Rosefield Solar Farm

Environmental Statement

Volume 2
Chapter 16: Water

APFP Regulation Reg 5(2)(a)

Planning Act 2008

Infrastructure Planning
(Applications: Prescribed Forms
and Procedure) Regulations 2009

EN010158/APP/6.2
September 2025
Rosefield Energyfarm Limited

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16. Water

16.1. Introduction

16.1.1. This chapter presents an assessment of likely significant effects arising from the construction, operation (including maintenance) and decommissioning of the Proposed Development upon the water environment, particularly water quality, flood risk and surface water drainage. An assessment of likely significant effects to groundwater bodies is presented within **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2]**. The full description of the Proposed Development is provided within **ES Volume 1, Chapter 3: Proposed Development Description [EN010158/APP/6.1]**.

16.1.2. This chapter is supported by the following figures presented in **ES Volume 3 [EN010158/APP/6.3]**:

- **Figure 16.1: Watercourses**;
- **Figure 16.2: Environment Agency Flood Zones**;
- **Figure 16.3: Environment Agency Risk of Surface Water Flooding**;
- **Figure 16.4: Fluvial Modelling of Claydon Brook Tributary**;
- **Figure 16.5: Pluvial Modelling of Claydon Brook Tributary**; and
- **Figure 16.6: WFD Waterbodies and Catchments**.

16.1.3. This chapter is further supported by the following technical appendices presented in **ES Volume 4 [EN010158/APP/6.4]**:

- **Appendix 16.1: Flood Risk Assessment**; and
- **Appendix 16.2: WFD Waterbodies Stage 1 Screening Assessment**.

16.1.4. This chapter is also supported by the following documents:

- **Outline Construction Environmental Management Plan (Outline CEMP) [EN010158/APP/7.2]**;
- **Outline Operational Environmental Management Plan (Outline OEMP) [EN010158/APP/7.3]**;
- **Outline Decommissioning Environmental Management Plan (Outline DEMP) [EN010158/APP/7.4]**;
- **Outline Battery Safety Management Plan [EN010158/APP/7.9]**; and
- **Outline Drainage Strategy [EN010158/APP/7.11]**.

16.1.5. This chapter should also be read in conjunction with the following assessment chapter(s) presented in **ES Volume 2 [EN010158/APP/6.2]**:

- **Chapter 7: Biodiversity [EN010158/APP/6.2]**, which provides details on the proposed ecological buffer areas;
- **Chapter 11: Land and Groundwater [EN010158/APP/6.2]**, which assess the potential impacts of the Proposed Development on groundwater bodies;
- **Chapter 12: Soil [EN010158/APP/6.2]**, which provides further details on existing ground conditions of the Site; and
- **Chapter 17: Cumulative Effects [EN010158/APP/6.2]**.

16.2. Legislative framework, planning policy and guidance

16.2.1. This assessment has been undertaken with regard to the following legislation, planning policy and guidance.

16.2.2. It should be noted that this chapter does not assess the compliance of the Proposed Development against relevant planning policy. Such an assessment is presented in the **Planning Statement [EN010158/APP/5.7]**.

Legislation

- The Land Drainage Act 1991 sets out the responsibilities of Local Authorities and Drainage Boards in relation to land drainage. It requires that a watercourse is maintained by its owner in such a condition that the free flow of water is not impeded **[Ref. 16-1]**;
- The Water Environment (Water Framework Directive (WFD)) (England and Wales) Regulations 2017 implemented several EU Directives including the Water Framework Directive 2000/60/EC. The Regulations were retained in UK law after EU Exit via the EU Withdrawal Act 2018. The Regulations aim to achieve good qualitative and quantitative health for water bodies by reducing and removing pollution and by ensuring that there is enough water to support wildlife at the same time as human needs. The Water Framework Directive requires a 6-yearly cycle of river basin management, with the next comprehensive update of classifications for all water bodies due in 2025. England aims to reach 'good' chemical and ecological status in inland and coastal waters by 2027 at the latest **[Ref. 16-2]**;
- The Flood and Water Management Act 2010 aims to improve flood risk management in England and Wales and ensures that flood risk responsibilities are better defined. It encourages more sustainable forms of drainage in new developments and allows for the creation of Lead Local Flood Authorities who have responsibilities for co-ordinating the management of flood risk from local sources **[Ref. 16-3]**;

- The Water Resources Act 1991 focuses on the management of water resources, water quality and flood defence. The Act includes a definition of 'Main Rivers' **[Ref. 16-4]**;
- The Water Industry Act 1991 **[Ref. 16-5]** sets out the main powers and duties of the water and sewerage companies. The Water Act 2003 **[Ref. 16.6]** and the Water Act 2014 **[Ref. 16.7]** have modified the framework set out under the Water Industry Act 1991;
- The Environmental Permitting (England and Wales) Regulations 2016 establish a permitting structure for those activities which have the potential to cause harm to human health or the environment. Environmental permits are required from the Environment Agency for certain industrial and waste installations, as well as for the discharge or abstraction of surface water or groundwater, and for activities on or near a Main River or flood defence that could have flood risk impacts **[Ref. 16-8]**;
- The Control of Pollution (Oil Storage) (England) Regulations 2001 makes requirements for the safe above ground storage of oil, including requirements for secondary containment and drip trays. Further obligations relate to pipework, fittings and pumps serving fixed and mobile oil bowsers **[Ref. 16-9]**;
- The Nitrate Pollution Prevention Regulations 2015 allows for the designation of land as Nitrate Vulnerable Zones and imposes annual limits on the amount of nitrogen from organic manure that may be applied to a crop in a Nitrate Vulnerable Zone **[Ref. 16-10]**;
- The Flood Directive 2007/60/EC **[Ref. 16-11]**, which is transposed into legislation for England via the Retained EU Law (Revocation and Reform) Act 2023 **[Ref. 16-12]**; and
- The Environment Act 2021 includes laws that relate to environmental protection including nature protection, water quality and clean air. It offers new powers to set new binding targets, including for air quality, water, biodiversity, and waste reduction **[Ref. 16-13]**.

National planning policy

- Overarching National Policy Statement for Energy (NPS EN-1) (2023) – Section 5.8 'Flood Risk' outlines the requirements in relation to flood risk and flood risk management, and the requirements for surface water drainage **[Ref. 16-14]**;
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023) – Section 2.10 gives specific consideration to solar development, specifically in relation to the layout and design which should consider the mitigation of flood risk **[Ref. 16-15]**;

- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023) – Section 2.3 details issues relating climate change and outlines the considerations required in relation to flood risk **[Ref. 16-16]**; and
- National Planning Policy Framework (2024) Section 14 'Meeting the challenge of climate change, flooding and coastal change' sets out the criteria for development and flood risk by stating that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere **[Ref. 16-17]**.

Local planning policy

- Vale of Aylesbury Local Plan (VALP) 2013 – 2033 (Adopted September 2021), specifically Policy I4 'Flooding' requires developments to be supported by a Flood Risk Assessment which demonstrates that the development will be safe from flooding for its lifetime, without increasing flood risk elsewhere and will explore opportunities to reduce flood risk overall. Where relevant, proposals must pass the Sequential Test and, where appropriate, the Exceptions Test. All development will be required to design and use sustainable drainage systems (SuDS) for the effective management of surface water run-off on site. Policy I5 'Water resources and wastewater infrastructure' seeks to improve water quality, ensure adequate water resources, promote sustainability in water use and ensure wastewater collection and treatment has sufficient capacity **[Ref. 16-18]**;
- Local Plan for Buckinghamshire: Draft vision and Objectives for 2040, specifically Objective 1 'Natural and built environment' aims to conserve and enhance Buckinghamshire's valued natural, historic, and built environments, to ensure they are protected from inappropriate development. The Local Plan will look to improve water quality in our rivers and watercourses, prioritising our chalk streams. Objective 2 'Mitigating/adapting to climate change' aims to ensure the delivery of sustainable development, mitigating climate change and adapting to the impacts on Buckinghamshire's environment. Objective 6 'Infrastructure' aims to ensure the right infrastructure required to support communities is provided in the right place and at the right time, and make best use of existing facilities **[Ref. 16-19]**; and
- Aylesbury Vale Watercourse Advice Note: NE2 River and stream corridors. This states that development proposals must not have an adverse impact on the functions and setting of any watercourse and its associated corridor. They should conserve and enhance the biodiversity, landscape and consider the recreational value of the watercourse and its corridor through good design. Opportunities for de-culverting of watercourses should be actively pursued. Planning

permission will only be granted for proposals which do not involve the culverting of watercourses and which do not prejudice future opportunities for de-culverting. Development proposals adjacent to or containing a watercourse shall provide or retain a 10m ecological buffer (unless existing physical constraints prevent) from the top of the watercourse bank and the development and include a long-term landscape and ecological management plan for this buffer **[Ref. 16-20]**.

Guidance

- Flood Risk and Coastal Change National Planning Practice Guidance (Department for Levelling Up, Housing and Communities, 2022) **[Ref. 16-21]**;
- Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Planning Inspectorate 2025) **[Ref. 16-22]**;
- Flood Risk Assessments: climate change allowances (Environment Agency, 2022) **[Ref. 16-23]**;
- Design Manual for Roads and Bridges (DMRB) LA 113 Road Drainage and the Water Environment (National Highways 2020) **[Ref. 16-24]**;
- The CIRIA SuDS Manual C753 (2007) **[Ref. 16-25]**;
- Defra's Non-Statutory National Standards for Sustainable Drainage Systems (2025) **[Ref. 16-26]**;
- Environment Agency 'Flood risk assessment: flood zones 1, 2, 3 and 3b' guidance (2024) **[Ref. 16-27]**;
- Environment Agency and Defra 'Oil Storage Regulations for Businesses' guidance (2015) **[Ref. 16-28]**;
- Environment Agency Pollution Prevention Guidance Notes (withdrawn from use in 2015 but still considered to contain useful advice on best practice in the absence of any replacement 'good practice' guidance) **[Ref. 16-29]**;
- Environment Agency Land Contamination Risk Management (LCRM) (2020) **[Ref. 16-30]**;
- Buckinghamshire County Council Sustainable Drainage Systems guidance for developers (2022) **[Ref. 16-31]**;
- "The Pollution Prevention for Businesses" guidance (Environment Agency, 2024**) [Ref. 16-32]** is a guidance is a document published by the UK Government to advise businesses on minimizing pollution, particularly related to watercourses; and
- BS EN 858-1 and 858-2 (Design and maintenance of oil separators) (EU 2002, fully UK adopted 2003) **[Ref. 16-33]** are European and British Standards that provide guidance on the design, selection,

installation, operation, and maintenance of oil separators, specifically for light liquids like oil and petrol.

16.3. Stakeholder engagement

16.3.1. **Table 16.1** provides a summary of the stakeholder engagement activities undertaken separate from the Environmental Impact Assessment (EIA) scoping, Phase One Consultation, Phase Two Consultation and Targeted Consultation process. This table also details the matters raised, how such matters have been addressed, and where they have been addressed within the DCO Application documentation.

16.3.2. **ES Volume 4, Appendix 5.3: EIA Scoping Opinion Response Matrix [EN010158/APP/6.4]** presents the responses received in the EIA Scoping Opinion and the Applicant's response to each matter that has been raised.

16.3.3. **Appendices A4, J1, J2 and K3** of the **Consultation Report Appendices [EN010158/APP/5.2]**, which is submitted in support of the DCO Application, sets out the feedback received during Phase One Consultation, Phase Two Consultation and Targeted Consultation and how regard has been afforded by the Applicant to each matter raised.

Table 16.1: Summary of stakeholder engagement

Consultee	Date of engagement	Summary of matters raised	Outcome of engagement	Where this matter is addressed in the DCO Application documentation
Environment Agency	6 February 2024	Initial meeting with Environment Agency National Infrastructure Team to give overview of the Proposed Development, discuss principles of development, and specific concerns that the Environment Agency has with the Proposed Development, summarised as: i. Placement of Solar PV modules and infrastructure within floodplain areas. ii. Floodplain delineation requirements. iii. Required watercourse easements.	Principles agreed in terms of scope of Flood Risk Assessment and ES: i. Agreement that, subject to appropriate mitigation, Solar PV modules can be sited in the floodplain. ii. Delineation of Flood Zone 3 and Flood Zone 2 required within the Flood Risk Assessment. iii. 10m watercourse easements included in all designs (to comply with ecology requirements as well as Environment Agency and Internal Drainage Board).	**ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]** **Outline Drainage Strategy [EN010158/APP/7.11]** **Annex A** of **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**
Environment Agency	29 January 2025	Follow up meeting with the Environment Agency to discuss additional design detail and mitigation as follows:	Specific mitigation agreed as follows: i. Agreement to utilise and rely on the East Claydon BESS	**ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**

Consultee	Date of engagement	Summary of matters raised	Outcome of engagement	Where this matter is addressed in the DCO Application documentation
		i. Floodplain delineation questions regarding the extent of Flood Zones 3a and 3b. ii. Sequential Approach to Development. iii. Floodplain compensation for development in Flood Zone 3. iv. Water Resources Assessment to review impacts on water resources. v. Water Framework Directive Screening Assessment to be undertaken and reviewed by the Environment Agency.	modelling to delineate various Flood Zones, including Flood Zones 3a and 3b. ii. Development layout informed by relevant flood risk constraints. Only Solar PV modules to be situated in Flood Zone 3, subject to appropriate mitigation being included. Panels will be raised above flood levels. iii. Floodplain loss will be negligible, as only Solar PV modules will be sited in areas of Flood Zone 3. Compensation can be provided by ground reprofiling, if required. iv. The Applicant to produce a Water Resources Assessment to satisfy Anglian Water requirements.	**Outline Drainage Strategy [EN010158/APP/7.11]** **Annex A** of **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]** **ES Volume 4, Appendix 16.2: WFD Waterbodies Stage 1 Screening Assessment [EN010158/APP/6.4]**

Consultee	Date of engagement	Summary of matters raised	Outcome of engagement	Where this matter is addressed in the DCO Application documentation
			v. Water Framework Directive Screening Assessment completed and Environment Agency comments received.	
Environment Agency	04 September 2025	Follow up meeting with the Environment Agency to discuss the design development and mitigation as follows: i. Biodiversity enhancements ii. Management of firewater from the BESS iii. Sequential Test iv. Floodplain compensation for development in Flood Zone 3.	The outcome of the matters raised are as follows: i. Update on the biodiversity enhancements and confirmation that these are outlined in further detail in and secured by the **Outline Landscape and Ecological Management Plan [EN010158/APP/7.6]** ii. Confirmation that the BESS firewater will be contained and managed in line with the measures detailed in and secured by the **Outline Battery Safety Management Plan [EN010158/APP/7.9]** and	**Outline Landscape and Ecological Management Plan [EN010158/APP/7.6]** **Appendix 5: Sequential and Exception Tests** of the **Planning Statement [EN010158/APP/5.7]** **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]** **Outline Drainage Strategy [EN010158/APP/7.11]** **Annex A** of **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**

Consultee	Date of engagement	Summary of matters raised	Outcome of engagement	Where this matter is addressed in the DCO Application documentation
			Outline Drainage Strategy [EN010158/APP/7.11] iii. Agreement on the approach to the sequential test with only Solar PV modules to be situated in Flood Zone 3. Any Solar PV modules in Flood Zone 3 would be up to 4.5m in height. iv. The Environment Agency requested for floodplain compensation to form part of the DCO Application; however, the Applicant confirmed that floodplain loss will be negligible, as only a small area of Solar PV modules will be sited in areas of Flood Zone 3.	**Outline Battery Safety Management Plan [EN010158/APP/7.9]**
Buckinghamshire Council - Lead Local Flood Authority	26 September 2024	Initial meeting with Lead Local Flood Authority to discuss principles of development and specific concerns that the Lead	Details of how the drainage hierarchy has been applied and SuDS implemented, including provision of adequate	**ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**

Consultee	Date of engagement	Summary of matters raised	Outcome of engagement	Where this matter is addressed in the DCO Application documentation
		Local Flood Authority has with the Proposed Development. Positively drained elements of the Proposed Development must include SuDS, limit runoff to greenfield rates, and provide appropriate attenuation. SuDS should be implemented, and drainage hierarchy should be followed.	attenuation, are included in the **Outline Drainage Strategy [EN010158/APP/7.11]** and are referenced and included within **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**.	**Outline Drainage Strategy [EN010158/APP/7.11]** **Annex A** of **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**
Buckinghamshire County Council - Lead Local Flood Authority	19 February 2025	Conference call with Lead Local Flood Authority to review comments to the Preliminary Environmental Information Report. Questions regarding the specific make up of BESS, Rosefield Substation and Internal Access Corridors with regard to impermeable areas. To be picked up in surface water drainage design.	Details of how the drainage hierarchy has been applied and SuDS implemented, including provision of adequate attenuation, are included in the **Outline Drainage Strategy [EN010158/APP/7.11]** and are referenced and included within **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**.	**Outline Drainage Strategy [EN010158/APP/7.11]** **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**

Consultee	Date of engagement	Summary of matters raised	Outcome of engagement	Where this matter is addressed in the DCO Application documentation
Buckinghamshire Council - Lead Local Flood Authority	30 April 2025	Conference call with Lead Local Flood Authority to discuss the provisional drainage strategy for the Proposed Development. The Lead Local Flood Authority queried the methodology around greenfield runoff rates and suggested these are in line with Internal Drainage Board requirements.	The specific greenfield runoff rates calculation methodology is included in the **Outline Drainage Strategy [EN010158/APP/7.11]** in line with agreements with the Lead Local Flood Authority and Internal Drainage Board.	**Outline Drainage Strategy [EN010158/APP/7.11]** **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**
Buckinghamshire Council - Lead Local Flood Authority	13 May 2025	Conference call with Internal Drainage Board and Lead Local Flood Authority to discuss the provisional drainage strategy for the Proposed Development.	Outcomes of this engagement can be found within the **Outline Drainage Strategy [EN010158/APP/7.11]**.	**Outline Drainage Strategy [EN010158/APP/7.11]**
Buckingham and River Ouzel Internal Drainage Board	14 October 2024	Email to the Internal Drainage Board following public consultation event. The Internal Drainage Board sets out general requirements including required easements adjacent to the watercourse network and	Easement requirements have been included in the **Outline Drainage Strategy [EN010158/APP/7.11]** and are referenced and included within **ES Volume 4, Appendix 16.1:**	**ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]** **Outline Drainage Strategy [EN010158/APP/7.11]**

Consultee	Date of engagement	Summary of matters raised	Outcome of engagement	Where this matter is addressed in the DCO Application documentation
		general principles in terms of runoff rates.	**Flood Risk Assessment [EN010158/APP/6.4]**.	**Annex A** of **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**
Buckingham and River Ouzel Internal Drainage Board	13 May 2025	Conference call with Lead Local Flood Authority and Internal Drainage Board to discuss the provisional drainage strategy for the Proposed Development. Specific Internal Drainage Board/Lead Local Flood Authority requirements set out with respect to off-site greenfield runoff rates.	The Applicant to align surface water drainage requirements with Internal Drainage Board and Lead Local Flood Authority requirements.	**ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]** **Outline Drainage Strategy [EN010158/APP/7.11]** **Annex A** of **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**
Anglian Water	13 January 2025	Conference call with Anglian Water to discuss Phase Two consultation response and Statement of Common Ground. Anglian Water advised that supply for domestic use is prioritised by them and that any requests for new connections for non-domestic	The Applicant will continue to liaise with Anglian Water regarding water use during construction, operation (including maintenance) and decommissioning phases. Waste/foul water discharge during the construction and	**Outline Drainage Strategy [EN010158/APP/7.11]** **ES Volume 1, Chapter 3: Proposed Development Description [EN010158/APP/6.1]**

Consultee	Date of engagement	Summary of matters raised	Outcome of engagement	Where this matter is addressed in the DCO Application documentation
		use will need to be assessed for viability. Anglian Water agreed to work with the Applicant to produce a Statement of Common Ground that will ensure the availability of potable water, where required, for construction, operation (including maintenance) and decommissioning phases of the Proposed Development.	decommissioning phases of the Proposed Development could be achieved through two possible disposal options: a potential connection to the local foul sewer network or, alternatively, the waste/foul water would be collected across the welfare areas of the Site and stored in cesspits. These would then be managed, inspected and drained by a licensed carrier who would then dispose of the waste/foul water discharge off-site.	
Buckinghamshire Fresh Water Resilience Project	9 April 2025	Conference call with Buckinghamshire Fresh Water Resilience Project. Buckinghamshire Fresh Water Resilience Project confirmed no specific projects lie within or close to the Order Limits. Buckinghamshire Fresh Water Resilience Project would welcome	Options for Natural Flood Risk Management to be explored. Opportunities to include Natural Flood Risk Management within the biodiversity net gain enhancement areas.	**ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]** **ES Volume 2, ES Chapter 7: Biodiversity [EN010158/APP/6.2]** **ES Volume 4, Appendix 7.17: Biodiversity Net Gain**

Consultee	Date of engagement	Summary of matters raised	Outcome of engagement	Where this matter is addressed in the DCO Application documentation
		partnership working with respect to opportunities for Natural Flood Risk Management, possibly incorporated within the planned biodiversity net gain enhancement works, specifically within Parcel 1a.		**Assessment [EN010158/APP/6.4]**

16.4. Approach to identifying the scope of the assessment

Study area

16.4.1. The zone of influence for impacts on surface water is considered to be 1km from the Order Limits due to the significant reduction in magnitude of impacts beyond this distance due to dilution/dispersion of contaminants and deposition of silts. Similarly for flood risk, significant effects are unlikely to be observed more than 1km from the cause of increased risk, due to the effect of floodwater spreading out across a flood envelope, with the impacts quickly reducing in magnitude towards the edge of the flood extent.

16.4.2. **ES Volume 3, Figure 16.1: Watercourses [EN010158/APP/6.3]** indicates the Order Limits with a 1km buffer zone applied. Potential impacts the Proposed Development may have on the water quality and resource of waterbodies within this 1km buffer have been assessed. This approach is consistent with the advice in DMRB LA 113 Road Drainage and the Water Environment **[Ref. 16-34]** which states *"for assessment of impacts associated with soluble pollutants, outfalls within 1km (measured along the watercourse) shall be aggregated for purposes of cumulative assessment"* (paragraph 3.11). This is a generalised approach; however, more specific assessment of potential pathways may indicate a much-reduced zone of influence, for example when considering areas up-gradient of the Site, within separate hydrological catchments.

16.4.3. The study area is depicted within **ES Volume 3, Figure 16.1: Watercourses [EN010158/APP/6.3]** and **ES Volume 3, Figure 16.2: Environment Agency Flood Zones [EN010158/APP/6.3]** that shows the areas of Flood Zone 2 and Flood Zone 3 and watercourses which have been considered as part of this assessment.

Scope of the assessment

16.4.4. The scope of this assessment has been established throughout the EIA process and design of the Proposed Development. Further information can be found in **ES Volume 1, Chapter 5: Approach to the EIA [EN010158/APP/6.1]**.

16.4.5. This section provides an update to the scope of the assessment from that presented in **ES Volume 4, Appendix 5.1: EIA Scoping Report [EN010158/APP/6.4]** and re-iterates/updates the evidence base for scoping receptors/matters in or out following further iterative assessment.

Receptors/matters scoped into the assessment

16.4.6. **Table 16.2** presents the receptors/matters that are scoped into the assessment reported within this ES, together with appropriate justification.

16.4.7. It should be noted that as set out in **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4]**, the Planning Inspectorate stated that the ES should assess impacts to groundwater during all phases of the Proposed Development where significant effects are likely to occur or otherwise explain why significant effects are not likely, with evidence of agreement to the approach from statutory consultation bodies. In this regard, groundwater is assessed in **ES Volume 2, ES Chapter 11: Land and Groundwater [EN010158/APP/6.2]**.

Table 16.2: Receptors/matters scoped into the assessment

Receptor/matter	Phase	Justification
Flood risk and surface water drainage	Construction, operation (including maintenance) and decommissioning	This matter was proposed to be scoped out of the assessment, as detailed within **ES Volume 4, Appendix 5.1: EIA Scoping Report [EN010158/APP/6.4]**. However, as set out in **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4]**, the Planning Inspectorate requested this matter to be scoped into the assessment, including an assessment of significant effects. Accordingly, an assessment has been undertaken which considers the construction, operation (including maintenance) and decommissioning phases of the Proposed Development. This matter is therefore scoped into the assessment. Any consideration relating to the interruption of existing land drainage networks are presented in **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**.
Water quality	Construction, operation (including maintenance) and decommissioning	This matter (receptor) was proposed to be scoped out of the assessment, as detailed within **ES Volume 4, Appendix 5.1: EIA Scoping Report [EN010158/APP/6.4]**. However, as set out in **ES Volume 4, Appendix 5.2: EIA**

Receptor/matter	Phase	Justification
		Scoping Opinion [EN010158/APP/6.4], the Planning Inspectorate stated that not enough evidence regarding the final design and control measures had been provided to scope impacts to water quality out during construction or decommissioning. Accordingly, an assessment has been undertaken which considers the construction, operation (including maintenance) and decommissioning phases of the Proposed Development. This matter is therefore scoped into the assessment.
Water Framework Directive waterbody (Claydon Brook Tributary)	Construction, operation (including maintenance) and decommissioning	This matter (receptor) was not specifically included for consideration within **ES Volume 4, Appendix 5.1: EIA Scoping Report [EN010158/APP/6.4]**. However, as there is one Water Framework Directive waterbody within the study area (Claydon Brook Tributary), this waterbody has been identified by the Applicant as a receptor which requires further assessment. This matter (receptor) is therefore scoped into the assessment. Construction and decommissioning activities can potentially result in an increased risk of silt-laden runoff which in turn has the potential to degrade water quality within the receiving watercourses. The **Outline Drainage Strategy [EN010158/APP/7.11]** presents the proposed treatment train and explains how adequate water quality is to be achieved through the use of SuDS and proprietary systems during the operation (including maintenance) phase. **ES Volume 4, Appendix 16.2: WFD Waterbodies Stage 1 Screening Assessment [EN010158/APP/6.4]** has been submitted to the Environment Agency as per the advice in Nationally

Receptor/matter	Phase	Justification
		Significant Infrastructure Projects: Advice on the Water Framework Directive **[Ref. 16-22]**. Within its response, the Environment Agency stated it was generally satisfied that the risks and impacts to surface Water Framework Directive waterbodies can be appropriately mitigated and secured, as set out in the document.

Receptors/matters scoped out of the assessment

16.4.8. **Table 16.3** presents the receptors/matters that are scoped out of the assessment that are therefore not considered as part of this ES, together with appropriate justification.

Table 16.3: Receptors/matters scoped out of the assessment

Receptor/matter	Phase	Justification
Water resources - foul water, potable water, private water supplies, abstraction licenses and discharge consents	Construction, operation (including maintenance) and decommissioning	This matter is scoped out of the assessment, as detailed within **ES Volume 4, Appendix 5:1 EIA Scoping Report [EN010158/APP/6.4]** and confirmed within **ES Volume 4, Appendix 5.2: EIA Scoping Opinion [EN010158/APP/6.4]**. Welfare facilities during construction, operation (including maintenance) and decommissioning have limited potential to put an increased demand on the local foul water network, as foul water generated in these areas would be transported off-site for disposal. Additionally, any localised effects on potable water and private water supplies (including abstraction and discharge licences) are considered negligible. Any required construction or decommissioning phase abstraction or discharge licences would be subject to obtaining the

Receptor/matter	Phase	Justification
		relevant permits from the Environment Agency. Anglian Water has advised that supply for domestic use is prioritised by them and that any requests for new connections for non-domestic use would need to be assessed for viability. Potential impacts to private water supplies and any abstraction and discharge consents are identified and appraised in **ES Volume 4, Appendix 11.1: Preliminary Risk Assessment [EN010158/APP/6.4]**.

16.5. Environmental baseline

Establishing baseline conditions

Data sources to inform the EIA baseline characterisation

16.5.1. The following data sources have been used to understand the existing water baseline conditions:

- Environment Agency flood mapping datasets including fluvial/tidal Flood Map for Planning, Surface Water Flood Risk mapping and Reservoir flood risk mapping **[Ref. 16-35]**;
- The British Geological Survey (BGS) Geology Mapping **[Ref. 16-36]**;
- Defra's MAGIC Maps **[Ref. 16-37]**;
- Fluvial and pluvial modelled outputs produced for the East Claydon BESS Development of the Claydon Brook Tributary (**Annex A** of **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**);
- Buckinghamshire Council Local Flood Risk Management Strategy **[Ref. 16-38]** and Preliminary Flood Risk Assessment **[Ref. 16-39]**;
- Defra's Catchment Data Explorer: Water Environment and Water Framework Directive classifications **[Ref. 16-40]**;
- The Environment Agency's Thames Basin District River Basin Management Plan (2022) **[Ref. 16-41]**;

- The Environment Agency's Anglian Basin District River Basin Management Plan (2022) **[Ref. 16-42]**;
- Ordnance Survey (OS) Mapping **[Ref. 16-43]**; and
- Environment Agency National Light Detection and Ranging (LiDAR) Programme **[Ref. 16-44]**.

Site visits/surveys

16.5.2. A targeted visual inspection of key hydrological features was undertaken in May 2025, focusing on the main watercourses within the study area, existing field ditches and ponds, areas where modelling for the East Claydon BESS development was undertaken, locations where infrastructure is proposed (such as the Rosefield Substation and BESS) and watercourse crossing locations (where accessible). Findings from the walkover are presented in **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**.

Additional reports

16.5.3. A Flood Risk Assessment has been undertaken and is presented as **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**. The Flood Risk Assessment has been prepared in accordance with the requirements of the relevant National Policy Statements EN-1 **[Ref. 16-14]**, EN-3 **[Ref. 16-15]** and EN-5 **[Ref. 16-16]**. **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]** includes a review of the above data sources, particularly the modelling undertaken for the East Claydon BESS development which has been approved by the Environment Agency; an assessment of the flood risk to the Proposed Development from all flooding sources (including, where relevant and appropriate, consideration of climate change); and identification of any mitigation measures required to ensure the Proposed Development would be safe, would remain operational during a design flood event, and would not result in an increase in flood risk elsewhere.

16.5.4. An **Outline Drainage Strategy [EN010158/APP/7.11]** has been developed to demonstrate how surface water runoff from the Proposed Development will be managed using SuDS, following the drainage hierarchy and incorporating measures to ensure there is no detriment to the quality of surface water runoff leaving the Site. The **Outline Drainage Strategy [EN010158/APP/7.11]** has been prepared in accordance with Defra's National Standards for Sustainable Drainage Systems and the NPS EN-1 **[Ref. 16-14]**, EN-3 **[Ref. 16-15]** and EN-5 **[Ref. 16-16]**, and the Lead Local Flood Authority SuDS Guidance **[Ref. 16-31]**.

16.5.5. **ES Volume 4, Appendix 16.2: WFD Waterbodies Stage 1 Screening Assessment [EN010158/APP/6.4]** has been prepared in consultation with

the Environment Agency, in accordance with the guidance in Planning Inspectorate – Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive **[Ref. 16-22]**. This identifies any Water Framework Directive waterbodies (surface water or groundwater) that could be impacted by the Proposed Development and assesses whether any activities associated with the various phases of the Proposed Development could cause a deterioration in the status of Water Framework Directive water bodies or prevent River Basin Management Plan objectives being met. The Environment Agency confirmed in correspondence (refer to **Table 16.1** above) that it agrees with the conclusions of **ES Volume 4, Appendix 16.2: WFD Waterbodies Stage 1 Screening Assessment [EN010158/APP/6.4]**, and that further assessment is not required.

Existing baseline

Topography

16.5.6. Parcels 1 and 1a are gently undulating with the highest point being Knowl Hill at around 116m above ordnance datum (AOD), as shown on **ES Volume 3, Figure 2.3: Topography Plan [EN010158/APP/6.3]**. The rest of Parcel 1 is at an elevation of 80-90m AOD and Parcel 1a at an elevation of 79-84m AOD. Parcel 2 is located on a low ridge crest at 136m AOD. Parcel 3 is located on relatively flat ground at 90-94m AOD on the north east of the ridge.

16.5.7. The Site is located on a watershed between two major river catchments. The northern section of the Site drains north/north east towards the Padbury Brook and the Claydon Brook which form part of the wider Great Ouse catchment generally draining to the north east. The southern section of the Site drains towards the River Ray to the south/south west that forms part of the wider River Thames catchment that drains to the south/south east. Mapping of these two catchments is included as **Figure 2.2** in **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**.

Hydrology

16.5.8. The Environment Agency categorises watercourses as primary, secondary and tertiary rivers. Primary watercourses consist of Main Rivers and major Ordinary Watercourses, secondary watercourses consist of smaller Ordinary Watercourses, and tertiary watercourses comprise drainage ditches and Ordinary Watercourses receiving limited flows.

16.5.9. Ordnance Survey mapping **[Ref. 16-43]** and the Environment Agency's web-based mapping **[Ref. 16-35]** indicates that the nearest Environment Agency Main River is the River Ray, located approximately 200m to the south of Parcel 2 directly south of Finemere Wood, and a tributary of the

River Ray located approximately 400m to the south west of Parcel 1a, and directly south of Sheephouse Wood.

16.5.10. OS mapping also identifies a number of Ordinary Watercourses crossing the Site, as shown in **ES Volume 3, Figure 16.1: Watercourses [EN010158/APP/6.3]**. These watercourses are unnamed but appear to form the headwaters of the Padbury Brook (in the north west), the Claydon Brook (in the north/north east) and the River Ray (to the south). These features are all classified as Ordinary Watercourses and would therefore be under the jurisdiction of the Buckinghamshire Council as the Lead Local Flood Authority or the Buckingham & River Ouzel Internal Drainage Board. The upstream section of the River Ray that flows along the northern boundary of Parcel 1a is known as the Muxwell Brook.

16.5.11. The site visit also noted a number of drainage ditches located within hedgerows of field boundaries throughout the Site, some of which connect into the wider drainage and watercourse network, and others which act as informal soakaway features (presumably receiving field drainage) with no observed onward connections. Many of these drainage features (including the upper reaches of the Muxwell Brook) were noted as dry during the site visit, which was undertaken on a dry sunny day in May 2025. These ponds and agricultural drains/ditches will all be retained.

Geology

16.5.12. Based on published geological records for the area (British Geological Survey online mapping):

- The majority of the Site is not underlain by superficial geology. There are small pockets of Glaciofluvial Deposits (Sand and Gravel), Glacial Deposits (Clay, Sand and Silt) and Till (Diamicton) throughout the Site and areas of Alluvium (Clay, Sand, Silt and Gravel) and River Terrace Deposits (Sand and Gravel) around the Claydon Brook and Claydon Brook Tributary to the north.
- The bedrock geology of the Site consists of areas of West Walton Formation (Mudstone) and Weymouth Member (Mudstone) in the south and eastern areas of the Site; and Stewartby Member (Mudstone) and Peterborough Member (Mudstone) in the northern and western regions of the Site.

16.5.13. BGS borehole logs have been reviewed for geological information, with a sample of these described in **Table 16.4**. **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2]**, which provides a more detailed description of the geology of the Site.

Table 16.4: BGS borehole records

BGS borehole ref.	Location in relation to Site	Geology recorded	Groundwater recorded
SP72SW25	Located to the south of the Site along the proposed East-West Railway development.	• Topsoil to 0.1m below ground level (BGL) • Made Ground to 1.20m BGL • Oxford Clay to 2.70m BGL	Not indicated
SP62SE39	Located to the west of the Site along the proposed East-West Railway development.	• Topsoil to 0.05m BGL • Glacial Deposits to 3.00m BGL • Oxford Clay to 8.00m BGL	Not indicated
SP72SW28	Located in the centre of the Site.	• Topsoil to 0.1m BGL • Oxford Clay to 4.60m BGL	Not indicated
SP72NW184	Located to the north of the Site.	• Sand and Gravel to 8.00m BGL • Clay to 65.00m BGL • Limestone to 75.00m BGL • Mudstone to 96.00m BGL	3.0mBGL

16.5.14. The BGS borehole logs confirm the underlying geology to be Sand, Silt Gravel and Clay over Mudstone bedrock.

Statutory designations

16.5.15. Defra's MAGIC maps **[Ref. 16-37]** show there are no Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar sites within the Order Limits. However, there are three nationally protected statutory designated nature conservation sites within 2km of the Order Limits:

- Sheephouse Wood SSSI – directly adjacent to Parcel 1 and 1a;
- Finemere Wood SSSI – directly adjacent to Parcel 2; and
- Grendon and Doddershall Woods SSSI – 1.36km south west of Parcel 1a.

16.5.16. Finemere Wood SSSI is a Groundwater Dependent Terrestrial Ecosystem (GWDTE). Further details on this GWDTE are discussed in **ES Volume 2, Chapter 11: Land and Groundwater [EN010158/APP/6.2]**.

Existing drainage

16.5.17. Given the rural setting of the Proposed Development, runoff is likely to be conveyed across undeveloped agricultural land via overland (and subsurface) flow at greenfield rates towards the existing surface watercourses and field drains, or infiltrate directly into the ground should ground conditions permit.

16.5.18. The Site is located on a watershed between two major river catchments, the northern section of the Site draining north/north east towards the Padbury Brook and the Claydon Brook that form part of the wider Great Ouse catchment generally draining to the north east, and the southern section of the Site draining towards the River Ray to the south/south west that forms part of the wider River Thames catchment that drains to the south/south east.

16.5.19. The on-site drainage pathways flow to the north, east, south and west from a central high point in Parcel 1 on Knowl Hill, with the majority of Parcel 1 draining to the north. Parcel 1a slopes from east to west/south west. Parcel 2 can be split into two sub areas, the northern area sloping generally to the north west, north and north east, with the southern area draining generally to the south/south west. Parcel 3 drains west to east toward the Claydon Brook Tributary watercourse that forms the eastern edge of the Order Limits. Mapping of these catchments is presented as **Figure 2.2** in **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**.

Surface water quality and Water Framework Directive designation

16.5.20. The Claydon Brook Tributary flows from south west to north east along the eastern boundary of Parcel 3, where it discharges into the Claydon Brook/Claydon Brook (DS Granborough) at the northern most area of the Parcel 3. The Claydon Brook Tributary is a heavily modified watercourse that was classified as ‘moderate’ overall ecological status under the Water Framework Directive in 2022 and had a chemical quality status which did not require assessment. Pressures affecting the watercourse are recorded as physical modification (e.g. for land drainage) and rural pollution (phosphate and chemicals). This watercourse falls within a Nitrate Vulnerable Zone.

16.5.21. The Claydon Brook flows from east to west past the northern most area of Parcel 3, where it is discharges into the Claydon Brook (DS Granborough), which then flows to the west away from the Site. It is a heavily modified watercourse that was classified as ‘moderate’ overall ecological status

under the Water Framework Directive in 2022 and had a chemical quality status which did not require assessment. Pressures affecting the watercourse are recorded as pollution from wastewater (e.g. for untreated wastewater being discharged into the watercourse) and rural and urban pollution (phosphate and chemicals). The watercourse falls within a Nitrate Vulnerable Zone.

16.5.22. After the Claydon Brook Tributary discharges into the Claydon Brook, is it reclassified as the Claydon Brook (DS Granborough) Water Framework Directive waterbody. This watercourse flows from east to north west from the northern most area of Parcel 3. This watercourse is a heavily modified and was classified as 'moderate' overall ecological status under the Water Framework Directive in 2022 and had a chemical quality status which did not require assessment. Pressures affecting the watercourse are recorded as pollution from wastewater (e.g. for untreated wastewater being discharged into the watercourse) and rural and urban pollution (phosphate and chemicals). The watercourse falls within a Nitrate Vulnerable Zone.

16.5.23. The River Ray flows from east to west to the south of the Site, with the closest point being approximately 200m south of the southern most point of Parcel 2. It is not designated artificial or heavily modified watercourse and was classified as 'moderate' overall ecological status under the Water Framework Directive in 2022 and had a chemical quality status which did not require assessment. Pressures affecting the watercourse are recorded as physical modification (e.g. for land drainage and flood protection) and rural and urban pollution (phosphate and chemicals). The watercourse falls within a Nitrate Vulnerable Zone and Safeguard Zone.

16.5.24. A full assessment of the Water Framework Directive status of local watercourses is provided in **ES Volume 4, Appendix 16.2: WFD Waterbodies Stage 1 Screening Assessment [EN010158/APP/6.4]** and a map showing the location of WFD waterbodies is presented in **ES Volume 3, Figure 16.6: WFD Waterbodies and Catchments [EN010158/APP/6.3]**.

Abstractions

16.5.25. There are currently no licensed groundwater abstractions or surface water abstractions within the Order Limits or 1km of the Site.

16.5.26. Two 'well' features are shown within Parcel 1 on OS mapping, together with a number of ponds within Parcel 1 and Parcel 2. Most of the ponds appear not to be linked to the surrounding watercourse network. Given the location of the 'wells' within agricultural fields, they are likely to be used for agricultural purposes (if still in operation).

Surface water drinking water safeguarding/protection zones

16.5.27. Defra's MAGIC Maps **[Ref. 16-37]** indicate that the Site is located within a Surface Water Drinking Water Safeguarding Zone, but not within 1km of Surface Water Drinking Water Protection Zone. The southern area of the Site is within the Lower Thames (Cookham Egham-Teddington) Drinking Water Protected Area. The northern area of the Site is within the River Great Ouse including Graham Water Drinking Water Protection Area.

Fluvial/flood risk

16.5.28. The latest Environment Agency published Flood Zone map (2025) is presented in **ES Volume 3, Figure 16.2: Environment Agency Flood Zones [EN010158/APP.6.3]** and shows that the majority of the Site is located within Flood Zone 1, which represents a less than 1 in 1000 year annual probability of flooding from fluvial and tidal sources.

16.5.29. There are areas of Flood Zone 2 and Flood Zone 3 associated with the Claydon Brook Tributary that run along the eastern boundary of Parcel 3 and the Claydon Brook in the north east corner of the Site. Flood Zone 2 represents a between 1 in 100 and 1 in 1000 year annual probability of fluvial flooding and 1 in 200 and 1 in 1000 year annual probability of tidal flooding, whilst Flood Zone 3 represents a greater than 1 in 100 year annual probability of fluvial flooding and 1 in 200 year annual probability of tidal flooding.

16.5.30. There is a small area of Flood Zone 2 and Flood Zone 3 located at the northern extent of the Order Limits. An area surrounding the Muxwell Brook in the south western area of the Site is also located within Flood Zone 2 and Flood Zone 3.

16.5.31. Modelling has been undertaken for the East Claydon BESS that is located immediately to the east of the Claydon Brook Tributary. The modelling outputs, as outlined in **ES Volume 3, Figure 16.4: Fluvial Modelling of Claydon Brook Tributary [EN010158/APP/6.3]** show that the modelled fluvial extents, including the appropriate climate change allowances, are broadly similar to that of the Environment Agency's modelling; they also indicate a delineation between Flood Zone 3a and Flood Zone 3b. A full analysis of flood risk is provided in **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**.

Surface water (pluvial) flood risk

16.5.32. The Environment Agency's Surface Water Flood Risk Mapping (2025) for the Site is shown on **ES Volume 3, Figure 16.3: Environment Agency Risk of Surface Water Flooding [EN010158/APP/6.3]**. Areas of surface water flood risk are shown on the Environment Agency's mapping, most

notably along the channels of the Ordinary Watercourses in the eastern and western areas of the Site and within the woodland areas to the south.

16.5.33. The majority of the Site is at 'very low' risk of surface water flooding, representing a less than 1 in 1000 year annual probability of surface water flooding, with areas of 'low' (between 0.1% and 1.0% annual probability), 'medium' (between 1.0% and 3.3% annual probability) and 'high' (greater than 3.3% annual probability) surface water risk identified at various locations across the Site.

16.5.34. Based on the Environment Agency's Risk of Surface Water Depth Mapping, in Parcel 1, the majority of the surface water risk is unlikely to exceed 300mm in depth, with the exception of an area in the far north western corner, which has a 'low' risk of reaching up to 600mm in depth. The depths of surface water in Parcels 1a and 2 are unlikely to exceed 300mm, whilst the local depths in Parcel 3 have a 'high' risk of reaching up to 600mm in depth.

16.5.35. As with the fluvial modelling, outputs have been provided from the surface water flood risk modelling undertaken for the East Claydon BESS. The modelling outputs illustrate a significant reduction in pluvial flood extents compared to the Environment Agency flood risk mapping. A full analysis of flood risk is provided in **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]** and **ES Volume 3, Figure 16.5: Pluvial Modelling of Claydon Brook Tributary [EN010158/APP/6.3]**.

Other sources of flood risk

16.5.36. Environment Agency mapping shows that the Site is not at risk of reservoir flooding during the 'Wet Day' (when there is also flooding from rivers) and the 'Dry Day' (when river levels are normal). The flood risk from reservoirs encroaches on the 1km buffer zone.

16.5.37. The Site is considered to be at very low risk from all over sources of flooding.

Summary of key receptors

16.5.38. Key receptors, including their sensitivity/importance (using the criteria presented in **Table 16.7**), are outlined in **Table 16.5** below.

Table 16.5: Key receptors

Key receptor	Sensitivity/importance	Reasoning
Claydon Brook	Medium	Ordinary Watercourse, 'moderate' ecological status and 'does not require assessment' for chemical status under the Water Framework Directive. No abstractions recorded within or downstream of the Site.
Claydon Brook Tributary	Medium	Ordinary Watercourse, 'moderate' ecological status and 'does not require assessment' for chemical status under the Water Framework Directive. No abstractions recorded within or downstream of the Site.
Areas of high fluvial and pluvial flood risk	High	Existing areas of fluvial and surface water flood risk on the Site may be sensitive to changes in flood risk resulting from the Proposed Development.
Sheephouse Wood SSSI	High	SSSI designation due to biological interest and proximity to the Site.
Finemere Wood SSSI	High	SSSI designation due to biological interest and proximity to the Site.

Future baseline in the absence of the Proposed Development

16.5.39. The future baseline of water quality within the study area in the absence of the Proposed Development is unlikely to change from the existing baseline. No significant changes in agricultural practices are anticipated; there is nothing to indicate that water quality would change for the watercourses within the study area in the absence of the Proposed Development.

16.5.40. Climate change is likely to result in wetter winters and longer drier summers. This could potentially result in increased risk of flooding from all sources but particularly from surface water flooding as 'flash' flooding becomes more frequent. Appropriate future climate change scenarios have been considered in this assessment.

16.5.41. Geomorphological processes, including erosion and sediment deposition, will over time affect the vertical and lateral morphology of watercourses and their floodplains, although changes are unlikely to be significant over time.

16.6. Approach to the assessment

Approach to design flexibility

16.6.1. The parameters, as outlined in **ES Volume 1, Chapter 3: Proposed Development Description [EN010158/APP/6.1]**, and the parameter plans presented in **ES Volume 3, Figure 3.1: Height Parameters [EN010158/APP/6.3]** and secured in **Appendix 1: Green and Blue Infrastructure Parameters** and **Appendix 3: Vegetation Removal Parameters** of the **Outline Landscape and Ecological Management Plan [EN010158/APP/7.6]**, **Design Commitments [EN010158/APP/5.11]** and **Works Plans [EN010158/APP/2.3]**, set out the reasonable 'worst-case' parameters for the Proposed Development.

16.6.2. **ES Volume 1, Chapter 5: Approach to the EIA [EN010158/APP/6.1]** sets out those elements of the Proposed Development for which optionality is present within the design. The reasonable 'worst-case' scenario that has been assessed in this water chapter for each element of the Proposed Development where optionality is present within the design is outlined within **Table 16.6**.

Table 16.6: Reasonable worst-case scenario assessed for water

Project element	Reasonable worst-case scenario that has been assessed
Solar PV modules	This assessment assumes that the Solar PV modules would be located throughout the fields shown in light blue, as outlined in **ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**. These locations include areas within the floodplain; however, the design incorporates an appropriate freeboard above the modelled flood levels.
Balance of Solar System (BoSS)	This assessment assumes that the BoSS would be located throughout the fields shown in light blue, as outlined in **ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**.
Satellite Collector Compounds	There are four fields that are considered suitable for the two Satellite Collector Compounds, as shown on **ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**. However, it is anticipated that one Collector Compound would be required in both Parcel 1 and Parcel 2.

Project element	Reasonable worst-case scenario that has been assessed
	It is assumed that the two Satellite Collector Compounds could be sited anywhere within the Proposed Siting Zone. One Satellite Collector Compound would be located Field B23 (South) in Parcel 1 within the extent shown. One Satellite Collector Compound would be located in Fields D8, D9 or/and D17 in Parcel 2 All fields have been assessed within this assessment.
Main Collector Compound	There are four fields that are considered suitable for the Main Collector Compound, which are located in Parcel 3, as outlined in **ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**. The final design of the Main Collector Compound would not occupy all of Fields E22, E21, E20 and/or E11 but, for the purposes of assessment, it has been assessed as being constructed in any of these four fields.
Battery Energy Storage System (BESS)	This assessment assumes that BESS would be located in Parcel 2 at both Fields D8 and D9, as outlined in **ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**.
Rosefield Substation	It is assumed, for assessment purposes, that the BESS would be constructed within the entire **Work No. 4** area (which applies to Fields D8 and D9), as outlined in **ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**.
Primary Construction Compounds	Eight fields are considered suitable for the locations of the three Primary Construction Compounds, as indicated on the **ES Volume 3, Figure 3.8: Indicative Location of Primary and Secondary Construction Compounds [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**. It is anticipated that only one Primary Construction Compound would be required within each Parcel.

Project element	Reasonable worst-case scenario that has been assessed
	It is assumed that the three Primary Construction Compounds could be sited anywhere within the Indicative Siting Zone. All fields considered suitable for the Primary Construction Compounds have been assessed within this assessment. Areas of surface water flood risk are located in Fields B23 (South), D7 and E23; however, the indicative locations of the Primary Construction Compounds are outside of areas of the most significant surface water flood risk. All Primary Construction Compound indicative locations are located in Flood Zone 1; however, Field E23 (and E21) contains areas of Flood Zone 2 and 3, which is avoided by appropriate placement within the Parcel. Given the extents of the areas of Flood Zone and surface water flood risk in Fields E23 and E21, these are considered reasonable worst-case locations.
Secondary Construction Compounds	Eight fields are currently being considered for the locations of the three Secondary Construction Compounds, as indicated on **ES Volume 3, Figure 3.8: Indicative Location of Primary and Secondary Construction Compounds [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**. It is anticipated that only one would be required in each Parcel. It is assumed that the three Secondary Construction Compounds could be sited anywhere within the Indicative Siting Zone. All fields considered suitable for the Secondary Construction Compounds have been assessed within this assessment. Whilst areas of surface water flood risk have been identified in the various locations, the reasonable worst case would involve siting the Secondary Construction Compounds in areas of high surface water flood risk.
Interconnecting Cable Corridor(s)	Below ground interconnecting cabling has been taken as the worst-case scenario, with a maximum trench width of 35m and expected depths of 1.5m (BGL), except where utility, road or ditch crossings are required (when depths would be at least 1.5m below roads, 0.5m below utilities and 2m below the bed of watercourses and ditches). The worst-case scenario in terms of construction techniques is open-cut trenching,

Project element	Reasonable worst-case scenario that has been assessed
	as an open excavation is potentially more likely to result in the introduction of new contamination, or degradation to watercourses, than the use of suspended ducts or fixed trays. The maximum construction width between Parcels 1 and 2 is 25m, with a maximum construction width of 50m between Parcels 2 and 3. This assessment has considered the maximum extent of these elements, as outlined in **ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**.
Grid Connection Cable Corridor	The assessment takes consideration of the following as the worst-case scenario: maximum construction working width 25m, maximum trench width 3m, depth 1.5m (BGL) except where utility, road or ditch crossings are required (when depths would be at least 1.5m below roads, 0.5m below utilities and 2m below the bed of watercourses and ditches). Jointing bays (separated by 500m to 800m) will be 5.5m wide, 20m long and 2.5m (BGL) deep. This assessment has considered the maximum extent of these elements, as outlined in **ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**.
AIL Access corridor	The assessment takes consideration of the following as the worst-case scenario: Maximum width 8m, construction using permeable materials, permanent AIL Access Corridor to remain in place. This assessment has considered the maximum extent of these elements, as outlined in **ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**.
Internal Access Corridor(s)	The assessment assumes a worst-case scenario of tracks that are 6m in width. This assessment has considered the maximum extent of these elements, as outlined in **ES Volume 3, Figure 3.5: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**.

Assessment assumptions

16.6.3. Analysis of flood extents is dependent on the accuracy of the various Environment Agency Flood Maps, although Surface Water Flood Risk mapping **[Ref. 16-35]** was updated in January 2025 and the Flood Map for Planning **[Ref. 16-35]** updated in March 2025.

16.6.4. The assessment relies on flood model extents and depths provided by **Annex A** of **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**. The Environment Agency has confirmed on the planning portal that the East Claydon BESS modelling and outputs have been approved in 2024; it is therefore considered that the modelling represents the best available data and is appropriate to support the assessment of flood risk from the Claydon Brook and Claydon Brook Tributary.

16.6.5. All watercourse crossings will be undertaken using best practice, and in agreement with the relevant Internal Drainage Board, Lead Local Flood Authority and Environment Agency requirements.

Assessment methodology and criteria

16.6.6. The assessment of effects assumes that the relevant embedded mitigation and standard good practice measures and any applicable consents/permits are in place before assessing the potential effects of the Proposed Development. The assessment is based on a source-pathway-receptor methodology, where the sensitivity/importance of the receptors and the magnitude of impact upon those receptors is identified within the study area. The significance of the likely effects of the Proposed Development has been classified by taking into account the sensitivity/importance of receptors and the magnitude of the impact upon them.

16.6.7. The assessment uses standard criteria to describe the sensitivity/ importance of the existing receptor that may be impacted (**Table 16.7**) and definitions of the magnitude of envisaged impacts (**Table 16.8**). The significance of effect matrix is set out in **Table 16.9**. These criteria have been informed by DMRB LA 113 Road Drainage and the Water Environment **[Ref. 16-34]**.

Table 16.7: Criteria for determining sensitivity/importance of the receptor

Receptor sensitivity/ importance	Description
High	• The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance. In terms of hydrological receptors, this relates to: ➢ A watercourse of National importance; ➢ Areas of Flood Zone 3 or at high risk of surface water [or other forms of] flood risk; ➢ Water Framework Directive recorded watercourse achieving 'Good' or targeted as 'Good' status (including immediately downstream watercourses); ➢ Regional sewer or water supply networks; ➢ A flood plain or defence protecting between 1 and 100 residential properties or industrial premises from flooding; and ➢ Protected or designated areas, e.g., SSSI, Ramsar sites, SPAs), SACs, which are highly sensitive to disruption.
Medium	• The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance. In terms of hydrological receptors this relates to: ➢ A watercourse of regional importance; ➢ Areas of Flood Zone 2 or medium surface water flood risk; ➢ Water Framework Directive recorded watercourse achieving 'Moderate' or targeted as 'Moderate' status (including immediately downstream watercourses); and ➢ Local sewer or water supply networks.
Low	• The receptor is tolerant of change without detriment to its character, is of low environmental value, or local importance in terms of hydrological receptors this relates to: ➢ A watercourse of Local importance; ➢ Areas of Flood Zone 1 or low surface water flood risk;

Receptor sensitivity/ importance	Description
	➢ Water Framework Directive recorded watercourse achieving 'Poor' or targeted as 'Poor' status (including immediately downstream watercourses); and ➢ On-site sewer or water supply networks.
Negligible	• A water resource with little or no interest or value.

16.6.8. The magnitude of any identified impacts is assessed using the criteria described in **Table 16.8**.

Table 16.8: Criteria for determining the magnitude of impact

Magnitude	Definition
Major	Total loss or major alteration to key elements of features of the baseline conditions to the extent that post-development character or composition of baseline conditions will be fundamentally changed.
Moderate	Loss or alteration to one or more key elements/features of the baseline conditions to the extent that post-development character or composition of the baseline conditions will be materially changed.
Minor	Minor shift away from baseline conditions. Changes arising will be detectable but not material; the underlying character or composition of the baseline conditions will be similar to the pre-development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a 'no change' situation.

16.6.9. **Table 16.9** illustrates the significance of effect. The shaded boxes indicate effects considered to be **significant**. Those effects identified as '**large**' or '**moderate**' are considered **significant**. Those effects identified as '**slight**' or '**neutral**' are considered **not significant**. Effects can be either adverse or beneficial.

Table 16.9: Criteria matrix for determining significance of effect

Magnitude of impact	Sensitivity/importance			
	High	Medium	Low	Negligible
Major	Large	Moderate	Slight	Slight
Moderate	Moderate	Moderate	Slight	Neutral
Minor	Slight	Slight	Neutral	Neutral
Negligible	Slight	Neutral	Neutral	Neutral

16.7. Mitigation embedded into the design

16.7.1. This assessment has been based on the principle that measures have been 'embedded' into the design of the Proposed Development to avoid or reduce potential significant effects as far as practicable, for example by the considered placement of infrastructure. The embedded mitigation relevant to this assessment is detailed in **Table 16.10** below.

16.7.2. The embedded mitigation aims are to successfully integrate the Proposed Development within the context of the existing landscape and prevent or reduce any adverse effects on the water environment.

Table 16.10: Embedded mitigation relevant to water

Embedded mitigation measures relevant to water	Function	Securing mechanism
The height of the highest part of the Solar PV module will be no greater than 4.5m above ground level AGL (post-earthworks) within flood areas. **The height of the lower part of the solar PV panels will be no greater than 1.8m AGL (post-earthworks) within Flood Zones.**	Where Solar PV modules are proposed within Flood Zone 3, the design of the arrays would enable the panels to sit above the flood water level and only the supporting structure of the panel would be below the flood water level. This will mitigate against the potential damage caused by flooding. Of additional note, the Solar PV modules would not require ground raising, therefore any Solar PV modules within Flood Zone	**Design Commitments [EN010158/APP/5.9]** **ES Volume 3, Figure 2.1: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**

Embedded mitigation measures relevant to water	Function	Securing mechanism
	3 will not lead to a loss of floodplain. Panel supports below the flood level are considered to displace a negligible volume of flood water.	
The spacing gap between consecutive rows of Solar PV modules will be at least 2.8m	The proposed design allows for rainwater to drain into the spacing between rows of Solar PV modules. This ensures the runoff from the Site would not increase as a result of the Solar PV modules. This is accepted as per NPS EN-3 **[Ref. 16-15]** paragraph 2.10.84; 'As solar PV panels will drain to the existing ground, the impact will not, in general, be significant.'	**ES Volume 3, Figure 2.1: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**
Rosefield Substation, BESS, ITS, Independent Outdoor Equipment (transformer, switchgear and central inverters), Collector Compounds and Construction Compounds will be located outside of Flood Zone 2 and 3 areas	By proposing to place these compounds and structures outside of Flood Zone 2 and Flood Zone 3 (for both siting scenarios), the likelihood of damage from fluvial flooding is reduced. By ensuring these compounds remain outside of flood zones means there will be no loss of floodplain and therefore no requirement to provide floodplain compensation.	**Design Commitments [EN010158/APP/5.9]** **ES Volume 3, Figure 2.1: Zonal Masterplan [EN010158/APP/6.3]**
Use of impermeable membranes and a bung and penstock system in the BESS design	To prevent surface water discharge of firewater runoff in the unlikely event of fire. This would prevent contaminated runoff	**Outline Drainage Strategy [EN010158/APP/7.11]** **Outline Battery Safety Management Plan [EN010158/APP/7.9]**

Embedded mitigation measures relevant to water	Function	Securing mechanism
	entering the wider hydrological environment.	
Perimeter fencing surrounding the Solar PV development will be offset at least 10m either side from all existing ditches and ordinary watercourses except where access tracks and/or cable routes are required to cross an existing feature. **Perimeter fencing surrounding the Solar PV development will be offset at least 20m from the top of bank of Claydon Brook in Fields E20, E11, E10 and north section of Field E21.**	The proposed offset provides a buffer for any sediment entrained within surface water runoff here sediment can deposit. The proposed offset ensures no erosion of the banking of the watercourses which could result in degradation of water quality.	**Design Commitments [EN010158/APP/5.9]**
Outline Drainage Strategy	The recommendations set out in the **Outline Drainage Strategy [EN010158/APP/7.11]** include that all SuDS features to be designed in accordance with the CIRIA C753 SuDS Manual **[Ref. 16-25]**, to ensure that surface water runoff discharged from the Site would be of an acceptable standard by following best design practices. As part of the embedded mitigation, the **Outline Drainage Strategy [EN010158/APP/7.11]** details the principles for ensuring firewater runoff is	**Outline Drainage Strategy [EN010158/APP/7.11]**

Embedded mitigation measures relevant to water	Function	Securing mechanism
	retained within BESS compound and would not enter the wider environment.	
Vegetation management	Vegetation below the Solar PV modules would ensure the kinetic energy from rainfall runoff dripping from the panel lip would be dispersed and reduce the risk of soil erosion. Vegetation would improve soil stability during the operation (including maintenance) phase. This would reduce the potential for silty runoff entering waterbodies.	**Outline Landscape and Ecological Management Plan [EN010158/APP/7.6]**
Construction compounds would be located at least 10m from existing watercourses	To limit the potential for mobilisation of sediment or pollutants to watercourses.	**ES Volume 3, Figure 2.1: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]**.
Perimeter fencing surrounding the Solar PV development will be offset at least 30m from existing woodland and hedgerows located along the boundaries of Field D29 and partially in Field D28	To limit the potential for mobilisation of sediment or pollutants to these statutory designated sites.	**ES Volume 3, Figure 2.1: Zonal Masterplan [EN010158/APP/6.3]** and secured in the **Works Plans [EN010158/APP/2.3]** **Design Commitments [EN010158/APP/5.9]**
Any watercourse crossings associated with the Abnormal Indivisible Load Access Track will be clear span bridge(s) or culvert(s), with crossings designed	Existing watercourse crossings have been utilised where possible. Watercourse crossings would be via clear span bridges or culverts with crossings designed to	**Design Commitments [EN010158/APP/5.9]**

Embedded mitigation measures relevant to water	Function	Securing mechanism
to ensure appropriate flood flows are maintained	ensure existing flood flows are maintained as agreed with the Lead Local Flood Authority and Internal Drainage Board.	

16.8. Assessment of likely effects (without additional mitigation)

Construction

Water quality

16.8.1. Construction activities have the potential to result in the release of chemicals, concrete washout and silt laden runoff which could be conveyed via overland flow or local drainage features into nearby watercourses. Open cut trenching for cable laying could also result in the release of sediment if not undertaken with appropriate control measures.

16.8.2. The Proposed Development includes embedded mitigation measures to reduce these risks, for example construction compounds would be located at least 10m from existing watercourses, as shown in **ES Volume 3, Figure 2.1: Zonal Masterplan [EN010163/APP/6.3]**. However, there remains the potential for release of hazardous materials and fine sediment from stockpiling materials (soil etc), plus from fuel, hydraulic fluids and other potentially polluting substances which will be stored and/or used on site. Leaks and spillages of these substances could pollute the nearby surface watercourses if their use or removal is not carefully controlled, with spillages entering existing flow pathways or water features directly.

16.8.3. The creation of the proposed Internal Access Corridors would require new watercourse crossings over Ordinary Watercourses. Additionally, buried cables are proposed beneath and in close proximity to Ordinary Watercourses. Crossings over watercourses would increase the number of vehicles within the vicinity of the watercourses and hence increase fuel pollution potential.

16.8.4. Finemere Wood SSSI is located adjacent to the southern boundary of Parcel 2. Due to the location and topography of the SSSI, it has a small upstream catchment and therefore the potential impact from mobilisation of sediment or pollutants from the Site to this area is considered to be low.

16.8.5. Sheephouse Wood SSSI is located adjacent to the southern boundary of Parcel 1. Due to the location and topography of the SSSI, it has a small

upstream catchment and therefore the potential impact from mobilisation of sediment or pollutants from the Site to this area is considered to be low.

Flood risk and surface water drainage

16.8.6. During the construction phase, there is the potential for increased surface water runoff from temporary hardstanding areas or areas of compacted ground which could result in increased flows in local watercourses and a resulting increase in flood risk from those watercourses to nearby residential receptors and to construction equipment.

16.8.7. There is also the potential for a reduction in channel capacity due to creation of new crossings or culverts. However, as part of the Proposed Development, existing watercourse crossings have been utilised where possible. Any new bridges/culverts would be designed to ensure flow capacity is retained and access to watercourse for maintenance is maintained.

16.8.8. Any land drainage systems damaged as part of the Proposed Development (through piling or other construction methods) would be reinstated or diverted.

Water framework directive waterbody (Claydon Brook Tributary)

16.8.9. An assessment of impacts on water quality for the Water Framework Directive classified waterbodies (Claydon Brook Tributary) is presented in **ES Volume 4, Appendix 16.2: WFD Waterbodies Stage 1 Screening Assessment [EN010158/APP/6.4]**. This establishes the baseline status of Water Framework Directive classified waterbodies within or hydraulically linked to the Site. It considers whether activities, such as physical works, watercourse crossings and culvert installations etc. associated with the Proposed Development have the potential to cause a deterioration in status of those waterbodies.

16.8.10. **ES Volume 4, Appendix 16.2: WFD Waterbodies Stage 1 Screening Assessment [EN010158/APP/6.4]** concludes that the Proposed Development does not present a risk of deterioration of status of Water Framework Directive waterbodies or jeopardise the attainment of 'good' overall status of Water Framework Directive waterbodies.

Operation (including maintenance)

Water quality

16.8.11. During the operation (including maintenance) phase, without additional mitigation there is the potential for water quality impacts to local watercourses due to accidental releases of chemicals or contaminated runoff, for example associated with chemical use within the BESS and

Rosefield Substation areas and the release of contaminated runoff in the event of a fire.

16.8.12. The area of the Site closest to the Claydon Brook and Claydon Brook Tributary is Parcel 3 which includes the Rosefield Substation and BESS components of the Proposed Development, alongside Solar PV modules. The nearest proposed infrastructure to the Claydon Brook Tributary is approximately 15m from the watercourse, to incorporate the appropriate ecological and hydrological buffers. Given the separation distance of these works from the watercourse, this infrastructure is considered to have minimal impact on natural fluvial processes (taking account of the potential for lateral geomorphological changes over the lifetime of the Proposed Development) and is not considered to restrict future river restoration projects.

16.8.13. The creation of the proposed Internal Access Corridors/haulage roads would require new watercourse crossings over Ordinary Watercourses. Additionally, buried cables are proposed beneath and in close proximity to Ordinary Watercourses. Crossings over watercourses would increase the number of vehicles within the vicinity of the watercourses and hence increase fuel pollution potential.

16.8.14. Finemere Wood SSSI is located adjacent to Parcel 2 at the southern edge of the Order Limits. Due to the location and topography of the SSSI, it has a small upstream catchment and therefore, the potential for mobilisation of sediment or pollutants to this area is considered to be low.

16.8.15. Sheephouse Wood SSSI is located adjacent to the southern boundary of Parcel 1. Due to the location and topography of the SSSI, it has a small upstream catchment and therefore, the potential for mobilisation of sediment or pollutants to this area is considered to be low.

16.8.16. During the operational life of the Proposed Development, damaged panels could result in the release of any contaminants under the action of rainwater, wind or other factors. Any damaged panels could result in the release of chemicals or heavy metals to the water environment.

Flood risk and surface water drainage

16.8.17. Only Solar PV development would be located within Flood Zone 2 and Flood Zone 3 (associated with the Claydon Brook and Claydon Brook Tributary) and Solar PV panels would be raised above appropriate flood levels. All infrastructure with foundations, such as the Rosefield Substation and BESS, would be located outside of these areas, as secured in the **Design Commitments [EN010158/APP/.5.9]**.

16.8.18. The areas of fluvial flood risk in the Interconnecting Cable Corridor between Parcel 1 and Parcel 2 corresponds to an area in the upper catchment of an unnamed tributary watercourse.

16.8.19. There is fluvial flood risk associated with the Muxwell Brook in Parcel 1a, which is proposed for biodiversity enhancement only; therefore, there would be no Solar PV development or supporting infrastructure located in this part of the Site.

16.8.20. A limited localised flood risk has been identified associated with surface water and fluvial flooding in the immediate vicinity of the Ordinary Watercourses and identified overland flow routes. Infrastructure within the limited areas of 'medium' and 'high' surface water risk is limited to the Solar PV development. The supporting poles have minimal cross-sectional areas and therefore would have negligible impact on local flows or displacement of floodwater.

16.8.21. Sensitive equipment is inherently raised above ground levels through its design and would be raised sufficiently so as to be above anticipated surface water flood levels. This would also provide protection against surface water flooding during extreme scenarios.

16.8.22. Safe access and egress would be available for personnel during fluvial and surface water flood events, with only shallow water expected in localised areas crossed by Internal Access Corridors. The duration of any fluvial or surface water flood events is expected to be short term due to the position of the Site high in the respective catchments of the various watercourses. It is anticipated that up to 24 permanent staff per day would be on-site during the operation (including maintenance) phase, with additional staff attending when required for maintenance, replacement of faulty or end of service life solar equipment, vegetation management activities and cleaning.

16.8.23. Forewarning of flood events is likely to be available via monitoring of the localised and national weather patterns, ground conditions, and to a lesser degree, the Environment Agency's Flood Warning service.

16.8.24. The **Outline Drainage Strategy [EN010158/APP/7.11]** describes how attenuation basins would be designed to capture runoff from the BESS and Rosefield Substation areas, with storage provided for the 1 in 100 year plus climate change event (plus an additional volume for firefighting water for the BESS area). Runoff would be released to appropriate locations at a controlled greenfield rate, with the option to shut off the outlet for the BESS in the event of a fire or other pollution incident. Linear SuDS features have also been proposed for the areas of Solar PV development and for the Internal Access Corridors. Many areas are considered to remain permeable and would continue to drain in a similar way to the predevelopment scenario. The **Outline Drainage Strategy**

[EN010158/APP/7.11] demonstrates that there would be no increase in surface water runoff associated with the Proposed Development. The principles of the **Outline Drainage Strategy [EN010158/APP/7.11]** have been agreed in consultation with the Lead Local Flood Authority and the Internal Drainage Board (refer to **Table 16.1** above).

16.8.25. Overall, the operational Proposed Development would be safe from a flooding perspective and would not result in any increase in flood risk either on or off the Site, taking account of the embedded mitigation. A full assessment of the flood risk associated with the Proposed Development is presented in **ES Volume 4, Appendix 16.1: Flood Risk Assessment [EN010158/APP/6.4]**.

Water framework directive waterbody (Claydon Brook Tributary)

16.8.26. **ES Volume 4, Appendix 16.2: WFD Waterbodies Stage 1 Screening Assessment [EN010158/APP/6.4]** concludes that the operation (including maintenance) phase of the Proposed Development does not present a risk of deterioration of status of Water Framework Directive waterbodies or jeopardise the attainment of 'good' overall status of Water Framework Directive waterbodies.

Decommissioning

16.8.27. During the decommissioning phase, likely effects are considered to be similar, or no greater than, those predicted for the construction phase.

16.9. Additional mitigation

Construction and decommissioning

Water quality

16.9.1. Water quality during the construction and decommissioning phases would be effectively protected by appropriate control measures and any adverse effects would be greatly reduced or eliminated. The additional mitigation measures outlined in **Paragraph 16.9.2** below would be applied. These additional mitigation measures are detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]** and **Outline DEMP [EN010158/APP/7.4]**.

16.9.2. The protection of water quality would be focused on reducing the mobilisation of silt and pollutant chemicals from entering watercourses, usually via rainfall runoff. A summary of the pollution prevention management measures detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]** and **Outline DEMP [EN010158/APP/7.4]** are outlined below:

- No vehicle, equipment or material storage is permitted within the Flood Zone 2 or Flood Zone 3 or within 20m of watercourses, where practicable.
- The placement of stockpiled materials as far away as practically possible from sensitive receptors (including watercourses).
- Vegetation removal to be undertaken on a phase-by-phase basis to avoid excessive exposure of bare soil.
- Silt fencing or straw bales to be placed downslope of construction works to prevent silt entering watercourses.
- Additional silt fencing kept on site for deployment at short notice.
- A wheel wash at the Site access to reduce silt migration across the Site.
- Vehicles to be inspected at the start of each day, and vehicles showing signs of fuel/oil drips, missing fuel caps, or damaged hydraulics would be rejected and not used on Site before repair.
- Fuels would be stored in a double skinned locked and bunded fuel bowser as far away from watercourses as reasonably practicable. Refuelling would be carried out over a drip tray. These would be regularly maintained and inspected for rainwater. Rainwater would be removed by specialist removal. A spill kit would be located next to any bowser.
- Spill kits would contain as a minimum: spill booms, granules, mats and gully covers.
- All surface waters and drains must be protected from silt runoff using gully guards, straw bales, gravel traps or silt fencing. These measures must be inspected daily.

Flood risk and surface water drainage

16.9.3. Trenchless HDD methods would be supported by an HDD Fluid Breakout Plan, as detailed in and secured by **Appendix 3** of the **Outline CEMP [EN010158/APP/7.2]**.

16.9.4. A temporary drainage strategy would be implemented during construction works to control runoff rates and sediment mobilisation, as detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]**.

16.9.5. A Flood Management and Evacuation Plan would be produced prior to the construction and decommissioning phases commencing, as detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]** and **Outline DEMP [EN010158/APP/7.4]**, for any areas of the Proposed Development (mainly Internal Access Corridors and Solar PV modules) that intersect areas of flood risk.

16.9.6. Cable crossing depths would take account of potential deepening of watercourse channels over the lifetime of the Proposed Development, as detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]**.

16.9.7. The Abnormal Indivisible Loads (AIL) access located in the north of Parcel 3 would not be used during flood events, as detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]**.

Water framework directive waterbody (Claydon Brook Tributary)

16.9.8. Relevant pollution prevention management measures are detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]** and **Outline DEMP [EN010158/APP/7.4]** and summarised in **Paragraph 16.9.2** above.

Operation (including maintenance)

Water quality

16.9.9. Due to the nature of the Proposed Development, there is a low likelihood that the water quality would be degraded at the receiving watercourses during the operation (including maintenance) phase. Once vegetation is established below Solar PV modules, this would support the stabilisation of soils which would be less prone to the erosional forces of rainfall runoff.

16.9.10. The operation (including maintenance) phase would not increase the risk of pollution discharge to watercourses and degradation to water quality during operations would be relatively low risk. Best practice mitigation measures, as detailed in and secured by the **Outline OEMP [EN010158/APP/7.3]**, would further reduce any residual effects on water quality. Such measures include:

- No vehicle, equipment or material storage is permitted within the Flood Zone 2 or Flood Zone 3 or within 20m of watercourses, where practicable.
- Vehicles to be inspected at the start of each day, and vehicles showing signs of fuel/oil drips, missing fuel caps, or damaged hydraulics would be rejected and not used on Site before repair.
- Spill kits would contain as a minimum: spill booms, granules, mats and gully covers.

Flood risk and surface water drainage

16.9.11. The requirement for a Flood Management Plan is detailed in and secured by the **Outline OEMP [EN010158/APP/7.3]**, for any areas of the Proposed Development (mainly Internal Access Corridors and Solar PV modules) that intersect areas of flood risk.

16.9.12. Cleaning of Solar PV modules would be undertaken using demineralised water which can be supplied either via bowser from off-site sources or filtered from rainwater harvesting water supplies on Site.

16.9.13. The Rosefield Substation and BESS compounds will incorporate appropriate added pollution mitigation measures, such as oil bunds and firewater storage, to ensure potential pollution impact to watercourses is minimal. These measures are detailed in and secured by the **Outline Battery Safety Management Plan [EN010158/APP/7.9]** and **Outline OEMP [EN010158/APP/7.3]**. All surface water runoff from these areas would also pass through a SuDS treatment train (sequence of sustainable drainage systems).

16.9.14. Maintenance visits would be timed to ensure there is no staff presence at times of increased flood risk, as detailed in and secured by the **Outline OEMP [EN010158/APP/7.3]**. Furthermore, monitoring of the Site can be undertaken remotely via CCTV, as detailed in and secured by the **Outline OEMP [EN010158/APP/7.3]**. If flooding is anticipated, personnel would be notified to leave the Site.

Water framework directive waterbody (Claydon Brook Tributary)

16.9.15. Relevant pollution prevention management measures are detailed in and secured by the **Outline OEMP [EN010158/APP/7.3]** and summarised in **Paragraph 16.9.10** above.

16.10. Assessment of residual effects (with additional mitigation)

Construction and decommissioning

Water quality

16.10.1. During the construction and decommissioning phase, the implementation of the measures detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]** and **Outline Drainage Strategy [EN010158/APP/7.11]** would ensure the magnitude of impact on surface water quality (a receptor of **medium** sensitivity/importance) would be reduced to **minor**, meaning the overall of water quality effect is reduced to **slight adverse**, which is considered to be **not significant**. The effect would be temporary, direct and of local importance.

16.10.2. The implementation of the measures detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]** and **Outline Drainage Strategy [EN010158/APP/7.11]** would ensure the magnitude of impact on watercourses within Finemere Wood SSSI and Sheephouse Wood SSSI (a receptor of **high** sensitivity/importance) would be reduced to **minor**, meaning the overall of water quality effect is reduced to **slight adverse**,

which is considered to be **not significant**. The effect would be temporary, direct and of local importance.

16.10.3. Measures detailed in and secured by the **Outline DEMP [EN010158/APP/7.4]** would reduce decommissioning phase water quality and flood risk effects to **slight adverse**, which is considered to be **not significant**.

Flood risk and surface water drainage

16.10.4. The implementation of a drainage strategy, as detailed in and secured by the **Outline Drainage Strategy [EN010158/APP/7.11]** and Flood Management Plan, as detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]** and **Outline DEMP [EN010158/APP/7.4]** for the duration of the works would reduce the magnitude of impact on flood risk (a receptor of **high** sensitivity/importance) during the construction and decommissioning phases to **minor**, meaning the overall flood risk effect is reduced to **slight adverse**, which is considered to be **not significant**. The effect would be temporary, direct and of local importance.

Water framework directive waterbody (Claydon Brook Tributary)

16.10.5. Claydon Brook Tributary, as a Water Framework Directive classified waterbody with a moderate ecological status, is considered to be of **medium** sensitivity/importance. The magnitude of impact following additional mitigation is considered to be **minor**, because as a result of the additional mitigation measures detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]** that the degradation of water quality within the waterbody can be prevented, meaning the residual effect is reduced to **slight adverse**, in the event of a pollution event occurring, which is considered to be **not significant**. The effect would be temporary, direct and of local importance.

Operation (including maintenance)

Water quality

16.10.6. During the operation (including maintenance) phase, the implementation of the measures detailed in and secured by the **Outline OEMP [EN010158/APP/7.3]** would ensure the magnitude of impact on surface water quality (a receptor of **medium** sensitivity/importance) would be reduced to **minor**, meaning the overall of water quality effect is reduced to **slight adverse**, which is considered to be **not significant**. The effect would be temporary, direct and of local importance.

16.10.7. The implementation of the measures detailed in and secured by the **Outline OEMP [EN010158/APP/7.3]** would ensure the magnitude of impact on watercourses within Finemere Wood SSSI and Sheephouse

Wood SSSI (a receptor of **high** sensitivity/importance) would be reduced to **minor**, meaning the overall of water quality effect is reduced to **slight adverse**, which is considered to be **not significant**. The effect would be temporary, direct and of local importance.

Flood risk and surface water drainage

16.10.8. The implementation of a drainage strategy, as detailed in and secured by the **Outline Drainage Strategy [EN010158/APP/7.11]** and Flood Management Plan, as detailed in and secured by the **Outline OEMP [EN010158/APP/7.3]** for the operation (including maintenance) phase of the Proposed Development would reduce the magnitude of impact on flood risk (a receptor of **high** sensitivity/importance) during the operation (including maintenance) phase to **minor**, meaning the overall flood risk effect is reduced to **slight adverse**, which is considered to be **not significant**. The effect would be temporary, direct and of local importance. The Proposed Development is designed to ensure there is no increase in flood risk elsewhere, accounting for the predicted impacts of climate change throughout the lifetime of the Proposed Development. Any residual effects can be managed through appropriate mitigation measures that will ensure there will be no increase in flood risk either on Site or elsewhere.

16.10.9. There will be no loss of floodplain storage.

16.10.10. Any deflection or constriction of flood flow routes will be safely managed within the Site.

Water framework directive waterbody (Claydon Brook Tributary)

16.10.11. Claydon Brook Tributary, as a Water Framework Directive classified waterbody with a moderate ecological status, is considered to be of **medium** sensitivity/importance. The magnitude of impact following additional mitigation is considered to be **minor** as a result of the additional mitigation measures detailed in and secured by the **Outline OEMP [EN010158/APP/7.3]** that the degradation of water quality within the waterbody can be prevented, meaning the residual effect is reduced to **slight adverse**, in the event of a pollution event occurring, which is considered to be **not significant**. The effect would be temporary, direct and of local importance.

16.11. Opportunities for enhancement

16.11.1. An opportunity for enhancement has been identified through biodiversity enhancements within Parcel 1a, where Finemere Wood SSSI and the Muxwell Brook are located. Through consultation with the North Bucks Freshwater Resilience Project, it is considered that there are opportunities to slow down the flow of water within these areas, potentially using leaky

dams to improve the natural environment and reduce downstream flood risk.

16.11.2. The proposed provision of vegetation cover (for the duration of the operation (including maintenance) phase) below the Solar PV modules would help slow the rate of surface water runoff from the Site during high intensity rainfall events and promote the interception of surface water runoff. This would result in a reduction in the rate of surface water runoff compared to the baseline scenario, as agricultural practices would periodically result in bare vegetation ground cover and exposed soils which can potentially increase the rate of surface water runoff. Furthermore, linear depressions caused by the repeated movement of agricultural vehicles over the soil can also increase the velocity in which surface water leaves the Site and potentially increased peak runoff rates. The change in land use would result in a decrease in flood risk both on site and downstream of the Proposed Development.

16.12. Monitoring requirements

16.12.1. There are no significant adverse residual effects identified, therefore there is no requirement for monitoring of the receptors assessed within this chapter. However, it would be best practice to monitor the effectiveness of silt management works during the construction and decommissioning phases, particularly immediately following prolonged periods of rainfall to ensure silt-laden runoff has not entered the watercourse. This recommendation is detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]** and the **Outline DEMP [EN010158/APP/7.4]**.

16.13. Difficulties and uncertainties

16.13.1. Access was not afforded to all parts of the Site for walkover surveys; however, the relevant detail has been obtained by reference to the relevant data sources, including mapping.

16.14. Summary

16.14.1. A summary of this assessment is presented in **Table 16.11**. The sensitivity/importance of each receptor is identified alongside any relevant embedded mitigation and the likely effects that could arise on those receptors. Any proposed additional mitigation measures are stated and the residual effects then assessed. Finally, any monitoring requirements are stated where applicable.

16.14.2. There are no significant residual effects during the construction, operation (including maintenance) and/or decommissioning phases.

Table 16.11: Summary of the water assessment

Receptor/ matter	Phase	Sensitivity/ importance of the receptor	Embedded mitigation	Likely effect (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Water quality	Construction	Medium	The Proposed Development would incorporate the required 10m minimum offset distance from all watercourses.	Water quality reduction and physical impacts (flows and fluvial processes) to watercourses. Risk of silt-laden runoff following rainfall during the construction phase.	**Outline CEMP [EN010158/APP/7.2]**	Minor	**Slight adverse** **(-) (I) (ST) (T)** **Not significant**	Possible on-site construction phase monitoring of local watercourses to be agreed with Environment Agency, once construction phase plan produced, as detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]**.
Flood risk and surface water drainage	Construction	High	Key infrastructure such as the BESS and Rosefield Substation would be located outside of areas of fluvial flood risk and 'high' surface water risk where feasible. Solar PV modules would be raised above ground level. No sensitive equipment would be located in areas of elevated flood risk. Temporary and permanent surface water drainage strategies would be implemented to control runoff rates.	Increase in flood risk due to displacement of floodwater or increased runoff.	**Outline CEMP [EN010158/APP/7.2]**	Minor	**Slight adverse** **(-) (I) (ST) (T)** **Not significant**	N/A
Water Framework Directive waterbody (Claydon Brook Tributary)	Construction	Medium	Vegetation management to stabilise soils and reduce silt laden rainfall runoff. Measures such as incorporation of Suds within **Outline Drainage Strategy [EN010158/APP/7.11]**.	Risk of silt-laden runoff following rainfall during the construction phase.	**Outline CEMP [EN010158/APP/7.2]**	Minor	**Slight adverse** **(-) (I) (ST) (T)** **Not significant**	Possible on-site construction phase monitoring of local watercourses to be agreed with Environment Agency, once construction phase plan produced, as detailed in and secured by the **Outline CEMP [EN010158/APP/7.2]**.

Receptor/ matter	Phase	Sensitivity/ importance of the receptor	Embedded mitigation	Likely effect (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
Water quality	Operation (including maintenance)	Medium	The Proposed Development would incorporate the required minimum 10m offset distance from all watercourses.	Water quality reduction and physical impacts (flows and fluvial processes) to watercourses. Risk of silt-laden runoff following rainfall during the operation (including maintenance) phase.	**Outline OEMP [EN010158/APP/7.3]** **Outline Drainage Strategy [EN010158/APP/7.11]**	Minor	**Slight adverse** **(-) (I) (ST) (T)** **Not significant**	N/A
Flood risk and surface water drainage	Operation (including maintenance)	High	The Proposed Development would be located outside of areas of fluvial flood risk and 'high' surface water risk where feasible. Solar PV modules would be raised above ground level taking into consideration the design flood depth/level. No sensitive equipment would be located in areas of elevated flood risk. Temporary and permanent surface water drainage strategies would be implemented to control runoff rates.	Increase in flood risk due to displacement of floodwater or increased runoff.	**Outline OEMP [EN010158/APP/7.3]** **Outline Drainage Strategy [EN010158/APP/7.11]**	Minor	**Slight adverse** **(-) (I) (ST) (T)** **Not significant**	N/A
Water Framework Directive waterbody (Claydon Brook Tributary)	Operation (including maintenance)	Medium	Measures such as incorporation of SuDS within **Outline Drainage Strategy [EN010158/APP/7.11]**. The Proposed Development would incorporate the required minimum offset distance from all watercourses.	Water quality reduction and physical impacts (flows and fluvial processes) to watercourses. Risk of silt-laden runoff following rainfall during the operation (including maintenance) phase.	**Outline OEMP [EN010158/APP/7.3]** **Outline Drainage Strategy [EN010158/APP/7.11]**.	Minor	**Slight adverse** **(-) (I) (ST) (T)** **Not significant**	N/A
Water quality	Decommissioning	Medium	The Proposed Development would incorporate the required minimum 10m offset	Water quality reduction and physical impacts (flows and fluvial	**Outline DEMP [EN010158/APP/7.4]**	Minor	**Slight adverse** **(-) (I) (ST) (T)**	Possible on-site decommissioning phase monitoring of local

Receptor/ matter	Phase	Sensitivity/ importance of the receptor	Embedded mitigation	Likely effect (without additional mitigation)	Additional mitigation	Magnitude of impact	Residual effect (with additional mitigation)	Monitoring requirement
			distance from all watercourses.	processes) to watercourses. Risk of silt-laden runoff following rainfall during the decommissioning phase.			**Not significant**	watercourses to be agreed with Environment Agency, once construction phase plan produced, as detailed in and secured by the **Outline DEMP [EN010158/APP/7.4]**.
Flood risk and surface water drainage	Decommissioning	High	The Proposed Development would be located outside of areas of fluvial flood risk and 'high' surface water risk. Solar PV modules would be raised above ground level. No sensitive equipment would be located in areas of elevated flood risk. Temporary and Permanent surface water drainage strategies would be implemented to control runoff rates.	Increase in flood risk due to displacement of floodwater or increased runoff.	**Outline DEMP [EN010158/APP/7.4]** **Outline Drainage Strategy [EN010158/APP/7.11]**.	Minor	**Slight adverse** **(-) (I) (ST) (T)** **Not significant**	N/A
Water Framework Directive waterbody (Claydon Brook Tributary)	Decommissioning	Medium	Vegetation management to stabilise soils and reduce silt laden rainfall runoff. Measures such as incorporation of SuDS within **Outline Drainage Strategy [EN010158/APP/7.11]**.	Risk of silt laden runoff following rainfall during the decommissioning phase.	**Outline DEMP [EN010158/APP/7.4]**	Minor	**Slight adverse** **(-) (I) (ST) (T)** **Not significant**	Possible on-site decommissioning phase monitoring of local watercourses to be agreed with Environment Agency, once construction phase plan produced, as detailed in and secured by the **Outline DEMP [EN010158/APP/7.4]**.
Key: **+ = positive or - = negative; D = direct or I = indirect; S T = short-term, MT = medium-term or LT = long-term; P = permanent or T = temporary**								

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