



RED BARN SOLAR FARM

DRAINAGE MANAGEMENT PLAN

EDEN RB SOLAR LTD

30/04/2026

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Report type

Drainage Management Plan

Project number

P25178

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Revision History

Revision	Date	Author	Checker	Approver	Comments
V01	15.01.26	AS	BF	CB	First Draft
V02	30.04.26	BF	CB	CB	Revised following client review

Quality Assurance

This report has been prepared according to Gavia Environmental Quality Management Process. Gavia Environmental employs consultant scientists who are members of appropriate professional institutions and adhere to professional codes of conduct.

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1 Introduction

Gavia Environmental Ltd (Gavia) has been commissioned by Eden RB Solar Ltd (the Client) to produce a Drainage Management Plan for the discharge of condition 4 with respect to planning application reference PL/2023/08481. Condition 4 is as outlined below.

Condition 4:

No development shall commence on site until a drainage management plan, which shall include monitoring of, and measures to retain, the existing vegetation across the site, has been submitted to and approved in writing by the Local Planning Authority. The drainage management plan shall include a robust soil, grass, and/or land management plan maintaining vegetative areas in between the solar arrays at a long length to help interrupt and slow the channelised flows, reducing erosion and also enhance and promote the infiltration and interception capacity. This should also include details of the regime for monitoring vegetation cover including frequency of visits, and set out remedial measures that could be implemented if problem areas are identified. The development shall be carried out in complete accordance with the agreed drainage management plan.

REASON: To ensure that surface water quality and quantity is managed throughout construction and operational phases, and so as not to increase flood risk, or pollution of watercourses.

This Drainage Management Plan shall demonstrate how surface water drainage features, soils, and vegetation will be managed, monitored, and maintained throughout the construction and operational phases of the proposed development, and throughout the lifetime of the solar farm. This also includes details of maintaining vegetative areas between proposed panel rows and beneath panels (post-development).

The site Operation and Maintenance Team will be responsible for implementing the monitoring and maintenance requirements outlined within this Drainage Management Plan. The O&M Team shall be responsible for undertaking inspections and monitoring, keeping records of inspections and maintenance, and implementing remedial actions where necessary.

As per the previously submitted drainage strategy, it is proposed for shallow interception swales to be located around the site to capture surface water runoff and slow the flows leaving the site, providing a betterment on existing conditions, where runoff is uncontrolled in all return-period events. This plan outlines the proposed maintenance of these drainage features.

2 Flood Risk

2.1 Fluvial

As identified in the Flood Risk Assessment, the Environment Agency Flood Map for Planning shows the site to be partially located within Flood Zones 2 and 3. These are the areas at medium to high risk of fluvial flooding associated with the Ordinary Watercourse flowing through the centre of the site. **Figure 1** illustrates the fluvial flood risk to the site.

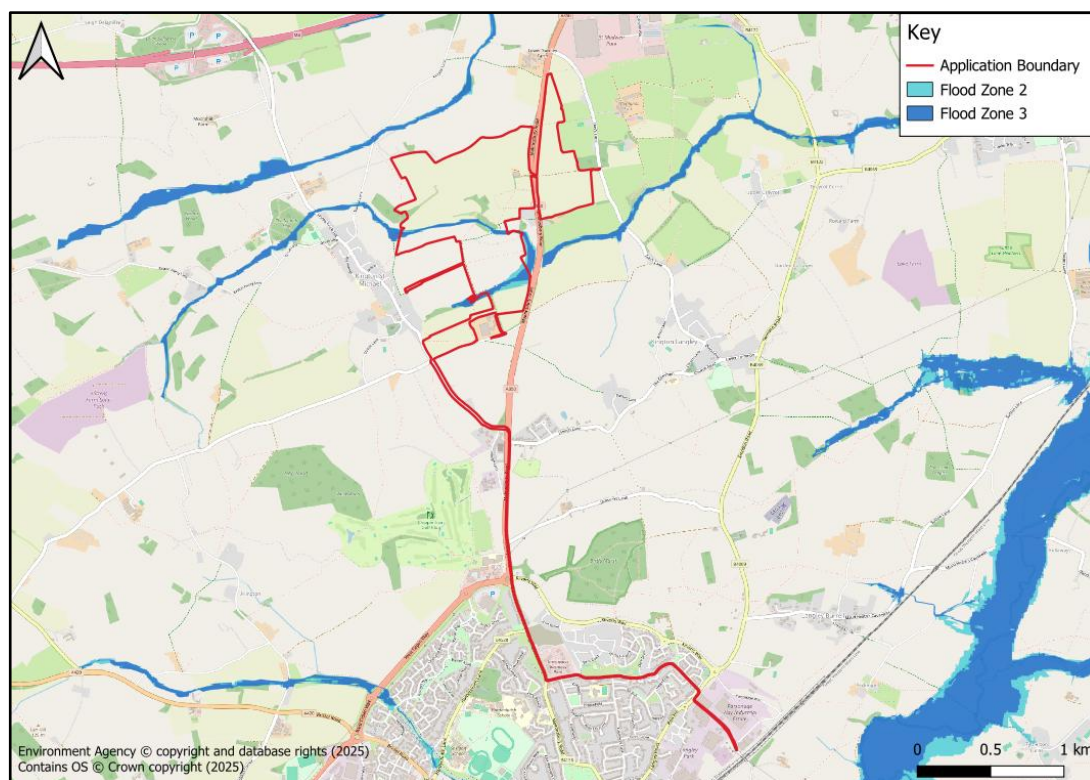


Figure 1: EA Flood Map for Planning

Figure 2 shows the main area of proposed panels which is at risk of flooding from fluvial sources, this being within the southern area of the site. It is recommended that this area is inspected following any fluvial flood events for signs of erosion and/or damage to vegetation beneath and between panel rows. Maintenance procedures such as reseeding and aeration of soils shall be undertaken where necessary. Further maintenance and monitoring details are provided within **Section 3**.

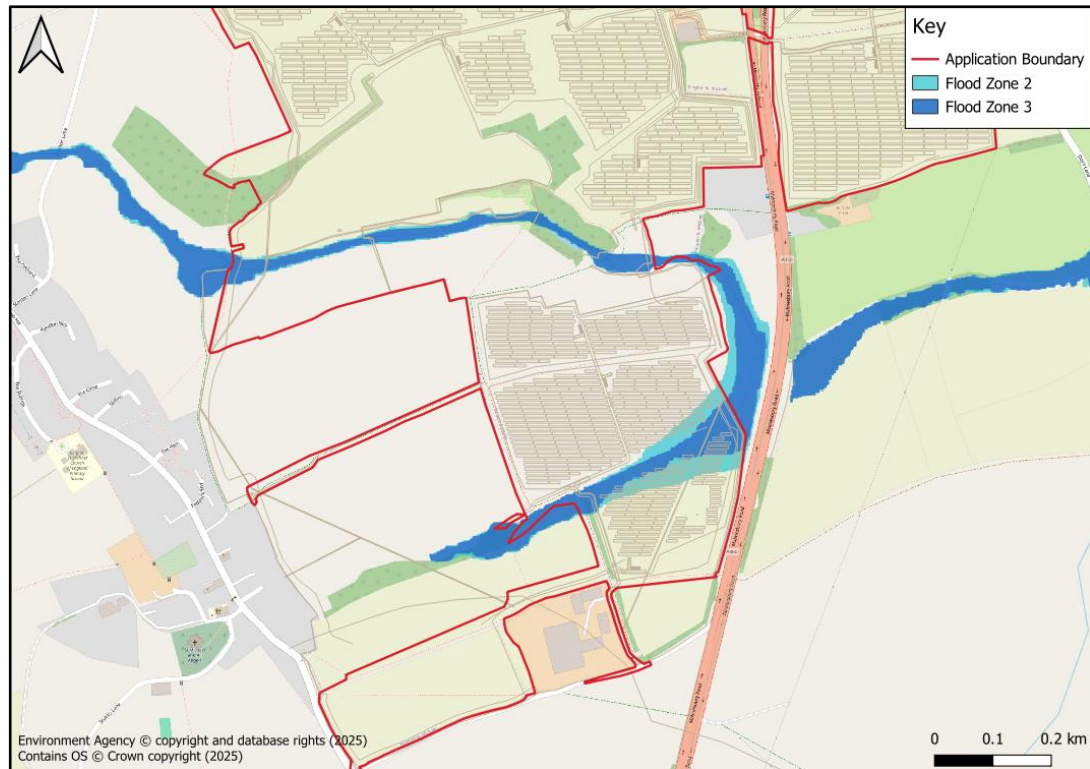


Figure 2: Fluvial Flood Zones in relation to proposed panels

2.2 Pluvial

Figure 3 shows the pluvial flood risk to the site. The site area to be occupied by solar panels is shown to be mostly at negligible risk of flooding from this source. Surface water runoff and pooling can cause an increase in erosion of soils, however as the risk to the site is shown to be negligible, no additional mitigation measures shall be required for this. The proposed interception swales shall capture runoff and slow surface water flows leaving the site.

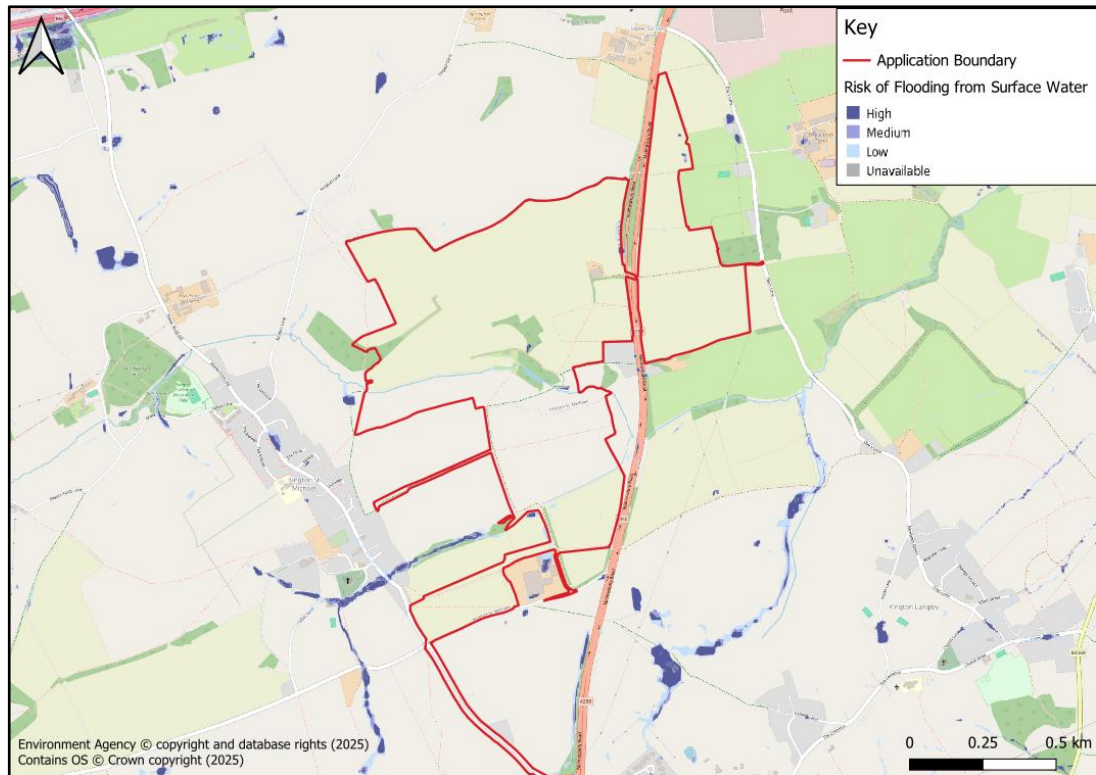


Figure 3: EA Pluvial Flood Map

3 Soil and Grass Management Plan

3.1 Construction Phase

During construction, the following measures shall be implemented to protect drainage performance:

- Minimisation of construction traffic routes and avoidance of trafficking outside defined access corridors
- Use of low-ground-pressure machinery where practicable to prevent soils from becoming compacted and reducing infiltration potential.
- Avoidance of works during prolonged wet conditions where this could cause soil compaction or an increase in erosion.
- Immediate reinstatement of disturbed areas with appropriate grass seed mixes to suit the existing vegetation at the site. This will retain the soil integrity being affected and prevent a reduction in infiltration potential.
- Temporary erosion control measures where required (such as geotextiles) to keep soils in place where necessary.
- Dampening down of any areas of exposed soil to prevent loose sediments being moved by wind or surface water, thus causing detriment to watercourses downstream.

Vegetation and soil condition shall be monitored monthly during construction, with additional inspections following heavy rainfall events. Any areas showing compaction, bare ground or signs of erosion will be addressed promptly as per CIRIA guidance.

3.2 Operation Phase

3.2.1 Vegetation Strategy Between Rows and Beneath Panels

A permanent grass sward will be maintained across the site, including beneath and between solar panel rows. The vegetation strategy has been designed to:

- Maximise surface roughness and maintain high grass height between panel rows to interrupt and slow overland flows. To help with this, vegetation between panel rows shall be maintained at a long length to promote infiltration potential and slow flows of surface water running off from the proposed panels.
- Enhance interception and infiltration potential of vegetation between panels and within interception swales through reseeding when necessary, with suitable plant species.
- Reduce the potential for channelised flow and erosion through maintaining taller grass/vegetation.
- Support soil health and structure through minimising potential for compacting of soils. Maintaining long length vegetation between panel rows shall prevent runoff from solar panels causing soils to become compacted or eroded. Monitoring and maintaining the length of vegetation between rows is essential in protecting soil structure. **Section 3.3** outlines the proposed monitoring regime.

Grass will be managed as long grass or species-rich grassland, appropriate to site conditions, in accordance with CIRIA C753 recommendations for vegetated SuDS components.

3.2.2 Soil Management

Soil management measures shall include:

- Avoidance of unnecessary traffic on grassed areas during maintenance. Vehicles shall utilise access roads included within the development design.
- Periodic inspection of soils beneath panels and between rows for compaction, thus reduction of infiltration.
- Aeration or decompaction shall be undertaken where reduced infiltration and/or compaction is identified.

- Maintenance of organic matter through appropriate grass management and removal of invasive or harmful species.

3.3 Monitoring Regime

It is proposed to monitor the soil and vegetation cover at the proposed development during construction and operation. In line with CIRIA guidance, a structured monitoring regime shall be implemented to ensure the ongoing effectiveness of the drainage and vegetation management plan.

Monitoring of vegetation and soils shall include:

- Visual inspection of vegetation coverage and density with particular attention to areas beneath panels and between panel rows.
- Identification of bare ground or thinning sward.
- Evidence of erosion, gully, or creation of new flow paths across the site.
- Signs of channelised overland flow, rather than runoff being directed to the proposed interception swales to residually infiltrate.
- Ponding or reduced infiltration.
- Sediment accumulation along flow paths.
- Inspection of soils and vegetation of any affected areas following a fluvial flood event.

3.4 Maintenance and Remedial Measures

A proactive maintenance regime will be implemented for the lifetime of the development.

Where monitoring identifies deficiencies in soil or grass, remedial measures may include:

- Reseeding or overseeding to restore vegetation cover and improve infiltration potential.
- Introduction of longer grass management or buffer strips. It is proposed for the grass between panel rows to be kept at long length to slow surface water runoff and promote infiltration and treatment.
- Localised regrading to remove incised flow paths where necessary.
- Soil aeration or other improvement measures, such as decompaction.
- Temporary protective measures during vegetation re-establishment. This may include the use of geotextiles to provide stability for soils and enhance vegetation growth.

Table 2 outlines the proposed regime for monitoring and maintenance of soils and vegetation.

Table 2: Monitoring and Maintenance Schedule for Vegetation and Soils as per CIRIA C753

Feature / Element	Phase	Inspection Frequency	Monitoring Criteria	Maintenance / Remedial Action
Vegetation cover between panel rows	Construction	Monthly and post-heavy rainfall events	Percentage cover, bare ground exposed, erosion	Reseeding, erosion repair
Vegetation cover between panel rows	Operation	Biannually Spring/Autumn	Density, sward height, flow paths	Overseeding, adjust cutting regime
Soil condition and integrity/stability	Construction	Monthly	Compaction due to runoff, rutting	Decompaction, soil reinstatement, reseeded
Soil condition and integrity/stability	Operation	Annually	Infiltration, ponding, compaction due to runoff from panels	Aeration, soil improvement, decompaction
Overland flow routes	All phases	Post-heavy rainfall	Channelisation, sediment	Regrading, flow disruption
Drainage performance of interception swales	Operation	Biannually	Runoff behaviour, infiltration rate, pooling (for longer periods)	Adaptive management, reseeded with aquatic plants and grass mix to promote infiltration and evapotranspiration

4 Maintenance Regime for Drainage Features

Maintenance of SuDS features is required to ensure that the surface water drainage remains effective and functional, preventing flooding of the site and surrounding area. It is also essential to maintain the health of proposed interception swales to promote infiltration and water quality treatment potential.

Table 1 contains a maintenance schedule for the drainage components within the proposed development, as per The SuDS Manual (CIRIA C753).

Table 1: Initial Maintenance Schedule as per CIRIA 753 The SuDS Manual

Drainage Component	Required Action	Typical Frequency
Interception Swales	Remove litter and debris.	Monthly (or as required)
	Cut grass to retain grass height within specified design range.	Twice a year; once in September, and then again in late winter
	Manage unwanted vegetation and remove nuisance plants.	Monthly (at start then as required)
	Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for >48 hours.	Monthly (or as required)
	Inspect vegetation coverage of swales. If soils are showing, reseedling will be required with suitable mixed grasses and aquatic plants.	Monthly for 6 months, quarterly for 2 years, then half yearly
	Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required. Reseed with aquatic plants to promote infiltration and treatment potential of proposed swales.	As required or if bare soil is exposed over 10% or more of the swale treatment area
	Repair erosion or other damage by returfing or reseedling.	As required
	Relevel uneven surfaces and reinstate design levels.	As required
	Scarify and spike topsoil layer to improve infiltration performance, brake up silt deposits and prevent compaction of the soil surface.	As required
	Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip.	As required
	Remove and dispose of oils or petrol residues using safe standard practices.	As required