood depths derived from the breach scenario will inform the design of the critical electrical infrastructure (such as the substation) with an appropriate freeboard allowance for climate change.

317. A brief desk-top data search was then undertaken to establish the sensitivity of the hydrological environment in which the Development is located.

318. Two designations of relevance to the hydrological and hydrogeological footprint of the Development site exist within 5 km:

- The Swale Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA), adjacent to the northern site boundary – designated for habitats comprising mudflats,

[60] Pre-development meeting. September 2017.

[61] North Kent Coastal Modelling Volume 2 - Isle of Grain, Medway, Swale up to and including Whitstable. JBA (2013).

saltmarsh, and freshwater grazing marsh, the latter being intersected by extensive dykes and fleets.

319. The banks of the South Swale are also classed as a Local Nature Reserve (LNR) for wildfowl.

320. As the Development is drained by land ditches that ultimately discharge into the coastal waters and mudflats around the SSSI, SPA and LNR; these receptors will be assessed within the ES.

8.3 Likely Environmental Effects

321. The baseline data will be used to assess the likely effects of the Development on hydrological resources within a study area including the Development site and a 5 km radius from the Development site boundary. This hydrological and hydrogeological study area is based on the hydrological connectivity of water bodies located downstream of the Development. At distances greater than 5 km it is considered that solar developments in low lying catchments are unlikely to have any pollution or sedimentation effects because of the attenuation and dilution of potentially polluting substances and sediments.

322. It is anticipated that the key issues to be addressed in the ES chapter are likely to include the following:

- Increase in surface water run-off from areas of hardstanding;
- Ensuring the Development is safe from coastal water ingress in the event of a breach of coastal flood defences;
- Potential impediment to drainage ditch flows as a result of new or upgraded crossings; and
- Potential transfer of sediment and pollutants to surface water resources during construction.

8.4 Assessment Methodology

8.4.1 Relevant Legislation and Guidelines

323. Section 3 of this Scoping Report sets out the planning policy context for the Development. The assessment will be undertaken in line with the following policy and guidance:

- Water Framework Directive (2000/60/EC)[62]. The Water Framework Directive (WFD) establishes a framework for the protection, improvement and sustainable use of all water environments;
- NPPF, paragraphs 100 to 108[63]. This states that for development comprising one hectare or above, the vulnerability to flooding, or the potential to add to flooding elsewhere should be assessed in a Flood Risk Assessment (FRA);
- Safeguarding our Soils: A Strategy for England[64]. This states that:
  - Agricultural soils will be better managed and threats to them will be addressed;
  - Soils will play a greater role in the fight against climate change and in helping DEFRA to manage its impacts;
  - Soils in urban areas will be valued during development, and construction practices will ensure vital soil functions can be maintained; and

[62] European Parliament (2000). "Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy" ("The Water Framework Directive"). [online] Available at: http://ec.europa.eu/environment/water/water-framework/index_en.html [Accessed 01/09/2015].
[63] Department for Communities and Local Government (DCLG) (2012). "National Planning Policy Framework - 10. Meeting the challenge of climate change, flooding and coastal change" [online] Available at: http://www.communities.gov.uk/documents/planningandbuilding/pdf/2116950.pdf [Accessed 01/09/2014].
[64] Safeguarding our Soils: A Strategy for England. DEFRA (2009). [online] Available at: https://www.gov.uk/government/publications/safeguarding-our-soils-a-strategy-for-england [Accessed 01/09/2015].

  - Pollution of soils will be prevented, and an historic legacy of contaminated land is being dealt with;

- Natural England Technical Information Note 101 (TIN101) "Solar Parks: maximising environmental benefits"[65] provides guidance relating to solar parks, their siting, their potential impacts and mitigation requirements for the safeguarding of the natural environment;
- The Land Drainage Act 1991[66]. Provides a set of administrative structures to ensure that drainage of low-lying land could be managed effectively;
- The Environmental Protection Act 1990[67]. Makes provisions for the improved control of pollution arising from certain industrial and other processes, relating to waste and the collection and disposal of waste.
- The Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C741) (2015)[68]. C741 provides guidance on how to avoid causing environmental damage when on a construction site; and
- CIRIA Control of Water Pollution from Construction Sites (C532) (2001)[69]. C532 provides guidance on how to plan and manage construction projects in order to control water pollution.

8.4.2 Proposed Desk Based Assessment

324. Arcus will obtain hydrology and geology data including data relating to the following processes and parameters:

- Downstream hydrological processes;
- Aquifer classification and vulnerability;
- Surface water quality;
- Public and private water supplies;
- Flooding; and
- Contaminated land.

8.4.3 Proposed Surveys/Site Visits

325. Following the desk based study a site walkover will be undertaken to verify the location and nature of watercourses and waterbodies within the study area likely to be affected by the Development. The walkover will augment the desk study where necessary by recording the presence of additional hydrological features or the absence of features. The sources of any public and private water supplies will be visited and will inform the overall risk assessment.

8.4.4 EIA Methodology

326. The assessment methodology proposed to assess the hydrological and hydrogeological impact of the Development has been developed in consultation with the EA, Natural England, Scottish Environment Protection Agency and Scottish Natural Heritage. The assessment will be based on a source-pathway-receptor methodology, where the sensitivity of the receptors and the magnitude of change upon those receptors is identified within the study area.

[65] Natural England Technical Information Note 101 "*Solar Parks: maximising environmental benefits*" [online] Available at: http://publications.naturalengland.org.uk/publication/32027 [Accessed 11/03/2015].
[66] The Land Drainage Act 1991 [online] Available at: http://www.legislation.gov.uk/ukpga/1991/59/contents [Accessed 01/09/2015].
[67] The Environmental Protection Act 1990 [online] Available at: http://www.legislation.gov.uk/ukpga/1990/43/contents [Accessed 01/09/2015].
[68] CIRIA (2015). "Environmental Good Practice On Site". C741. [online] Available at: http://www.ciria.org [Accessed 19/08/2015].
[69] CIRIA (2001). "Control of Water Pollution from Construction Sites". [online] Available at: http://www.ciria.org [Accessed 22/08/2015].

327. The sensitivity of a receptor or its surroundings to the effects of the Development is a description of the degree to which the key attributes of a receptor can be affected by a given level of change *i.e.*, a high sensitivity receptor will be affected more than a low sensitivity receptor.

328. Sensitivity can be classified as high, moderate or low. These classifications are dependent upon factors such as the quality and quantity of water within the receptor, their purpose (*e.g.*, whether used for drinking, fisheries, *etc.*) and existing influences, such as land-use.

329. These criteria are outlined in Table 8.1 and are based on professional judgement and experience.

Table 8.1 Receptor sensitivity criteria

Receptor Sensitivity	Sensitivity Description
High	• A large, medium or small water body with an EA Current Ecological Quality classification of "High" or "Good" and / or a Current Chemical Quality classification of "Good"; •The hydrological receptor and downstream environment will struggle to attenuate natural fluctuations in hydrochemistry and cannot absorb further changes without fundamentally altering its baseline characteristics / natural processes; • The hydrological receptor is of high environmental importance or is designated as having national or international importance, such as SACs and SSSIs; •The hydrological receptor is designated for supporting ecological interest; • The hydrological receptor acts as an active floodplain or other flood defence; •The hydrological receptor will support abstractions for public water supply or private water abstractions for more than 25 people; • Areas containing geological or geomorphological features considered to be of national importance (*e.g.,* SSSIs); and / or • Local groundwater constitutes a valuable resource because of its high quality and yield, *e.g.*, aquifer(s) of local or regional value, statutorily designated nature conservation sites (*e.g.*, SACs and SSSIs) dependent on groundwater.
Moderate	• A large, medium or small water body with an EA Current Ecological Quality classification of "Moderate"; • The hydrological receptor and downstream environment will have some capacity to attenuate natural fluctuations in hydrochemistry but cannot absorb some changes without fundamentally altering its baseline characteristics / natural processes; • The hydrological receptor is of regional environmental importance; • The hydrological receptor does not act as an active floodplain or other flood defence; • The hydrological receptor is not used for recreation; • The hydrological receptor supports public water supply or private water abstractions for less than 25 people; • Areas containing geological features of designated regional importance including Regionally Important Geological Sites (RIGS) considered worthy of protection for their historic or aesthetic importance; and / or • Aquifer(s) of limited value (less than local importance) as water quality does not allow potable or other quality sensitive uses, *e.g.,* exploitation of local groundwater is not far-reaching or local areas of nature conservation known to be sensitive to groundwater impacts.

Receptor Sensitivity	Sensitivity Description
Low	• A large, medium or small water body with a EA Current Ecological Quality classification of "Poor" or "Bad" and / or a Current Chemical Quality classification of "Fail"; • The hydrological receptor and downstream environment will have the capacity to attenuate natural fluctuations in hydrochemistry but can absorb some changes without fundamentally altering its baseline characteristics / natural processes; • The hydrological receptor is not of regional, national or international environmental importance; • The hydrological receptor is not designated for supporting freshwater ecological interest; • The hydrological receptor does not act as an active floodplain or other flood defence; • The hydrological receptor is not used for recreation; • The hydrological receptor does not support abstractions for public water supply or private water abstractions; • Geological features or geology are not protected and not considered worthy of specific protection; • The groundwater is of poor quality and / or very low permeability making exploitation of groundwater unfeasible; changes to groundwater are not expected to affect local ecology; and / or • Other hydrological receptors not included in the definitions of High or Moderate sensitivity.

330. The magnitude of change is determined by the timing, scale, size and duration of the likely effect resulting from the Development. The magnitude of effects can be classified as major, moderate, minor or negligible, as set out in Table 8.2.

Table 8.2 Magnitude criteria

Magnitude of Change	Magnitude Description
Major	• A short or long term major shift in hydrochemistry or hydrological conditions sufficient to negatively change the ecology of the receptor. This change would equate to a downgrading of an EA Current Ecological Quality classification by two classes *e.g.*, from "High" to "Moderate"; • A sufficient material increase in the probability of flooding onsite and offsite, adding to the area of land which requires protection by flood prevention measures or affecting the ability of the functional flood plain to attenuate the effects of flooding by storing flood water (in accordance with NPPF paragraphs 100 to 108); • A major (greater than 50%) or total loss of a geological receptor or peat habitat site, or where there would be complete severance of a site such as to fundamentally affect the integrity of the site (*e.g.*, blocking hydrological connectivity); • Major permanent or long term negative change (*i.e.,* degradation of quality) to groundwater quality or a reduction in the available yield; • Major permanent or long term negative change to geological receptor; and / or • Changes to quality or water table level will cause harm local ecology or will lead to flooding issues.
Moderate	• A short or long term non-fundamental change to the hydrochemistry or hydrological environment, resulting in a change in ecological status. This change would equate to a downgrading of an EA Current Ecological Quality classification by one class *e.g.*, from "Good" to "Moderate";

Magnitude of Change	Magnitude Description
	• A moderate increase in the probability of flooding onsite and offsite, adding to the area of land which requires protection by flood prevention measures or affecting the ability of the functional flood plain to attenuate the effects of flooding by storing flood water (in accordance with NPPF paragraphs 100 to 108); • A loss of part (approximately 15% to 50%) of a geological receptor or peat habitat site, major severance, major effects to its integrity as a feature, or disturbance such that the value of the site would be affected, but could still function; • Changes to the local groundwater regime may slightly affect the use of the receptor; • The yield of existing supplies may be reduced or quality slightly deteriorated; and / or • Fundamental degradation of local habitats may occur, resulting in impaired functionality.
Minor	• A detectable non-detrimental change to the baseline hydrochemistry or hydrological environment. This change would not reduce the EA Current Ecological Quality classification; • A marginal increase in the probability of flooding onsite and offsite, adding to the area of land which requires protection by flood prevention measures or affecting the ability of the functional flood plain to attenuate the effects of flooding by storing flood water (in accordance with NPPF paragraphs 100 to 108); • A detectable but non-material effect on the receptor (up to 15%) or a moderate effect on its integrity as a feature or where there would be a minor severance or disturbance such that the functionality of the receptor would not be affected; and / or • Changes to groundwater quality, levels or yields that do not represent a risk to existing baseline conditions or ecology.
Negligible[70]	• No perceptible changes to the baseline hydrochemistry or hydrological environment; • No change to the EA water quality classification; • No increase in the probability of flooding onsite and offsite; and / or • A slight or negligible change from baseline condition of geological resources; change hardly discernible, approximating to a situation of 'no change' in geological condition.

8.4.5 Significance Criteria

331. The significance of the likely effects of the Development will be classified by taking into account the sensitivity of receptors and the magnitude of the effect on them. The significance of the unmitigated effect is as defined in Table 4.1.

[70] Negligible magnitude of change includes magnitude of effects that would be assessed as no change to the baseline scenario.

332. Embedded mitigation measures will be outlined within the ES chapter and within a Construction Environmental Management Plan (CEMP). They are likely to comprise good practice methods and works that are established and effective measures to which the Applicant will be committed throughout the development process and which can be secured by appropriate planning requirements.

333. There is sufficient confidence in the effectiveness of the measures that will be set out in the CEMP for them to be treated as part of the Development for the purposes of the assessment. Accordingly, the assessment of significance of effects of the Development will be considered following implementation of the measures in the CEMP.

334. The chapter will consider the likelihood of an event occurring and concludes whether the residual or overall significance will be major, moderate, minor or negligible, before appropriate mitigation (beyond that specified in the CEMP) is implemented. This assessment will rely on professional judgment to ensure that the effects are appropriately assessed.

335. A residual effect is considered to be a likely significant effect in accordance with EIA Regulations if assessed as moderate or major following the preceding methodology.

8.4.6 Flood Risk Assessment Methodology

336. As the Development site is located within Flood Zone 3a, the FRA will need to demonstrate that the Development passes the Sequential and Exception tests outlined in the NPPF. Whilst the Development site is offered protection from flood defences, there will be a requirement to raise all electronically sensitive equipment at least 700 mm above the highest modelled flood level for the 1 in 200-year flooding event, or have a commitment to install flood resilient measures on site infrastructure.

337. A standalone FRA will be produced which will focus on the following elements:

- The risk of flooding at the Development site from all sources (tidal/coastal, fluvial and groundwater *etc.*);
- Assessment of the introduction of new hardstanding areas on the greenfield run-off rates, using Micro Drainage software;
- Storage requirement calculations to accommodate the 30-year and 100-year storm events, based on computer modelling. Modelling will include a 20% allowance for climate change, in accordance with Table 2 *peak rainfall intensity allowance in small and urban catchments (use 1961 to 1990 baseline)* (Environment Agency, 2016)[71]; and
- Calculating the sizing of storage tanks and Sustainable Urban Drainage Systems (SuDS) required to accommodate any increase in surface water run-off.

8.5 Assessment of Cumulative Effects

338. A cumulative effect is considered to be an additional effect on hydrological resources arising from the Development in combination with other proposed developments (either under construction, consented but not yet built, or at application stage) likely to affect the hydrological environment. At distances greater than 10 km (twice the distance considered for the Development in isolation) or in different hydrological and hydrogeological catchments, as defined by GIS mapping or the EA Groundwater Protection Zone (GPZ) Maps, it is considered that schemes are unlikely to contribute to a cumulative hydrological effect due to attenuation and dilution over distance of potentially polluting chemicals and sediment. The cumulative study area will therefore consider developments out to a range of 10 km from the Development site.

[71] Environment Agency "Flood risk assessments: climate change allowances" (2016) [online] Available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances [Accessed 30/10/2017].

9 CULTURAL HERITAGE AND ARCHAEOLOGY

9.1 Introduction

339. The cultural heritage and archaeology chapter of the ES will assess the likely impact of the Development upon the historic environment and heritage assets within and surrounding the Development site. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available.

9.2 Preliminary Baseline Conditions

9.2.1 Desk Based Assessment

340. A desk-based assessment (DBA) of cultural heritage records was undertaken in May 2017. Data was gathered from the following sources:

- Kent Historic Environment Record (HER);
- The National Monuments Record (NMR) on Pastscape as held by Historic England;
- The National Heritage List for England (NHLE) as held by Historic England;
- Aerial records of known sites and monuments;
- Cartographic evidence including OS 1st and 2nd Edition map coverage;
- Aerial photographs and other cartographic information on pre-recent land uses;
- Local Studies libraries and other archives as appropriate; and
- Other relevant information, as appropriate and available.

341. The desk based assessment was augmented by a walkover survey.

342. There are no designated sites (Listed Buildings, Scheduled Monuments, Historic Parks and Gardens, Registered Battlefields or World Heritage Sites) or Conservation Areas within the Development site.

343. There are however approximately 30 historic environment features recorded on the Kent HER as located within the Development site. These are scattered across the Development site and comprise of World War II features such as pillboxes, trenches and decoy ponds associated with the Naval Decoy Station SH1 situated on Graveney Marshes, as well as numerous undated features. The undated features point to earlier land use and comprise of sheepfolds, the former sea wall, revetments and numerous features identified by aerial photography. These consist of mounds, enclosures and other cropmarks and a possible saltern.

344. Preliminary research shows Graveney Marshes, on which the Development is situated, as the site of the last battle fought on British soil. The battle was fought during World War II between the crew of a downed German bomber and the London Irish Rifles.

345. Detailed assessments will be undertaken for designated sites within the study area (1 km of the final Development site boundary where there is considered to be potential for significant environmental effects) and any additional assets beyond this range identified during consultation. This will provisionally include:

Table 9.1 Listed Buildings within 1 km of Development site boundary

HB Number	Name	Grade
1069110	Church of All Saints	I
1069107	Barn 30 Metres South Of Murton's Farmhouse	II
1069108	Graveney Court	II

HB Number	Name	Grade
1069109	Headstone To Thomas Barman In The Churchyard South East Of The Church Of All Saints	II
1069143	Sparrow Court	II
1069147	Bridge House	II
1069148	Post Office	II
1119654	Sandbanks Farmhouse	II
1240464	Ham Farmhouse and Walls Attached	II
1240465	The Shipwrights Arms Public House	II
1260995	Pair of Houses at TR 021 627	II
1261008	Barn About 30 m north Of Ham Farmhouse	II
1344023	Murton's Farmhouse	II

346. Listed Buildings are nationally designated and placed on lists maintained by Historic England. Whilst they are all a nationally important resource they are subject to a grading process (Grade I, II* and II). This categorisation is indicative of a presumed level of sensitivity, based on rarity, period, architectural style *etc*. None the less, all Listed Buildings receive equal protection under the law and are considered to be of high sensitivity.

347. The majority of the Listed Buildings identified above are associated with Graveney Church and Graveney Bridge Conservation Areas which lie within the study area to the south of the Development site.

348. The locations of Listed Buildings, Conservation Areas and other cultural heritage features within the study area are shown on Figure 9 in Appendix A.

349. Although beyond the study area, the group of Scheduled medieval salterns to the east, as well as the Faversham and Goodnestone Conservation Areas to the south-west and south will be considered for assessment and these features are also shown on Figure 9.

350. Information gathered through consultation and further assessment will be incorporated into an updated DBA which will be submitted in support of the Archaeology and Cultural Heritage chapter.

9.3 Likely Environmental Effects

351. A study area including a radius of 1 km around the Development site was used in the DBA to collect data to inform the assessment of the physical and ground-based archaeological potential of the Development site. Based on previous experience and professional judgement, it is only those assets within relatively close proximity to the Development site which have the potential to receive a significant effect on their settings. The 1 km study area will therefore also be used for the purposes of wider visual assessment in which the likely indirect effects upon the setting of cultural heritage features will be assessed. This assessment will be made against the same ZTV used in the LVIA.

352. Based on the number of recorded heritage assets within the Development site it is anticipated that the likely environmental effects could consist of:

- Damage or destruction of known archaeological sites; and
- Damage or destruction of unknown archaeological sites.

353. Listed Buildings and Conservation Areas are located within the study area therefore there may be settings effects as a result of visible changes caused by the Development.

9.4 Assessment Methodology

9.4.1 Relevant Legislation and Guidelines

354. The ES chapter will refer to the relevant statutory and planning frameworks for the historic environment.

355. Legislation includes the Ancient Monuments and Archaeological Areas Act 1979, the National Heritage Act 1983 and the Listed Buildings and Conservation Areas Act 1990.

356. Section 3 of this Scoping Report sets out the planning policy context for the Development.

357. The assessment will be in accordance with current best practice and guidelines which includes the Chartered Institute for Archaeologists (CIfA), and Historic England's Good Practice Advice, specifically Note 3 - The Setting of Heritage Assets.

9.4.2 Proposed Surveys/Site Visits

358. The desk-based assessment and environment chapter will be augmented by walkover surveys to:

- Assess and validate documentary data collected;
- Identify the extent and condition of any visible archaeological monuments;
- Determine whether previously unrecorded historic features are visible: and
- Assess the likely settings effects caused by the Development.

359. The requirement for and extent of any additional surveys whether intrusive or non-intrusive, will be agreed with Kent County Council (KCC) in the form of a Written Scheme of Investigation (WSI), and the results used to inform the assessment. Reports containing the findings of this work will also be appended to the ES.

9.4.3 EIA Approach

360. For the purposes of the assessment, cultural heritage interests are deemed to include both above ground (the built heritage) and below ground remains. The assessment will consider direct and indirect (largely visual) effects upon the following cultural heritage receptors:

- Archaeology – above and below ground, designated or not. Consideration will be given to the potential for currently unknown (buried) archaeological remains to exist within the Development site; and
- Cultural Heritage - World Heritage Sites, Scheduled Monuments, Listed Buildings, Historic Parks and Gardens, Registered Battlefields, Conservation Areas and hedgerows that may qualify as historically important under the Hedgerow Regulations.

361. The assessment will involve:

- Consultation with statutory and non-statutory authorities to obtain data establishing the baseline conditions for the Development site and its surrounding area;
- Desk-based studies to contribute to and validate data relevant to establishing the baseline conditions;
- Site visits to establish archaeological potential and to validate the baseline conditions and to assist in the assessment of indirect effects;
- Assessment of the likely effects of the Development upon the baseline conditions;
- Assessment of the significance of the effects taking into account the sensitivity of the Development site (and selected features beyond the Development site), the

magnitude of effects (both direct and indirect) and the likelihood of such effects occurring; and
- Identification of means to mitigate and avoid, where possible, adverse effects occurring, as well as the assessment of the residual effects which may exist after mitigation.

9.4.4 Assessment of Effects Methodology

362. The assessment of effects on the historic environment resource is concerned with direct (physical) and indirect (effect on setting) effects.

9.4.4.1 Direct (physical) effects

363. The assessment of physical effects will consider direct effects upon features of cultural heritage interest, where sites or potential sites and any buried archaeological remains are in danger of being disturbed or destroyed. Physical effects are likely to occur during the construction and decommissioning phases of the Development, and are permanent and irreversible. The potential for the occurrence of direct effects will be assessed by analysis of information provided by the Kent County Council HER and information derived from national datasets of designated features.

9.4.4.2 Indirect (visual) effects

364. The assessment of indirect effects will consider changes in the setting which have the potential to affect the significance of the heritage asset. In terms of the NPPF, the setting consists of the surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral. Therefore, the importance of "setting" is in what it contributes to the significance of a heritage asset[72].

365. Setting can therefore be tangible, such as a defined boundary, or intangible, such as atmosphere or ambience. Setting is not simply to be identified with a visual envelope, but can include an archaeological or historic context, which may not be visually apparent. The main concern for visual effects on a cultural heritage setting is the potential for the Development to fragment the historic landscape, separate connectivity between historic sites and impinge on views to and from sites with important landscape settings, although the visually permeable nature of the Development may permit the visible setting to a special interest to still be apparent.

366. Nevertheless, as noted above, for purposes of this assessment, and reflecting the requirements of the NPPF, setting is only one attribute contributing to the significance of a specific heritage asset. Whilst a change in setting may occur, the setting may make little or no contribution to the significance of an asset, or a change in setting may not be considered to lead to any loss of significance of an asset.

9.4.5 Significance Criteria

367. The assessment will proceed from a consideration of the sensitivity of a cultural heritage feature against the magnitude of any likely effect, to arrive at the significance of the effect.

368. Sensitivity for the purposes of this assessment will be linked directly with designation status, or importance, as shown in Table 9.2. However, following the NPPF (paragraph 135) consideration will be given to non-designated archaeological remains, including sites

[72] Historic England (2015) Historic Environment Good Practice Advice in Planning Note 3: The setting of Heritage Assets. Available at https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/ (Accessed on 08/09/2015)

recorded in the Historic Environment Record, and the lack of formal designation does not automatically equate to low significance.

Table 9.2 Sensitivity of cultural heritage features

Level of Sensitivity	Designation Status
Very High	World Heritage Sites, which are internationally important.
High	Scheduled Monuments, Listed Buildings, Registered Battlefields, Registered Historic Parks and Gardens, which are considered to be nationally important.
Medium	Regionally important archaeological features and areas (as defined in the Historic Environment Record). Conservation Areas, which are considered regionally important.
Low	Sites and features noted as locally important in the Historic Environment Record. Other, non-designated features of cultural heritage significance.
Negligible	Badly preserved / damaged or very common archaeological features / buildings of little or no value at local or other scale.

369. Listed Buildings are all nationally designated and are placed on lists maintained by English Heritage. Whilst they are all regarded as a nationally important resource, they are subject to a grading process (Grade I, II* and II) and this categorisation is indicative of a presumed level of sensitivity, based on rarity, period, architectural style, completeness, degree of subsequent alterations, *etc*. English Heritage categorise Listed Buildings using the following descriptions: Grade I buildings of exceptional interest; Grade II* particularly important buildings of more than special interest; and Grade II listed buildings of national importance[73]. All Listed Buildings receive equal protection under the law, and as such all grades are considered to be of "high" sensitivity as shown in Table 9.2.

370. Magnitude is a measure of the nature of the predicted effect. It has been broken down for direct and indirect effects, as shown in Table 9.3. For the purposes of visual assessment, the degree of visibility as well as proximity to the Development (within the Zone of Theoretical Visibility) will be taken as important attributes likely to cause a change in setting (and hence the contribution setting makes to an asset's significance).

Table 9.3 Magnitude

Level of Magnitude	Definition
Very High	Loss, blocking or severance of key visual or other aspect of setting, resulting in the reduction in the contribution that the setting makes to the significance of the asset of such magnitude that the asset itself suffers a major loss of significance.
High	Major physical damage to or significant alteration to a site, building or other feature. Extensive change (*e.g.*, loss of dominance, intrusion on key view or sightline) to the setting of a Scheduled Monument, Listed Building or other feature registered as nationally important, which may lead to a major reduction in the contribution of that setting to the significance of the heritage asset itself leading to a loss of significance for the asset itself.
Medium	Damage or alteration to a site, building or other feature. Encroachment on an area considered to have a high archaeological potential. Change in setting (*e.g.*, intrusion on designed sight-lines and vistas) to monuments / buildings and other features, which may lead to a moderate reduction in the contribution of that setting to the significance of the

[73] Historic England (nd.) Listed Buildings Webpage. Available at http://www.english-heritage.org.uk/caring/listing/listed-buildings/ [Accessed on 01/12/2017]

Level of Magnitude	Definition
	heritage asset leading to a loss of significance for the asset itself.
Low	Minor damage or alteration to a site, building or other feature. Encroachment on an area where it is considered that low archaeological potential exists. Minor change in setting (*e.g.*, above historic skylines or in designed vistas) of Monuments, Listed Buildings, sites and other features, which may lead to a small reduction in the contribution the setting makes to the significance of the heritage asset leading to a minor or negligible loss of significance.
Negligible	No physical effect. Slight or no change in setting, with no or very limited change in the contribution that setting makes to the significance of the asset. No or negligible loss of significance of the asset itself.

371. The significance of an effect can be arrived at by matching sensitivity against magnitude as shown in Table 4.1.

372. The assessments will begin with a brief description of the asset, its designation status, its significance (in terms of its archaeological, architectural, artistic and/or historic interest), and a description of its setting. Consideration will be given to what contribution that this setting makes to the significance of the asset itself.

373. The assessment will then consider, using professional judgement, the extent to which the identified setting is changed by the Development, and then proceed to consider whether the Development will impact on the attributes of setting which contribute to the significance of the cultural heritage asset it relates to. The effect thus finally assessed is whether any identified change in the contribution made by the setting to the significance of the asset is of such magnitude that the significance of the asset is itself changed (diminished).

374. Likely effects that are assessed as "minor" or "not significant" are both considered to be "not significant" in terms of the EIA Regulations.

375. As noted previously, the assessment will take an approach in which potential changes (direct or indirect) occasioned by the Development are considered in relation to their effect (if any) on the special interests in a heritage asset, and whether any effect on those interests change (reduce) the significance of the asset itself. Visual setting is one part of that interest, where applicable. In considering and effect on setting, simple intervisibility with the Development is not necessarily considered to be harmful. Where considered appropriate (*i.e.*, where there is a potential that the visual presence of the Development may change or affect an attribute, including visual setting, that contributes to an asset's significance), consideration will be given to the effect that Development will have on views towards the asset which include the Development("in combination" views), as well as in views towards the Development from the asset (where such views are considered an important contributor to the significance of that asset).

376. Forest, woodlands and hedges, as well as buildings, can provide visual screening to the cultural heritage features and, where appropriate, this will be taken into account in the detailed assessments of specific features.

377. The matrix based approach will be used in conjunction with professional judgement, based on experience.

9.5 Assessment of Cumulative Effects

378. An assessment will also be made of likely cumulative effects that may arise from the addition of the Development to a baseline including other, proposed development that could impact the same receptors as the Development. For purposes of the assessment of cultural

heritage cumulative effects, only developments within 5 km of the Development will be considered. This range gives the opportunity for Developments that could affect all receptors included in the assessment of the Development in isolation to be included in the cumulative assessment.

10 NOISE AND VIBRATION

10.1 Introduction

379. The noise and vibration chapter of the ES will assess the likely impact of the Development upon noise sensitive receptors surrounding the Development site. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available.

10.2 Preliminary Baseline Conditions

380. Initial site visits have identified the following potential sources of background noise in the local area:

- Road traffic from local roads;
- Birdsong;
- Electrical equipment at the Cleve Hill substation and 400 kV overhead lines;
- Aerodynamic noise from the wind;
- Trains along the north Kent line; and
- Agricultural farming activity.

381. These are typical of background noise in rural locations.

10.3 Likely Environmental Effects

382. Sources of noise during operation are likely to primarily be related to electrical equipment such as inverters, transformers and other plant associated with the substation(s) and battery storage elements of the Development. Residential receptors within 200 m of such plant will be assessed as receptors.

383. Sources of noise during construction and decommissioning are primarily vehicles delivering materials, generators, and mobile plant working onsite such as tracked excavators. Residential properties along the construction route(s) and the nearest residential receptors to the construction site will be assessed.

384. The primary likely environmental effect is disturbance to nearby residents due to noise arising from the construction, operation and decommissioning of the Development. The results of the noise assessment will feed into the final design, ensuring noise impacts are kept to a minimum.

385. Vibration during construction is a potential effect, and will be considered accordingly in the noise assessment.

10.4 Assessment Methodology

10.4.1 Relevant Legislation and Guidelines

10.4.1.1 Construction and Decommissioning Noise

386. The following legislation and standards are of particular relevance to construction and decommissioning noise:

The Control of Pollution Act 1974 (CoPA 1974);

387. CoPA 1974 provides Local Authorities in England, Scotland and Wales with powers to control noise and vibration from construction sites. Section 60 of the Act enables a Local Authority to serve a notice to persons carrying out construction work of its requirements for the control of site noise. Section 61 of the Act allows for those carrying out construction work to apply to the Local Authority in advance for consent to carry out the works.

The Environmental Protection Act 1990 (EPA 1990); and

388. The EPA 1990 specifies mandatory powers available to Local Authorities in respect of any noise that either constitutes or is likely to cause a statutory nuisance, which is also defined in the Act. A duty is imposed on Local Authorities to carry out inspections to identify statutory nuisances, and to serve abatement notices against these. Procedures are also specified with regards to complaints from persons affected by a statutory nuisance.

BS 5228:2009+A1 2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites (BS 5228).

389. BS 5228 provides guidance on controlling noise and vibration from construction sites. It:

- Refers to the need for the protection against noise and vibration of persons living and working in the vicinity of and those working on construction sites;
- Recommends procedures for noise and vibration control in respect of construction operations; and
- Stresses the importance of community relations, stating that early establishment and maintenance of these relations throughout the carrying out of site operations will go some way towards allaying people's concerns.

10.4.1.2 Operational Noise

390. Section 3 of this Scoping Report sets out the planning policy context for the Development. The following legislation and standards are of particular relevance to operational noise:

The Noise Policy Statement for England; and

391. The NPSE sets out the role and purpose of noise policy, together with the Government's Noise Policy Vision and Aims, consistent with the NPPF.

392. The aims of the NPSE require that:

- Significant adverse effects on health and quality of life are avoided, while taking into account the guiding principles of sustainable development;
- Adverse impacts on health and quality of life are minimised; and
- Where possible, noise management should seek to improve health and quality of life, within the context of Government policy on sustainable development.

BS 4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound

393. BS 4142:2014 describes methods for rating and assessing industrial or commercial noise, in order to provide an indication of the likely impact of the noise upon nearby receptors (typically residential dwellings).

10.4.2 Proposed Desk Based Assessment

394. Noise due to the operation of the Development will be modelled in accordance with the methodology described in ISO 9613-2:1996[74]. This method predicts noise levels at surrounding noise sensitive receptors by taking noise emission levels of the source/sources, and applying a number of attenuation factors that determine the resulting sound pressure level at the receptor location (*i.e.*, the noise immission level).

395. In the first instance, a noise contour plot will be produced, based upon the current site layout and plant details in order to identify the geographical scope of the assessment. Potential noise sensitive receptors in the area around the Development will be identified

[74] ISO 9613-2:1996 – Acoustics; Attenuation of sound during propagation outdoors – Part 2: General method of calculation

using Ordnance Survey Address Layer 2 data and online aerial imagery. All identified noise-sensitive receptors will be included on the noise contour plot.

396. The noise contour plot will then be used to determine the location and number of noise monitoring locations required in order to complete the assessment in accordance with BS 4142:2014 methodology. The selected monitoring locations will be discussed and agreed with the EHO of Swale Borough Council. At this stage, it is estimated that approximately three or four monitoring locations will be required.

10.4.3 Proposed Surveys/Site Visits

397. If a baseline noise survey is found to be necessary, monitoring will be carried out at a representative selection of locations. Suitable locations will be selected by identifying those receptors that are likely to be subject to the greatest noise levels, in consultation with SBC. The Development layout will be subject to on-going assessment, and if necessary modified during the design process to ensure the Development will comply with the agreed assessment criteria.

10.4.4 Assessment of Construction Noise

398. Construction noise levels will be predicted at the closest identified noise-sensitive receptors based on the likely site preparation and construction methodologies and programme, in accordance with BS 5228. Where appropriate, the assessment of construction noise will also consider off-site activities such as construction traffic and deliveries, where the necessary information is available, following guidance contained within CRTN[75] and DMRB[76].

399. Predicted construction noise levels will be assessed against relevant BS 5228 criteria, and best practice methods for managing the impact of construction noise will be discussed.

400. Vibration effects will be considered following the recommendations of BS 5228 Part 2, based upon the likely vibration-inducing plant and the distance to noise-sensitive receptors.

10.4.5 Assessment of Operational Noise

10.4.5.1 Determination of the Specific Noise Level

401. Operational noise will be assessed in accordance with BS 4142:2014. The specific noise level (*i.e.*, the noise level due to operation of the Development) will be calculated at the closest noise-sensitive receptors using the environmental noise propagation model ISO 9613-2:1996.

10.4.5.2 Determination of the Rating Level

402. BS 4142 states that corrections should be applied to the specific noise level in order to account for certain acoustic features (tonality, intermittency and impulsivity) which have the potential to increase the level of perception of the noise at nearby dwellings. Any required character corrections will be added to the specific sound level in order to determine the rating level, which is then assessed against the agreed criteria.

10.4.5.3 Assessment of Impact

403. The rating level will be assessed against the existing prevailing background noise level (dB, L_{A90}) in order to determine a likely level of impact. The amount by which the rating level exceeds the prevailing background noise level indicates the following potential impacts, as presented in BS 4142:2014:

[75] Calculation of Road Traffic Noise, 1988

[76] The Design Manual for Roads and Bridges (DMRB) HD213/11, Volume 11, 2011.

- A difference of 10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around 5 dB is likely to be an indication of an adverse impact, depending on the context; and
- Where the rating level does not exceed the background noise level, this is an indication of the specific sound source having a low impact, depending on the context.

10.4.5.3.1 Subjective and Contextual Factors

404. BS 4142 highlights the need for consideration of contextual factors inherent in determining the overall level of noise impact. The following factors will therefore be considered in conjunction with the above assessment criteria:

- The absolute level of sound (particularly relevant in area of low background noise or during quieter times of day);
- The character of the background noise environment compared to the character of the specific sound (*i.e.*, the noise due to the Development);
- The sensitivity of the receptor(s) under consideration; and
- Factors relating to individual properties, such as existing screening, or local noise sources specific to that location.

10.4.6 Assessment of Decommissioning Noise

405. The effects of noise during decommissioning of the Development are likely to be similar to those during construction. However, both the magnitude and duration of such effects are likely to be less than those during construction. It is therefore proposed to scope out decommissioning noise, subject to a suitable noise assessment being carried out prior to decommissioning work taking place in accordance with guidance, standards and best practice relevant at that time.

10.5 Assessment of Cumulative Effects

406. Any proposed noise-generating developments in close proximity to the Development site boundary would require the assessment of cumulative noise impacts, however currently there are none. Therefore no cumulative noise assessment is proposed to be undertaken for the Development, unless such developments are identified prior to final drafting of the ES.

11 SOCIO-ECONOMICS, TOURISM, RECREATION AND LAND-USE

407. The socio-economics, tourism, recreation and land-use chapter of the ES will bring together these related assessments of the likely socio-economic impact of the Development upon the population, economy and use of the land within and around the Development site. This section sets out the proposed approach that will be taken in the assessments, together with a summary of information that is currently available.

11.1 Socio-economics and Tourism

11.1.1 Introduction

408. This section will consider the likely socio-economic and tourism effects that could result from the construction and operation of the Development.

11.1.2 Preliminary Baseline Conditions

11.1.2.1 Economic Development Policy

409. The UK has a central policy objective of achieving *"strong, sustainable and balanced growth"*, as stated in Plan for Growth which sets out a range of ambitions relating to national economic development designed to realise this core policy objective. The ambitions contained within the Plan for Growth emphasise the need to stimulate growth through the private sector, broaden the UK's economic base and to promote investment, skills development and employment creation across the whole of the UK. In addition to the general focus on economic growth nationally, there is a clear policy emphasis on securing economic benefits arising from changes in the energy mix and investment in renewable energy developments.

410. The emphasis on economic growth is also clear in relevant local economic development plans. Both the South East Local Enterprise Partnership and the Swale Local Authority put employment and the economy high on the local agenda. The LEP aims to create 200,000 private sector jobs between 2011 and 2021 and lever £10 billion of investment to stimulate growth in the region. There are also plans to create nationally significant energy hubs and clusters throughout Kent and other areas[77].

411. The Swale Economic Development Strategy aims to promote Swale as an investment location and stimulate economic growth with a focus on local businesses and promoting the tourism economy.[78] The publication version of the Local Plan places a lot of weight towards renewable energy and plans to expand the use of renewable energy across the district, including solar photovoltaic energy[79]. SBC also commissioned a study on renewable energy[80] to scope the potential for its development across the district and a specific guidance note[81] on the development of large scale solar arrays.

11.1.2.2 Current Socio-economic Conditions

412. Baseline socio-economic conditions in the Swale Local Authority Area and two comparator areas (Kent and Medway, and England) are provided in this section.

413. The Development site is located on the north Kent coast in the local authority area of Swale. The local authority area has a total population of approximately 140,000 residents and encompasses three main settlements:

[77] South East LEP, Growth Deal and Strategic Economic Plan 2014

[78] Swale Borough Council, Open For Business - Economic Development Strategy 2013-16

[79] Swale Borough Council, The Swale Borough Local Plan Part 1 – Publication Version, December 2014

[80] AECOM, Swale Renewable Energy & Sustainable Development Study, 2011

[81] Swale Borough Council, Renewable Energy Planning Guidance Note 2, The Development of Large Scale (>50kW) Solar Arrays, 2014

- Sittingbourne (population approximately 42,000);
- Faversham (population approximately 18,000); and
- Sheerness (population approximately 11,700).

414. Table 11.2 shows the latest available figures for the size of the economy in each impact area as measured by Gross Value Added (GVA)[82] and employment[83].

Table 11.2 Economy size

	GVA (£ million)	**Employment**
Swale Local Authority	2,694	51,300
Kent and Medway	37,783	714,900
England	1,433,164	25,530,500

415. Table 11.3 shows the sectoral breakdown of employment and how concentrated employment is in the sector relative to the sector nationally.

Table 11.3 Employment sectors (2016)

	Swale Employment	**Kent and Medway Employment**	**England Employment**
Primary Industries (Agriculture/Mining/Utilities)	3,000	22,800	442,000
Manufacturing	7,000	47,000	2,049,500
Construction	3,500	44,000	1,144,500
Wholesale and retail trade	7,500	122,000	3,906,000
Transportation and storage	4,800	44,500	1,274,500
Accommodation and food service activities	3,300	47,000	1,875,500
Information and communication	900	19,600	1,130,500
Financial and insurance activities	500	20,300	921,500
Real estate activities	900	13,100	423,500
Professional, scientific and technical activities	3,000	43,300	2,294,000
Administrative and support service activities	4,500	68,000	2,341,000
Public administration and defence	1,800	27,000	1,021,000
Education	4,500	73,500	2,287,500
Human health and social work activities	4,500	92,000	3,259,500
Arts, entertainment and recreation	1,000	16,800	631,000
Other service activities	900	14,100	529,000
Total	**51,300**	**714,900**	**25,530,500**

416. Data from 2016 estimates employment at 51,300 in Swale. This has increased by 2.1% from 2015 to 2016 (a greater rate than for England as a whole). Swale's unemployment rate is on par with the national rate of 5.9%[84].

[82] Business Intelligence Statistical Bulletin, Gross Value Added (GVA) at 2015 (April 2017) Available at: https://www.kent.gov.uk/__data/assets/pdf_file/0012/8202/Gross-Value-Added-bulletin.pdf [Accessed 01/12/2017]

[83] Business Intelligence Statistical Bulletin, Business Register & Employment Survey (BRES) results for 2016 (October 2017) Available at: http://www.kent.gov.uk/__data/assets/pdf_file/0017/8180/Business-Register-and-Employment-Survey-BRES.pdf [Accessed 01/12/2017]

[84] ONS, Annual Population Survey, March 2015

417. The largest sector in Swale, Kent and Medway and England is the wholesale and retail trade sector, with construction, manufacturing and transport & storage also contributing to a large proportion of employment. The proportion of workers in the Construction sector, the Manufacturing sector and the Transport and Storage sector in Swale are 1.5, 1.7 and 1.9 times those of England, respectively, showing that these are very important sectors to the district. Within Kent and Medway, employment relative to England is spread fairly evenly with a slightly higher concentration in construction and transport and storage, and a lower concentration in manufacturing.

11.1.2.3 Tourism in Swale

418. In 2015 there were over 4,630,000 day visits to Swale (up 4% on 2013) and 399,000 staying visitors (up 2% on 2013) amounting to a total value of £228 million placed on the tourism economy (includes supply chain and induced spend impacts), a modest 2% increase on that of 2013. This supported an estimated 4,561 jobs making up 9% of employment[85].

419. As well as general visits, tourists to the Swale local authority area are particularly attracted by:

- History and Heritage tourism: the area has a long maritime and aviation history and there is a variety of historic churches and buildings as well as various homes and gardens (such as Belmont House and Doddington Place Gardens); and
- Outdoors and wildlife tourism: the natural environment attracts both coastal and inland visitors.

11.1.3Likely Environmental Effects

420. The assessment will consider the effect of the Development on socio-economic and tourism receptors during the three development phases: construction, operation and decommissioning.

11.1.3.1 Construction Phase

421. During the construction phase, direct effects on socio-economic receptors could arise through:

- Transport and on-site assembly / installation of components: spend on transport and installation could stimulate economic impacts in the UK in the form of jobs and GVA supported in this part of the Development's supply chain. The scale and spatial distribution of direct impacts and the area over which they materialise will depend on the location of the company (or companies) carrying out this activity and where they source their labour from.
- Construction of associated infrastructure: Any investment in access tracks and other supporting infrastructure would support jobs and GVA in its supply chain. Again the scale and spatial distribution of impact will depend on the location of contractors and the area over which they source their labour.

422. In addition to these direct impacts there is scope for indirect effects on socio-economic and tourism receptors. These indirect effects will occur in the supply chain of the companies providing goods and services to the development. It is difficult to predict the likely scale of indirect effects (these depend, to a large extent, on the geography of the direct impacts assessed in other technical chapters) but is likely to be some impact associated with activities which occur on or close to the Development site.

423. The construction of the Development could have a variety of physical effects which could give rise to economic effects, including but not limited to:

[85] Destination Research, Economic Impact of Tourism: Swale – 2015 Results, 2016

- Visual and landscape effects;
- Noise effects;
- Effects on traffic and transport; and
- Disruption to recreational resources and public rights of way (PRoW).

424. The assessment of the significance of these physical effects will cross reference to other relevant chapters. The socio-economic assessment will then consider whether there is scope for these physical effects to have wider effects on socio-economic receptors, such as employment, equality, community cohesion and well-being particularly with reference to tourism receptors.

11.1.3.2 Operational Phase

425. Once constructed, there will be an ongoing requirement for operation and maintenance which could stimulate impacts in a similar way to the construction activities, but to a much lesser extent. These impacts are expected to be modest overall and are proposed to be scoped out of the EIA.

426. There are potentially effects associated with the operation of the solar array on tourism receptors, and these will be considered.

11.1.3.3 Decommissioning

427. Although the operational phase of the Development is not anticipated to be time limited, when the operational phase ends, the Development will require decommissioning. The cost of this additional activity could generate further direct and indirect socio-economic impacts and effects similar to those of the construction phase. However, the scale of these impacts is outside the scope of this assessment due to the uncertainty over the nature and costs of this activity, particularly as the sector, engineering approaches and technologies evolve over the lifecycle of the array.

11.1.3.4 Summary of Likely Environmental Effects

428. The identification of receptors that could be subject to likely significant effects has been informed by the initial baseline analysis, as well as consideration of evidence on socio-economic effects associated with the construction and operation of similar developments.

Table 11.4 Socio-economic receptors identified

Receptor		**Indicator**	**Impact Areas**
Economy	The size, diversity and prosperity of the local economy	GVA	• Swale LA • Kent County Council • England
		Employment	
	People in employment or seeking employment	Skills	• Swale LA • Kent County Council • England
		Unemployment	
Tourism Economy	The visitor economy in Swale Local Authority Area	The nature and strength of the tourism offer	• Swale LA
		Specific tourism assets and attractions	
		Volume and Value of Tourism	

429. Direct and indirect effects on these receptors will be assessed for both the construction and operation phases of the development.

11.1.4Assessment Methodology

430. There is no legislation relevant to the assessment of socio-economic effects, but national planning and economic development policy are a relevant consideration in the scoping assessment for socio-economic effects. Section 3 of this Scoping Report sets out the planning policy context for the Development.

431. The methodology for assessment of socio-economic effects has been developed with reference to good practice EIA guidance, such as that published by IEMA and from considerable experience of socio-economic impact assessment of similar developments.

432. Table 11.1 describes the list of data sources expected to be used to establish the baseline.

Table 11.1 Socio-economic and tourism data sources

Receptor		**Source**
Economy	GVA	Strategic Business Development & Intelligence, Kent County Council Office of National Statistics
	Employment	
	Skills	
	Unemployment	
Tourism	The nature and strength of the tourism offer	Consultation with Swale local authority and any key DMOs in the area
	Specific tourism assets and attractions	
	Volume and Value of Tourism	Destination Research, Economic Impact of Tourism: Swale – 2015 Results, 2016

433. The socio-economic assessment will consider the extent to which the impacts set out above will materialise within three primary impact areas:

- The local authority area in which the Development site is located;
- The Kent region; and
- The national impact area – England.

434. For tourism receptors, the impact areas are more localised, *i.e.*, just the local authority area and potentially a smaller area in the immediate vicinity of the Development site. The definition of this impact area would need to be determined with reference to other technical areas such as LVIA, noise and access and traffic.

11.1.4.1 Magnitude of Impact

435. Table 11.5 outlines the methodology that will be used to determine the absolute scale of impacts on each receptor during the construction and operation phase.

Table 11.5 Methods for assessing the scale of impact

Receptor		**Indicator**	**Method for Assessing Scale of Impact**
Economy	The size, diversity and prosperity of the local economy	GVA Employment	• Absolute impact on GVA and employment calculating using an economic impact model. • Key inputs to this will be estimates of direct construction expenditure and assumptions about the pattern of sourcing of key components and services (informed by consultation with developer) • Indirect effects modelled using national and derived regional and local multipliers (the selection of these to be informed by

Receptor		Indicator	Method for Assessing Scale of Impact
			consultation with developer)
	People in employment or seeking employment	Skills	• The potential impact on unemployment and skills will be assessed in light of the absolute level of direct and indirect employment generated by the development
		Unemployment	
Tourism Economy	The visitor economy in Swale Local Authority Area	The nature and strength of the tourism economy	• Review of other relevant technical chapters • Develop list of any significant effects for consideration in the assessment of tourism effects.
		Specific tourism assets and attractions	
		Volume and Value of Tourism	

436. The magnitude of impact will then be determined with reference to the baseline conditions, using the criteria in Table 11.6.

Table 11.6 Methods for assessing the magnitude of impact

Magnitude of Impact (including positive or negative)	Description
High	Proposals would cause a large change – judged beneficial or adverse - to baseline socio-economic conditions in terms of absolute and/or percentage change.
Medium	Proposals would cause a moderate change – judged as beneficial or adverse - to existing socio-economic conditions in terms of absolute and/or percentage change.
Low	Proposals would cause a slight change – judged as beneficial or adverse - to existing socio-economic conditions in terms of absolute and/or percentage change.
Negligible	No discernible change, either way, in baseline socio-economic conditions.
No Change	No change, either way, in baseline socio-economic conditions.

Sensitivity of Receptor

437. The framework for assessing the sensitivity of each socio-economic receptor is outlined in Table 11.7. The assessment requires professional judgment and takes account of the importance attached to each receptor in local and regional economic development, regeneration policy, *i.e.*, where specific socio-economic issues have been prioritised by policy makers (*e.g.*, lack of employment opportunities, growth of a particular employment sector), as well as drawing on analysis within the socio-economic and visitor economy baseline about the scale of these receptors.

Table 11.7 Sensitivity of receptors

Sensitivity	Criteria	Examples of measures relating to the identified criteria
Very High	Receptor is accorded a very high priority in local, regional and national economic development and regeneration policy.	• Identified as a highest ranking thematic (*e.g.*, low levels of wealth creation across an economy) or spatial (*e.g.*, pockets of deprivation in particular localities) socio-economic priority. These priorities may also be informed by the economic potential and/or need to achieve change on a particular socio-economic measure. • Evidence of severe socio-economic challenges, under-performance or vulnerability *e.g.*, patterns of

Sensitivity	Criteria	Examples of measures relating to the identified criteria
		deprivation, employment and wealth generation, employment forecasts, exposure to socio-economic threats.
High	Receptor is accorded a high priority in local, regional and national economic development and regeneration policy.	• Identified as a key thematic or spatial priority (as a result of economic potential and/or need). • Evidence of major socio-economic challenges, under-performance or vulnerability *e.g.*, patterns of deprivation, employment and wealth generation, employment forecasts, exposure to socio-economic threats.
Medium	Receptor is accorded a medium priority in local, regional and national economic development and regeneration policy.	• Not identified as a key thematic or spatial priority (as a result of economic potential and/or need). • Evidence of significant socio-economic challenges, under-performance or vulnerability.
Low	Receptor is accorded a low priority in local, regional and national economic development and regeneration policy.	• Not identified as a key thematic or spatial priority (as a result of economic potential and/or need) • Evidence of economic prosperity, buoyancy and resilience *e.g.*, low levels of deprivation, high employment and average wealth per head, relatively strong employment forecasts.

Significance Matrix

438. The significance of any impact upon receptors will be determined through combining assessments of the magnitude of the impact and the sensitivity of the receptor. The significance matrix presented in Table 4.1 of this Scoping Report will be used as part of this process.

11.1.5 Assessment of Cumulative Effects

439. Cumulative effects of other developments will need to be considered as part of the assessment. The cumulative assessment for the economy receptors will consider the impact of these developments on supply chain and labour market capacity and capability in the impact areas and the extent to which this might interfere with the ability of the developer's ability to source key goods and services from within the impact areas.

440. For the tourism economy receptor, the cumulative assessment will draw upon the cumulative assessments of the other chapters to consider the overall scale of cumulative effects on the tourism economy.

11.2 Recreation

11.2.1 Introduction

441. This section will consider the likely effects on recreational receptors that could be result from the construction and operation of the Development.

11.2.2 Preliminary Baseline Conditions

442. The principal recreational receptors at the Development site are the Public Rights of Way (PRoW) on and around the Development site used by walkers and cyclists.

443. Five PRoW have been identified within or in close proximity to the Development site (see Section 4.2).

- National Cycle Network (NCN) route 1 passes adjacent to the Development site entrance off Seasalter Road and also to the south-west of the Development site where the route joins Sandbanks Lane at Nagden.
- The Saxon Shore Way Long Distance Trail (LDT)(ZR484) runs parallel to the south-western, western and northern boundaries of the Development site mostly at a distance of between 30 and 50 m.
- A Public Right of Way (PRoW) crosses the western part of the Development site from south to north (ZR485). A second PRoW runs from Nagden in the west to Graveney in the east passing adjacent to the Development site to the south (ZR486). A third PRoW runs from Seasalter Road to the east of Cleve Hill Farm south-west to The Old Vicarage to the west of Graveney passing through the eastern part of the Development site (ZR488).

11.2.3 Likely Environmental Effects

444. The Development may impact upon the recreational amenity value of the PRoW at the Development site and other recreational resources in the area. An assessment of the potential for the Development to affect recreational receptors and change the recreational use of the Development site and surrounding area will therefore be undertaken. This will utilise the findings of the LVIA (section 5 of this Scoping Report).

11.2.4 Assessment Methodology

445. Significant effects on recreational receptors are those where the Development would lead to material or fundamental impacts on receptors or where it would substantially affect recreational resources that have more than local use or importance.

446. For assessing significance, consideration is given to the sensitivity (taking into account the national, regional and local importance) of the receptor and its sensitivity to change. The significance of the effect in terms of the EIA Regulations is determined in proportion to the magnitude of impact and the sensitivity of each receptor. This is informed by the desk-based research and consultation and is a qualitative assessment based on professional judgement.

447. It is important to note that the likely effects of the Development on tourism and recreation are closely related to public attitudes towards solar PV development in the landscape and information on this, where available, will be included in the chapter.

11.2.5 Assessment of Cumulative Effects

448. An assessment will also be made of likely cumulative effects that may arise from the addition of the Development to a baseline including similar development types. For purposes of the assessment of recreational cumulative effects, only proposed developments within 5 km of the Development and that could impact the same receptors will be considered. This area of search has been chosen to reflect the general nature of usage of public rights of way and other recreational amenities on and around the Development site.

11.3 Land-use

11.3.1 Introduction

449. This section will consider the likely effects on land-use that could be result from the construction and operation of the Development.

450. It is generally accepted that where ground-mounted solar PV developments are proposed to be sited on agricultural land, it should be demonstrated that poorer quality land is used in preference to higher quality, and that options are explored for continued agriculture use.

11.3.2 Preliminary Baseline Conditions

451. An Agricultural Land Classification (ALC) survey of an earlier iteration of the Development site boundary (covering approximately 380 ha omitting the land around the existing Cleve Hill Substation and a strip of land on the western boundary) was undertaken in March 2017 with reference to the Ministry of Agriculture, Fisheries and Food guidelines[86].

452. 97.1% of the agricultural land surveyed was found to be sub-grade 3b.

453. The areas of different ALC within the Development site are summarised in Table 11.8.

Table 11.8 ALC results

Grade / Sub-grade	Area (ha)	% of the agricultural land surveyed	% of the total area surveyed
Grade 2	1.9	0.5	0.5
Sub-grade 3a	8.8	2.4	2.3
Sub-grade 3b	359.9	97.1	94.2
Non-Agricultural	11.2	-	3.0

11.3.3 Likely Environmental Effects

454. The Development will result in a change to the dominant land-use within the Development site, from its current use for arable cultivation, to that of energy generation using solar PV.

455. It is not currently known how the land will be managed under and around the solar PV modules. There is potential for continued agricultural use of the land through grazing and the proposals relating to this will be presented in the ES to inform the assessment.

11.3.4 Assessment Methodology

456. The physical effects of the Development on existing land-use patterns are assessed by considering the effect of the Development on the current land-use of the Development site. The assessment of the sensitivity of land-use receptors would be undertaken with reference to the ALC survey results and the subsequent status of the land as not best and most versatile (BMV) agricultural land. Significant effects in terms of the EIA Regulations would be those which resulted in a moderate or major change affecting a sensitive or valuable land-use resource.

11.3.5 Assessment of Cumulative Effects

457. An assessment will also be made of likely cumulative effects that may arise from the addition of the Development to a baseline including other, proposed development. For purposes of the assessment of cumulative land-use effects, impacts will be considered at a regional (Kent) level.

[86] MAFF (1988) Agricultural Land Classification for England and Wales; Guidelines and Criteria for Grading the Quality of Agricultural Land.

12 ACCESS AND TRAFFIC

12.1 Introduction

458. The access and traffic chapter of the ES will assess the likely impact of the Development upon the road network and traffic volumes. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available.

12.2 Preliminary Baseline Conditions

459. There are potentially several viable routes to the Development site for the construction and operation of the Development. All routes approach from the M2/A2 corridor. From the M2/A2, all potential routes would use the A299 Thanet Way (see Figure 12).

460. An initial high level appraisal of the potential road access routes to the Development site has been undertaken. Alternative access options via sea, rail and air have also been considered.

461. At this stage it is considered that the most likely access route is by road, and would exit the A299 onto Whitstable Road north-west bound before turning onto Head Hill, which becomes Head Hill Road. Traffic would stay on this road through Goodnestone and Graveney as it becomes Seasalter Road, before turning onto the Development site via the existing entrance to Cleve Hill Substation.

462. The A299 Thanet Way is a high quality Dual 2-Lane (D2AP) carriageway of width 7.3 m with hard strips.

463. Head Hill / Head Hill Road / Seasalter Road is a Major Access Road, 5.5 m wide carriageway in accordance with Council typical parameters.

464. At least one abnormal load delivery is expected to be required, to deliver the largest components of the Development substation. From the A299, the initial assessment is that the route potentially has restricted geometry at a railway overbridge in Graveney. It is anticipated that some swept path analysis of the approach roads will be required to determine points of constraint where road improvements could potentially be required.

12.3 Likely Environmental Effects

465. The movement of Heavy Goods Vehicles (HGVs) delivering construction materials to and from the Development site, including concrete, aggregates, components and construction plant are likely to impact on the surrounding road network and nearby receptors.

466. Rural or semi-rural road networks to the Development site can require some degree of upgrading to accommodate construction traffic.

467. Increased traffic flows generated by the construction works could cause delays on the road network in the vicinity of the Development site. Transportation of loads could cause delays and associated environmental impacts (such as severance, driver delay, pedestrian delay; as set out in the IEMA guidance referred to in section 12.4.1) along the delivery route to the Development site. Receptors of these effects include users of roads along the construction route and residents of properties along the construction route.

468. During the operational phase of the Development, it is envisaged that the volume of traffic associated with the scheme would be minimal. Occasional visits may be made to the Development site for maintenance checks. The vehicles used for these visits are likely to be a four wheel drive off road type, vans or similar and there may on occasion be a need for a HGV to access the Development site for maintenance and repairs. It is considered that the significance of the environmental effects of operational traffic would be negligible and

therefore detailed assessment of the operational phase of the Development is proposed to be scoped out of the EIA.

12.4 Assessment Methodology

12.4.1 Relevant Legislation and Guidelines

469. Section 3 of this Scoping Report sets out the planning policy context for the Development. In addition to the policy set out in Section 3 the assessment will also be undertaken in line with the following guidance:

- Guidelines for the Environmental Assessment of Road Traffic (IEMA, 1993); and
- Guidelines for Traffic Impact Assessment (IHT, 1994).

12.4.2 Proposed Desk Based Assessment

470. The assessment will be a primarily desk based assessment, supported by site visits.

12.4.3 Proposed Surveys/Site Visits

471. Site visits will be undertaken to further assess the route to the Development site and conduct traffic surveys. Initial Automatic Traffic Count (ATC) surveys were undertaken in May 2017 and the results of these surveys will be incorporated into the assessment.

12.4.4 EIA Methodology

472. The methodology to be employed in the assessment has been developed from the guidance stated in section 12.2.1.

473. It is proposed that baseline traffic conditions are established using existing Department for Transport (DfT) Traffic counts located on the M2 and A299. These should provide an up to date and comprehensive indication of the existing traffic levels on this section of the strategic delivery route. ATC traffic surveys have been undertaken on Head Hill Road and Seasalter Road.

474. In order to factor in traffic growth during the time period between the assessment and the commencement of the construction phase of the Development the DfT's Trip End Model Presentation Program (TEMPRO) will be used to estimate appropriate traffic growth factors to apply to the measured baseline.

475. The assessment will then quantify the predicted traffic generated by the Development. This will principally focus on traffic generated during the construction phase of the Development, where the effects will be greatest. Traffic during construction can be expected to consist of heavy goods vehicles for the delivery of construction materials and light goods vehicles (LGVs) and cars for the transportation of construction personnel to and from the Development site. The principal effects that will be considered during the assessment include:

- Traffic generation;
- Accidents and Safety;
- Driver delay;
- Pedestrian Amenity; and
- Severance.

476. In terms of road networks, the sensitivity to change in traffic levels of any given road segment or junction is generally assessed by considering the residual capacity of the network under existing conditions. Where there is a high degree of residual capacity, the network may readily accept and absorb an increase in traffic, and therefore the sensitivity may be said to be low.

477. Conversely, where the existing traffic levels are high compared to the road capacity, there is little spare capacity, and the sensitivity to any change in traffic levels would be considered to be high.

478. The determination of the magnitude of the effects will be undertaken by reviewing the outline proposals for the Development, establishing the parameters of the road traffic that may cause an effect, and quantifying these effects.

479. The significance of the predicted increase in traffic levels caused by the Development will be assessed against the thresholds defined in the IEMA guidelines. Broadly, where the proposed increase in traffic is less than 30% then the effect of that increase may be considered to be not significant. The majority of traffic associated with the Development will occur only during construction and is therefore temporary and this will also be taken into account. The assessment will also consider the effect of any increases in traffic on sensitive receptors and at focus points, for example at junctions, where lower thresholds of significance may be more appropriate.

480. In brief, the assessment follows the following stages:

- Consultation with the relevant roads authorities and emergency services (Kent County Council, Highways England, Police, *etc.*);
- Procure existing traffic data, and arrange additional surveys where necessary;
- Route inspections including detailed observations of each community potentially affected by the Development within the study area. We would provide general effects statements for the wider M2 and A299 corridor however, the detailed and numeric assessment would be limited to the roads in closer proximity to the Development site;
- Based on the route inspections, sensitive receptors would be identified;
- In consultation with the Applicant and the relevant roads authorities, route options would be explored;
- Obtain relevant information from the Cleve Hill substation planning application, CTMP and other relevant evidence related to that development;
- An initial assessment of traffic generation from the Development, increase of traffic to the network and an initial assessment of effects would be undertaken;
- Obtain refined project needs, refine traffic generation, and re-assess effects, using obtained / gathered baseline traffic data;
- Incorporate the outcomes of consultation with key stakeholders including statutory consultees, other key stakeholders and local residents;
- Assess residual effects following the primary mitigation built in by virtue of the above-mentioned iteration, and any required residual mitigation needs; and
- Identify and assess the cumulative effects based on other known developments.

12.4.5 Construction Traffic Management Plan

481. A Construction Traffic Management Plan (CTMP) will be developed containing the details of road design and traffic management measures. The Local Highways Authority, and any other relevant parties, would be consulted on the details of a CTMP.

12.4.6 Assessment of Cumulative Effects

482. For this Development, cumulative effects on the road network would result if another substantial development were to be constructed at the same time, with the same, or some overlap in construction traffic routes and programmes. This will be limited to consideration of non-trunk roads along the final identified route to the Development site.

A search of projects in the planning system or other developments which could alter the future baseline during the construction phase will be undertaken to identify any projects which could overlap with the Development, both spatially and temporally. If any such developments are identified, a cumulative assessment of the effects of combining the traffic

increases as a result of both developments will be assessed on the basis of information available in the public domain, or provided by consultees.

13 MISCELLANEOUS ISSUES

483. The Miscellaneous Issues chapter of the ES will assess the likely impact of the Development upon receptors surrounding the Development site which are not covered in other technical disciplines. This section sets out the proposed approach in respect of additional environmental assessments that are required in order to provide a comprehensive assessment of the likely environmental impacts of the Development together with a summary of information that is currently available.

13.1 Glint and Glare

13.1.1 Introduction

484. A glint and glare assessment will be undertaken to assess the likely impact of solar reflection on receptors within the Development's surrounding environment.

485. Glint and glare in this context is the effect of reflected sunlight causing harm or discomfort to a sensitive receptor. A glint can be defined as the momentary receipt of a bright light and a glare can be defined as the receipt of a bright light over an extended or continuous period of time[87].

13.1.2 Preliminary Environmental Effects

486. There are no solar PV modules in the local area currently, and therefore no glint or glare effects associated with them. Other reflection effects occur from windows, glasshouses, car windscreens and waterbodies, including the sea.

13.1.3 Assessment Methodology

13.1.3.1 Relevant Legislation, Guidelines and Policy

487. Glint and glare assessments are sometimes required to accompany planning applications for solar developments, depending on the determining authority's judgement of their need. There are no guidelines setting out a particular methodological approach, but the receptors of interest are specified in the NPPF as well as guidance issued by the Department for Communities and Local Government (DCLG)[88] which states:

> *'Particular factors a local planning authority will need to consider include… the effect on landscape of glint and glare and on neighbouring uses and aircraft safety.'*

488. Accordingly, sensitive receptors are considered to be aviation receptors, such as control towers and aircraft, residential receptors and ground based transport receptors, such as drivers and passengers in cars and trains[89].

13.1.3.2 EIA Methodology

489. A geometric assessment will be undertaken to identify the potential for solar reflections to impact on sensitive receptors. The assessment is proposed to be limited to ground based receptors and will exclude aviation receptors. The nearest active airfield is Maypole Airfield, approximately 13.5 km to the east; at this distance significant glint and glare impacts are extremely unlikely.

490. The proposed assessment methodology will adhere to the following sequence:

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87 BRE (2015) Planning Guidance for the Development of Large Scale Ground mounted Solar PV Systems. Available at: http://www.bre.co.uk/filelibrary/pdf/other_pdfs/KN5524_Planning_Guidance_reduced.pdf [Accessed 21/11/2017]

88 UK Planning Practice Guidance, 2015. Renewable and low carbon energy - What are the particular planning considerations that relate to large scale ground-mounted solar photovoltaic Farms? [Accessed 28/11/2017]

89 Hirsch, A. (2014) Impacts and Mitigation Strategies from Solar Array Systems within Colorado Department of Transportation's Highway Right of Way Areas. ICSI 2014: pp. 880-891.

1. Identify the receptors of concern;
2. Choose appropriate receptor locations based on the above;
3. Define the proposed solar farm area and choose an appropriate assessment resolution;
4. Undertake geometric calculations to determine whether a solar reflection may occur, and if so, when it will occur;
5. If a reflection can occur, determine whether the reflecting panels will be visible from the identified receptor locations. If the panels are not visible from the receptor then no reflection can occur;
6. If it is calculated that a reflection will occur, consider the location of the solar reflection with respect to the location of the sun in the sky, its angle above the horizontal and the time of day at which a reflection could occur;
7. Consider both the solar reflection from the proposed solar farm and the location of the direct sun light with respect to the receptor's position;
8. Consider the solar reflection with respect to the published studies; and
9. Determine whether the solar reflection is likely to be a significant nuisance or a hazard to safety.
10. Propose mitigation in the event that a significant impact is identified.

13.2 Human Health

491. A Human Health Impact Assessment (HHIA) will be included in the Miscellaneous Issues chapter of the ES. This section will draw together the findings of other assessments undertaken as part of the EIA process.

492. Limited interactions with human health are possible, and consideration will be given to the findings of the following information provided elsewhere in the submitted documents:

- Traffic and Transportation;
- Noise;
- Residential Amenity;
- Security;
- Health and Safety at Work; and
- Electric, Magnetic and Electromagnetic Fields.

493. Properly designed and maintained solar parks are a safe technology. The site design and inbuilt buffers from sensitive receptors will minimise any risk to human health resulting from the operation of the Development. Risks associated with electrical infrastructure such as from lightning strikes are removed or reduced through inbuilt control systems and can be scoped out at this stage.

13.2.1 Electric, Magnetic and Electromagnetic Fields

494. Power frequency electric, magnetic and electromagnetic fields (EMFs) arise from generation, transmission, distribution and use of electricity and occur around power lines and electric cables and around domestic, office or industrial equipment that uses electricity. Electric fields are the result of voltages applied to electrical conductors and equipment. Fences, shrubs and buildings can block electric fields. Magnetic fields are produced by the flow of electric current; however most materials do not readily block magnetic fields. The intensity of both electric fields and magnetic fields diminishes with increasing distance from the source.

495. Electric fields depend on the operating voltage of the equipment. Magnetic fields depend on the electrical currents flowing and are not significantly limited by most common materials. Typically, ground-level magnetic fields from underground cables fall much more rapidly with distance than those from a corresponding overhead line, but can be higher at small distances from the cable.

496. There is no direct statutory provision in the planning system relating to protection from EMFs. Guidance published by the Department for Energy and Climate Change (DECC) in 2012 suggests that guidelines for both public and occupational exposure published by the International Commission on Non – Ionizing Radiation Protection (ICNIRP) in 1998 should be taken into account[90].

497. The DECC guidance states that 'overhead power lines at voltages up to and including 132 kV, underground cables at voltages up to and including 132 kV and substations at and beyond the publicly accessible perimeter' are not capable of exceeding the ICNIRP exposure guidelines and therefore no assessment is required for these and other types of infrastructure listed on the Energy Networks Association website[91].

498. Therefore the scope of the assessment of EMFs in the ES will be limited to consideration any cables associated with the Development which exceed 132 kV. The only part of the Development likely to exceed this voltage is the underground export cable between the Development Substation and the existing Cleve Hill Substation which will likely be a 400 kV cable.

13.3 Telecommunications, Television Reception and Utilities

499. Solar parks have the potential to affect existing utility infrastructure below ground. To identify any existing infrastructure constraints, both consultation and a desk based study will be undertaken. Consultation with relevant telecommunication and utilities providers is a routine part of solar development and consultees will include water, gas and electricity utilities providers and telecommunications providers as appropriate.

500. Information obtained from consultation will be used to inform the layout design.

13.4 Waste

501. At this stage, the exact quantities and types of waste likely to be generated during construction are unknown however it is expected that waste streams could include:

- Welfare facility waste;
- Waste chemicals, fuels and oils;
- Waste metals;
- Waste water from dewatering of excavations;
- Waste water from cleaning activities (*e.g.*, wheelwash);
- Packaging; and
- General construction waste (paper, cardboard, wood, *etc.*).

502. A Site Waste Management Plan (SWMP) will detail how waste streams are to be managed, following the Waste Hierarchy of prevention, reuse, recycle, recover and as a last resort, disposal to landfill.

503. All waste transported off the Development site will be to the appropriate licenced receivers of such materials. The number of vehicles associated with the removal of waste material associated with decommissioning and construction will be considered within chapter 14: Access and Traffic.

504. Given that operators receiving any waste materials resulting from the Development will be subject to their own consenting procedures, there is no requirement for further consideration of waste to be undertaken, beyond the volume of any traffic generated during the construction phase resulting from its transportation.

[90] DECC Power Lines: Demonstrating compliance with EMF public exposure guidelines, A Voluntary Code of Practice 2012

[91] Energy Networks Association Website, Electric and Magnetic Fields http://www.energynetworks.org/electricity/she/emfs.html [accessed 28/11/2017]

13.5 Air Quality

505. The Development is not expected to result in new emissions to air. Consideration of air quality is therefore likely to be restricted to effects during construction and decommissioning (*e.g.*, dust and emissions from plant and machinery). These effects are considered in the access and traffic chapter, and good practice construction methodologies will be proposed to manage dust and emissions during construction. Therefore these impacts are proposed to be scoped out of the EIA.

506. Following construction the Development is expected to result in minimal alteration to the baseline in respect of air quality (*i.e.*, under arable cultivation the land is worked by machinery, and exists in vegetated and unvegetated states at different times of year). Therefore consideration of air quality impacts during the operational phase is also proposed to be scoped out of the EIA.

14 CLIMATE CHANGE IMPACT ASSESSMENT

507. The Climate Change Impact Assessment (CCIA) chapter of the ES will determine how the Development is likely to interact with a changing climate and whether any significant effects could arise. This section sets out the proposed approach that will be taken in the assessment, together with a summary of information that is currently available.

508. CCIA is a relatively new form of environmental assessment required by the amended European Commission (EC) Directive 2014/52/EU[92] as transposed into UK law by the EIA Regulations.

509. The Institute of Environmental Management and Assessment (IEMA) published 'Environmental Impact Assessment Guide to Climate Change Resilience and Adaptation' [93] in November 2015 with the intention of providing an updated and finalised version in 2017, after the Directive was transposed into UK law. As of early July 2017, this updated guidance has not yet been published. Accordingly, the proposed CCIA methodology was developed in line with the 2015 IEMA guidance and the text of the EU Directive and EC guidance[94] in order to establish a comprehensive assessment methodology. This methodology focuses on the following elements:

- Assessment of the Development's effects on climate change (calculation of carbon footprint) to include calculation of greenhouse gas emissions relating to construction, operation, decommissioning and the production of electricity;
- Assessment of the Development's vulnerabilities and resilience in the context of climate change by identifying appropriate climate change projections and climate change effects; and
- Assessment of the Development's effects upon identified environmental receptors in the context of the emerging baseline.

510. The most recent climate projection iteration, UKCP09[95], has identified the following relevant climatic trends as a result of climate change:

- Increased temperature;
- Changes in the frequency, intensity and distribution of rainfall events (*e.g.*, an increase in the contribution to winter rainfall from heavy precipitation events and decreases in summer rainfall);
- Increased windstorms; and
- Sea level rise.

511. The Development is inherently designed to reduce adverse climate change effects by offsetting the carbon dioxide produced by generating electricity by burning fossil fuels through use of renewable sources for generating electricity. The current baseline with respect to greenhouse gas emissions from existing methods of electricity generation will be identified using existing data from the Government, operational sites, and experience of other similar developments. This information will provide the baseline information against which to assess the contribution of the Development to reducing greenhouse gas emissions and identifying any potential for significant effects to arise.

[92] European Parliament and Council Directive 2014/52/EU amending Directive 2011/92/EU on the Assessment of the Effects of Certain Public and Private Projects on the Environment.

[93] Institute of Environmental Management and Assessment (2015) IEMA Environmental Impact Assessment guide to Climate Change Resilience and Adaptation.

[94] European Commission (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment. Available at http://ec.europa.eu/environment/eia/pdf/EIA%20Guidance.pdf [Accessed 01/12/2017].

[95] UK Climate Projections Website. Available at: http://ukclimateprojections-ui.metoffice.gov.uk/ui/admin/login.php [Accessed on 01/12/2017]

15 INTERACTION AND ACCUMULATION OF EFFECTS

512. When the effects of the Development have been determined in relation to each technical area, the likely interaction and accumulation of the effects across each technical area will be assessed, as required by the EIA Regulations.

APPENDIX A: FIGURES

P:\Projects\Environment\Scoping Reports\2238 Cleve Hill Solar Park.aprx\2238-REP-070 Fig01 Site Location

CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

1:75,000 Scale @ A3

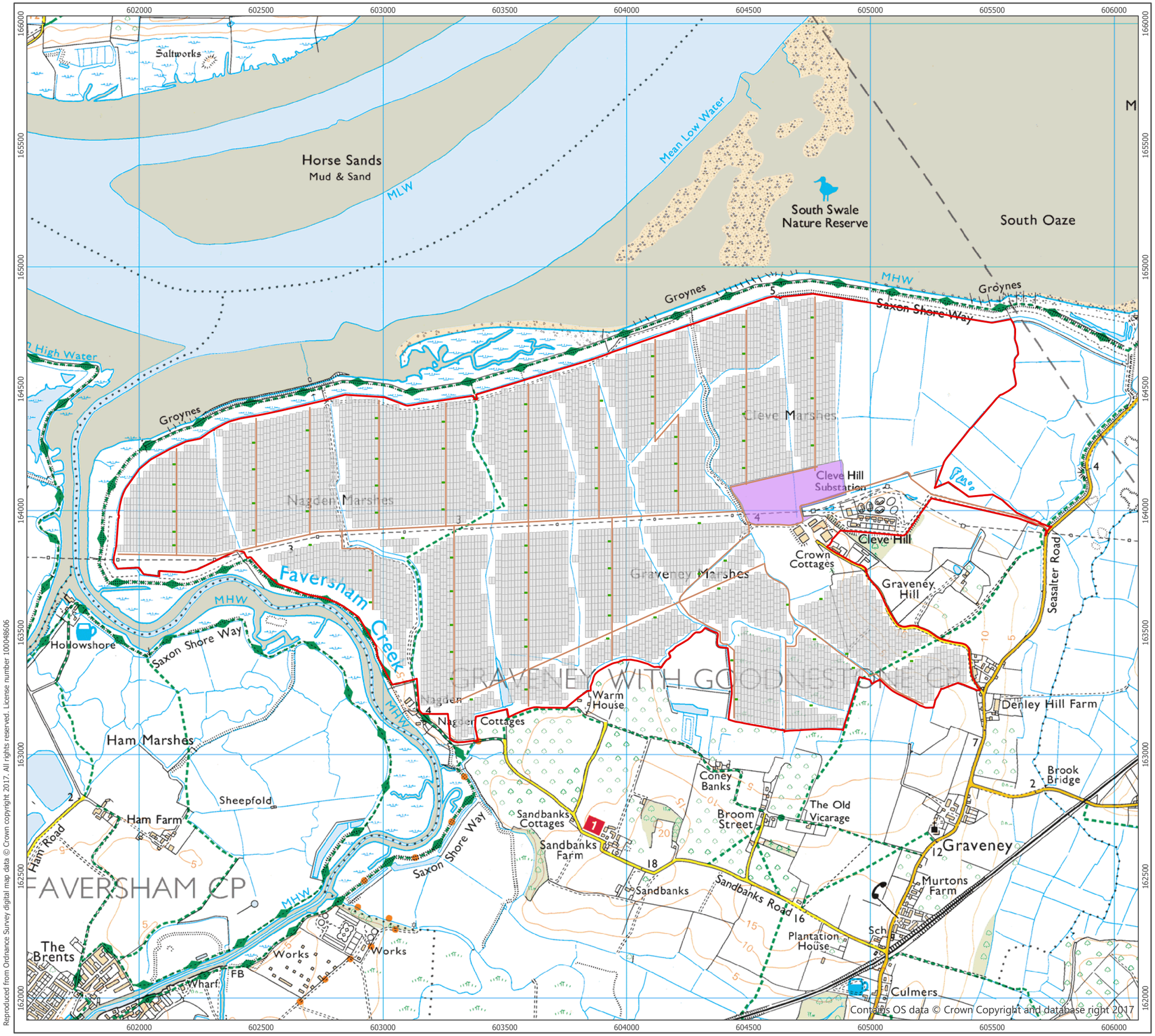
0 1 2 km

NORTH

Produced By: SC	Ref: 2238-REP-070
Checked By: AM	Date: 27/11/2017

Site Location
Figure 1

Cleve Hill Solar Park
Scoping Report



CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Module Tables
- Electrical Infrastructure
- Transformer
- Access Track

1:15,000 Scale @ A3

0 250 500 m

NORTH

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Checked By: AM	Date: 04/12/2017

Indicative Development Layout
Figure 2

Cleve Hill Solar Park
Scoping Report

N:\Projects\Environment\Scoping Reports\2238 Cleve Hill Solar Park.aprx\2238-REP-072 Fig02 Proposed Development Layout

CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- 2 km Core Study Area
- Proposed Viewpoint Location
- Area of High Landscape Value - Kent Level

Landscape Character Area

- Eastern Fruit Belt
- Eastern Swale Marshes
- Swale Marshes

1:30,000 Scale @ A3

0 0.5 1 km

NORTH

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Landscape Character
Figure 5.1

Cleve Hill Solar Park Scoping Report

N:\Projects\Environment\Scoping Reports\2238 Cleve Hill Solar Park.aprx\2238-REP-074 Fig05.1 Landscape Character

CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- 5 km Study Area
- Proposed Viewpoint Location
- Kent Downs AONB
- Mount Ephraim Registered Park and Garden

1:50,000 Scale @ A3

0 1 2 km

NORTH

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Landscape Designations
Figure 5.2

Cleve Hill Solar Park Scoping Report

N:\Projects\Environment\Scoping Reports\2238 Cleve Hill Solar Park.aprx\2238-REP-080 Fig05.2 Landscape Designations

CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Sites of Special Scientific Interest
- Special Protection Areas
- Ramsar Site
- Local Nature Reserve
- National Nature Reserve
- Special Area of Conservation
- The Swale Estuary Marine Conservation Zone
- 5 km Study Area

1:50,000 Scale @ A3

0 1 2 km

NORTH

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Ecology and Ornithology Designations

Figure 6

Cleve Hill Solar Park Scoping Report

N:\Projects\Environment\Scoping Reports\2238 Cleve Hill Solar Park.aprx\2238-REP-075 Fig06 Ecology and Ornithology Designations

CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- Sea wall flood defences
- Areas Benefiting from Flood Defences
- Flood Zone 3

1:15,000 Scale @ A3

0 250 500 m

NORTH

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Flood Risk Maps
Figure 8

Cleve Hill Solar Park Scoping Report

N:\Projects\Environment\Scoping Reports\2238 Cleve Hill Solar Park.aprx\2238-REP-077 Fig08 Flood Risk Maps

CLEVE HILL SOLAR PARK

ARCUS

- Site Boundary
- 1 km Study Area
- Conservation Area
- Scheduled Monument
- Grade I Listed Building
- Grade II* Listed Building
- Grade II Listed Building

HER Feature

- Unknown
- Early Iron Age to Roman
- Medieval
- Modern
- Neolithic
- Post Medieval
- Post Medieval to Modern

1:25,000 Scale @ A3

0 0.5 1 km

NORTH

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Cultural Heritage Features
Figure 9

Cleve Hill Solar Park Scoping Report

N:\Projects\Environment\Scoping Reports\2238 Cleve Hill Solar Park.aprx\2238-REP-076 Fig09 Cultural Heritage Features

CLEVE HILL SOLAR PARK

ARCUS

Site Boundary

Route to Site

1:25,000 Scale @ A3

0 0.5 1 km

NORTH

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Site Access Route
Figure 12

Cleve Hill Solar Park Scoping Report

N:\Projects\Environment\Scoping Reports\2238 Cleve Hill Solar Park.aprx\2238-REP-078 Fig12 Site Access Route

CLEVE HILL
SOLAR PARK

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