

COMMITTEE DATE: 15/05/2019

APPLICATION No. **19/00397/MJR** APPLICATION DATE: 22/02/2019

ED: **RUMNEY**

APP: TYPE: Full Planning Permission

APPLICANT: Cardiff Council

LOCATION: LAMBY WAY LANDFILL SITE, LAMBY WAY, WENTLOOG,
CARDIFF, CF3 2HP

PROPOSAL: INSTALLATION OF A GROUND-MOUNTED
PHOTOVOLTAIC SOLAR FARM AND ANCILLARY
DEVELOPMENT

RECOMMENDATION 1: That planning permission be **GRANTED** subject to the following conditions:

1. STATUTORY TIME LIMIT

The development permitted shall be begun before the expiration of five years from the date of this planning permission.

Reason: In accordance with the provisions of Section 91 of the Town and Country Planning Act 1990.

2. PLANS AND DOCUMENTS

The development shall be carried out in accordance with the following plans and documents:

- (i) Site Location Plan – LAM-DWG001.1;
- (ii) Red Line Area Plan – LAM-DWG001.2;
- (iii) Land Ownership Plan – LAM-DWG001.3;
- (iv) Site Layout Plan – LAM-DWG002;
- (v) Solar Array Layout – LAM-DWG003 V2;
- (vi) Mounting Structure Details – LAM-DWG004.1;
- (vii) Mounting System Elevation – LAM-DWG004.2;
- (viii) Fence Details Plan – LAM-DWG005;
- (ix) CCTV Layout Plan – LAM-DWG006.1;
- (x) CCTV Details – LAM-DWG006.2;
- (xi) DNO Substation Plan – LAM-DWG007.2;
- (xii) Private Wire Substation – LAM-DWG007.3;
- (xiii) Transformer Station – LAM-DWG007.4;
- (xiv) Inverter Mounting System – LAM-DWG007.5;
- (xv) Inverter – LAM-DWG007.6;
- (xvi) Substation Housing – LAM-DWG007.7;
- (xvii) Landscape and Visual Impact Assessment, Wardell Armstrong, February 2019;
- (xviii) Preliminary Ecological Appraisal, Udall-Martin Associates,

- December 2017;
- (xix) Ecological Appraisal Report, Arcadis, January 2019;
 - (xx) Statement to Inform an Appropriate Assessment, Arcadis, Version 3, April 2019;
 - (xxi) Topography and Screening Note, received 12 April 2019;
 - (xxii) Existing Ground Topography Longitudinal Sections;
 - (xxiii) Redshank Roost Technical Note, Arcadis, 26 April 2019;
 - (xxiv) Reptile Mitigation Strategy, Arcadis, January 2019;
 - (xxv) Reptile Mitigation Strategy Addendum, Arcadis, 2 April 2019;
 - (xxvi) Ecological Management Plan, Arcadis, February 2019;
 - (xxvii) Preliminary Invertebrate Walk-Over Survey, Udall-Martin Associates, December 2017;
 - (xxviii) Interim Reptile Survey Report, Udall-Martin Associates, November 2017;
 - (xxix) Ground-Nesting Bird Surveys, Udall-Martin Associates, September 2017;
 - (xxx) Overwintering Bird Survey Report, Arcadis, April 2019;
 - (xxxi) Memo to Council Ecologist, Arcadis, 2 April 2019.
- Reason: The plans and documents form part of the application

3. CONSTRUCTION AND DECOMMISSIONING MANAGEMENT PLAN

No development shall take place until a Construction and De-Commissioning Management Plan (CDMP) has been submitted to and approved in writing by the Local Planning Authority (LPA). The CDMP shall include:

- (i) the phasing of construction and decommissioning works;
- (ii) any temporary site access roads/haul roads and other areas of hardstanding, including areas of temporary road matting;
- (iii) parking facilities for delivery and removal vehicles and staff vehicles within the site; details of the location of compounds for the storage of plants and materials; measures to prevent dust pollution; plant and wheel washing facilities.
- (iv) measures to ameliorate water quality such that there is no contaminated surface water run-off from the development site into the Severn Estuary.

The CDMP shall be carried out in accordance with the approved details and shall remain in operation for the duration of the construction and decommissioning periods.

Reason: In the interests of highway safety, public amenity, and to avoid unacceptable harm to sites of international nature conservation importance which are protected under the Conservation of Habitats Regulations 2017.

4. GREEN INFRASTRUCTURE STATEMENT

No development shall take place until a Green Infrastructure Statement (GIS) has been submitted to and approved in writing by the Local Planning Authority. The GIS shall demonstrate how all elements of the proposed green infrastructure (retained and new) and any associated

uses and movement have a clear role and purpose in the new development. The GIS shall include illustrations, plans and drawings that articulate how reports and technical data have been interpreted spatially and how this has informed the design layout and landscape strategy. The GIS shall include the conclusions and recommendations of the Ecological Appraisal Report, The Ecological Management Plan, The Reptile Mitigation Strategy and its addendum dated 02/04/19, the Memo dated 02/04/19, the Overwintering Bird Survey Report from April 2019, the Statement to Inform the Appropriate Assessment (Version 3, April 2019) and the Redshank Roost Technical Note dated 26 April 2019. The development shall be carried out in accordance with the approved GIS.

Reason: To ensure the green resource is protected, enhanced and managed so that its integrity and connectivity is maintained.

5. FENCE DETAILS

Prior to its installation, the colour finish of the deer fencing hereby approved on drawing no. LAM-DWG.005 shall be submitted to and approved in writing by the Local Planning Authority. The fence shall be constructed in accordance with the approved details prior to the beneficial operation of the solar farm.

Reason: To ensure a satisfactory finished appearance.

6. NO PILING

No piling or other foundation designs using penetrative methods shall be used.

Reason: To prevent any pollution of the water environment.

7. EXPIRY DATE

The permission hereby approved shall expire 35 years from the date when electrical power is first exported ('first export date') from the solar farm to the electricity grid network, excluding electricity exported during initial testing and commissioning. Written confirmation of the first export date shall be provided to the Local Planning Authority no later than one calendar month after the event.

Reason: The approved scheme has a 35 year lifespan.

8. DECOMMISSIONING AND SITE RESTORATION SCHEME

No later than 12 months before the expiry date of the planning permission hereby granted, a decommissioning and site restoration scheme including a timetable for implementation shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall include details of the removal of all the solar panels and their associated mounting and structures, buildings, equipment, fencing and CCTV and all surface elements of the development. The approved scheme shall be implemented in accordance with the approved

scheme and timetable.

Reason: To ensure for the future restoration of the site.

9. UNEXPECTED CESSATION OF USE

In the event of the solar farm failing to produce electricity supplied to the local grid for a continuous period of 6 months, then it will be deemed to have ceased to be required, the solar farm and its ancillary equipment shall be dismantled and removed and the site restored to its former condition in accordance with a scheme that shall first be submitted to and approved in writing by the Local Planning Authority.

Reason: To ensure the solar farm beneficially generates electricity or is otherwise removed to the benefit of the character and appearance of the area.

10. ACCESS TRACK DETAILS

Prior to the construction of any track details of their construction shall be submitted to and approved in writing by the Local Planning Authority. The tracks shall be constructed in accordance with the approved details prior to beneficial use.

Reason: To ensure any tracks are constructed in a fully reversible way in the long-term interests of restoring the site.

11. CONTAMINATED LAND MEASURES

No part of the development hereby permitted shall be commenced until a scheme is submitted which provides details of any measures necessary to protect future occupiers/users of the land from chemicals, gases and other contaminants. All measures in the approved scheme shall be undertaken in accordance with a timetable which shall be agreed in writing with the Local Planning Authority.

Reason: To ensure that the safety of future occupiers is not prejudiced.

12. CONTAMINATED LAND MEASURES – UNFORESEEN CONTAMINATION

In the event that contamination is found at any time when carrying out the approved development that was not previously identified it must be reported in writing within 2 days to the Local Planning Authority, all associated works must stop, and no further development shall take place unless otherwise agreed in writing until a scheme to deal with the contamination found has been approved. An investigation and risk assessment must be undertaken and where remediation is necessary a remediation scheme and verification plan must be prepared and submitted to and approved in writing by the Local Planning Authority. Following completion of measures identified in the approved remediation scheme a verification report must be submitted to and approved in writing by the Local Planning Authority. The timescale for the above actions shall be agreed with the Local Planning Authority

within 2 weeks of the discovery of any unsuspected contamination.

Reason: To ensure that any unacceptable risks from land contamination to the future users of the land, neighbouring land, controlled waters, property and ecological systems are minimised, and to ensure that the development can be carried out safely without unacceptable risks to workers, neighbours and other offsite receptors in accordance with policy EN13 of the Cardiff Local Development Plan.

13. IMPORTED SOIL

Any topsoil [natural or manufactured], or subsoil, to be imported shall be assessed for chemical or other potential contaminants in accordance with a scheme of investigation which shall be submitted to and approved in writing by the Local Planning Authority in advance of its importation. Only material approved by the Local Planning Authority shall be imported. All measures specified in the approved scheme shall be undertaken in accordance with the relevant Code of Practice and Guidance Notes. Subject to approval of the above, sampling of the material received at the development site to verify that the imported soil is free from contamination shall be undertaken in accordance with a scheme and timescale to be agreed in writing by the Local Planning Authority.

Reason: To ensure that the safety of future occupiers is not prejudiced.

14. IMPORTED AGGREGATES

Any aggregate (other than virgin quarry stone) or recycled aggregate material to be imported shall be assessed for chemical or other potential contaminants in accordance with a scheme of investigation which shall be submitted to and approved in writing by the Local Planning Authority in advance of its importation. Only material approved by the Local Planning Authority shall be imported. All measures specified in the approved scheme shall be undertaken in accordance with the relevant Code of Practice and Guidance Notes. Subject to approval of the above, sampling of the material received at the development site to verify that the imported material is free from contamination shall be undertaken in accordance with a scheme and timescale to be agreed in writing by the Local Planning Authority.

Reason: To ensure that the safety of future occupiers is not prejudiced.

15. USE OF SITE WON MATERIALS

Any site won material including soils, aggregates, recycled materials shall be assessed for chemical or other potential contaminants in accordance with a sampling scheme which shall be submitted to and approved in writing by the Local Planning Authority in advance of the re-use of site won materials. Only material which meets site specific target values approved by the Local Planning Authority shall be reused.

Reason: To ensure that the safety of future occupiers is not prejudiced.

16. OVERWINTERING AND MIGRATORY BIRDS

No construction or decommissioning works shall take place between October and March (inclusive) when over-wintering and passage qualifying species associated with the Severn Estuary SPA/ Ramsar site would be present.

Reason: To avoid unacceptable harm to sites of international nature conservation importance which are protected under the Conservation of Habitats Regulations 2017.

RECOMMENDATION 2: To protect the amenities of occupiers of other premises in the vicinity attention is drawn to the provisions of Section 60 of the Control of Pollution Act 1974 in relation to the control of noise from demolition and construction activities. Further to this the applicant is advised that no noise audible outside the site boundary adjacent to the curtilage of residential property shall be created by construction activities in respect of the implementation of this consent outside the hours of 0800-1800 hours Mondays to Fridays and 0800 - 1300 hours on Saturdays or at any time on Sunday or public holidays. The applicant is also advised to seek approval for any proposed piling operations.

RECOMMENDATION 3: The contamination assessments and the effects of unstable land are considered on the basis of the best information available to the Planning Authority and are not necessarily exhaustive. The Authority takes due diligence when assessing these impacts, however you are minded that the responsibility for

- (i) determining the extent and effects of such constraints and;
- (ii) ensuring that any imported materials (including, topsoils, subsoils, aggregates and recycled or manufactured aggregates / soils) are chemically suitable for the proposed end use. Under no circumstances should controlled waste be imported. It is an offence under section 33 of the environmental Protection Act 1990 to deposit controlled waste on a site which does not benefit from an appropriate waste management license. The following must not be imported to a development site:
 - Unprocessed / unsorted demolition wastes.
 - Any materials originating from a site confirmed as being contaminated or potentially contaminated by chemical or radioactive substances.
 - Japanese Knotweed stems, leaves and rhizome infested soils. In addition to section 33 above, it is also an offence under the Wildlife and Countryside Act 1981 to spread this invasive weed; and
- (iii) the safe development and secure occupancy of the site rests with the developer.

Proposals for areas of possible land instability should take due account of the physical and chemical constraints and may include action on land reclamation or other remedial action to enable beneficial use of unstable land.

The Local Planning Authority has determined the application on the basis of the information available to it, but this does not mean that the land can be considered free from contamination.

RECOMMENDATION 4: Prior to the commencement of development, the developer shall notify the Local Planning Authority of the commencement of development, and shall display a site notice and plan on, or near the site, in accordance with the requirements of Article 12 of the Town & Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016

RECOMMENDATION 5: That the Applicant / Developer be advised of Dwr Cymru Welsh Water's advice regarding water supply provision and conditions for development near water mains set out in their letter of 15 March 2019, forwarded to the Agent acting on behalf of the Applicant.

RECOMMENDATION 6: That the Applicant / Developer be advised that the permission of the SuDs Approval Body (SAB) for the sustainable drainage of surface water from the site will be required before any construction work commences.

RECOMMENDATION 7: That the Applicant / Developer be advised of South Wales Police advice regarding security measures set out in their email dated 8 March 2019, forwarded to the Agent acting on behalf of the Applicant.

1. **DESCRIPTION OF PROPOSED DEVELOPMENT**

- 1.1 Planning permission is sought for the installation of a ground-mounted photovoltaic solar farm and ancillary development on land at Lamby Way Landfill Site, Rumney.
- 1.2 The site occupies the western half of the Lamby Way landfill site and extends to approximately 17 hectares. The anticipated output will be approximately 8.7MW.
- 1.3 The installation will include c. 31,688 individual panels which will be arranged in rows. The panels will be supported by a galvanized steel structure supported on a surface mounted ballasted/concrete pad with a maximum height of approximately 2.8 metres. No demolition or penetrative works are proposed.
- 1.4 The electricity supply generated from the solar panels will be fed to the National Grid by connecting to a substation north of the site via underground cabling.
- 1.5 The application also seeks permission for ancillary containerised and similar structures containing high voltage equipment. These will be constructed on a raft foundation to spread the load across a wider area.

- 1.6 A security fence 2.2 metres in height will also be erected around the site and 39 no. camera poles approximately 3-4 metres high will also be located around the site, each pole supporting a CCTV camera for surveillance.
- 1.7 The solar farm would be operational for 35 years, following which it would be de-commissioned and all equipment would be dismantled and removed from the site.
- 1.8 The proposals were screened in October 2018 with regard to the need for the preparation of an Environmental Statement to accompany the application in accordance with the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 (see paragraph 3.1). The Council formed the opinion that the development, although being 'Schedule 2' development, did not constitute EIA development as the proposals did not constitute a major development of more than local importance, is not in a particularly environmentally sensitive or vulnerable location, is not likely to give rise to unusually complex and potentially hazardous effects and would not be likely to have significant effects on the environment by virtue of factors such as its nature, size or location.
- 1.9 The screening opinion took place on the basis that the site size was 16.5 hectares and the power output would be approximately 7.5MW. This application marginally exceeds these parameters by 0.5 hectares and 1.2MW respectively. It is not considered that these increases would lead to a different opinion being reached on the need for an Environmental Statement to accompany the application.

2. **DESCRIPTION OF SITE**

- 2.1 The site extends to the western half of the Lamby Way landfill site which adjoins the River Rhymney and its confluence with the Severn Estuary. The site has been capped and is covered by rough grassland and scrub with some tree cover on the north and western site perimeter. An attenuation pond is located towards the centre of the site (excluded from the application site for ecology reasons).
- 2.2 Most of the landfill site is around 9-10 metres AOD and the land rises to a central point in the east part of the site at approximately 25 metres.
- 2.3 Various maintenance tracks cross the site and, being a landfill site, gas wells and various gas monitoring apparatus are located across the whole site.
- 2.4 Neighbouring development is largely industrial in nature including the rest of the Council's waste and recycling centre and a number of business and industrial parks off Lamby Way and Wentloog Avenue. There are residential communities further afield in Rumney to the northwest and Tremorfa to the southwest.
- 2.5 There are a number of ecological designations in close proximity to the site. Immediately adjoining the site to the south and west are the River Rhymney

and the Lamby Salt Marsh Sites of Importance for Nature Conservation (SINCs). The Severn Estuary also benefits from protection as a European Site, being a designated Special Area of Conservation (SAC), a Special Protection Area (SPA) and a RAMSAR site. The site also adjoins the Severn Estuary Site of Special Scientific Interest (SSSI). The Gwent Levels: Rumney and Peterstone SSSI is approximately 120 metres to the east.

- 2.6 The site is located within the Wentloog Levels Archaeologically Sensitive Area.
- 2.7 The Wales Coast Path currently circumnavigates the landfill site to the east, north and west however new route options across the landfill are being explored by Cardiff Council in consultation with Natural Resources Wales and the Welsh Government.

3 SITE HISTORY

- 3.1 SC/18/00003/MJR: Screening opinion issued in October 2018 concluding that the proposed development did not constitute Environmental Impact Assessment development requiring the submission of an Environmental Statement.
- 3.2 16/01309/MJR: Permission granted in August 2016 for the construction of a household waste recycling centre on the existing staff car park with revised access and egress arrangements including the relocation of the staff car park and drainage improvements.
- 3.3 08/02293/E: Permission granted in November 2008 for the erection of 280 metres of 4 metre high fencing.
- 3.4 03/02096/R: Permission granted in December 2003 for extension to materials recycling facility building, new car park and vehicular circulation.
- 3.5 03/01291/R: Permission granted in July 2003 for a public art work consisting of a landmark structure in plain and coloured glass, steel and aluminium.
- 3.6 01/00509/R: Permission granted in May 2001 to modify condition 23 of planning permission 95/01367/R to change opening hours from 0700 – 1900 to 24 hour opening.
- 3.7 95/01367/R: Permission granted in January 2000 for landfill waste disposal site and associated mitigation works, to include recreational use of land north of Lamby Way.
- 3.8 94/00030/R: Permission granted in August 1995 for waste landfill site and associated mitigation work.

4 POLICY FRAMEWORK

- 4.1 Planning Policy Wales, Edition 10 (December 2018)

4.2 Technical Advice Notes (TANs):

- 5 Nature Conservation and Planning
- 8 Planning for Renewable Energy
- 12 Design
- 15 Development and Flood Risk
- 18 Transport

4.3 Local Development Plan (January 2016):

- KP5 Good Quality and Sustainable Design
- KP6 New Infrastructure
- KP7 Planning Obligations
- KP15 Climate Change
- KP16 Green Infrastructure
- KP18 Natural Resources
- EN3 Landscape Protection
- EN4 River Corridors
- EN5 Designated Sites
- EN6 Ecological Networks and Features of Importance for Biodiversity
- EN7 Priority Habitats and Species
- EN8 Trees, Woodlands and Hedgerows
- EN9 Conservation of the Historic Environment
- EN10 Water Sensitive Design
- EN12 Renewable Energy and Low Carbon Technologies
- EN13 Air, Noise, Light Pollution and Land Contamination
- EN14 Flood Risk
- T5 Managing Transport Impacts
- T7 Strategic Transportation Infrastructure
- T8 Strategic Recreational Routes

4.4 Supplementary Planning Guidance:

- Archaeology and Archaeologically Sensitive Areas (July 2018)
- Green Infrastructure (November 2017)
- Managing Transportation Impacts (July 2018)

5 INTERNAL CONSULTEES RESPONSES

- 5.1 The **Operational Manager, Transportation**, has no objection to the application. He recommends a construction management condition.
- 5.2 **Shared Regulatory Services, Environment**, notes that the development is located on a remediated and capped landfill site with associated infrastructure and gas monitoring points. The planning statement supporting the application confirms that no penetrative ground works are required in relation to the solar panels and associated electrical structures. It is also noted that the trenching required for the installation of cables will be designed to protect the landfill cap. The developer needs to demonstrate that the landfill cap will not be

disturbed. Detailed design proposals for infrastructure at the development including trenching, should be submitted to demonstrate that there is suitable thickness of capping to enable infrastructure to be installed in such a way as to ensure that the capping layer is not breached. They recommend that an amended version of their contamination condition be placed on this application until it is fully demonstrated that development will not compromise the capping layer at this site.

- 5.3 It is unclear whether additional landscaping is proposed, but the applicant has indicated that construction of maintenance tracks will necessitate the introduction of hardcore for surfacing. Should there be any importation of soils to develop the landscaped areas of the development, or any site won recycled material, or materials imported as part of the construction of the development, then it must be demonstrated that they are suitable for the end use. This is to prevent the introduction or recycling of materials containing chemical or other potential contaminants which may give rise to potential risks to human health and the environment for the proposed end use. They recommend relevant conditions be attached to any planning permission granted.
- 5.4 The Council's **Tree Officer** is satisfied, based on the submitted information and conversations he has had with the Council's Ecologist and Parks Conservation Officer, that a tree assessment in accordance with the Trees and Development Technical Guidance Note (TGN) would not serve a useful purpose in terms of the design of development. The trees are young (approx. 20 years), and at closest will be 10m from any proposed structure (security fence) and 15m from any panel. A 10m lateral root protection distance would apply to a tree with a trunk diameter at 1.5m height in excess of 825mm diameter and his understanding is the site supports trees that are not close to these dimensions and are never likely to be. Furthermore, branch spreads in excess of 10m would be applicable only to very large and old trees such as oaks, so even if the trees were of a large, long-lived species and grew to their full potential, they are only ever likely to come into conflict via branch tips contacting the security fence. There will not be an issue for example with trees over-growing solar panels, which was his primary concern. These comments notwithstanding, he understands that the tree belt will fall under a management regime in the interests of benefitting ecological interests at the site, so he would advise that a long-term ecological management plan is agreed with the Ecologist and Parks Officers that incorporates management of the young tree belt.
- 5.5 The **Council's Ecologist** has considered the Ecological Appraisal Report, The Ecological Management Plan, The Reptile Mitigation Strategy and its addendum dated 02/04/19, the Memo in response to his previous draft comments dated 02/04/19, the Overwintering Bird Survey Report from April 2019 and the Statement to Inform the Appropriate Assessment, submitted in support of this application. Where he has not provided comment below on a particular detail or aspect of these documents, then it should be assumed that he supports these details or aspects. These comments are made without prejudice to any further comments that he may make in the light of any new information or of alterations to the plans as submitted.

- 5.6 The site is adjacent to internationally designated sites, the Severn Estuary Special Protection Area (SPA), Severn Estuary Special Area of Conservation (SAC) and Severn Estuary Ramsar Site, and as such a Habitats Regulations Assessment (HRA) will be needed. The applicant has provided an amended Statement to Inform the Appropriate Assessment and an accompanying Technical Note regarding Redshank Roosts in which they present a case for a conclusion of 'no adverse effect' on the integrity of the Severn Estuary arising from the proposals. In general, the HRA Screening Document provides an adequate basis for the HRA of the project, and he does agree with its conclusions.
- 5.7 He has undertaken, and completed the Habitats Regulations Appraisal (HRA), taking into account the amendments to the applicant's 'Statement to Inform the Appropriate Assessment' and the Redshank Roost Technical Note received on 29 April 2019. The amended HRA concludes that, based upon the planning application and supporting documents, and provided the suggested planning conditions are attached and implemented, the proposed development will not have an adverse effect upon the integrity of the Severn Estuary European Marine Sites. A copy of the Council's Appropriate Assessment is appended to this Committee report.
- 5.8 Concerning nationally designated sites, the site is adjacent to the Gwent Levels: Rumney and Peterstone Site of Special Scientific Interest (SSSI) and also the Severn Estuary SSSI. The Ecological Appraisal Report does not appear to give any consideration to impacts upon these sites other than to say that the residual effect upon all designated sites is 'Neutral'. However, he is of the view that the installation of the solar array could not cause any impact upon the Gwent Levels SSSI above and beyond that which the existing landfill site already causes. As the features of the Severn Estuary SSSI overlap substantially with those of the international designations of that site, any impact upon that SSSI and subsequent mitigation will be considered by the HRA.
- 5.9 Turning to European Protected Species (EPS), he generally supports the original Reptile Mitigation Strategy as proposed, but has some comments. In section 2.3.4, it is stated that directional clearance of vegetation will be employed to persuade reptiles to move in a north-westerly direction from the south-east to the north-west, towards the receptor site. This raises the prospect of reptiles in the south east of the site being expected to move up to 500 metres to the receptor. This may not be an issue for grass snakes but short-limbed animals such as common lizards may be stressed by having to move such a distance, and if slow-worms are present then they too are much less mobile than grass snakes. In any event, such displacement renders the animal vulnerable to predation, so the distances they are persuaded to move should be kept to a minimum. A more realistic approach would be to begin vegetation clearance in the vicinity of the pond and work outwards so that most animals are not displaced more than 150 metres to the nearest buffer zone. He notes that the Addendum to the Reptile Mitigation Strategy sets out

confirmation to clear the site beginning at the pond and moving outwards, and he is satisfied with that approach.

- 5.10 In addition, the vegetation clearance technique involves the use of strimmers / brush cutters, followed by raking, presumably by hand. His estimate is that the area to be cleared is about 17 Ha, so he requested some assurance from prospective contractors that it would be feasible to undertake this operation by hand, twice, within the space of one or two months, not accounting for delays due to the detection of nesting birds. The Addendum to the Reptile Mitigation Strategy has provided him with this assurance, and he accepts that pedestrian tractors and quad mowers are likely to be able to clear the site quickly whilst reasonably avoiding harm to reptiles.
- 5.11 The table in section 2.3.4 suggests that vegetation clearance would take place in April / May 2019. However, the subsequent paragraphs refer to clearance taking place March to September, and can continue up until reptiles enter hibernation in October. If the vegetation referred to is part of the persuasion technique to displace reptiles towards retained habitats, then continuing into September and October is sub-optimal. For example, in September the displacement will involve neonates, which are much smaller and thus not able to travel as far, plus there are more of them, increasing the impact of the exercise. Also, reptiles displaced during October may not have time to orientate themselves and find suitable hibernacula before frosts begin. Therefore every effort should be made to complete the displacement exercise in spring / early summer. As set out in the Addendum to the Reptile Mitigation Strategy, clearance can be undertaken relatively quickly, and as construction has to be completed by October 2019, he accepts that displacement of reptiles will take place during spring and early summer.
- 5.12 Section 2.3.5 - Reptile fencing. Assuming it is feasible to install reptile fencing over a thin cap of soil above a geotextile lining, he would question the value of a reptile fence separating the main site from the receptor area. Mindful of his comments about the clearance method above, whatever clearance is used, there is no feasible way of ensuring that all of the reptiles on site can be persuaded to migrate to the receptor area. It is inevitable that many or indeed most will flee to the buffer zones around the perimeter of the site. Assuming it is impractical to install a fence around the perimeter of the site (about 2Km), then a fence along the boundary with the receptor area would have little value, unless it is demonstrated through monitoring that the reptile population in the receptor area had substantially increased. The Addendum to the Reptile Mitigation Strategy has since confirmed that reptile fencing will not be deployed.
- 5.13 In terms of the locations of the reptile hibernacula, one of the locations at the south western point of the site appears to be shaded by trees to the south and west, and so should be moved to a better location. Also, if the northern parcel of the site is to act as a receptor area, then it too should be provided with hibernacula and egg-laying piles. The Addendum to the Reptile Mitigation Strategy has confirmed that this will be the case.

- 5.14 In the Ecological Management Plan he can see no mention of the habitat management of the reptile receptor area. This area will need to be sensitively managed in order to maintain an open mosaic of grassland and scrub, whilst avoiding harm to reptiles in the process. The Ecological Management Plan should set out this management regime. For the avoidance of doubt, the receptor area should not be mown by tractor mower. He is not concerned at the prospect of the Wales Coastal Path being diverted through this area. The 02/04/19 Memo in response to his original comments has confirmed that the Ecological Management Plan will be amended to set out appropriate management of the receptor area.
- 5.15 Despite the effort that is proposed in the Reptile Mitigation Strategy, there was no proposal to monitor the impact of the scheme upon reptiles by surveying for the reptiles themselves. He recommends that the reptile receptor area is surveyed in the first spring after installation of the solar array, then the solar array area itself is monitored in year 5 after installation. The 02/04/19 Memo in response to his original comments has confirmed that monitoring will be in place.
- 5.16 Therefore provided the mitigation measures set out in The Reptile Mitigation Strategy and its addendum dated 02/04/19 and the Memo in response to his previous draft comments dated 02/04/19, are incorporated into a Green Infrastructure Statement or GI Mitigation Strategy (GIMS) or similar as below, secured by planning condition, then his concerns over the clearance strategy are satisfied.
- 5.17 He notes the outcome of the invertebrate surveys which demonstrate that the site as a whole would qualify as a SINC for its invertebrate fauna assemblage. This assemblage is dependent upon the mosaic of grassland and scrub habitats. The presence of a SINC or of SINC-qualifying habitat does not constrain development on a site, but Section 5.5.3 of TAN 5 does state that developer should avoid harm to these features where possible, and that where harm is unavoidable it should be minimised by mitigation measures and offset as far as possible by compensation measures designed to ensure that there is no reduction in the overall nature conservation value of the area or features. Therefore, the mosaic of neutral / calcareous grassland and scrub should be the focus of avoidance, mitigation and compensation efforts. In the latter respect, consideration should be given to using the eastern half of the Lamby Way Landfill Site (that most recently capped) as compensatory habitat under appropriate management. On the basis of the 02/04/19 Memo in response to his original comments, he is satisfied with the principles of mitigation of impacts upon invertebrates, provided further details are incorporated into a Green Infrastructure Statement or GI Mitigation Strategy (GIMS) or similar as below, secured by planning condition.
- 5.18 Section 2.3.7 of the Reptile Mitigation Strategy refers to breeding birds, and states that a check will be made for nesting birds prior to the commencement of clearance. Given that clearance of the site by hand is likely to be a substantial and time-consuming exercise, it should be clear that monitoring for

nesting activity should be ongoing throughout the clearance, and not just one check at the start of what may well be a two-month exercise.

- 5.19 Table 1 in the Ecological Appraisal Report proposes a similar measure ‘immediately prior to construction commencing’. Assuming the term construction refers to the site clearance prior to installation of the solar panels and infrastructure, again this is may be a lengthy exercise so a single check prior to commencement would not detect any nesting which begins during the clearance. Therefore ongoing or regular surveillance should be used. The Memo in response to his previous draft comments dated 02/04/19 confirms that monitoring for nesting birds will be ongoing as long as site clearance continues.
- 5.20 Table 1 also assesses the impact of the overall scheme as ‘Beneficial’ partly on the basis that ‘*Grassland would be maintained beneath the (solar) array which would provide largely undisturbed ground nesting conditions*’. Firstly, he does not accept that installation of the array will leave areas of grassland undisturbed, as installation of concrete plinths, tracking of vehicles and installation of cables and other ancillary infrastructure will inevitably disturb all grassland within the footprint of the development. Secondly, for some ground nesting birds, an open aspect is important to allow visibility of potential predators, so the solar panels and their plinths would not allow unobstructed views across the grassland. Therefore he does not agree that ground nesting could continue in and amongst the solar array, though if the applicant’s ecologist can put forward examples of where ground-nesting birds have continued to breed within a solar array, he would be happy to take this into account. The Memo in response to his previous draft comments dated 02/04/19 accepts that the grassland within the solar array may not be directly suitable for ground-nesting birds’ nests, but that it may form part of their foraging habitat. In this context he does not support the general conclusion in Section 7 of the Ecological Appraisal Report ‘*the most suitable habitat features for these species would not be significantly impacted by the proposed development.*’ Areas of scrub and grassland within the footprint will be completely lost during construction, and recreated habitats will be managed differently post-installation. Certain species such as reptiles are likely to re-colonise, but the mosaic of rough grassland and scrub will be lost for the lifetime of the development. Appropriate management of the eastern side of the Lamby Way landfill site would allow habitat compensation for both ground and above-ground nesting birds.
- 5.21 Section 4.3.3 of the Ecological Appraisal Report gives examples of some of the plant species recorded in the grassland and other habitats. The applicant’s ecologist has confirmed that the plant species already quoted comprise the full list of species observed. From the species given, the site as a whole would qualify as a Site of Importance for Nature Conservation (SINC) for its neutral grassland habitats, and is close to qualifying for calcareous grassland habitats as well, in accordance with the SINC selection criteria that are used. Other habitats such as scrub may also qualify under SINC criteria, and the presence of Flowering Rush *Butomus umbellatus* is a SINC qualifying feature in its own right. As set out in section 1.5.13 of the approved Ecology and Biodiversity

TGN, sites which would qualify as SINC are treated as though they are designated, for the purposes of the planning system.

- 5.22 The presence of a SINC or of SINC-qualifying habitat does not constrain development on a site, but Section 5.5.3 of TAN 5 does state that developer should avoid harm to these habitats where possible, and that where harm is unavoidable it should be minimised by mitigation measures and offset as far as possible by compensation measures designed to ensure that there is no reduction in the overall nature conservation value of the area or features. Therefore, the mosaic of neutral / calcareous grassland and scrub should be the focus of avoidance, mitigation and compensation efforts. In the latter respect, consideration should be given to using the eastern half of the Lamby Way Landfill Site (that most recently capped). Retention of the ponds on site will ensure protection of the Flowering Rush.
- 5.23 He has the following comments on the Ecological Management Plan:
- (i) He does not see the need for use of herbicides to control weeds in areas to be re-seeded, unless of course there are invasive non-native species such as Himalayan Balsam or Japanese Knotweed Present. Many 'weed' species provide food for invertebrates and birds, and do not need to be controlled. The Memo in response to his previous draft comments dated 02/04/19 confirms that this will be amended such that no herbicides will be used other than if invasive non-native plants are found.
 - (ii) Grassland re-seeding. Assuming the seed mix is Germinal RE10 Marginal Land (U20 Grassland) seed mix, then he has no concerns over this.
- 5.24 Grassland Management states that conservation mowing will take place 2 – 4 times per year. As part of a GI Statement or GIMS he would like extra detail of the timing of this mowing, to ensure that the timing allows for most plants to flower and set seed in the summer. The table in section 4.1 refers to cutting in March and in August, which is likely to be favourable, but if four cuts are used it is not clear when the other two would take place. The Memo in response to his previous draft comments dated 02/04/19 confirms that two cuts in March and August will be used.
- 5.25 In order to create a smoother ecotone between the planted woodland and the grassland, he would prefer to see a greater proportion of scrub in this buffer zone area, and he does not agree that scrub should be restricted to 2% of this area. Ideally the edge of woodland would grade into smaller scrub or understorey species, then tall ruderals and eventually rough grassland, across the 10 metre buffer zone. Section 3.4 refers to the need to create a graded edge profile, but instead invokes removal and coppicing of trees rather than allowing scrub to develop. In practice he would like to see a combination of both management of woodland and management of grassland and scrub employed to create this graded woodland edge. The Memo in response to his

previous draft comments dated 02/04/19 confirms that this type of management will be set out as part of a GI Statement or GIMS.

- 5.26 He welcomes the proposals to remove arisings of grassland mowing, as this will help maintain the diversity of the sward. However, he questions whether it is feasible to use a baler in between solar panels to collect and bale the resulting hay? If this is not possible then an alternative should be proposed, although cutting and collecting by hand seems equally difficult. Arisings could be used to create and then top up hibernacula and egg-laying piles. The Memo in response to his previous draft comments dated 02/04/19 confirms that this type of management will be set out as part of a GI Statement or GIMS.
- 5.27 Drainage of the developed site will be required to be sustainable, and to gain approval from the SUDS Approval Body (SAB). One of the six standards to which and SuDS must adhere is Standard 5: Biodiversity, and any mitigation measures designed to counteract ecological impacts caused by construction of the scheme should be able to demonstrate conformity with this standard. For example, installation of solar panels within the catchment of the pond may result in poaching of the ground, and during a rain event result in increased turbidity of surface water run-off into the pond. Increased turbidity may affect plant and invertebrate life in the pond, thus resulting in a negative impact upon biodiversity. Therefore mitigation measures designed to avoid impacts from the scheme itself should also demonstrate contribution to the biodiversity standard of whatever sustainable drainage scheme is employed.
- 5.28 In accordance with sections 2.4.1 and 2.4.2 of the Green Infrastructure SPG, the culmination of analysis and conclusions of any impact assessments should be used to inform a Green Infrastructure Statement, which shows how all elements of the proposed green infrastructure (retained and new) and any associated uses and movement have a clear role and purpose in the new development. Conclusions drawn from analysis of this resource should be expressed in an illustrative way, in the form of a Green Infrastructure Masterplan or Landscape Masterplan or similar. It would be helpful if such a masterplan included the whole of the Lamby Way site, such that the PV array can be seen in the context of the land use of the eastern half of the Lamby Way site, and proposed changes to public rights of way through the whole site and the nearby Parc Tredelerch and the Rhydney Trail.
- 5.29 The Green Infrastructure Statement will include illustrations, plans and drawings that articulate how reports and technical data (e.g. tree and hedgerow assessments, landscape studies, environmental statements, hydrological reports) have been interpreted spatially. These need to communicate how conclusions have been drawn and how this has informed the design layout and landscape strategy. The GI Statement should incorporate the Ecological Appraisal Report, The Ecological Management Plan, The Reptile Mitigation Strategy and its addendum dated 02/04/19, the Memo in response to his previous draft comments dated 02/04/19, the Overwintering Bird Survey Report from April 2019, the amended Statement to Inform the Appropriate Assessment and Redshank Roost Technical Note,

taking account of his concerns raised as above, and integrate these with requirements for sustainable drainage standards, public rights of way and tree protection. The GI Statement should be secured by a planning condition.

- 5.30 As set out in section 2.4.4 of the approved Green Infrastructure SPG, the Environment (Wales) Act 2016 places a duty upon public bodies such as Cardiff Council to promote the resilience of ecosystems. Similarly, the Guidelines for Ecological Impact Assessment 2016 2nd edition produced by CIEEM require that impacts upon ecosystems are considered as well as those upon habitats and species, for example at sections 1.3, 1.9, 2.3, 4.1 and 4.8 etc. Therefore all major planning applications should set out how impacts upon ecosystems have been assessed, and where necessary, mitigated. This assessment should be included in the Green Infrastructure Statement as above. This will allow Cardiff Council to demonstrate compliance with the ecosystem approach as required by the legislation referred to above. The Memo in response to his previous draft comments dated 02/04/19 confirms that this consideration will be set out as part of a GI Statement or GIMS.
- 5.31 These comments contribute to this Authority's discharge of its duties under Section 6 of the Environment (Wales) Act 2016. This duty is that the Council must seek to maintain and enhance biodiversity in the exercise of its functions, and in so doing promote the resilience of ecosystems, so far as is consistent with the proper exercise of those functions. In complying with this duty the Council will have to take account of the resilience of ecosystems, in particular the diversity between and within ecosystems; the connections between and within ecosystems; the scale of ecosystems; the condition of ecosystems and the adaptability of ecosystems.
- 5.32 The **Shared Regulatory Services, Neighbourhood Services**, is satisfied that a noise assessment is unnecessary for this site as it is highly unlikely that the noise level of the equipment will be audible above existing background noise levels. In respect of the potential for light reflection/glare from the panels, they accept that the panels are designed to accept solar rays rather than reflect. Furthermore, due to the angle of the panels, any residual reflection would be directed away from any potential impacts to the south. They accept that the nearest residential properties are found away from this southern axis e.g. to the south west therefore, mindful of the degree of separation and the relatively low-lying nature of the panels, the odds of any affects materialising are very small.
- 5.33 The Council's **Access Officer** has been consulted and any comments received will be reported to Planning Committee.
- 5.34 The **Operational Manager, Drainage Division**, advises that the application to the SuDs Approval Body (SAB) will assess all relevant surface water drainage issues.
- 5.35 The **Operational Manager, Parks and Sport**, notes that the proposals for the solar panels are located in one part of the site but to enable them to be seen in context he would have liked to have seen a masterplan for the whole of

Lamby Way, setting out the different land uses and links to areas beyond the site e.g. the Wales Coastal Path. Past proposals for Lamby Way included use of at least part of the site as public open space. Given the time period involved he no longer has access to these documents or the requirements set out in the original remediation strategy for the site. However given the biodiversity comments and the public benefit there should be a strong argument for the retained eastern part of the site becoming public open space once remediation and settlement has taken place, reflecting the type of open space at Grangemoor Park. This should be combined with a network of footpaths around other parts of Lamby Way outside the solar farm boundary, with the creation of possible links to the existing open space at Parc Tredelerch and improvements to the route of the coastal footpath.

- 5.36 The **Public Rights of Way Officer** advises that the access to construct and manage the site appears to mainly refer to the access track from Lamby Way through the centre of the landfill site. The site layout plan shows a new track being created across the receptor site and through the woodland. The Wales Coast Path (WCP) is also featured parallel to the north of this track. They seek clarification if this is a new route being created and the proposed construction method. Also if this track is being created, the WCP alignment may need to be realigned to avoid having two parallel routes.
- 5.37 The WCP alignment has not been formally confirmed as the alignment project will require further habitat assessments and approval by Natural Resources Wales as well determining ground conditions for suitability for walkers, etc. The desire is to keep walkers away from the solar farm where possible and use the maintenance tracks as alternative leisure routes for walkers. She requests, if appropriate, planting around the compound at the north of the site for additional screening to create a natural barrier between the walkers and the solar farm. She also queries whether there will be additional CCTV at the start of the track as well as around the perimeter of the solar farm itself.
- 5.38 As there will be public access across the site for the Wales Coast Path and other leisure routes, this will need to be considered for any current proposals if there isn't already something in situ.
- 5.39 The existing dirt track through the centre of the site is being proposed for hardcore base improvements where needed. Most of the route will also be considered as a circular walk option for walkers therefore surfacing will need to be compact and suitable for walkers rather than large stones with an uneven surface.
- 5.40 Clarification is sought whether the perimeter maintenance track surface will also be improved as it is shown as part of the route that will be used to maintain the solar farm. This route will create a circular walk option in the near future and there are several sections that become boggy where potholes have formed over the years from vehicle usage.
- 5.41 The Wales Coast Path and remainder of the Lamby Way site will be kept for the public to access. Therefore the Solar Panel farm project should consider

the opportunity to contribute funding for the pedestrian crossing to link public open space at Parc Tredelerch to Lamby Way as part of the WCP and public access, provide biodiversity enhancements and education information as part of this project and contribute to enhancing the existing maintenance tracks and provide interpretation information for the public to view as a welcome benefit for all.

6 EXTERNAL CONSULTEES RESPONSES

6.1 **Dwr Cymru Welsh Water** advise that it is unclear if a foul water connection is required to the public sewer. Their response is on the assumption that one is not required, however if a connection is preferred then they kindly ask that they be re-consulted and details of the drainage proposal shared for further assessment. No problems are envisaged with the Waste Water Treatment Works for the treatment of domestic discharges from this site. A water supply can be made available to serve this proposed development. The developer may be required to contribute, under Sections 40 - 41 of the Water Industry Act 1991, towards the provision of new off-site and/or on-site watermains and associated infrastructure. The level of contribution can be calculated upon receipt of detailed site layout plans which should be sent to the address above. The proposed development is crossed by a 63mm distribution watermain. Dwr Cymru Welsh Water as Statutory Undertaker has statutory powers to access its apparatus at all times. It may be possible for this watermain to be diverted under Section 185 of the Water Industry Act 1991, the cost of which will be re-charged to the developer. The developer must consult Dwr Cymru Welsh Water before any development commences on site. An easement of 4 metres either side of the main is required. Notwithstanding the above, they have no objection to the proposal.

6.2 **Glamorgan Gwent Archaeological Trust (GGAT)** has consulted the regional Historic Environment Record and notes that the proposal is located in the Gwent Levels Registered Historic Landscape, specifically the Rumney Historic Character Area (HLCA018) which is described as complex "irregular landscape" with a dispersed settlement pattern. Reclaimed first in the medieval period, the character area has evidence of sea walls originating from this period and evidence of water management. Alluvial deposits are also noted to have preserved archaeological deposits relating to land and water management. The application is also within the Cardiff Archaeologically Sensitive Area.

However, the Modern use of the site as landfill and the subsequent remediation and capping as noted in the supporting information, suggests that any potential buried archaeological resource would be at a great depth. The solar panels will be secured using a ballasted/concrete pad with no penetrative works proposed. The requisite ancillary structures will require raft foundations, but these are unlikely to be of sufficient depth to encounter any potential remains. As a result there is unlikely to be an archaeological restraint to this proposed development and consequently, as the archaeological advisors to the Council, they have no objections to the positive determination of this application. The record is not definitive, however, and features may be

disturbed during the course of the work. In this event, please contact this division of the Trust.

6.3 **Natural Resources Wales** have considered the amended Appropriate Assessment (AA) and the additional technical note received on 29 April 2019 which provided additional assessment on potential operational effects. They advise as follows:

- (i) The technical note has focussed on the potential effects on roost sites supporting redshank and dunlin from visual disturbance including glare effects resulting from the project;
- (ii) They are satisfied the technical note has identified the solar arrays which are visible from the relevant roost locations. The assessment concludes no adverse effect on the integrity of the roost resulting from visual disturbance. The technical note also provides detailed evidence and assessment to conclude that any glare from the solar arrays will not have an adverse effect on the roost location. Based on these conclusions they agree that additional mitigation measures for operational effects will not be required.
- (iii) Therefore, based on the evidence within the technical note and the conclusions of the Appropriate Assessment (AA) they consider the project is not likely to have an adverse effect on the Severn Estuary SPA, subject to planning conditions being secured to any consent. These conditions are set out in section 2 of the AA. They advise that the Council attaches the technical note to its AA for completeness.

6.4 The **South Wales Police Crime Prevention Design Advisor** has no objection to proposal but recognises the vulnerability of industrial installations to crime. Power supplies are also key to maintaining the economic and social well-being of an area and they need to be protected. South Wales Police welcome consideration given to security such as perimeter fencing and CCTV but would also make the following recommendations:

- (i) Transformer facilities and other key equipment are enclosed and protected either by robust structure or fencing, and fitted with alarms and CCTV to alert and monitor any activity;
- (ii) Perimeter fence complies with LPS 1175 SR1 standards and is installed to leave no gaps between fence and ground level;
- (iii) Gate design proposed shows a climbing step near locking latch this should be redesigned with cover plate to prevent creating a step over;
- (iv) CCTV system should have full day time/night time functionality and have ability to produce evidential quality imagery and all images should have time , date, and camera meta data;
- (v) The site should be signed that CCTV is in operation for safety and security and scheme registered and operated in accordance with DATA Protection legislation.

7. **REPRESENTATIONS**

- 7.1 Local Members have been consulted and any comments received will be reported to Planning Committee.
- 7.2 The application was publicised by press and site notices on 7 March 2019 as a major development.
- 7.3 Neighbouring occupiers have been consulted. Any comments received will be reported to Planning Committee.

8. ANALYSIS

- 8.1 The main considerations of this application are whether it complies with policies relating to renewable energy development, the nature of its impact upon the various nature conservation designations in the vicinity of the site, ground conditions and the impact upon the existing transport network during both construction and operation.

Policy Context

- 8.2 The provision of solar power is supported by national planning policy:
- (i) *Planning authorities should facilitate all forms of renewable and low carbon energy development. In doing so, planning authorities should seek to ensure their area's full potential for renewable and low carbon energy generation is maximised and renewable energy targets are achieved. (PPW10 paragraph 5.9.1).*
 - (ii) *Other than in circumstances where visual impact is critically damaging to a listed building, ancient monument or a conservation area vista, proposals for appropriately designed solar thermal and PV systems should be supported (TAN8 paragraph 3.15).*
- 8.3 Paragraphs 5.9.16 to 5.9.18 of Planning Policy Wales Edition 10 (PPW10) state:

"In determining applications for the range of renewable and low carbon energy technologies, planning authorities should take into account the contribution a proposal will make to meeting identified Welsh, UK and European targets; the contribution to cutting greenhouse gas emissions; and the wider environmental, social and economic benefits and opportunities from renewable and low carbon energy development.

Planning authorities should give significant weight to the Welsh Government's targets to increase renewable and low carbon energy generation, as part of our overall approach to tackling climate change and increasing energy security. In circumstances where protected landscape, biodiversity and historical designations and buildings are considered in the decision making process, only the direct irreversible impacts on statutorily protected sites and buildings and their settings (where appropriate) should be considered. In all

cases, considerable weight should be attached to the need to produce more energy from renewable and low carbon sources, in order for Wales to meet its carbon and renewable targets.

Planning authorities should also identify and require suitable ways to avoid, mitigate or compensate adverse impacts of renewable and low carbon energy development. The construction, operation, decommissioning, remediation and aftercare of proposals should take into account:

- the need to minimise impacts on local communities, such as from noise and air pollution, to safeguard quality of life for existing and future generations;*
- the impact on the natural and historic environment;*
- cumulative impact;*
- The capacity of, and effects on the transportation network;*
- grid connection issues where renewable (electricity) energy developments are proposed; and*
- the impacts of climate change on the location, design, build and operation of renewable and low carbon energy development. In doing so, consider whether measures to adapt to climate change impacts give rise to additional impacts*

- 8.4 The Local Development Plan (LDP) Policy KP15 states that increasing the supply of renewable energy should be considered in development proposals and remediating contaminated sites is in Cardiff's long-term sustainable development interests (LDP Policy KP18). LDP Policy EN12 places a requirement on major and strategic development proposals to maximise the potential for renewable energy.
- 8.5 These policies promoting renewable energy must be considered against policies designed to protect Cardiff's distinctive environmental assets, including local, national and statutory designations. LDP Policy KP16 (Green Infrastructure) recognises the need to protect, enhance and manage the City's network of spaces to ensure their integrity is maintained, whilst accepting that protection and conservation needs to be reconciled with the benefits of development. Specific reference is given to the City's undeveloped coastline, strategically important river valleys including the River Rhymney, and biodiversity interests including designated sites.
- 8.6 Development judged to cause unacceptable harm to the character and quality of the Wentloog Levels will not be permitted (LDP Policy EN3). The natural heritage, character and other key features of the River Rhymney Corridor will be protected, promoted and enhanced, together with facilitating public access and recreation (LDP Policy EN4). Development will not be permitted that would cause unacceptable harm to site of international or national nature conservation importance and proposals affecting local designations should ensure they maintain or enhance such designations. In such cases where this is not possible and the need for development outweighs the site's conservation importance, applications will need to demonstrate that there is no satisfactory alternative location and provide appropriate compensation to ensure no reduction in the overall value of the area (LDP Policy EN5).

Energy Targets

- 8.7 The proposals will contribute to the Welsh Government's targets for Wales to generate 70% of its electricity consumption from renewable energy by 2030; for one Gigawatt of renewable energy capacity in Wales to be locally owned by 2030 and for new renewable energy projects to have at least an element of local ownership by 2020.
- 8.8 The development will also contribute to the wider environmental, social and economic benefits of renewable energy.

Environmental Impact

- 8.9 The application site, being adjacent to the Severn Estuary Marine Sites, and the Severn Estuary Site of Special Scientific Interest (SSSI), amongst other interests, must be carefully considered in respect of its impact upon these designations, which are of international importance.
- 8.10 The Council's Ecologist has undertaken an 'Appropriate Assessment' (AA) on behalf of the Council as the 'competent authority' which concludes that, based upon the submitted application, the proposed development will not have an adverse effect upon the integrity of the Severn Estuary sites, provided certain conditions are attached to any permission. A copy of the amended AA is appended to this report.
- 8.11 Following NRW's initial concerns regarding the potential effects of the development upon Redshank and Dunlin roost sites at the mouth of the River Rhymney, the applicant provided a further technical note (appended to this report) following a further assessment on potential operational effects. Reading both documents together, NRW have now confirmed their agreement with the overall conclusions that there will be no adverse effect and therefore they advise that no additional mitigation measures are required.
- 8.12 The Council's Ecologist is satisfied that features of the Severn Estuary SSSI, given they overlap substantially with the international designations, are satisfactorily covered by the amended AA.
- 8.13 During the course of the application amended and additional information has been received in respect of reptiles. Invertebrates and nesting birds, and an ecology management plan have also been considered in the Ecologist's assessment. He advises that a condition be attached to any decision Members may be minded to grant to secure the submission of a Green Infrastructure Statement. This document will show how the various elements of the green infrastructure and any associated uses and movement have a clear role and purpose in the development. The conclusions and recommendations of the supporting documents will be incorporated into the Statement to ensure that the green resource is protected, enhanced and managed so that its integrity and connectivity is maintained.

- 8.14 There is not considered to be any impact upon existing trees on the site as a buffer of 10 metres will be retained to any site perimeter fencing and 15 metres to any solar panel. The Council's Tree Officer is satisfied that the species and size of trees on the site mean that impacts are unlikely to occur over the lifetime of the development and he notes that a long-term ecological management plan will be conditioned which will provide for management of the young tree belt.
- 8.15 In respect of impact upon the archaeological resource, Glamorgan Gwent Archaeological Trust (GGAT) recognised that the modern use of the site as landfill with subsequent remediation and capping means that any potential buried archaeological resource would be at a great depth. No piling or penetrative works are proposed. The ancillary structures will be constructed on a raft foundation but GGAT acknowledge that these are unlikely to impact upon the resource.
- 8.16 In respect of flood risk, although sited immediately adjacent to the River Severn and River Rhymney, the topography of the land rises sharply such that the site does not fall within C1 or C2 land on the Development Advice Maps.
- 8.17 Shared Regulatory Services, Environment, considers that their concerns regarding the potential breach of the sealed and capped landfill can be adequately safeguarded through relevant conditions.
- 8.18 Following the introduction of the SuDs Approval Body (SAB) on 7 January 2019, the Operational Manager, Drainage Division has advised that any surface water drainage matters would be assessed under this separate process.

Transportation

- 8.19 The Operational Manager, Transportation, raised no concerns regarding the transport impacts of the development, either during construction or operation. A condition is recommended to ensure the submission and approval of a Construction and Environmental Management Plan (CEMP) prior to the commencement of development to agree phasing of construction works, location of parking and construction compounds, plant and material storage, and pollution prevention measures including control of dust and wheel washing.
- 8.20 On site activity is expected to be minimal following construction. Once operational, the applicant anticipates planned visits to the site every quarter for maintenance activities.

Amenity Considerations

- 8.21 Regarding noise, members are advised to note the comments of the Shared Regulatory Services Neighbourhood Services Officer in paragraph 5.31, who was satisfied that the noise level of the equipment, both during construction

and operation, is unlikely to be audible above existing background noise levels.

- 8.22 They also accepted that light and reflection issues would be unlikely to arise due to the design and orientation of the panels in relation to residential properties.
- 8.23 The proposals will not be readily visible from public viewpoints. The development will be most prominent from viewpoints to the southwest, including the Wales Coast Path adjacent to Rover Way and residential properties in Pengam Green, and further away in Rumney to the north. The Landscape and Visual Impact Assessment concludes that the proposals would have a negligible effect during construction and operation on the landscape and no more than a negligible effect on views. Officers agree with these conclusions.

Cumulative Impact

- 8.24 Aside from the existing wind turbine on Wentloog Avenue approximately 1.8 km northeast of the site, there are no other known renewable energy schemes or any other solar farm developments in the area. Consequently, there is not considered to be any harmful cumulative impact arising from the proposed development.

Grid Connections

- 8.25 The proposed point of connection to the grid would be to an existing substation to the north near the main entrance to Lamby Way. Other potential routes for separate private wire connections may come forward however any such connection would be subject to a separate planning application.

Wales Coast Path

- 8.26 Separate to this application, plans are being developed to re-route the existing Wales Coast Path so that it crosses the landfill. The exact alignment of the path is yet to be confirmed however it will not cross the application site. The submitted plans show that the existing maintenance/access track around the perimeter of the site adjacent to the edge of the River Rhymney would be retained outside of the solar farm and would be retained as a future footpath option (either as the official Coast Path route or an alternative footpath option).
- 8.27 The development does not preclude the future public access of parts of the landfill site in line with Policy EN4 (River Corridors).

Other Considerations

- 8.28 *Crime and Disorder Act 1998* – Section 17(1) of the Crime and Disorder Act 1998 imposes a duty on the Local Authority to exercise its various functions with due regard to the likely effect of the exercise of those functions on, and

the need to do all that it reasonably can to prevent, crime and disorder in its area. This duty has been considered in the evaluation of this application. It is considered that there would be no significant or unacceptable increase in crime and disorder as a result of the proposed decision.

- 8.29 *Equality Act 2010* – The Equality Act 2010 identifies a number of ‘protected characteristics’, namely age; disability; gender reassignment; pregnancy and maternity; race; religion or belief; sex; sexual orientation; marriage and civil partnership. The Council’s duty under the above Act has been given due consideration in the determination of this application. It is considered that the proposed development does not have any significant implications for, or effect on, persons who share a protected characteristic.
- 8.30 *Well-Being of Future Generations Act 2016* – Section 3 of this Act imposes a duty on public bodies to carry out sustainable development in accordance with the sustainable development principle to act in a manner which seeks to ensure that the needs of the present are met without compromising the ability of future generations to meet their own needs (Section 5). This duty has been considered in the evaluation of this application. It is considered that there would be no significant or unacceptable impact upon the achievement of wellbeing objectives as a result of the recommended decision.

9. CONCLUSIONS

- 9.1 The development is considered to comply with local and national planning policies, which advises Local Planning Authorities to “*facilitate all forms of renewable and low carbon energy development*” and “*give significant weight to the Welsh Government’s targets to increase renewable and low carbon energy generation.*” It will deliver a clear benefit in the form of low carbon electricity generation which supports the development of a prosperous and resilient Cardiff that is aiming to improve its renewable energy production.
- 9.2 The impacts upon the neighbouring nature conservation designations including European Sites, national sites, and protected species have been assessed, with an Appropriate Assessment (AA) being undertaken by the Council to assess the impacts upon the Severn Estuary sites. The Council’s Ecologist is satisfied that there will be no adverse effect upon the integrity of the Severn Estuary sites, nor will there be any harmful impact upon the Severn Estuary SSSI or wildlife interests. Relevant conditions are recommended.
- 9.3 Natural Resources Wales (NRW) are satisfied with the conclusions of the updated AA.
- 9.4 Conditions are recommended in respect of the decommissioning of the operation after its 35 year life span, or sooner if required, and the restoration of the land to its former use.
- 9.5 It is recommended that planning permission be granted subject to relevant conditions.

Habitats Regulations Appraisal

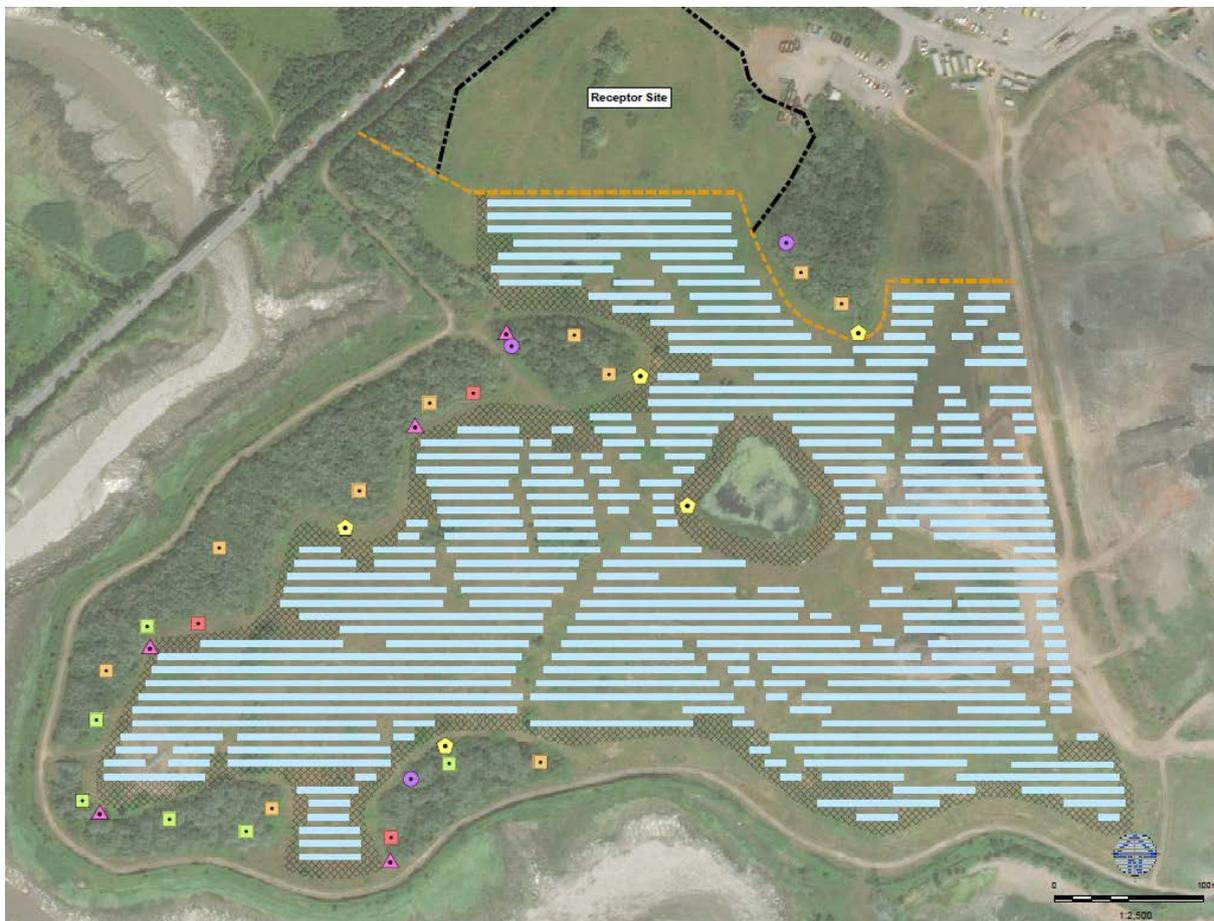
Severn Estuary Special Protection Area (SPA), Special Area of Conservation (SAC), and Wetland of International Importance (Ramsar Site)

Application No: 19/00397/MJR

Proposal: Installation of a ground-mounted photovoltaic solar farm and ancillary development

Location: Lamby Way Landfill Site, Lamby Way, Wentloog, Cardiff, CF3 2HP

DC Officer: Tim Walter



Contents

- 0 Introduction
- 1 Stage 1 Test of Likely Significance
- 2 Stage 2 Appropriate Assessment
- 3 Conclusion
- 4 Consultation with Natural Resources Wales
- 5 References

Tables

- Table 1 HRA Key Stages
- Table 2 SAC Vulnerabilities
- Table 3 SPA Vulnerabilities
- Table 4 Ramsar Site Vulnerabilities
- Table 5 Birds recorded in Parc Tredelerch
- Table 6 Birds recorded in Cors Crychydd
- Table 7 SPA/Ramsar site individual qualifying species recorded in Rhymney Estuary and Great Wharf
- Table 8 Comparison of likely impacts of the project with categories of operations which may cause deterioration or disturbance
- Table 9 Levels of sensitivity of Severn Estuary SAC, SPA and Ramsar site features to identified pathways for adverse effect
- Table 10 Screened-in Factors
- Table 11 Summary of Test of Likely Significance
- Table 12 Summary of Test of Adverse Effect upon Integrity

Appendices

Appendix 1. Technical Note: Lamby Way Solar Farm HRA – Redshank Roost Update. Arcadis, 26/04/19.

Introduction

0.1 This planning application was identified as requiring a Habitats Regulations Appraisal in accordance with section 1.5.11 of the approved Green Infrastructure Supplementary Planning Guidance.

0.2 Under Regulation 63(1) of the Conservation of Habitats and Species Regulations 2017, referred to as the 'Habitats Regulations', a competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which...

- a) is likely to have a significant effect on a European site or a European offshore marine site (either alone or in combination with other plans or projects), and
- b) is not directly connected with or necessary to the management of that site,

...must make an appropriate assessment of the implications for that site in view of that site's conservation objectives. In the light of the conclusions of the assessment, the competent authority may agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site.

0.3 The European Sites considered here are the Severn Estuary Special Area of Conservation (SAC) and the Severn Estuary Special Protection Area (SPA).

0.4 As a matter of Welsh Government policy, Ramsar sites (sites listed under the Ramsar convention as wetlands of international importance) should be treated in the same way as SACs and SPAs, including in particular in relation to the consideration of plans and projects likely to affect them. Therefore following a procedure analogous to Regulation 63 in relation to the Severn Estuary Ramsar Site would also help ensure adherence to WG policy. For the remainder of this document these three designations will be referred to as the Severn Estuary European Marine Site (Severn Estuary EMS).

0.5 This procedure, known as a Habitats Regulations Appraisal (HRA), has been invoked because it has been identified that the current project has the potential to affect the Severn Estuary EMS and it is not directly connected with or necessary to the management of those sites.

0.6 Table 1 below sets out the main stages in undertaking a HRA. The subsequent HRA text will refer to Stage 1, Stage 2 etc as described in this table. It may not be necessary to complete all stages for all factors which may affect the designated sites.

Table 1	
Habitats Regulations Appraisal: Key Stages	
Stage 1	
Screening for likely significant effect	<ul style="list-style-type: none"> ▪ Describe the project being considered ▪ Identify international sites in and around the plan/ strategy area in a search area agreed with the Statutory Body Natural Resources Wales ▪ Examine conservation objectives of the interest feature(s)(where available) ▪ Review proposals and consider potential effects on European sites (magnitude, duration, location, extent) ▪ Examine other plans and programmes that could contribute to in combination effects ▪ Produce Screening Assessment <p><i>If no effects likely – report no significant effect (taking advice from NRW if necessary).</i></p> <p><i>If effects are judged likely or uncertainty exists – the precautionary principle applies proceed to stage 2</i></p>
Stage 2	
Appropriate Assessment	<ul style="list-style-type: none"> ▪ Agree scope and method of AA with NRW ▪ Consider how project, in combination with other projects, will interact when implemented, taking into account inherent avoidance and mitigation measures (the Appropriate Assessment) ▪ Using the AA, and any conditions or restrictions which may be applied to any planning consent, undertake Integrity Test ▪ Report outcomes of HRA including mitigation measures, conditions or restrictions, and consult with NRW <p><i>If plan will not significantly affect European site proceed without further reference to Habitats Regulations</i></p> <p><i>If effects or uncertainty remain following the consideration of alternatives and development of mitigations proceed to stage 3</i></p>
Stage 3	
Procedures where significant effect on integrity of international site remains	<ul style="list-style-type: none"> ▪ Consider alternative solutions, delete from plan or modify ▪ Consider if priority species/ habitats affected ▪ Identify ‘imperative reasons of overriding public interest’ (IROPI) economic, social, environmental, human health, public safety ▪ Notify Welsh Government ▪ Develop and secure compensatory measures

0.7 The check for likelihood of significant effects is an initial filter, and should be a relatively quick way of deciding whether the project would be likely to negatively affect the site in a significant way. The subsequent appropriate assessment stage would normally form the more in depth assessment. The term ‘likelihood’ is important. The test is a likelihood of effects rather than a certainty of effects. The check should only allow those projects to proceed where it is clear that any significant effect is unlikely. If there is doubt and further information is needed, it should be concluded that there is a likelihood of significant effects. In this context, and using the normal meaning of the words, “significant” effects are taken to be effects that are worthy of attention, noteworthy. A likely effect is one that is probable or well might happen. (Tyldesley, D. 2009).

0.8 In the Waddenzee case the ECJ ruled that a project should be subject to appropriate assessment **“if it cannot be excluded, on the basis of objective information, that it will have a significant effect on the site, either individually or in combination with other plans and projects”**. This is an important ruling because it establishes that ‘likely’ should not be interpreted as ‘probable’ or ‘more likely than not’. Rather an effect should be considered likely if it cannot be ruled out on the basis of objective information. (Tyldesley, D. 2009).

0.9 When undertaking an appropriate assessment, the competent authority should distinguish clearly between mitigation (avoidance and reduction) measures and compensatory measures. It should take account of the avoidance and reduction measures built into the project and forming part of the project as proposed or applied for (Tyldesley, D. 2009).

0.10 In considering whether it can ascertain whether the project would have an adverse effect on the integrity of the European site, the competent authority should consider whether the imposition of conditions, or other restrictions, on the project, and the way in which it would be carried out, would enable it to be ascertained that the project would not have an adverse effect on the integrity of the site. (Tyldesley, D. 2009).

0.11 The following definition of the integrity of a site has been adopted by the UK Government. The integrity of the site is *“the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified”*.

0.12 The present HRA report is based upon the ‘Statement to Inform an Appropriate Assessment’ Version 03 dated April 2019, submitted in support of the planning application 19/00397/MJR by Arcadis Consulting (UK) Ltd.

1.0 Stage 1

1.1 Project Description (as set out in Design and Access Statement submitted in support of this application)

1.1.1 The site is situated on the eastern edge of Cardiff. To the north there is a car park and recycling plant, to the east a recently capped area of landfill (with landfill areas further beyond), to the southeast and south there is the Severn Estuary/Bristol Channel and to the southwest and west there is the Rhymney River.

1.1.2 The proposed solar project would be located on the capped and restored landfill site (approximately 19 Ha in size). The capping has been ongoing since the 1970s, with final capping completed in 1999. The site has since been restored with new grassland, woodland and ponds being created. The development focusses on the open areas of grassland and does not require the removal of the woodland areas or ponds.

1.1.3 The site clearance works will take place in April / May 2019. The solar farm will be constructed following completion of the clearance works between April / May and September / October 2019.

1.1.4 The proposed development comprises a new 8.7MW ground-mounted solar farm. The proposal includes provision for a galvanized steel mounting structure supported on surface mounted concrete pads. The solar panels (each measuring 1m x 1.67m) are fixed directly to the mounting structure and these are referred to as arrays. The arrays will not exceed 2.8m in height and the lower edge will be around 750mm above ground level (the undulating nature of the ground means this measure cannot be precise). The arrays will face due south and will be spaced between 1.6 and 6.5m apart (depending on the local topography of the site). The panels will be mounted at an angle of between 15 and 25 degrees to the sun. The existing vegetation on the site will remain and be allowed to recover post completion.

1.1.5 The proposed development also requires a number of containerised and similar structures to house high voltage electrical equipment including inverters, transformers and switchgear. Each of these will be set on a concrete raft foundation to spread the load across a wider area.

1.1.6 The panels would be set back from the boundary with the scrub adjacent to the River Rhymney, being retained. It is proposed that the Wales Coastal Path will be rerouted to pass along the northern and eastern boundaries of the site from its current alignment, which takes it inland to the east of the landfill site. In order to provide areas of open habitat, a 10 m buffer will be retained between the areas of plantation woodland around the site and the perimeter fenceline. The site will be secured using a 2.2m high security fence (agricultural timber and wire fence), with 3-4m high CCTV camera poles located at intervals inside the site and close to the fence. Access would be provided via proposed tracks which will be constructed with hardcore or via injecting cement powder into the top 300mm of the cap.

1.1.7 The installation has been designed to ensure that the existing constraints of the site are properly considered. Nothing will penetrate through the landfill cap. The existing gas management system will be retained and measures to ensure its maintenance have been included in the design including offsets around well heads, maintenance tracks, and access to maintain gas pipework.

1.1.8 Most of the equipment will be brought in by HGV trucks, with around 50 vehicles expected during the construction period. The haul route into the construction site will follow the existing

Lamby Way to the north of the proposed development. Access into the construction site will also be located at the northern end of the proposed development site. There will be 5 tracks (4 for transformer stations and 1 for customer substations) across the construction site in order to install the solar farm.

1.1.9 The total construction period is expected to last 12 weeks. The deliveries will be spaced across the construction period, with typically up to 10 a day throughout the construction phase. A Construction and Decommissioning Method Statement will be produced for the proposed development.

1.1.10 During the construction period the following activities will be undertaken:

- site clearance, which will involve clearing vegetation (including a reptile translocation) and marking out the site;
- erecting the security fence, creating internal access roads, compound and crane area;
- installing the concrete foundations and the frames and mounting frames [Note: piling methods will not be used for this activity];
- affixing the panels to the mounting frames and stringing (connecting the panels together);
- trenching for the cable (designed to protect the engineering cap), and laying cables;
- pouring the concrete base for the electrical housing / cabinets (Switchgear, Transformer, Inverters etc.);
- installation of the housing / cabinets;
- erecting pole mounted CCTV cameras;
- connecting all the cables up and backfilling the cable trenches; and
- landscaping works.

1.1.11 The solar development would constitute a temporary development and would be decommissioned at the end of its operational period (approximately 35 years). The decommissioning would typically last a similar length of time and would have similar impacts as the construction phase.

1.2 Designated sites and their features

1.2.1 Severn Estuary Special Area of Conservation (SAC)

SAC Habitat Features

- Estuaries;
- Mudflats and sandflats not covered by seawater at low tide;
- Atlantic salt meadow (*Glauco-Puccinellietalia maritimae*).
- Sandbanks which are slightly covered by sea water all the time; and
- Reefs.

SAC Species Features

- Sea lamprey *Petromyzon marinus*;
- River lamprey *Lampetra fluviatilis*; and
- Twait shad *Alosa fallax*.

1.2.2 Severn Estuary Special Protection Area (SPA)

The Severn Estuary SPA supports internationally important assemblages of wildfowl and waders during the winter months and migratory periods. These designations are based on:

- Internationally important populations of the Annex 1 species Bewick's Swan.
- Internationally important populations of regularly occurring migratory species (Gadwall, Shelduck, Redshank, Dunlin and European White-Fronted Goose).

The site also qualifies as an SPA since it regularly supports in excess of 60,000 waterfowl during the winter. The species listed on the SPA citation as forming part of the assemblage include Wigeon, Teal, Pintail, Pochard, Tufted Duck, Ringed Plover, Grey Plover, Curlew, Whimbrel and Spotted Redshank. Mallard, Lapwing and Shoveler have also been added as a result of the 1995 SPA review.

1.2.3 Severn Estuary Ramsar Site

- Estuaries
- Assemblage of migratory fish species
- Bewick's swan
- European white-fronted goose
- Dunlin
- Redshank
- Shelduck
- Gadwall
- Assemblage of waterfowl

1.3 Conservation Objectives of the Relevant Designated Sites

The Conservation Objectives of the Relevant Designated Sites are taken as set out in the following document:- Natural England & CCW (2009) *The Severn Estuary / Môr Hafren European Marine Site comprising: The Severn Estuary / Môr Hafren Special Area of Conservation (SAC), The Severn Estuary Special Protection Area (SPA), The Severn Estuary / Môr Hafren Ramsar Site.* Natural England & the Countryside Council for Wales' advice given under Regulation 33(2)(a) of the Conservation (Natural Habitats, &c.) Regulations 1994, as amended. June 2009.

1.3.1 The Conservation Objectives of the Severn Estuary SAC are:-

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the Favourable Conservation Status of its Qualifying Features, by maintaining or restoring;

- The extent and distribution of qualifying natural habitats and habitats of qualifying species
- The structure and function (including typical species) of qualifying natural habitats
- The structure and function of the habitats of qualifying species
- The supporting processes on which qualifying natural habitats and the habitats of qualifying species rely
- The populations of qualifying species, and,
- The distribution of qualifying species within the site.

Further information on the Severn Estuary SAC can be found at :-

<http://www.jncc.gov.uk/ProtectedSites/SACselection/sac.asp?EUCode=UK0013030>

1.3.2 The Conservation Objectives Severn Estuary SPA are:

Ensure that the integrity of the site is maintained or restored as appropriate, and ensure that the site contributes to achieving the aims of the Wild Birds Directive, by maintaining or restoring;

- The extent and distribution of the habitats of the qualifying features
- The structure and function of the habitats of the qualifying features
- The supporting processes on which the habitats of the qualifying features rely
- The population of each of the qualifying features, and,
- The distribution of the qualifying features within the site.

Further information on the Severn Estuary SPA and Ramsar Site can be found at:-

<http://www.jncc.gov.uk/default.aspx?page=2066>.

The Conservation Objectives for the features of the Ramsar site are the same as those for the homologous features of the SAC and SPA.

Further information on the Severn Estuary Ramsar Site can be found

at <http://www.jncc.gov.uk/pdf/RIS/UK11081.pdf>.

1.4 Factors to which site features are sensitive

1.4.1 With reference to the Conservation Objectives for the features of each site, the tables below list the factors to which each feature is sensitive for issues other than harm to birds. These tables are duplicated from those set out in 'Regulation 33' advice for these sites – see references below.

Table 2 SAC Vulnerabilities

Sensitivity		Exposure		Vulnerability	
High sensitivity	OOO O	High Exposure	x x x x	High vulnerability	⊗⊗⊗⊗ ⊗⊗⊗O ⊗⊗⊗x
Moderate sensitivity	OOO	Medium Exposure	x x x	Moderate vulnerability	⊗⊗⊗O ⊗⊗x x ⊗⊗⊗
Low sensitivity	OO	Low Exposure	x x	Low vulnerability	⊗⊗O ⊗xxx ⊗⊗x ⊗xx ⊗⊗ ⊗x
No detectable sensitivity	O	No exposure	x	No vulnerability	⊗O
?S=Insufficient information on sensitivity; ✓ = migratory fish considered to be sensitive, but insufficient information to assess level of sensitivity					Unknown vulnerability

Categories of operations which may cause deterioration or disturbance ²⁵	Annex I features					Annex II species
	Estuaries	Subtidal Sandbanks	Mudflats & sandflats	Atlantic saltmeadow	Reefs	Fish ²⁶
Physical loss						
Removal / substratum loss	⊗⊗⊗⊗	⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗O	⊗x
Smothering	⊗⊗⊗O	⊗⊗x	⊗⊗⊗	⊗⊗⊗O	⊗⊗	⊗x
Physical damage						
Changes in suspended sediment	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗x
Desiccation & changes in emergence regime	⊗⊗O	⊗O	⊗⊗O	⊗⊗OO	⊗O	✓xx
Changes in water flow rate	⊗⊗⊗x	⊗⊗O	⊗⊗⊗x	⊗⊗⊗x	⊗⊗O	✓xx
Changes in wave exposure	⊗⊗⊗⊗	⊗⊗O	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗O	⊗x
Abrasion / physical disturbance (of habitats)	⊗⊗⊗x	⊗⊗x	⊗⊗⊗x	⊗⊗⊗x	⊗⊗O	✓xx
Changes in grazing management	⊗⊗	Not relevant	Not relevant	⊗⊗⊗⊗	Not relevant	Not relevant
Non-physical disturbance						
Noise & visual presence	⊗xx	⊗xx	⊗⊗x	⊗xxx	⊗x	✓xxx
Toxic contamination						
Introduction of synthetic compounds	⊗⊗⊗x	⊗⊗⊗x	⊗⊗⊗⊗	⊗⊗⊗x	⊗⊗xx	✓xxxx
Introduction of non-synthetic compounds	⊗⊗⊗x	⊗⊗⊗x	⊗⊗⊗⊗	⊗⊗⊗⊗	?Sxxxx	✓xxxx
Introduction of radionuclides	?Sxx	?Sxx	?Sxx	?Sxx	?Sxx	✓xx
Non-toxic contamination²⁷						
Changes in nutrient loading	⊗⊗⊗⊗ ²⁸	⊗⊗xx	⊗⊗⊗x	⊗⊗⊗x	⊗⊗xx	✓xxxx
Changes in thermal regime	⊗⊗⊗	⊗⊗	⊗⊗⊗	⊗⊗	⊗⊗	✓xxxx
Changes in turbidity ²⁹ (light penetration)	⊗⊗x	⊗⊗x	⊗⊗x	⊗x	⊗xx	✓xxx
Changes in salinity	⊗⊗⊗x	⊗⊗⊗x	⊗⊗xx	⊗⊗⊗x	⊗⊗xx	✓xxxx
Changes in oxygenation	⊗⊗⊗x	⊗⊗xx	⊗⊗xx	⊗⊗xx	⊗⊗xx	✓xxxx
Biological disturbance						
Introduction of microbial pathogens	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗xx	?Sxxxx	✓xxxx
Introduction of non-native species	⊗⊗⊗O	⊗⊗O	⊗⊗OO	⊗⊗	?Sxx	✓xx
Selective extraction of species	⊗⊗⊗x	⊗⊗	⊗⊗	⊗⊗	⊗⊗	✓xx

²⁵ For a further explanation of each category see <http://www.marlin.ac.uk/sah/basketemplate.php?benchmarks>

²⁶ River lamprey, sea lamprey & twaite shad

²⁷ All elements of non toxic contamination are interrelated and also link closely with changes in suspended sediment (physical damage)

²⁸ The high natural turbidity of the estuary negates these high levels with algal productivity being generally low – the estuary feature is therefore not considered vulnerable – see section 5.6.1.3.(viii)

²⁹ Turbidity here incorporates light penetration; suspended sediment under ‘changes in suspended sediment’ and its deposition under ‘smothering’

Table 3 SPA Vulnerabilities

Sensitivity		Exposure		Vulnerability	
High sensitivity	OOOO	High Exposure	x x x x	High vulnerability	⊗⊗⊗⊗ ⊗⊗⊗O ⊗⊗⊗x
Moderate sensitivity	OOO	Medium Exposure	x x x	Moderate vulnerability	⊗⊗OO ⊗⊗x x ⊗⊗⊗
Low sensitivity	OO	Low Exposure	x x	Low vulnerability	⊗⊗O ⊗xxx ⊗⊗x ⊗xx ⊗⊗ ⊗x
No detectable sensitivity	O	No exposure	x	No vulnerability	⊗O
?S =Insufficient information on sensitivity				Unknown vulnerability	

Categories of operations which may cause deterioration or disturbance	Internationally important populations of regularly occurring Annex 1 species		Internationally important migratory species and waterfowl assemblage		
	Intertidal mudflats and sandflats	Saltmarsh	Intertidal mudflats and sandflats	Saltmarsh	Hard substrates
Physical Loss					
Removal/substratum loss	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗⊗
Smothering	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗
Physical Damage					
Changes in suspended sediment	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗
Desiccation and changes in emergence regime	⊗⊗O	⊗⊗OO	⊗⊗O	⊗⊗OO	⊗⊗O
Changes in water flow	⊗⊗⊗x	⊗⊗⊗x	⊗⊗⊗x	⊗⊗⊗x	⊗⊗⊗x
Changes in wave exposure	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗⊗
Abrasion / physical disturbance (of habitats)	⊗⊗	⊗⊗O	⊗⊗⊗⊗	⊗⊗⊗x	⊗⊗⊗x
Grazing management	Not relevant	⊗⊗⊗⊗	Not relevant	⊗⊗⊗⊗	Not relevant
Non-physical disturbance					
Noise & visual presence	⊗⊗OO	⊗⊗⊗O	⊗⊗⊗O	⊗⊗⊗⊗	⊗⊗⊗O
Toxic contamination					
Introduction of synthetic compounds	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗x	⊗⊗⊗x
Introduction of non-synthetic compounds	⊗⊗⊗	⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗⊗	⊗⊗⊗x
Introduction of radionuclides	?Sxx	?Sxx	?Sxx	?Sxx	?Sxx
Non-toxic contamination					
Changes in nutrient loading	⊗xxx	⊗⊗⊗x	⊗⊗⊗x	⊗⊗⊗x	⊗⊗xx
Changes in thermal regime	⊗x	⊗⊗	⊗⊗⊗	⊗⊗	⊗⊗
Changes in turbidity (light penetration)	⊗xx	⊗x	⊗⊗x	⊗x	⊗⊗x
Changes in salinity	⊗xxx	⊗⊗⊗x	⊗⊗xx	⊗⊗⊗x	⊗⊗xx
Changes in oxygenation	⊗xxx	⊗⊗xx	⊗⊗xx	⊗⊗xx	⊗⊗xx
Biological disturbance					
Introduction of microbial pathogens	⊗⊗xx	⊗⊗xx	⊗⊗⊗⊗	⊗⊗xx	⊗⊗⊗⊗
Introduction of non-native species	⊗x	⊗⊗	⊗⊗OO	⊗⊗	⊗⊗OO
Selective extraction of species	⊗⊗O	⊗⊗O	⊗⊗⊗	⊗⊗⊗	⊗xx

Table 4 Ramsar Vulnerabilities (as related to tables 1 & 2 above, and referring to sections and tables in Reg 33 advice (ref 12.1)).

Ramsar interest features	Relevant SAC and SPA features and supporting habitats	Reference section for advice on operations relevant to the Ramsar features
<i>Ramsar Interest feature 1 : Estuaries</i>	SAC: Annex I habitats Estuaries Intertidal mudflats and sandflats Atlantic Salt Meadows	Section 5.6.1 & Table 22 Section 5.6.3 & Table 22 Section 5.6.4 & Table 22
<i>Ramsar Interest feature 2 : Migratory fish assemblage</i>	SAC : Annex II species River lamprey <i>Lampetra fluviatilis</i> ; Sea lamprey <i>Petromyzon marinus</i> ; Twaite shad <i>Alosa fallax</i>	Section 5.6.6 & Table 22 Section 5.6.6 & Table 22 Section 5.6.6 & Table 22
Internationally important populations of waterfowl <i>Ramsar Interest feature 3: Bewick's swan</i> <i>Ramsar Interest feature 4: European white-fronted goose</i> <i>Ramsar Interest feature 5: Dunlin</i> <i>Ramsar Interest feature 6: Redshank</i> <i>Ramsar Interest feature 7: Shelduck</i> <i>Ramsar Interest feature 8: Gadwall</i>	SPA : Internationally important populations of regularly occurring Annex I species (Bewick's swan) SPA: Internationally important populations of regularly occurring migratory species (same species as column to left) Supporting habitats Intertidal mudflats and sandflats Saltmarsh Hard substrates	Section 5.7.1 & Table 23 Section 5.7.2 & Table 23 Section 5.6.3 & Table 22 Section 5.6.4 & Table 22
<i>Ramsar Interest feature 9 Internationally important assemblage of waterfowl</i>	SPA: Internationally important assemblage of waterfowl Supporting habitats Intertidal mudflats and sandflats Saltmarsh Hard substrates	Section 5.7.2 & Table 23 Section 5.6.3 & Table 22 Section 5.6.4 & Table 22

1.5 Baseline Environment

1.5.1 Overview

This section provides details of the ecological information gathered to inform the Stage 1 screening assessment. Reference to site-specific surveys undertaken for the project have been included, where relevant.

1.5.2 Ecological Information

1.5.2.1 The following sources of ecological information have been considered during the screening exercise:

- British Trust for Ornithology (BTO) Bird Track.
- Glamorgan Bird Club (East Glamorgan Bird Atlas).
- Natural England goose and swan functional land Impact Risk Zone (IRZ) buffer.
- BTO Wetland Bird Survey (WeBS) data.
- South East Wales Biodiversity Records Centre (SEWBRc) Records.
- Ecological Surveys of the site.

1.5.2.2 Each of these data sources, and the results of the data gathering exercise, is described below.

BTO Bird Track records

1.5.2.3 Bird Track is an online recording portal available through the BTO that anyone can register to use, and enables birdwatchers to upload their sightings. Whilst it cannot necessarily be relied upon to provide accurate and detailed location information of bird sightings; it provides a useful guide as to the presence of large flocks of SPA/ Ramsar site species and covers a much wider area than would be covered by regular, standardised surveys, such as WeBS.

1.5.2.4 A search of the Bird Track records did not identify any records within the proposed development boundary, the nearest records of SPA/ Ramsar site species were more than 2km to the east of the site within the Gwent Levels – Rumney and Peterstone Site of Special Scientific Interest (SSSI).

Glamorgan Bird Club

1.5.2.5 Glamorgan Bird Club hold an online Bird Atlas with records from 421 tetrads within East Glamorgan. The proposed solar farm development lies within tetrad ST271 (Lamby Way). The Atlas includes breeding and wintering records covering a 50-year period. However, for the purposes of this Report, the most recent wintering records, covering 2007 – 2011, were reviewed. The tetrad data shows that there are records of six SPA/ Ramsar site qualifying species (including: Bewick's swan, shelduck, pintail, ringed plover, dunlin and redshank), plus a further 33 species which could form part of the qualifying waterbird assemblage present within tetrad ST271. However, as the tetrad includes the edge of the Severn Estuary SPA/ Ramsar site, Lamby Salt Marsh Site of Importance for Nature Conservation (SINC), and the River Rhymney SINC, it is likely that the records relate to these other more suitable locations, rather than the proposed development site itself.

Natural England goose and swan functional land IRZ buffer (GIS Data)

1.5.2.6 Natural England have produced a swan and goose functional land IRZ buffer, to provide an indication as to the potential for areas to support wintering geese and swans associated with SPA/ Ramsar sites across England and the borders of Wales around the Dee Estuary and the Severn Estuary. The IRZ does not take account of the presence of existing development, as such, being within the buffer does not necessarily mean an area supports suitable habitat, but does provide an indication as to where suitable habitat could be present. Due to the close proximity of the proposed development site to the Severn Estuary, the site does lie within the goose and swan functional land IRZ buffer.

BTO WeBS data

1.5.2.7 The BTO carry out the WeBS monitoring scheme for non-breeding waterbirds across the UK. Synchronised monthly counts at wetlands of all habitat types, are carried out mainly during the winter period. These WeBS Core Counts are supplemented by occasional WeBS Low Tide Counts undertaken on estuaries, with the aim of identifying key feeding areas. There are four WeBS Core Count sectors adjacent to the proposed development site.

1.5.2.8 Low tide Count data is available for the Severn Estuary; however the most recent data is from 2008/09. Given that this data is now ten years old, and more recent data is available from other sources, it was not deemed necessary to obtain the Low tide Count data.

1.5.2.9 The Core Count sectors adjacent to the proposed development site comprise:

- Parc Tredelerch – Cardiff (Location Code: 60055)

- Cors Crychudd Reen (Location Code: 60011)
- Rhymney Estuary and Great Wharf (Location Code: 61405)
- Peterstone Wentlooge (Location Code: 60401)

1.5.2.10 All of these sectors have been counted in the last five years, and data has been obtained for the three Core Count sectors (Parc Tredelerch – Cardiff, Cors Crychudd Reen, and Rhymney Estuary and Great Wharf) closest to the proposed development.

Parc Tredelerch – Cardiff (Location Code: 60055)

1.5.2.11 This count sector is located to the northwest of the proposed development site. The WeBS data shows that no SPA/ Ramsar site qualifying species have been recorded. However, 13 bird species which would form part of the waterbird assemblage are present within the count sector in small numbers (refer to Table 5).

Table 5: Birds recorded within the Parc Tredelerch - Cardiff count sector

Species	5 yr average (2012/13 – 2016/17)
Canada goose	12
Tufted duck	12
Cormorant	2
Moorhen	8
Black-headed gull	155
Lesser black-backed gull	38
Mute swan	9
Mallard	33
Great crested grebe	6
Grey heron	1
Coot	16
Common gull	1
Herring gull	91

The Cors Crychudd Reen (Location Code: 60011)

1.5.2.12 This Count sector is located to the northeast of the proposed development site. The WeBS data for this Count sector also shows that no SPA/ Ramsar site qualifying species were recorded. However, eight bird species which would form part of the waterbird assemblage are present within the count sector in small numbers (refer to Table 6).

Table 6: Birds recorded within the Cors Crychudd Reen count sector

Species	5 yr average (2012/13 – 2016/17)
Mute swan	6
Canada goose	2
Mallard	16
Little grebe	4
Lamby Way, Rumney, Cardiff	15
Grey heron	1
Moorhen	18
Coot	5
Black-headed gull	1

Rhymney Estuary and Great Wharf (Location Code: 61405)

1.5.2.13 This Count sector is located to the south and east of the proposed development site. The WeBS data for this Count sector shows that individual SPA/ Ramsar site qualifying species are present within the count sector (refer to Table 7). Species which would form part of the waterbird assemblage are present within the count sector.

Table 7: SPA/ Ramsar site individual qualifying species recorded within the Rhymney Estuary and Great Wharf count sector

Species	5 yr average (2012/13 – 2016/17)
Ringed plover (on passage)	9
Curlew	4
Dunlin	1500
Pintail	155
Redshank	1167
Shelduck	428
Gadwall	9
Lesser black-backed gull (breeding only)	37
Teal	41

1.5.2.14 Numbers of Dunlin and Redshank are of particular importance. The numbers of Dunlin recorded in this count sector (adjacent to the proposed development) represent approximately 3.5% of the total number of wintering Dunlin recorded when the SPA was designated (41,683, 5 year mean peak between 1988/9 and 1992/3) and more than 50% of Redshank numbers (2013, 5 year mean peak between 1988/9 and 1992/3). The conservation objectives contained within the regulation 33 advice for both Dunlin and Redshank require maintenance of the population such that numbers do not fall below the 5 year mean peak between 1988/9 and 1992/3. Therefore, maintenance of the Dunlin population so numbers do not fall below 41,683 individuals and maintenance of Redshank populations so that numbers do not fall below 2013 individuals.

SEWBReC

1.5.2.15 As part of the desk study for the Preliminary Ecological Appraisal (PEA) of the proposed development, SEWBReC were contacted for records of protected and/or notable species, including records of SPA/ Ramsar site species. The records from 2008 to 2016, identified one waterfowl species (gadwall), within the site itself, with the remainder of the records outside of the site. Little ringed plover, lapwing, greenshank, kingfisher, and whimbrel were recorded approximately 100m away (associated with the Rhymney River), with records of other waterfowl species being associated with the Severn Estuary.

1.5.2.16 SEWBReC did not provide any records of qualifying fish species associated with the Severn Estuary SAC/ Ramsar site.

1.5.2.17 Habitat information provided by SEWBReC identified that the adjacent River Rhymney and Estuary supported the SAC and Ramsar site qualifying habitats Atlantic salt meadow (saltmarsh), Intertidal mudflats and sandflats, and Estuaries.

Ecological Surveys of the Site

1.5.2.18 Ecological surveys have been carried out at the site during 2017 and 2018, including a Preliminary Ecological Appraisal (PEA) (Udall-Martin Associates Ltd, December 2017) and Ground-nesting Bird Surveys (Udall-Martin Associates Ltd, September 2017). Over-wintering bird surveys were not included in the scope of 2017 surveys. Arcadis undertook an over-wintering bird habitat assessment in October 2018 to assess the suitability of the site for over-wintering birds. Despite the poor habitat quality, further overwintering / migratory birds surveys were undertaken on the Lamby Way site in February and March 2019.

Preliminary Ecological Appraisal

1.5.2.19 The Extended Phase 1 habitat survey identified the site as *'dominated by grassland, with scattered and dense patches of scrub, pockets of woodland, a large pond, small pond and several scattered areas of wet pools/marshy areas. The central area of the site comprised reasonably flat ground (although with localised humps and hollows) with the site sloping downwards to the south and west towards the Severn Estuary and Rhymney River respectively.'* The River Rhymney to the west of the proposed site is not within the Severn Estuary SPA/ Ramsar site or SAC, however, the desk study undertaken as part of the PEA identified that it is a designated as a SINC, along with Lamby Saltmarsh SINC to the south of the proposed solar development.

1.5.2.20 Lamby Saltmarsh SINC is described as *'The remnant edges of the originally large Lamby Saltings that were reclaimed by land fill....located on the eastern banks of the River Rhymney, bounded by the Severn Estuary to the south and Lamby tip to the north. The site is important for rare salt-marsh and coastal plants...and as a rest place and breeding site for birds frequenting the Rhymney Estuary for feeding.'*

1.5.2.21 River Rhymney SINC is described as *'One of the three main rivers within Cardiff...Rhymney River Valley Complex SINC, Rhymney Grassland East SINC and Lamby North SINC and Lamby Salt Marsh SINC all bound the River Rhymney SINC towards the south. The river is important for migratory fish, otters, wildfowl and bankside vegetation and acts as a major wildlife corridor. Bats, dormice, grass snakes, eel and trout have been recorded in and around the River Rhymney.'*

1.5.2.22 The Gwent Levels – Rumney and Peterstone SSSI is also located to the east of the site and supports tidal mudflats and saltmarsh, as well as a network of ditches and reens. The area is important during the spring and autumn migration for waders along the west coast of Britain, and also supports large numbers of birds in the winter including oystercatcher, curlew, dunlin, redshank, knot, turnstone, grey plover, shelduck, teal, pintail, wigeon, shoveler, and avocet.

1.5.2.23 The PEA identified that the waterbodies and wet pool/marshy areas within the proposed development site provide potential habitat for waterfowl (species recorded during the protected species walkover survey included common snipe, coot, moorhen, and grey heron), and the site was also identified as suitable for breeding birds. Further bird surveys were carried out in 2017, as described below.

Ground-nesting Bird Surveys

1.5.2.24 The Ground-nesting Bird Surveys were carried out in June and July 2017 (Udall-Martin Associates Ltd, September 2017). The surveys identified the presence of oystercatcher (up to two pairs on the active landfill site) and lapwing (two nests identified, but appeared to fail) on the adjacent landfill site. Neither species were recorded within the proposed development site boundary. Shelduck were also recorded as present to the south-west of the active landfill site, but

no breeding was noted. Little grebe, mute swan, grey heron, moorhen and coot were recorded utilising the waterbodies within the survey area, but again were not recorded breeding. Gulls were recorded during the surveys, but no potentially suitable features for nesting were present within the proposed development site. The three gull species (black-headed gull, lesser black-backed gull and herring gull) that were noted were recorded as flying over or loafing on the adjacent roofs of industrial buildings.

1.5.2.25 The presence of these waterbird species suggest that the proposed development site could provide some suitable habitat for over wintering birds - species such as lapwing will utilise the same areas for wintering and breeding. However, the Ground-nesting Bird Survey Report concluded that predation and disturbance on site are major constraints to successful breeding, and these issues would be prevalent during the winter, thereby reducing the sites' potential suitability for over-wintering birds.

Over-wintering Bird Habitat Assessment

1.5.2.26 In order to determine the potential use of the proposed development site for over-wintering birds, a habitat assessment was carried out in October 2018. The assessment identified that the majority of the site supported tall ruderal herbs and scrubby grassland, which was unsuitable for use by the SPA/Ramsar site qualifying bird species, for breeding, foraging or roosting purposes. The pond at the northern end of the proposed development site could be used infrequently by small numbers of ducks, but it was not sufficient in size to be support a significant proportion of the SPA overwintering bird assemblage. It supported densely vegetated margins with no areas suitable for probing waders, such as curlew, redshank or dunlin.

1.5.2.27 It was considered possible that species such as lapwing or shelduck could land within the site and utilise the small number of areas with a shorter sward. However, these habitats were subject to frequent disturbance and were not sufficient in extent to support such species in significant numbers, being generally less than 20m² in size.

1.5.2.28 The boundaries of the site comprised scrub and woodland that screened the proposed development site from the adjacent Severn Estuary and Rhydney River.

1.5.2.29 Despite the poor habitat suitability within the proposed development site, further overwintering bird surveys were undertaken in February and March 2019.

1.6 Potential Impacts Arising From Project

1.6.1 The proposed development site is between 55 and 600 metres to the north of the foreshore of the Severn Estuary, which at this point is designated as a Site of Special Scientific Interest (SSSI), as a Special Area of Conservation (SAC), is classified as a Special Protection Area (SPA), and listed as a Ramsar site.

1.6.2 However, the proposed development will not encroach upon the Severn Estuary EMS, so there is no potential for effects due to land take or immediate physical disturbance of habitats. Nonetheless, mindful of the vulnerabilities in Section 1.4 above, there is potential for the proposed development to have the following impacts:

- Direct habitat and species loss associated with European sites.
- Habitat degradation as a result of increased air pollution.
- Changes in water quality within the European sites.

- Loss of habitat functionally linked to a European site (i.e. used by overwintering or passage birds for foraging).
- Disturbance/displacement to species using the adjacent Rhymney River and Severn Estuary.

1.6.3 These impacts correlate with the categories of operations which may cause deterioration or disturbance as set out in tables 2 to 4 above, as follows:-

Table 8. Comparison of likely impacts of the project with categories of operations which may cause deterioration or disturbance		Impacts arising from proposed development as set out above				
		Direct habitat and species loss associated with European sites.	Habitat degradation as a result of increased air pollution.	Changes in water quality within the European sites.	Loss of habitat functionally linked to a European site (i.e. used by overwintering or passage birds for foraging).	Disturbance/displacement to species using the adjacent Rhymney River and Severn Estuary.
Categories of operations which may cause deterioration or disturbance as set out in tables 2 to 4 above	Noise & Visual presence	N	N	N	Y	Y
	Introduction of synthetic compounds	N	Y	Y	N	N
	Introduction of non-synthetic compounds	N	Y	Y	N	N
	Changes in nutrient loading	N	Y	Y	N	N
	Smothering of habitats	N	Y	Y	N	N
	Removal / substratum loss	Y	N	N	Y	N
	Selective extraction of species	Y	N	N	N	N

1.6.4 Tables 2 to 4 above also set out the levels of sensitivity of each of the features of the designations to the categories of operations which may cause deterioration or disturbance. These are summarised in Table 6 below. These levels of sensitivity will be used to assess the likelihood of any significant effect and subsequently and any adverse effect upon the integrity of the Severn Estuary EMS.

Table 9. Levels of sensitivity of Severn Estuary EMS features to identified pathways for adverse effect.

Receptors – Severn Estuary EMS Features		Pathway for adverse effect								
		Mobilisation of existing ground/groundwater contaminants		Disturbance		Smothering	Changes in nutrient loading		Removal / substratum loss	Selective extraction of species
		Toxic Contamination – Introduction of Synthetic Compounds	Toxic Contamination – Introduction of Non-synthetic Compounds	Noise	Visual	Dust	Dust	Surface water run-off		
SAC Annex I Habitats	Estuaries	High	High	Low	Low	High	Low	Low	High	High
	Subtidal Sandbanks	High	High	Low	Low	Low	Moderate	Moderate	Moderate	Low
	Mudflats & sandflats	High	High	Low	Low	Moderate	High	High	High	Low
	Atlantic Salt-meadow	High	High	Low	Low	High	High	High	High	Low
	Reefs	Moderate	Unknown	Low	Low	Low	Moderate	Moderate	Low	Low
SAC Annex II Species	Fish	Unknown	Unknown	Unknown	Unknown	Low	Unknown	Unknown	Low	Unknown
Habitats of SPA Annex I species	Intertidal mudflats & sandflats	Moderate	Moderate	Moderate	Moderate	Moderate	Low	Low	High	Low
	Saltmarsh	Moderate	Moderate	High	High	Moderate	High	High	High	Low
Habitats of SPA migratory species and waterfowl assemblage	Intertidal mudflats & sandflats	High	High	High	High	Moderate	High	High	High	Moderate
	Saltmarsh	High	High	High	High	Moderate	High	High	High	Moderate
	Hard substrates	High	High	High	High	Moderate	Moderate	Moderate	High	Low

1.6.5 Therefore in summary, looking at the factors which may affect the features of the Severn Estuary EMS from section 1.6.2 above, the likelihood or magnitude of impact from Table 6 above is summarised as follows:-

Table 10. Likelihood / magnitude of impact of screened-in factors	
Screened-in factors from Section 1.6.2 above	Maximum Likelihood / magnitude of impact for any Severn Estuary EMS feature from Table 6 above
Direct habitat and species loss associated with European sites.	High
Habitat degradation as a result of increased air pollution.	High
Changes in water quality within the European sites.	High
Loss of habitat functionally linked to a European site (i.e. used by overwintering or passage birds).	High
Disturbance/displacement to species using the adjacent Rhymney River and Severn Estuary.	High

1.6.6 The potential impacts from section 1.4.2.2 above are considered in turn, as part of the test of likely significant effect, in the following section. Further details on the site features, their conservation objectives and the impact of factors upon those features is given in Appendix A of the 'Statement to Inform an Appropriate Assessment' Version 03 dated April 2019, submitted in support of the planning application 19/00397/MJR by Arcadis Consulting (UK) Ltd.

Test of Likely Significance

1.7 Direct habitat and species loss associated with European sites

1.7.1 The proposed solar farm is located outside the Severn Estuary EMS boundary and therefore, there would be no direct habitat or species loss within the Severn Estuary EMS as a result of the proposed development.

1.7.2 Therefore this potential impact pathway has been screened out of further assessment as there is no likely significant effect alone and/ or in combination with any other plans or projects.

1.8 Habitat degradation as a result of air pollution

1.8.1 Changes in air quality from increased traffic and development could have impacts on European sites through an increase in nitrogen deposition which could occur as a result of construction activities in the vicinity of European sites. Given the proximity of the proposed development to the Severn Estuary, there is the potential for air quality impacts.

1.8.2 The Site Improvement Plan for the Severn Estuary (Natural England, 2015) identified the risk of atmospheric nitrogen deposition as a potential pressure/threat to the European sites. The plan states that:

'Activities around the Estuary include fertiliser application, potentially dairy and poultry production, road traffic, industry (including power stations), and shipping which are all sources of nitrogen

pollution. Nitrogen deposition exceeds site relevant critical loads, with potential impacts on vegetation structure and diversity.'

1.8.3 The Site Improvement Plan includes the following qualifying features of the Severn Estuary which are sensitive to nitrogen deposition: gadwall, Estuaries, Atlantic salt meadows, sea lamprey, river lamprey, Twaite shad, and the waterbird assemblage. The only potential impact pathway associated with air pollution and the proposed development would be through increased traffic during the construction phase. Given that the construction works (and any future decommissioning works) will take place outside of the main winter period, there would be no direct impacts on gadwall or the waterbird assemblage. The remaining features could be present within 200m during the construction phase.

1.8.4 Current air quality guidance suggests that any construction sites or routes used by construction vehicles within 50 m of a designated site¹; and the presence of any European site within 200 m of the main access roads used by HGVs accessing the site² could lead to likely significant effects on the European site during the construction phases of new development.

1.9 Changes in water quality within the European sites

1.9.1 Changes in water quality as a result of the proposed development could have impacts on European sites. For example, damaging the engineering cap of the landfill site could release contaminants into the Rhymney River/ Severn Estuary, there is an increased risk of potential pollution incidents, and potential increases in suspended sediments resulting in ecological effects, such as the direct loss of habitats caused by re-deposition of suspended sediment, and the consequential health or mortality effects on prey species, particularly invertebrates associated with the intertidal mudflats.

1.9.2 The Site Improvement Plan for the Severn Estuary (Natural England, 2015) identified the risk of water pollution as a potential pressure/threat to the European sites. The plan states that:

'There is uncertainty over water quality in the Estuary due to diffuse (including agricultural) or direct pollution (e.g. industrial, sewage treatment works, thermal, radioactive). There is a requirement for better understanding of water and sediment quality issues. The Severn River Basin Management Plan identifies that 17 % of the estuarine waterbodies in the river basin district currently achieve good ecological status while the others are at moderate status. Macrophytobenthos (benthic macro algae) have been identified in localised hotspots and may be having adverse impacts on the invertebrate communities there. The extent of issues like this, the presence and mobilisation of a range of contaminants and reasons behind the moderate statuses need to be understood. This includes analysis of current data and consideration of potential issues with contaminants in sediment.'

1.9.3 The Site Improvement Plan includes the following qualifying features of the Severn Estuary which are sensitive to water pollution: gadwall, dunlin, common redshank, greater white-fronted goose, subtidal sandbanks, Estuaries, intertidal mudflats and sandflats, reefs, Atlantic salt meadows, sea lamprey, river lamprey, twaite shad and the waterbird assemblage.

¹ Institute of Air Quality Management (IAQM), Guidance on the assessment of dust from demolition and construction (2014)

² Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1, HA 207/07 – Air Quality, Highways Agency, 2007.

1.9.4 Based on the available construction information, the solar farm will be fixed to the ground via structural supporting units with concrete shoe foundations. The access routes will be laid over the existing ground, and there will be no ground penetration below 1m (refer to Section 2 for further details). The engineering cap on the landfill will not be affected by the works and as such, no release of contaminants are predicted from the landfill during the construction, operational or decommissioning phases of the development.

1.9.5 There is a potential impact pathway of water quality impacts during construction if no mitigation was put in place.

1.10 Disturbance/displacement to species using the adjacent Rhymney River and Severn Estuary

1.10.1 The Site Improvement Plan for the Severn Estuary does not include effects associated with disturbance/ displacement (as a result of construction activities/ operational stage) as a potential threat on the European site. However, there is the potential to disturb qualifying species within European sites, in particular birds, during the construction and operational phases of new developments. Disturbance/displacement could occur as a result of the following:

- Noise and visual disturbance to overwintering birds during construction and decommissioning of the solar farm, and changes to visual surroundings caused by its presence.
- Potential collision with the new solar panels and visual disturbance to overwintering birds during operation, from glare.

1.11 Noise and visual disturbance to overwintering birds during construction and decommissioning of the solar farm, and changes to visual surroundings caused by its presence.

1.11.1 The information presented in the baseline (Section 5) indicates that the River Rhymney SINC, Lamby Saltmarsh SINC and adjacent estuarine habitat of the Severn Estuary provide roosting and foraging areas for SPA/ Ramsar site qualifying features, in particular important numbers of Redshank and Dunlin.

1.11.2 There is potential for disturbance/displacement effects on the over-wintering and passage SPA/Ramsar site qualifying bird species using the adjacent habitats during the construction, operation and decommissioning phases of the project, without mitigation.

1.11.3 As a general rule, a distance of 200m between the receptor (i.e. the birds) and the activity (i.e. construction) is taken as the maximum distance over which the activity can affect the receptor. Roughly half of the proposed project is within 200m of mean high water, and therefore potentially all installation works at this site may cause disturbance to wetland birds on the foreshore. In addition, the change in visual surroundings caused by the presence of the solar farm in operation may cause displacement of wetland bird species, perturbed by the radical change in visual aspect.

1.12 Potential collision with the new solar panels and visual disturbance to overwintering birds during operation, from glare

1.12.1 Given the proximity of the SPA/ Ramsar site to the proposed development site, there is the potential for visual disturbance to overwintering birds during the operational phase, from glare, and the potential for collision with the new solar panels.

1.12.2 Although there is the potential for birds to collide with the solar panels, there is little scientific evidence that this is actually the case. A study by DeVault et al (2014) conducted 515 bird surveys at solar PV sites, but found no obvious evidence for bird casualty caused by solar panels. The literature review carried out by Natural England (Natural England, 2017) concluded that current evidence suggests that bird collision risk from solar panels is very low and that there is likely to be more of a collision risk to birds presented by infrastructure associated with solar PV developments, such as overhead power lines.

1.13 Loss of habitat functionally linked to a European site

1.13.1 Functionally-linked land is considered to be any land outside of a European site, which is regularly used by significant numbers of birds that are qualifying interest features of that European site. The Site Improvement Plan for the Severn Estuary EMS does not include loss of functionally-linked land as a potential threat to the European sites.

1.13.2 The information presented in the baseline section of this report, including an overwintering bird habitat assessment of the proposed development site, indicates that the land within the proposed development site is largely unsuitable for supporting breeding, foraging and roosting SPA/Ramsar site species. Although small areas of habitat offered some potential to support SPA/Ramsar site species, these were assessed by experienced ornithologists as being unsuitable to support significant numbers of birds due to their limited extent, sub-optimal habitat suitability, predation and frequent levels of disturbance from the active landfill site. Furthermore, the most suitable habitats, namely the waterbody within the proposed development site, would be retained as part of the development proposals.

1.13.3 The desk study data shows that surrounding habitats including the Severn Estuary EMS site itself, the River Rhymney SINC, Lamby Saltmarsh SINC and the Gwent Levels – Peterstone SSSI provide more suitable foraging and roosting habitat, and regularly support EMS site species during the over-winter period (as indicated by the WeBS data).

1.13.4 Given the poor suitability of the proposed development site for SPA/Ramsar site species it is not considered to be functionally linked land to the Severn Estuary SPA/ Ramsar site. As such, there would be no likely significant effect on the qualifying features of the Severn Estuary SPA/ Ramsar site as a result of the loss of 19ha of sub-optimal habitat under the footprint of the proposed solar farm.

1.13.5 Further overwintering and migratory bird surveys on the application site in February and March 2019 did not detect any birds which are features of the Severn Estuary EMS using the habitats on site, other than a pair of Mallards.

1.13.6 This potential impact has been **screened out** of further assessment alone and/ or in combination.

1.14 Results of the Test of Likely Significance

The results of the Test of Likely Significance are set out in the table below. Where likely significant effect has been identified, the relevant factors will be considered in turn in the Appropriate Assessment section below.

Table 11 – Summary of Test of Likely Significance	
Factor	Likely Significant Effect?
Direct habitat and species loss associated with European sites	No
Habitat degradation as a result of air pollution	Yes
Changes in water quality within the European sites	Yes
Loss of habitat functionally linked to a European site	No
Disturbance/displacement to species using the adjacent Rhymney River and Severn Estuary	
(i) Noise and visual disturbance to overwintering birds during the construction, operation and decommissioning phases of the solar farm	Yes
(ii) Potential collision with the new solar panels and visual disturbance to overwintering birds during operation, from glare	Yes

2.0 Appropriate Assessment

2.1 Habitat degradation as a result of air pollution

2.1.1 Based on the available construction information, the construction site for the proposed development would be more than 50m from the edge of the European site; therefore, potential air quality impacts associated with the construction site itself can be ruled out. The proposed haul routes would use Lamby Way to the north of the proposed development and access the site at the northern end of the construction area. Lamby Way is over 700m from the Severn Estuary, and the entrance to the construction site would be more than 400m from the Severn Estuary. Potential impacts associated with the construction can therefore also be ruled out. The decommissioning site and haul routes would be expected to be the same as those used for the construction phase.

2.1.2 Furthermore, Shared Regulatory Services in their responses to consultation have not raised any issues in regards to impacts upon air quality. Therefore due to the distance of haul routes from the Severn estuary European Sites, there would be no air quality impacts associated with the operational phase of the proposed solar farm and no adverse effects on the integrity of the Severn Estuary EMS and no need to progress to Stage 3.

2.2 Changes in water quality within the European sites

2.2.1 In order to protect water quality during the construction and decommissioning phases of the development as a result of potential pollution incidents, or run off from the construction site, the Construction and Decommissioning Method Statement will include water quality protection measures. These will comprise best practices and measures set out within relevant CIRIA publications, such as:

- undertaking regular checking of waterbodies located near areas of construction works for changes in water quality;
- avoiding spillages by using bunds around storage tanks to prevent leakages,
- use of drip trays around mobile plant,
- designating specific areas for re-fuelling to prevent run off; and
- use of grips, sumps, straw bales and sediment trap to capture silt, if required.

These will be secured by a planning condition, and also by the SuDS Approval process, which requires that SuDS meet a series of standards, one of which is the Biodiversity Standard.

2.2.2 These standard pollution protection measures are considered sufficient to protect water quality within the Severn Estuary EMS during the construction and decommissioning phases of the proposed development, and no likely significant effects on water quality of the adjacent European sites are predicted.

2.2.3 Taking into account the above mitigation measures, there will be no adverse effect on the integrity of the Severn Estuary EMS and no need to progress to Stage 3.

2.3 Noise and visual disturbance to overwintering birds during construction and decommissioning of the solar farm, and changes to visual surroundings caused by its presence

2.3.1 To avoid this impact, no construction or decommissioning works will take place during the main overwintering period when over-wintering and passage qualifying species associated with the Severn

Estuary SPA/ Ramsar site would be present. All construction works, including site clearance and construction of the solar arrays will be completed prior to the main winter period 2019/2020, although minor works would continue into October, the majority of the works would already be completed by this time. Decommissioning would be expected to take place during the summer of 2054. The timing of the works will mean that visual and noise disturbance to birds will be avoided and this will be secured by a planning condition.

2.3.2 Despite a detailed literature review there is very little evidence to suggest that a change in the visual appearance of a site is likely to cause displacement or disturbance to bird species (Natural England, 2017). The majority of the literature cites anthropogenic factors such as noise and the visual appearance of people as more likely to cause disturbance and displacement of bird species. Nevertheless, there is potential for displacement effects on the over-wintering and passage SPA/Ramsar site qualifying bird species using the adjacent habitats due to changes in visual appearance during the construction or decommissioning phases of the project without mitigation. This could affect the integrity of the European Sites given the high numbers of Redshank and Dunlin using the adjacent Rhymney Estuary.

2.3.3 To avoid this impact, the existing landscape planting, which provides effective screening of the proposed development from the Rhymney Estuary, will be retained and maintained for the duration of the operational phase to reduce the potential for changes in visual appearance to be noticed by bird species, reducing the potential for displacement. The retention and management of this screening vegetation can be secured through a planning condition and will be part of the green infrastructure strategy and ecological management plan for the proposed scheme.

2.3.4 Images 1 and 2 below show the existing landscape screening demonstrating effective screening of the proposed development. Image 3 shows the escarpment and location of existing hedgerow / fencing. Further details on this area are included in an Addendum to this report provided by Cardiff Council.

Image 1 showing existing landscape screening (Image from Google Earth)



Image 2 View of landscape screening seen from bridge on Lamby Way (Image Google Earth)



Image 3 showing the location of escarpment, fencing and hedgerow and areas that will be subject to enhancement via hedgerow planting. The orange star marks the location of Image 4 (Image Google Earth).



Proposed development located above an escarpment, hedgerow and existing fenceline screening its view from the low-lying areas. Enhancement hedgerow planting would be used to increase screening along the boundaries (shown in orange).

Image 4 Photo taken from Google Earth looking north to the proposed development site from the Rhymney Estuary



Proposed development located above an escarpment screening its view from the low-lying areas. Image taken from location shown in Image 3 looking north.

2.3.5 In addition to the existing woodland planting, there is an existing security fence surrounding the Lamby Way Landfill site which has dense scrub and trees associated with it, in the form of Hawthorn, Blackthorn and Elder etc. This vegetation is likely to provide an effective visual screen between birds on the upper sections of the foreshore and the solar array. There are some gaps in this vegetation, but the retention, management and stopping-up of gaps with bolster planting will be specified in the Green Infrastructure Statement, secured by planning condition.

2.3.6 It is envisaged that birds will to some extent already be habituated to changes in visual appearance when the landfill was operational and subsequently capped and also due to the ongoing development in the local area.

2.3.7 In addition, no construction or decommissioning works will take place during the main overwintering period (October to March) when the over-wintering and passage qualifying species associated with the Severn Estuary SPA/ Ramsar site would be present. All construction works, including site clearance and construction of the solar arrays will be completed prior to the main winter period 2019/2020. Although minor works would continue into October, all construction works would already be completed by this time. Decommissioning would be expected to take place during the summer of 2024.

2.3.8 The Severn Estuary Ramsar site includes lesser black-backed gull as a qualifying feature during the breeding season. Although recorded in small numbers (less than 1% of the SPA/Ramsar site population) during the ground-nesting bird surveys (Udall-Martin Associates Ltd, September 2017), no record of breeding was noted. Taking into account the timing of the works and the lack of breeding lesser black-backed gull there will be no adverse effect on the integrity of the Severn Estuary EMS.

2.3.9 Taking into account the timing of works and the mitigation measures set out above to be secured by planning condition, no adverse effect on the integrity of the sites is expected due to a change in visual surroundings either during or following construction, or during decommissioning.

2.4 Potential collision with the new solar panels and visual disturbance to overwintering birds during operation, from glare

2.4.1 Given the small-scale of the proposed solar farm and the positioning of the arrays, which by design, allows gaps in between the banks of panels to break up the surface, potential impacts associated with collision with the panels are considered unlikely.

2.4.2 Although there is the potential for glint and glare from the new solar arrays, the solar farm will be mostly screened from the adjacent River Rhymney and Severn Estuary from existing woodland and scrub at the edge of the site. In addition, as described in the previous paragraph, the design of the solar farm means that gaps will be left between the banks of panels to break up the surface, further reducing the likelihood of solar glare. Given the retention of screening vegetation around the edge of the proposed new solar farm, and the positioning of the arrays, potential impacts associated with glare are considered unlikely.

2.4.3 Furthermore, the efficiency of solar panel depends upon them absorbing as much solar radiation as possible, rather than reflecting it, so they are inherently designed to reduce glare.

2.4.4 However, on a precautionary basis to take account of the remaining possibility that glint and glare may disturb wetland birds, a further Technical Note dated 26/04/19 has been provided, which is attached to this HRA. This Technical note demonstrates that at high tide events when birds such as Redshank are high up on the foreshore, it is not possible for directly reflected light to impact upon them, even when the sun is low in the sky.

2.4.4 Therefore, given the mitigation measures outlined above no adverse effects on the integrity of the Severn Estuary EMS would occur and there is no need to progress to Stage 3.

2.5 Other plans and programmes that could contribute to in combination effects

2.5.1 Consideration of In-combination effects has identified two projects:

- The Frag Tip Application (Parc Calon Gwyrdd 17/02909/MNR)
- Flood risk management works comprising a new sea wall at Tremorfa (at business case stage completion design estimated February 2020)

2.5.2 The Appropriate Assessment for the Frag Tip application has concluded no adverse effect on the integrity of the Severn Estuary SAC/SPA/Ramsar. No residual effects have been identified, therefore there will be no In-Combination effects in association with Frag Tip.

2.5.3 The proposed new sea wall is on the south side of the Rhymney River directly opposite Lamby Way. There is the potential for both developments acting together to cause disturbance to overwintering bird species using the Rhymney Estuary. However, as the construction works for Lamby way will be completed before the main 2019/2020 bird overwintering period and the flood risk works will only be at completion of design stage by 2020 this is can be ruled out as the projects will not be constructed during the same time period.

2.5.4 Therefore, no residual effects have been identified and no adverse effects on the integrity of the Severn Estuary EMS are envisaged.

2.6 Summary of the results of the assessment of adverse effects on the integrity

2.6.1 A summary of the results of the assessment of adverse effects on the integrity of the Severn Estuary EMS is given in the following table

Table 12 – Summary of Test of Adverse Effect upon Integrity		
Factor	Adverse Effect upon Integrity?	
	Alone	In Combination
Habitat degradation as a result of air pollution	No	No
Changes in water quality within the European sites	No	No
Noise and visual disturbance to overwintering birds during the construction and decommissioning phases of the solar farm	No	No
Potential collision with the new solar panels and visual disturbance to overwintering birds during operation, from glare	No	No

3. Conclusion

3.1 It is the conclusion of this Habitats Regulation Appraisal that, based upon the planning application and supporting documents as submitted, and provided the suggested planning conditions are attached and implemented, **the proposed development will not have an adverse effect upon the integrity of the Severn Estuary EMS.**

4. Consultation with Natural Resources Wales

4.1 In accordance with Regulation 61(3) of the Conservation of Habitats and Species Regulations 2010 (as amended):- *‘The competent authority must for the purposes of the assessment consult the appropriate nature conservation body and have regard to any representations made by that body within such reasonable time as the authority specify’.*

4.2 NRW were consulted on the planning application and present HRA, and provided written comments on 29/03/19 and 10/04/19, and verbal comments on 10/04/19. Concerns were raised by the NRW ornithological specialist that the importance of the Redshank and Dunlin roosts was not given adequate consideration, and that the change in visual environment caused by the solar array once in place may cause species such as these to abandon these roosts. These concerns have been addressed in the 26/04/19 Technical Note – Redshank Roost Update and the resulting changes incorporated into this finalised HRA. NRW have confirmed in their letter of 01/05/19 that they have accepted the conclusions of the Appropriate Assessment on this basis.

5. References

The Conservation of Habitats and Species Regulations 2017 <https://www.legislation.gov.uk/uksi/2017/1012/contents/made>

European Commission (EC) (2000) Managing Natura 2000 Sites: The Provisions of Article 6 of the 'Habitats' Directive 92/43/EEC.

EC (2001) Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC.

EC (2007) Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of Concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.

IAQM (2012) *Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites*, [Online], Available: www.iaqm.co.uk/guidance.html.

IAQM (2016) *Guidance on the Assessment of Dust from Demolition and Construction v1.1*.

Natural England & CCW (2009) *The Severn Estuary / Môr Hafren European Marine Site comprising: The Severn Estuary / Môr Hafren Special Area of Conservation (SAC), The Severn Estuary Special Protection Area (SPA), The Severn Estuary / Môr Hafren Ramsar Site. Natural England & the Countryside Council for Wales' advice given under Regulation 33(2)(a) of the Conservation (Natural Habitats, &c.) Regulations 1994, as amended. June 2009.*

Tyldesley, D., (2009) Draft Guidance for Plan Making Authorities in Wales: The Appraisal of Plans under the Habitats Directive, for Countryside Council for Wales CCW Bangor.

'Waddenzee ruling' Case C-127/02, JUDGMENT OF THE COURT (Grand Chamber) 7 September 2004 (1) (Directive 92/43/EEC – Conservation of natural habitats and of wild flora and fauna – Concept of 'plan' or 'project' – Assessment of the implications of certain plans or projects for the protected site).

European Commission (2000) Managing Natura 2000 sites: the provisions of Article 6 of the Habitats Directive 92/43/EEC.

JNCC (2001) Severn Estuary SPA Description and Citation. <http://jncc.defra.gov.uk/default.aspx?page=2066>

JNCC (2008) Severn Estuary Ramsar Site Information Sheet and Citation. <http://jncc.defra.gov.uk/pdf/RIS/UK11081.pdf>

JNCC (2015) Severn Estuary Citation.

<http://jncc.defra.gov.uk/protectedsites/sacselection/sac.asp?EUCode=UK0013030> and Natura 2000 standard data form for the site:

<http://jncc.defra.gov.uk/protectedsites/sacselection/n2kforms/UK0013030.pdf>

Natural England (2015) Site Improvement Plan Severn Estuary

Natural England (9 March 2017) Evidence review of the impact of solar farms on birds, bats and general ecology (NEER012) 1st edition.

Natural Recourses Wales (accessed 2016)

<http://publications.naturalengland.org.uk/category/4582026845880320> accessed 04/08/16.

SI 2017/1012 (2017): Explanatory memorandum to the Conservation of Habitats and Species Regulations.

Udall-Martin Associates Ltd (September 2017) Ground-nesting Bird Surveys

Udall-Martin Associates Ltd (December 2017) Preliminary Ecological Appraisal

Welsh Assembly Government (October 2006) Annex to Technical Advice Note 5: Nature conservation and planning. The Assessment of Development Plans in Wales Under the Provision of The Habitats Regulations'.

Appendix 1. Technical Note: Lamby Way Solar Farm HRA – Redshank Roost Update. Arcadis, 26/04/19.

SUBJECT
Lamby Way Solar Farm HRA – Redshank Roost Update

DATE
26th April 2019

DEPARTMENT
Ecology

TO
Gareth Harcombe (Cardiff Council)
James Davies (Natural Resources Wales)

OUR REF

PROJECT NUMBER
10025418

FROM
Arcadis

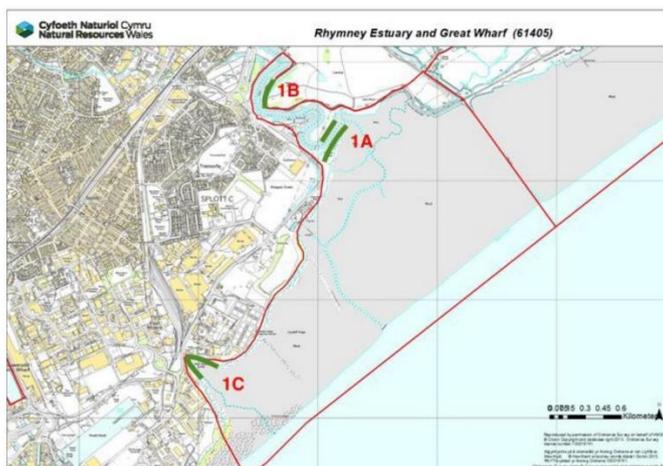
Introduction

This technical note provides clarification in relation to the presence of a significant redshank roost to the south of the proposed solar development. The potential impacts of the solar development are assessed to determine the need for mitigation measures to be incorporated into the proposals to ensure no effects on the integrity of the SPA as a result of disturbance to the roost would occur.

Potential Impacts

Information arising since submission of the Habitats Regulation Assessment (HRA) shows the locations of wader roost sites (Image A) supporting significant numbers of redshank and to a lesser extent dunlin, on land to the south of the proposed solar development (details of the roost location were provided by Natural Resources Wales (NRW) on 25 April 2019). Both species are qualifying features of the Severn Estuary SPA, therefore further information in relation to the potential for the solar development to affect the roost was requested from NRW prior to planning permission being granted.

Image A: Wader Roost Locations



Roosts 1B and 1C as shown on Image 1 are either completely screened by woodland (Roost 1B) or separated from the proposed development by existing development (Roost 1C) and therefore no effects as a result of the solar development would occur at these roost locations. Roost 1A is located across two spits of land on either side of the River Rhymney where it joins the Severn Estuary. The roost lies between 200m and 500m to the south of the site boundary as well as being approximately 10m below the level of the closest row of solar panels.

A number of potential impacts – were assessed within the HRA which concluded that there would be no

Arcadis (UK) Limited, Manning House, 22 Carlisle Place, London, SW1P 1JA, United Kingdom, T +44 20 3014 9000 arcadis.com

Arcadis (UK) Limited is a private limited company registered in England registration number: 1093549. Registered office, Arcadis House, 34 York Way, London, N1 9AB. Part of the Arcadis Group of Companies along with other entities in the UK. Regulated by RICS.

effects on the integrity of the SPA. The additional potential operational effects arising as a result of the details pertaining to the roost location, which were not assessed, comprise visual disturbance and the potential for effects of glare from the panels adversely affecting roosting birds.

A site visit was undertaken on 23 April 2019 during which photographs were taken from the spit supporting the wader roost in order to produce a photomontage so that the visual impact from the roost site can be assessed. The photomontage shows that only a small amount of the overall extent of solar panels to be installed would be visible from the roost. The panels would be set at an angle of 20° to the horizontal and will be dark grey/black in colour. In addition, the visible rows would also be broken up by existing planting and through restrictions from the topography so there would not be a significant change in the landscape that would be visible to the roosting birds at sea level. As such, no adverse effect on the integrity of the roost is anticipated as a result of visual disturbance.

Please refer to Appendix B to view the proposed photomontage.

The second potential impact that was identified related to glare from the solar panels causing birds to be disturbed should a significant glare event affect the roost location. The visual assessment has shown that only a limited number of solar panels would be visible to the roost and therefore the likelihood of a significant glare occurring would be minimal, since it is large expanses of panels which tend to result in such effects occurring. Analysis by Solrac, the solar engineers who have developed the scheme layout, has also shown that, at the particular positioning of the solar panels proposed for Lamby Way, all reflections are skywards, generally in a northerly direction and therefore away from the roost areas on the peninsula to the south (see Appendix A for the detailed glint and glare analysis). As such, in the event that sun conditions led to solar glare occurring this would not be visible to the south and therefore the roost site would not be affected at any point (especially during overwintering bird season) and any adverse effects as a result of disturbance due to solar glare can be ruled out.

Conclusion

The assessment of the potential impacts of visual and solar glare disturbance to the adjacent wader roost has shown that only a very limited proportion of the solar development would be visible from the roost location and that solar glare would always be directed away from the roost site. Therefore, no adverse effects on the integrity of the populations of redshank and dunlin associated with the Severn Estuary SPA would occur as a result of these potential operational effects and no mitigation (such as additional screening) for operational impacts would be required.

This Technical Note provides additional information in relation to potential operational effects which were not fully assessed in the submitted HRA following receipt of additional information in relation to the location of a wader roost immediately south of the proposed solar development. All other conclusions within the submitted HRA (dated 4 April 2019) remain unchanged.

Appendix A:

Supplementary Glint and Glare Analysis Impact on SPA roosting areas in the Rhymney Estuary

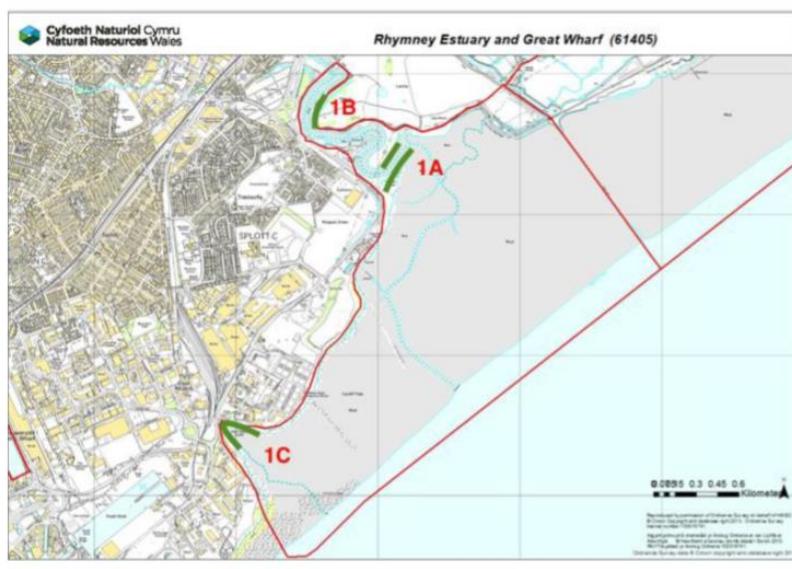
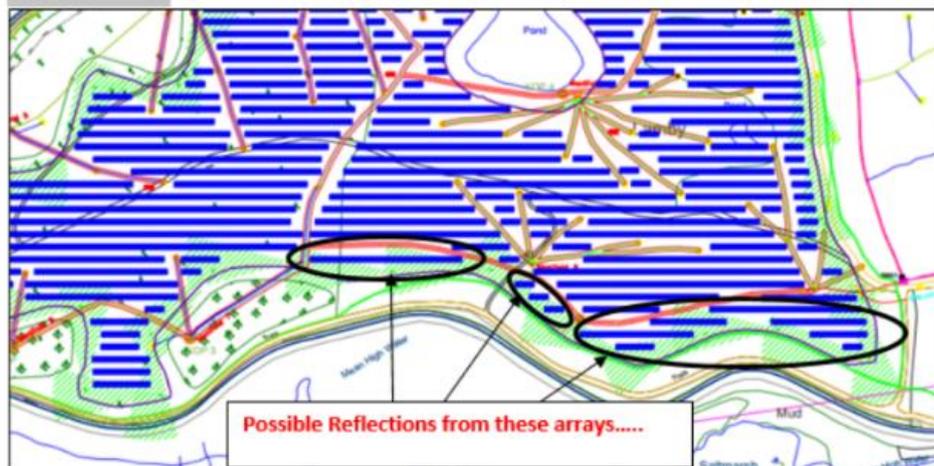
Introduction

This document has been prepared to address concerns expressed by Natural Resources Wales (NRW) that the Lamby Way Solar Farm proposal may have an adverse “Glint and Glare” impact on roosting areas for overwintering bird species associated with the adjacent Severn Estuary SPA .

The document contains an assessment of the glare that could be experienced at the roost site; including its duration and the potential for high tide roosts to be exposed by this.

The document is focussed on an analysis of the solar panels marked within black circles in the first layout plan below (which are the panels generally visible at the roost location), and their possible reflective impact on the roost areas labelled as 1A in the second plan below.

Layout Plan



Solar PV Panel Reflectivity

Solar PV panels are designed to absorb light.

Their primary function is to absorb sunlight and convert this to electricity. Solar PV panels are not designed to reflect sunlight although there is a small reflective component for modern solar panels. The glass which coats solar panels is specifically designed with a low iron content to aid the absorption of daylight and thus has a much lower level of reflectivity than the glass typically seen in conventional windows. Furthermore the surface is not a flat pane, but has a series of minor undulations specifically designed to reduce reflection and increase absorption. This means that less than 9% of the total incident visible light is reflected, while normal glass reflects approximately 19%. Thus, reflectance levels from a given solar site are much lower than the reflectance generated by standard glass and other common reflective surfaces. The chart below gives some further comparisons.

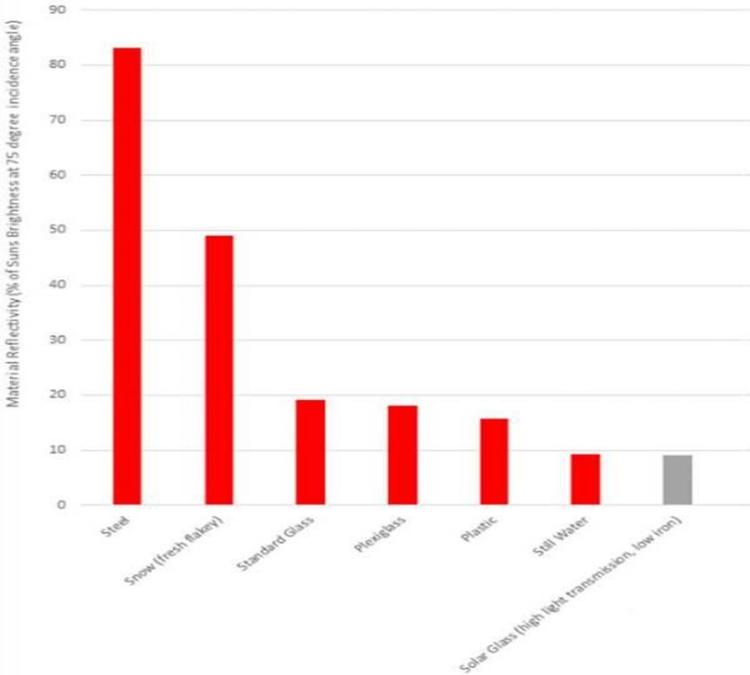


Figure 1: Approximate Reflectivity of Common Materials (Sunpower Corporation, 2010)

As distance from the glint source increases, the intensity of the event drops appreciably. This is due to both the diffraction of light after it reflects off the panel, and atmospheric conditions such as the presence of particulates, haze or low cloud, in addition to the subtended viewing angle.

The Lamby Way Proposal

In the specific case of the Lamby Way Solar Farm it is not possible for reflection, glint or glare to be experienced from the protected roost areas in the SPA, either early in the morning or at any other time of day as demonstrated below:

In order to gain maximum solar efficiency from the particular irradiance characteristics of the site the solar panels will be arranged at a 20 degree angle from the horizontal, and all are positioned to face due south.

The following charts represent cross sections through the solar panels and show how the sun is reflected from its position at Solar Noon in each month of the year. The charts clearly show that, at this particular positioning of the solar panels, all reflections are skywards and generally in a northerly direction. Only noon sunshine in May, June and July would reflect at less than 90 degrees to the south-side horizontal. With the sun in its highest position (noon on 22nd June) the reflection would be 77 degrees away from the south-side horizontal. Accordingly, there could be no possibility of mid-day reflection onto the roost areas at sea level to the south at any time of year. At all times during the rest of the day the sun would be in a lower position and so the reflection angles away from the south would be even greater.

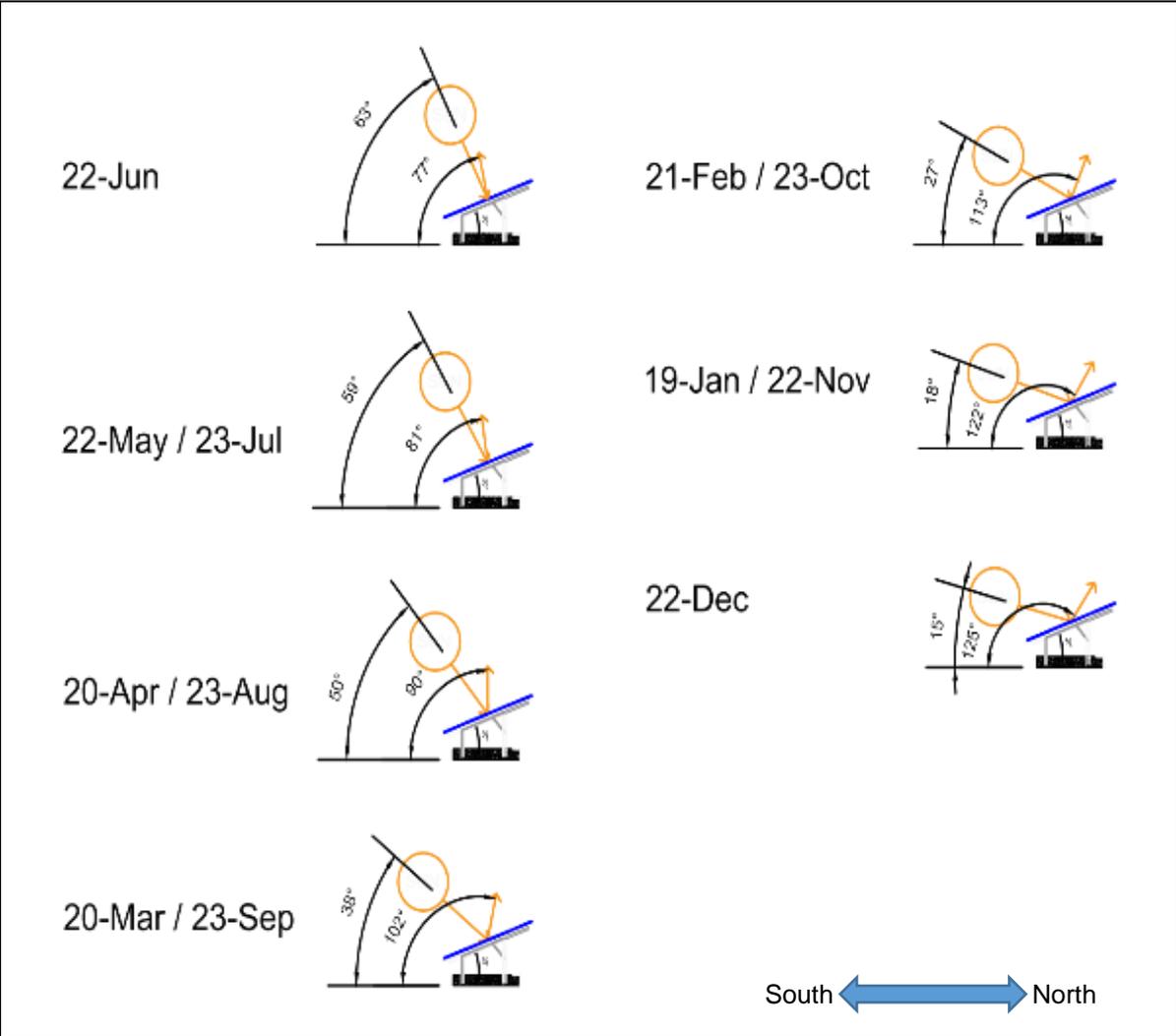


Figure 2: Angles of reflection at solar noon on solar panels positioned at 20 degrees to the horizontal and facing due south (Source Solrac Ltd)

It should also be noted that, in the case of the Lamby Way Solar farm proposals, the arrays that are positioned closest to the roost areas are a minimum of 15m above sea level and some way above any part of peninsular roosting site. Clearly this sets any reflections at an even greater variance away from the roost area than those shown in the analysis above.

At Sunrise and Sunset the reflective angle would be much lower, but again, would always be generally upwards from the solar panel, and never towards the ground. In addition, the sun would be at a very oblique angle to the south facing panels at these times - from the east at sunrise and the west at sunset. This would both dilute any reflective effect further still and direct away remaining reflection either east or west of the roost site and still generally skywards. Accordingly, there could be no possibility of sunrise or sunset reflection onto the roost areas at sea level to the south. The 3D representations below give more detail.

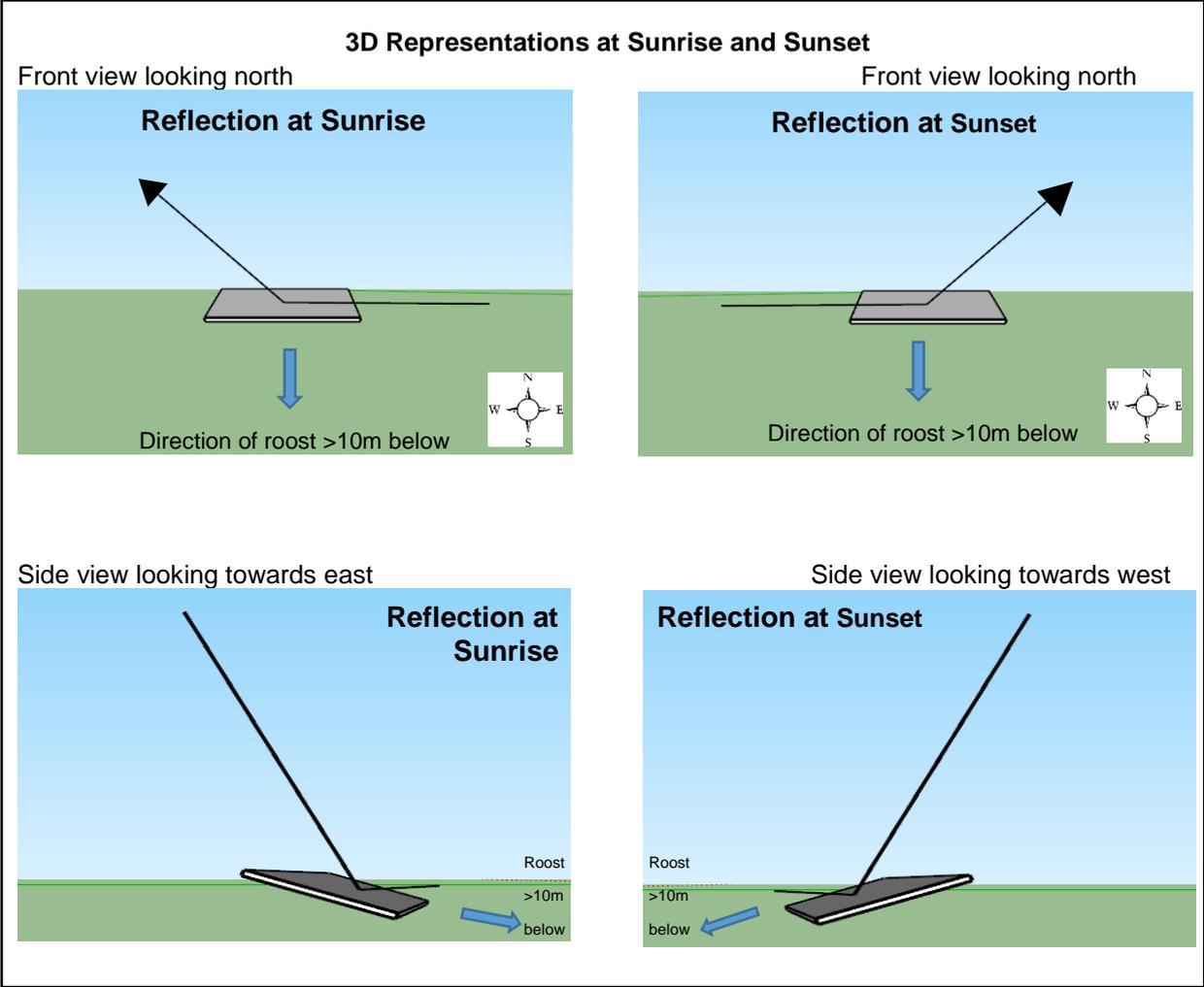


Figure 3: Angles of reflection at sunrise and sunset on solar panels positioned at 20 degrees to the horizontal and facing due south (Source Solrac Ltd)

The charts shown above give the full range and maximum extent of possible reflection directions throughout the year at the site. The diagrams clearly show that all possible reflections at all times of the year, and especially through the overwintering period, would be upwards from the elevation of the solar panels, traveling in an arc that is opposite to the sun’s daily movement (i.e. from west to north to east) and always north of and away from the roost areas on the peninsula.

Conclusion

This evidence clearly demonstrates that the estimated 9% of solar irradiance that might be reflected from the light absorbing solar panels at Lamby Way will be directed away from the peninsula and its roost areas in the Rhymney River Estuary at all times during the year and especially during the overwintering season.

Glint and glare is therefore not an issue that could be observed by, or affect the overwintering bird species in the identified roost areas protected by the SPA designation.

Appendix B:

**Photomontage of proposed development in the vicinity of roost site
1A**

(Please zoom in to see the extent of the visible solar panels)

- Indicative view of solar arrays



Origin and direction of image denoted by blue arrow on image, left

DESIGN KEY

Cardiff Council Ownership

Site Boundary

No.	Revision/Issue	Date

PROJECT DETAILS

Lamby Way
 Unnamed Road,
 Rumney, Cardiff
 CF3 2HP

TOTAL POWER: 8,746.08 kWp (DC)

No. of MODULES: 30,688

MODULE POWER: 285Wp

INVERTERS: 120x60kVA@25C
 Total 7,200kW (AC)

Gates: 5

No. of CCTV: 39

NOTES:

PROJECT: Lamby Way

DESCRIPTION: Site Location Plan

DRAWING No.: LAM-DWG001.1

DRAWN by: Davide Orio

CHECKED by: Carlos Javier

APPROVED by: Carlos Javier

Date: 10/01/2019

ISSUE: V3

SCALE: 1:2500 @ A1



DESIGN KEY

- Blue Line
- Red Line
- Gate
- Footpath
- Track
- Transformer
- Substation
- Access Track

No.	Revision/Issue	Date

PROJECT DETAILS

Lamby Way Unnamed Road, Rumney, Cardiff CF3 2HP	
TOTAL POWER:	8,746.08 kWp (DC)
No. of MODULES:	30,688
MODULE POWER:	285Wp
INVERTERS:	120x60kVA@25C Total 7,200kW (AC)
Gates:	5
No. of CCTV:	39

NOTES:

PROJECT:	Lamby Way
DESCRIPTION:	Solar Array Layout
DRAWING No.:	LAM-DWG003
DRAWN by:	Daide Orio
CHECKED by:	Carlos Javier
APPROVED by:	Carlos Javier
Date:	21/03/2019
ISSUE:	V2
SCALE:	1:1250 @ A1

