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Project:

Tydd Solar

Guanock Farm, Sutton St Edmund Lincolnshire, PE12 0LW

Addendum to the Surface Water Management Plan

Client:

PACE Titan Energy Limited

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1 Introduction

1.1 Background

A planning application has been submitted to South Holland District Council by Pace Titan Energy Ltd Ref: H19-0329-24 for a temporary ground-mounted solar photovoltaic (PV) farm with battery storage and associated works at Land East of Guanockgate Road, Sutton St Edmund, Spalding, Lincolnshire, PE13 4PL.

Cambridgeshire County Council is the Lead Local Flood Authority (LLFA) and a comprehensive pre-application meeting was held with their Flood and Water Team to discuss flood risk and associated surface water management requirements.

Following submission of the planning application, the LLFA wrote to South Holland District Council on 07 May 2024 (see full letter in **Appendix A**) objecting to the proposals for the sole reason stated below;

> ***Surface water drainage***
>
> *Whilst it is broadly accepted that solar farms do not respond in the same was as impermeable surfaces, they can lead to localised channelling of rainfall, particularly on sloping sites. This has the potential to increase flood risk downstream.*
>
> *Options such as the inclusion of a French drains at the base of each row/ along access tracks to intercept flows and address water quality, inclusion of a swale(s) at the lowest parts of the site and designing panels with horizontal slots across the surface area should be considered as measures to manage surface water.*

This addendum addresses the objection fully and aims to overcome it by providing an extensive network of swales at the site to manage surface water. The design of the swales are in accordance with the Council's *'SuDS Design & Adoption Guide – Swales and Filter Strips'* (see https://www.cambridge.gov.uk/media/5464/suds-design-and-adoption-guide-part-7.pdf) and wider national guidelines for surface water run-off management.

1.2 Cambridgeshire CC - Surface Water Guidance, SuDS Hierarchy

The current SuDS Policy (as detailed in Floodline Consulting Surface Water Management Plan (SWMP) ref: FCL/644/SW01, Section 4.1 – SuDS Hierarchy) *'Developers and local authorities should seek opportunities to reduce the overall level of flood risk in the area and beyond through the layout and form of the development, and the appropriate application of sustainable drainage systems'.*

SuDS is a concept that incorporates long term environmental and social factors in order to design surface water drainage systems, in accordance with the ideals of sustainable development. SuDS takes into account the quantity and quality of surface water run-off, and the value of surface water to the urban and rural environments.

The following receptors have been considered for the SW run-off in order of preference taking into consideration the LLFA's *SuDS Hierarchy and Standing Advice – Solar Panels (PV) and Solar Farms, dated January 2022*;

1. Discharge by infiltration into the ground: *Optimum option for this site. However, the impact of the development on the natural infiltration to the underlying soil is negligible as rainwater would infiltrate to ground in the same manner as in the undeveloped-site conditions.*

2. Discharge into perimeter swales or filter strips every 10th row of PV panels: *Use of perimeter swales are suitable for this site where necessary.*

3. Discharge into open surface water body: *Not applicable as there are no ponds, lakes or watercourses within close proximity of the site.*

4. Use Green, Brown or Blue Roofs: *Not applicable.*

5. Discharge into SW sewer: *Not applicable.*

6. Discharge into Combined Sewer: *Not applicable.*

2 Overcoming the Objection

2.1 Site Levels

The ground levels at the site slope gently from the western boundary to the Lady Nunn's Old Eau located centrally within the site as shown in **Figure 1** below. The 'Eau' is a natural open channel conveying water in a southerly direction through the lowest topography at the site.

Ground levels at the east of the site are lower but also drain to the Lady Nunn's Old Eau via a network of ditches.

The proposed development will not alter existing ground levels thus allowing the natural drainage paths via existing ditches to the Eau to be maintained. The SWMP report confirms SW flood risk at the site is **low** and the photovoltaic panels will not increase flood risk downstream or elsewhere. The report also refers to the provision of catchment swale which are clarified in this addendum.

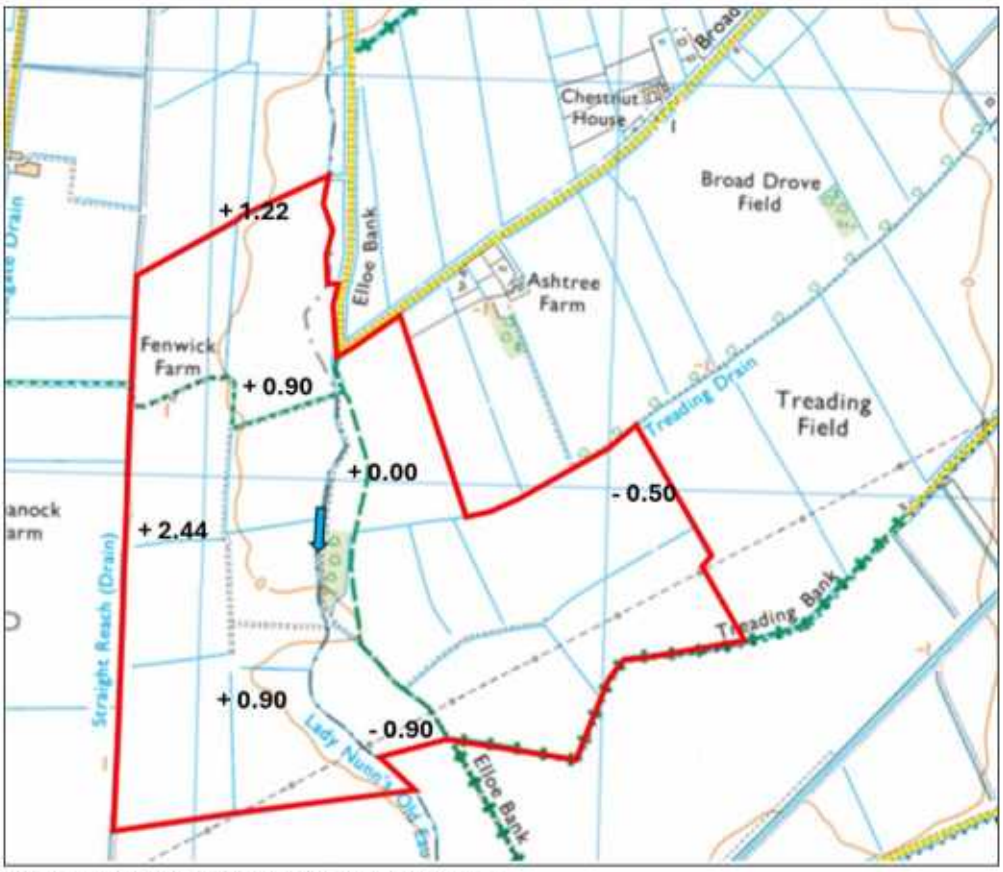

Figure 1: *Ground levels and ditches at the site*

2.2 Swales and Filter Strips

Swales are shallow, broad and vegetated channels with shallow slopes designed to store and/or convey surface water run-off and remove pollutants They may be used as conveyance structures to pass the run-off to the next stage of the treatment train and can be designed to promote infiltration where soil and groundwater conditions allow.

Check dams and berms also can be installed across the flow path of a swale in order to promote settling and infiltration.

Filter strips are gently sloping turfed channel that direct run-off to a swale or drain. The main purpose of a filter strip is to aid in removing silt from the run-off to prevent clogging in the receiving swale.

Swales and filter strips are simple yet very effective systems in managing surface water run-off. They are easy to incoprate into landscaping, they reduce run-off rates, have a low capital and maintenance cost and provides opportunities for habitat creation.

Figure 2 below shows a section through a typical, grass covered, swale taken from Cambridgeshire CC SuDS Design & Adoption Guide. A typical swale is 300mm deep, with 1 in 3 side slopes to ensure stability, and lines with grass. These swales can be installed rapidly with a specialist profiler fitted to an excavator for the desired section as shown in **Figure 3**.

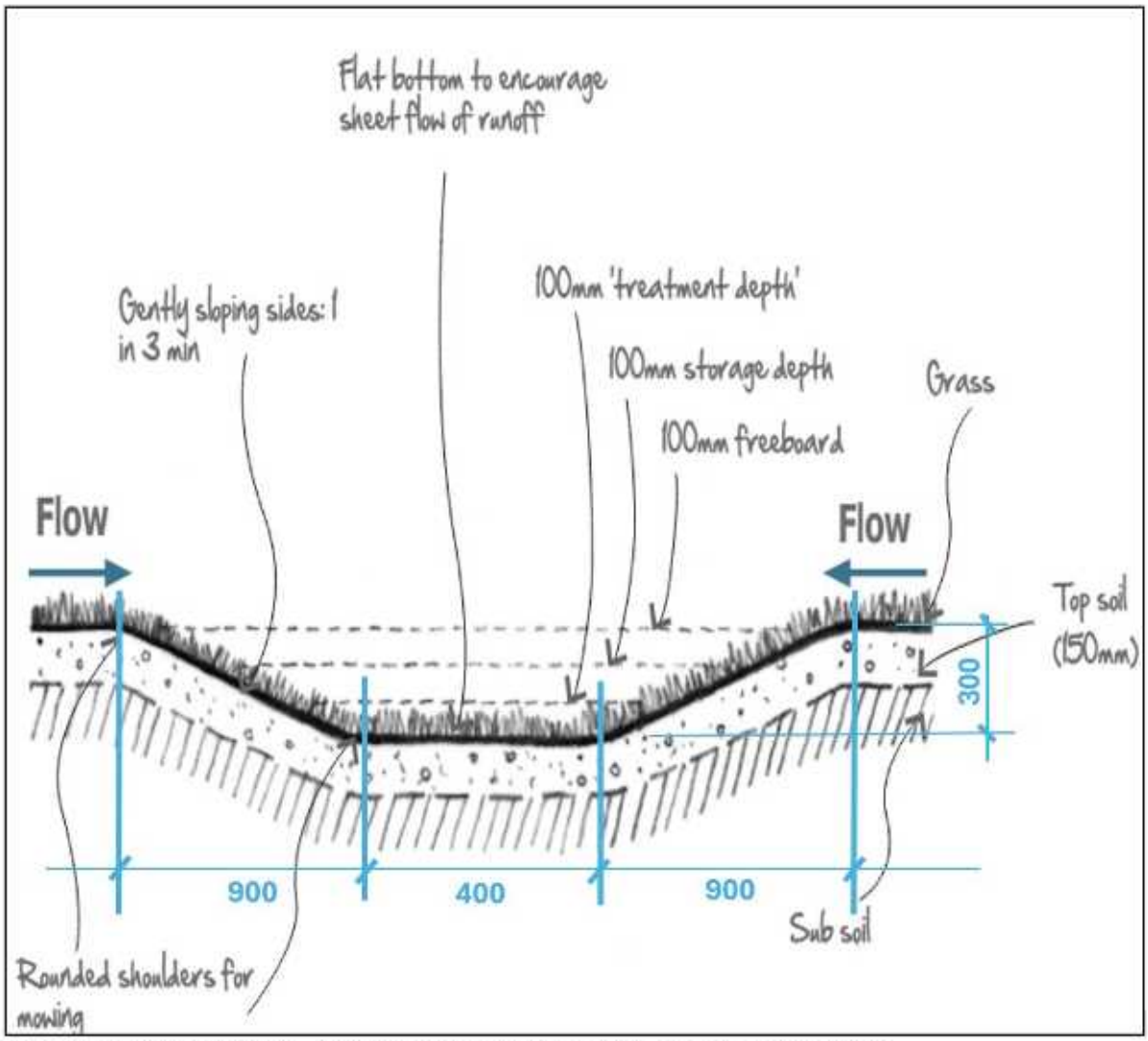

Figure 2: *Cambridgeshire CC – SuDS Design & Adoption Guide - Swales and Filter Strips*

Figure 3: *Construction of a swale*

Figure 4 is an extract from a Cambridgeshire CC SuDS Case Study showing a typical swale installed at the base of a gentle slope at Loves Farm in St Neots.

Figure 4: *Cambridgeshire CC – SuDS Case Study, Swale at Loves Farm, St Neots*

2.3 Proposed Swales at Tydd Solar Farm

An extensive network of swales is proposed at Tydd Solar Farm as shown in **Figure 5** below totalling approximately 3,600m. The swales extend along the lower boundaries of individual fields to intercept exceedence flow routes into existing ditches, drains and watercourses.

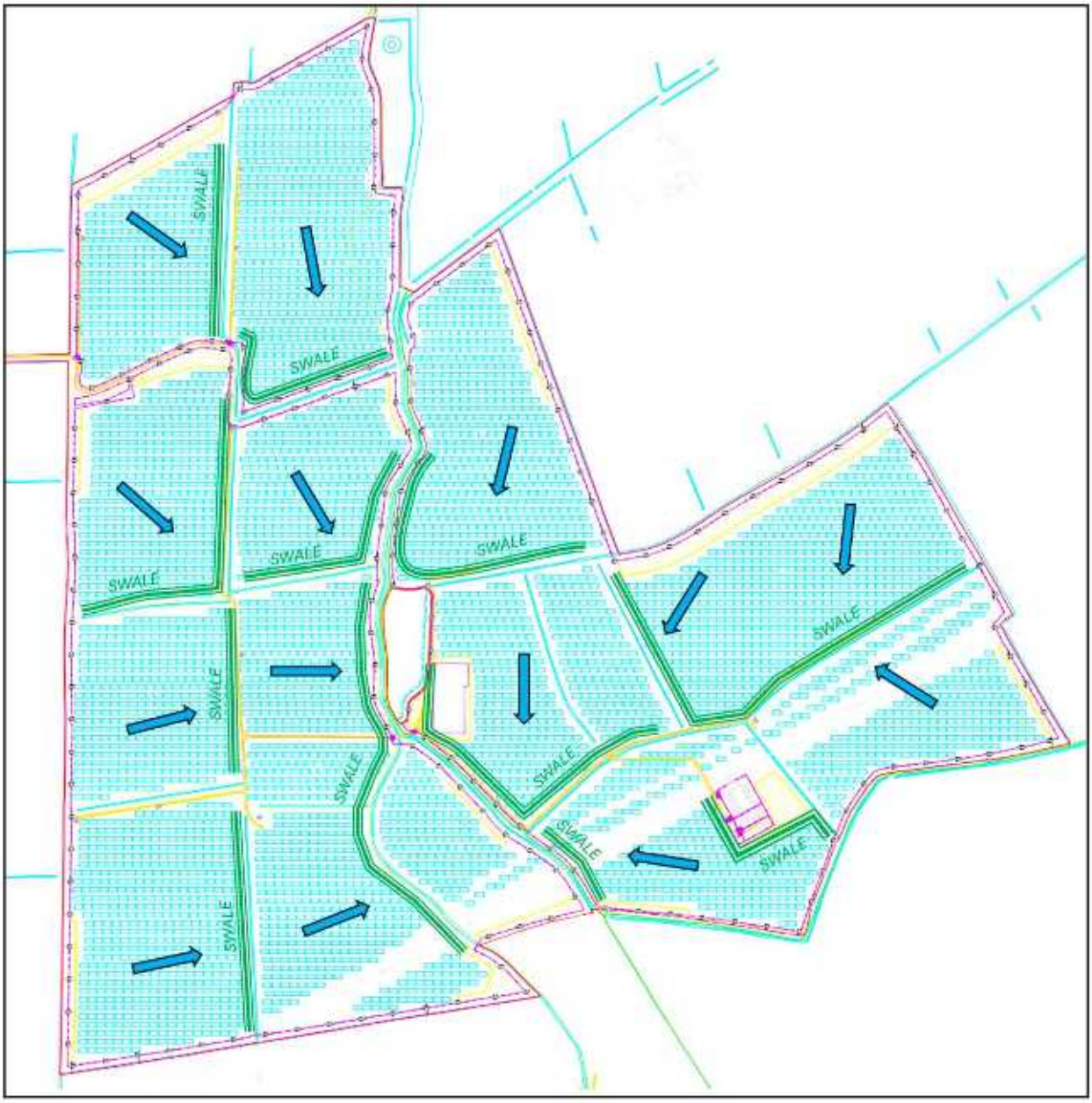

Figure 5: *Proposed Swales and SW Exceedence Routes Plan*

The existing and proposed SW exceedence flow routes remain the same as there is no requirement to alter the existing topography as a result of the panel installation. The new swales are easiliy accessible for future maintenance by Pace personnel.

The proposed SuDS strategy for the site includes an environmental mitigation and enhancement plan as shown in **Figure 5** below and as detailed in the SWMP report. The new swales, ditches, filter drains and French drains form an integral part of the enhancement plan for the site to prevent pollution and encourage biodiversity.

The environmental proposals for the site include new:

1. Log/wood piles as refuge for reptiles and amphibians
2. Native hedging to add to existing hedgerows
3. Native tree planting to supplement existing trees
4. Extensive corridors between stretches of native woodland
5. Deer fencing to protect newly planted trees
6. Management of the existing copse
7. Wildlife and mammal gates at strategic points to maintain access through the site
8. Reed beds
9. Wildflower meadows around/underneath solar panels maintained by managed sheep grazing
10. Maintenance of existing public rights of way

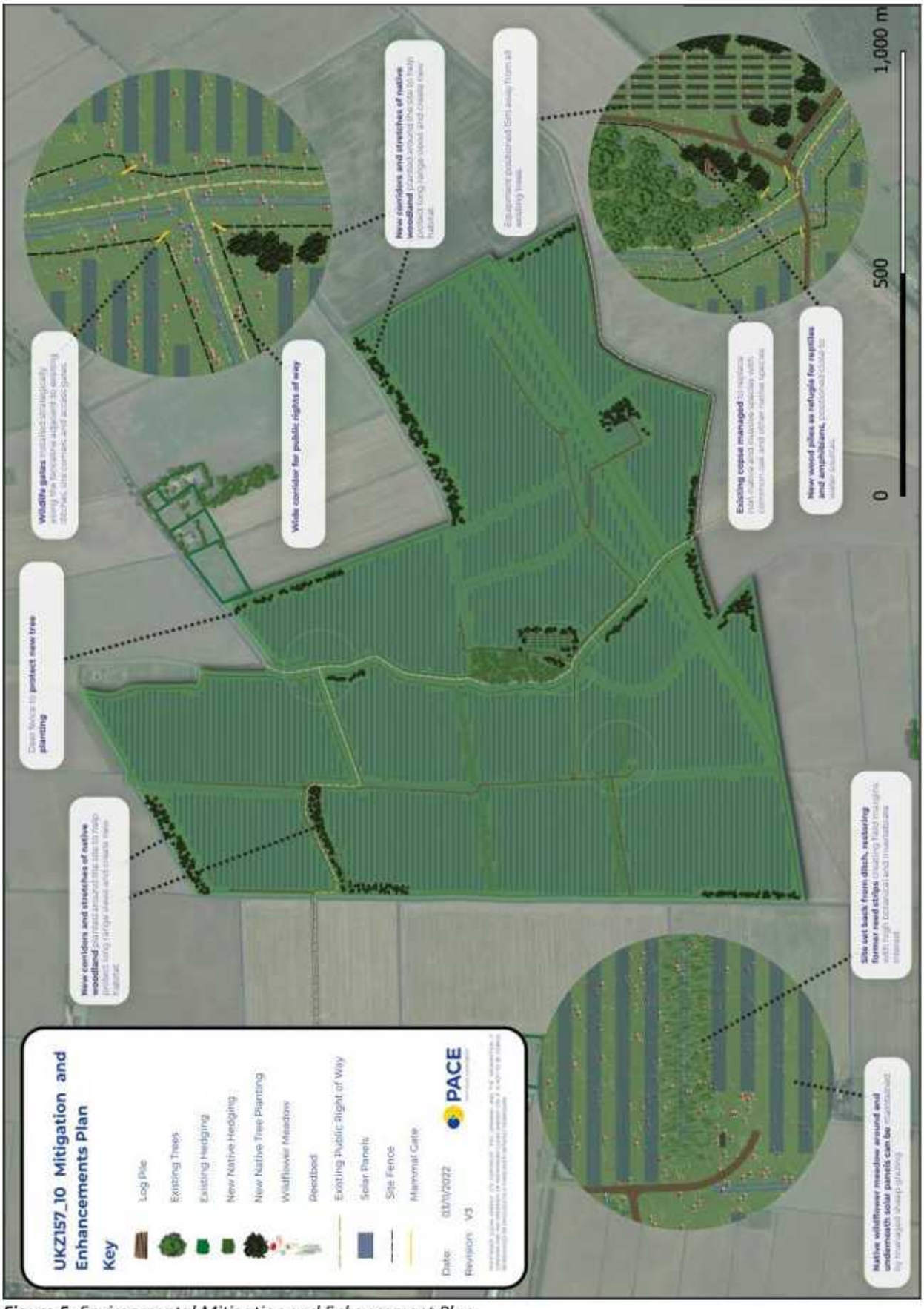

Figure 5: *Environmental Mitigation and Enhancement Plan*

3 Conclusions

The objective of this addendum report is to fully address and overcome the single objection raised by the Lead Local Flood Authority;

- The site gently slopes to a central watercourse (Lady Nunn's Old Eau) allowing surface water run-off from fields to be adequately maintained and managed within the site boundaries. Exceedance flow routes are clearly defined and flow velocity is **low** resulting in a low flood risk classification for the site.

- The topography of the site allows for extensive use of swales to manage surface water run-off in a sustainable manner. Approximately 3,600m length of swale is proposed at the lower sections of the fields to intercept overland flow upstream of existing drains, ditches and watercourses. No changes to existing terrain is proposed as a result of the new facilities therefore there is no negative impact on existing watercourses

- The existing site is greenfield comprising 99.9% vegetated permeable surfaces. The proposed facility will retain the same permeable area. There will be no increase in peak SW run-off generated from the site thus mimicking the existing hydrological characteristics of the fields

- The swales are to be 300mm deep, formed with 1 in 3 slopes and lined with grass and other vegetation. The design of the swale is complaint with the Council's *'SuDS Design & Adoption Guide – Swales and Filter Strips'*

- The swales, in conjunction with proposed French drains and other ditches, will provide effective pollution control including reduction in flow rates and settlement of suspended solid and silt in the flow.

- The swales also provide opportunities for biodiversity as part of a wider environment enhancement and management plan for the site.

- All SuDS features, including the swales, will be maintained and managed by Pace's operations and maintenance personnel on a regular basis as set out in the SuDS report, issued under separate cover.

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2 Appendices

Appendix A – FR/24-000164 Cambridgeshire CC, Comments from LLFA on 07 May 2024

Appendix A

FR/24-000164 Cambridgeshire CC, 07 Comments from LLFA on May 2024