

**East Midlands Gateway
Phase 2 (EMG2)**

Document DCO 6.13I/MCO 6.13I

ENVIRONMENTAL STATEMENT

Technical Appendices

Appendix 13I

Flood Risk Assessment – EMG1 Works

August 2025

13

The East Midlands Gateway Phase 2
and Highway Order 202X and The East Midlands Gateway
Rail Freight and Highway (Amendment) Order 202X

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SEGRO (Properties) Ltd
East Midlands Gateway 2
Flood Risk Assessment - EMG1 Works

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EXECUTIVE SUMMARY

This Flood Risk Assessment (FRA) has been prepared in accordance with the requirements set out in the National Policy Statement for National Networks (NPSNN). It has been produced on behalf of SEGRO (Properties) Ltd in respect of a Development Consent Order (DCO) for the proposed East Midlands Gateway Phase 2 (EMG2) and East Midlands Gateway Rail Freight Interchange Material Change Order (MCO).

The DCO and MCO comprises a number of elements which, due to their geographical locations, are covered by three individual assessments of flood risk. This FRA focuses on the works which fall within the existing SEGRO East Midlands Gateway Logistics Park (known as EMG1). These are referred to throughout the report as the 'EMG1 Works' and the 'study site'

This report demonstrates that the EMG1 Works are not at significant flood risk. Moreover, in compliance with the requirements of the NPSNN, the development will not increase flood risk to the wider catchment area subject to suitable management of surface water runoff.

The Environment Agency (EA) Flood Map for Planning identifies that the EMG1 Works are located entirely within Flood Zone 1 (land at low risk of flooding from rivers and sea). The nearest Flood Zones are located approximately 180m north which are attributed to the Lockington Brook, a designated EA Main River.

The EMG1 Works falls within the surface water drainage catchment of the existing EMG1 development. This drainage infrastructure was designed to manage surface water runoff from EMG1 up to and including the 1 in 100-year storm event including an allowance for future climate change. Therefore, the potential flood risk from surface water runoff and drainage/sewer sources is low.

The EMG1 Works will introduce new areas of impermeable surface to EMG1. To manage the additional surface water runoff that this will generate it is proposed to provide upgrades to the existing EMG1 drainage infrastructure in the form of additional attenuated storage and Sustainable Drainage Systems (SuDS). These will be designed to ensure surface water is restricted to the equivalent greenfield QBAR rate and are designed with capacity for the 1 in 100-year storm with an allowance for climate change.

The EMG1 Works have been reviewed against other sources of flood risk including coastal, groundwater, canals, and reservoirs and large waterbodies. The overall risk posed by these sources is low.

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1. INTRODUCTION

1.1 This Flood Risk Assessment (FRA) has been prepared in accordance with the requirements set out in the National Policy Statement for National Networks (NPSNN). It has been produced on behalf of SEGRO (Properties) Ltd in respect of a Development Consent Order (DCO) for the proposed East Midlands Gateway Phase 2 (EMG2) and East Midlands Gateway Rail Freight Interchange Material Change Order (MCO).

1.2 The DCO and MCO comprises a number of elements and due to their geographical location, they are covered by three individual assessments. This FRA focuses on the 'EMG1 Works', including the following:

- Construction of a new rail-served warehouse building on land adjacent to the rail-freight terminal referred to as Plot 16 (MCO, Works No. 3A) together with associated access (MCO, Works No. 5A) and landscaping (MCO, Works No. 6A).
- Alterations to the existing rail-freight terminal to improve its operation and efficiency;
- An expansion of the EMG1 Management Suite by the EMG1 site entrance to cater for the additional demand on management facilities resulting from EMG1 (MCO, Works No. 3B);
- Enhancements to the Public Transport Interchange by way of the installation of EV charging infrastructure for buses and provision of a drop-off layby adjacent to the transport hub (MCO, Works No. 5B and 5C); and
- Provision of a signalised crossing over the EMG1 exit road approach to the access junction to EMG1 (MCO, Works No. 8A).

1.3 Summary information is included as **Table 1.1**.

Table 1.1: Site Summary

Site Name	EMG1 Works
NGR (approx.)	SK470270
Development Type	Industrial/Commercial/Utilities and rail infrastructure
Flood Zone Classification	Flood Zone 1
NPPF Vulnerability	Less Vulnerable – Industrial/Commercial
Anticipated Development Lifetime	75 years*
Environment Agency Office	East Midlands
Lead Local Flood Authority	Leicestershire County Council

*In accordance with Paragraph 006 of the Flood Risk and Coastal Change Planning Practice Guidance

Sources of Data

- i. Environment Agency (EA) 2022 1m LiDAR Data
- ii. OS Explorer Series Mapping
- iii. EA Hemington, Lockington, Castle Donington Brooks Modelling Study (2022) Information
- iv. North West Leicestershire Strategic Flood Risk Assessment
- v. Leicestershire County Council Preliminary Flood Risk Assessment
- vi. Leicestershire County Council Preliminary Flood Risk Assessment Addendum
- vii. Local Flood Risk Management Strategy for Leicestershire
- viii. Humber River Basin Flood Risk Management Plan
- ix. North West Leicestershire Local Plan
- x. British Geological Survey (BGS) Drift & Geology Maps
- xi. EA Surface Water Flood Risk Maps
- xii. EA Flood Map for Planning

Situational Context and Development Proposals

- 1.4 The proposed development comprises a number of interrelated component parts as follows, and collectively they are referred to as the EMG2 Project:

- **EMG2 Works:**
 - o Construction of logistics and advanced manufacturing development and ancillary buildings (DCO, Works No. 1);
 - o Construction of road infrastructure (DCO, Works No. 2);
 - o Construction of bus interchange (DCO, Works No. 3);
 - o Construction of HGV parking (DCO Works No. 4);
 - o Provision of hard and soft landscaping (DCO Works No. 5);
 - o Creation of a Community Park (DCO, Work No. 21); and
 - o Upgrade of the EMG1 substation (DCO, Work No. 20)¹.
- **Highways Works²**
 - o A453 access junction works to the EMG2 Main Site (Works No. 6);
 - o Hyam's Lane works (Works No. 7);
 - o Works to the M1 northbound (Works No. 8);
 - o Construction of link road from the M1 northbound to the A50 westbound (Works No. 9);
 - o Works to the A50 westbound (Works No. 10);

¹ Note – Due to its distance from the other EMG2 Works, for the purpose of assessing flood risk the upgrade of the EMG1 substation is included in the Highway Works Flood Risk Screening Report (ref: EMG2-BWB-ZZ-XX-T-W-0007).

² Note - Due to their geographical location for the purpose of assessing flood risk Works No. 6, 7, 15, 17, and 21 are included in this EMG2 Works Flood Risk Assessment (ref: EMG2-BWB-ZZ-XX-T-W-0001).

- Works to the link road from the M1 southbound and A50 eastbound to M1 Junction 24 (Works No. 11);
- Works to the west side of the M1 Junction 24 roundabout and A453 northbound approach (Works No. 12a);
- Works to the east side of the M1 Junction 24 roundabout and A453 southbound approach (Works No. 12b);
- Improvements to the EMG1 access junction (Works No. 13);
- Construction of the Active Travel Link between the EMG1 access junction and the A453 west of Finger Farm roundabout (Works No. 14);
- Provision of an uncontrolled crossing of the A453 at the East Midland Airport signalised access junction (Works No. 15);
- Works to M1 northbound signage on the approach to M1 Junction 23A (Works No. 16);
- Works to Long Holden (Works No. 17);
- Works to the A42/A453 Finger Farm roundabout (Works No. 18); and
- Upgrade to public footpath L57 to a cycle track (Works No. 19).

- **EMG1 Works**

- Construction of a new rail-served warehouse building on land adjacent to the rail-freight terminal referred to as Plot 16 (MCO, Works No. 3A) together with associated access (MCO, Works No. 5A) and landscaping (MCO, Works No. 6A).
- Alterations to the maximum permitted height of gantry cranes at the rail freight interchange by 4m, to 24m overall;
- An expansion of the EMG1 Management Suite by the EMG1 site entrance to cater for the additional demand on management facilities resulting from EMG1 (MCO, Works No. 3B);
- Enhancements to the Public Transport Interchange by way of the installation of EV charging infrastructure for buses and provision of a drop-off layby adjacent to the transport hub (MCO, Works No. 5B and 5C); and
- Provision of a signalised crossing over the EMG1 exit road approach to the access junction to EMG1 (MCO, Works No. 8A) connecting to the drop-off layby.

- 1.5 An illustrative site location plan is provided as **Figure 1.1**, which also identities the approximate extent of the development component parts. For ease of reference and for the purpose of the Flood Risk Assessments, the individual components have been grouped together based upon the geographical location, as shown in **Figure 1.2**.
- 1.6 This FRA has been prepared in relation to the 'EMG1 Works', referred to as 'the study site' throughout for the purpose of this report. Refer to Document MCO 2.5 for the Parameters Plan.
- 1.7 The EMG2 Works and Highway Works have been reviewed under separate cover (references: EMG2-BWB-ZZ-XX-T-W-0001 and EMG2-BWB-ZZ-XX-T-W-0007, respectively).

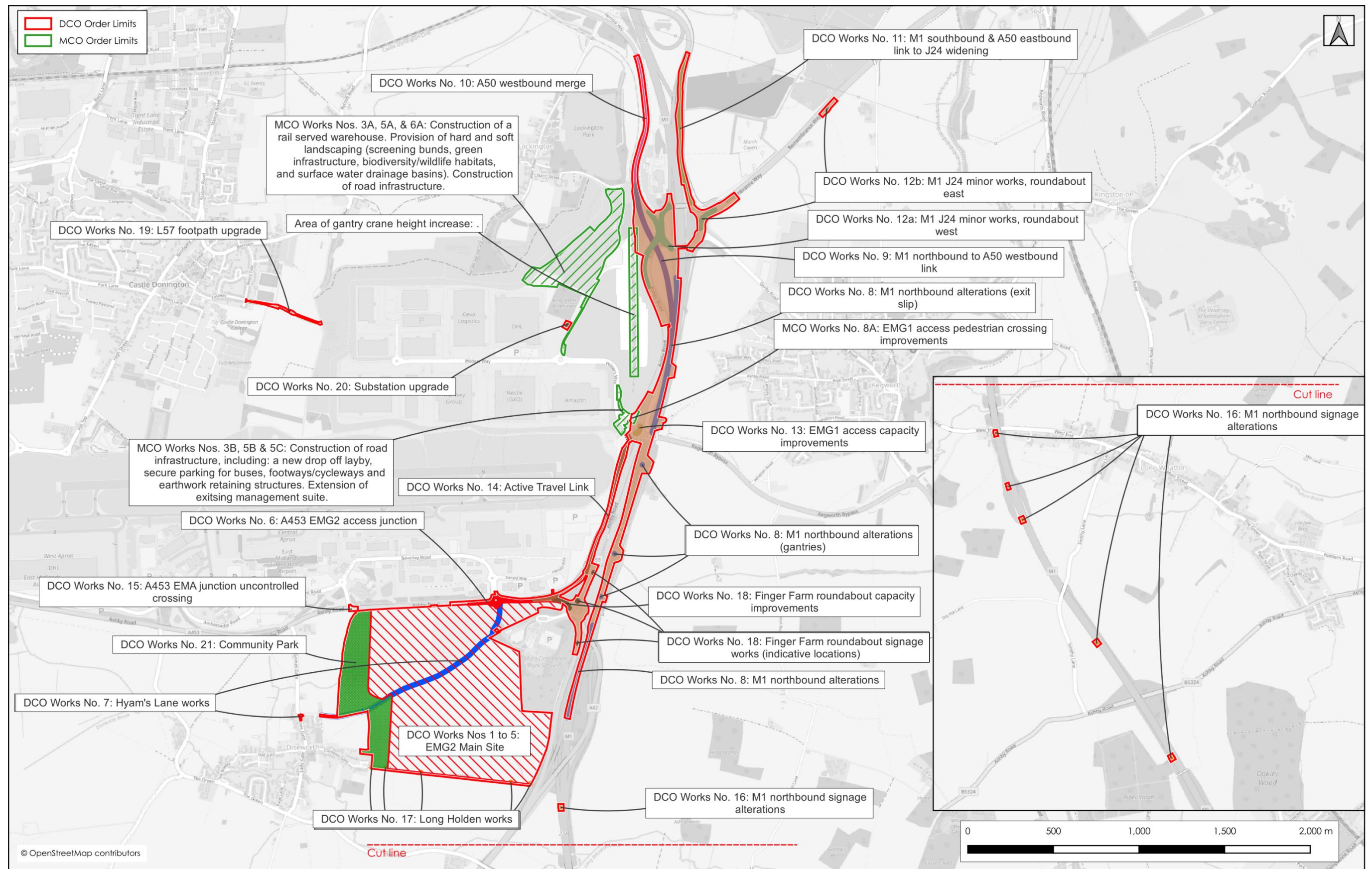


Figure 1.1: The EMG2 Project



Existing Site

- 1.8 The study site is located across three parcels within EMG1. They are located approximately 1.5km northeast of the EMG2 Main Site and are bound to the south and west by the existing EMG1 development, to the north by greenfield grassland, and to the east by the A453 and A50. Their location is shown within **Figure 1.3**.

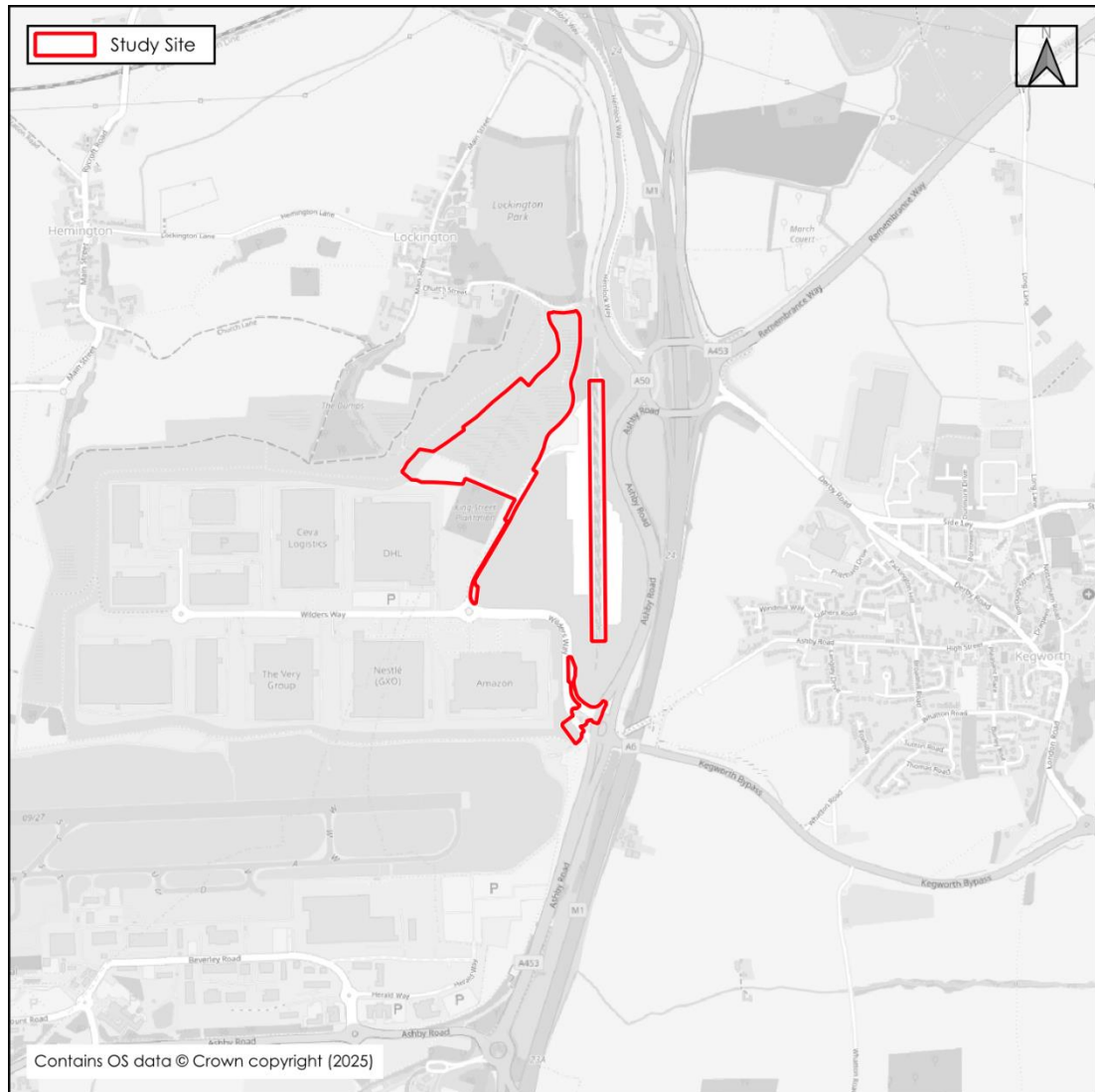


Figure 1.3: Study Site Location

- 1.9 EA LiDAR data provides an overview of the ground levels within the study site and in the wider area, an extract of mapping is included as **Figure 1.4**.

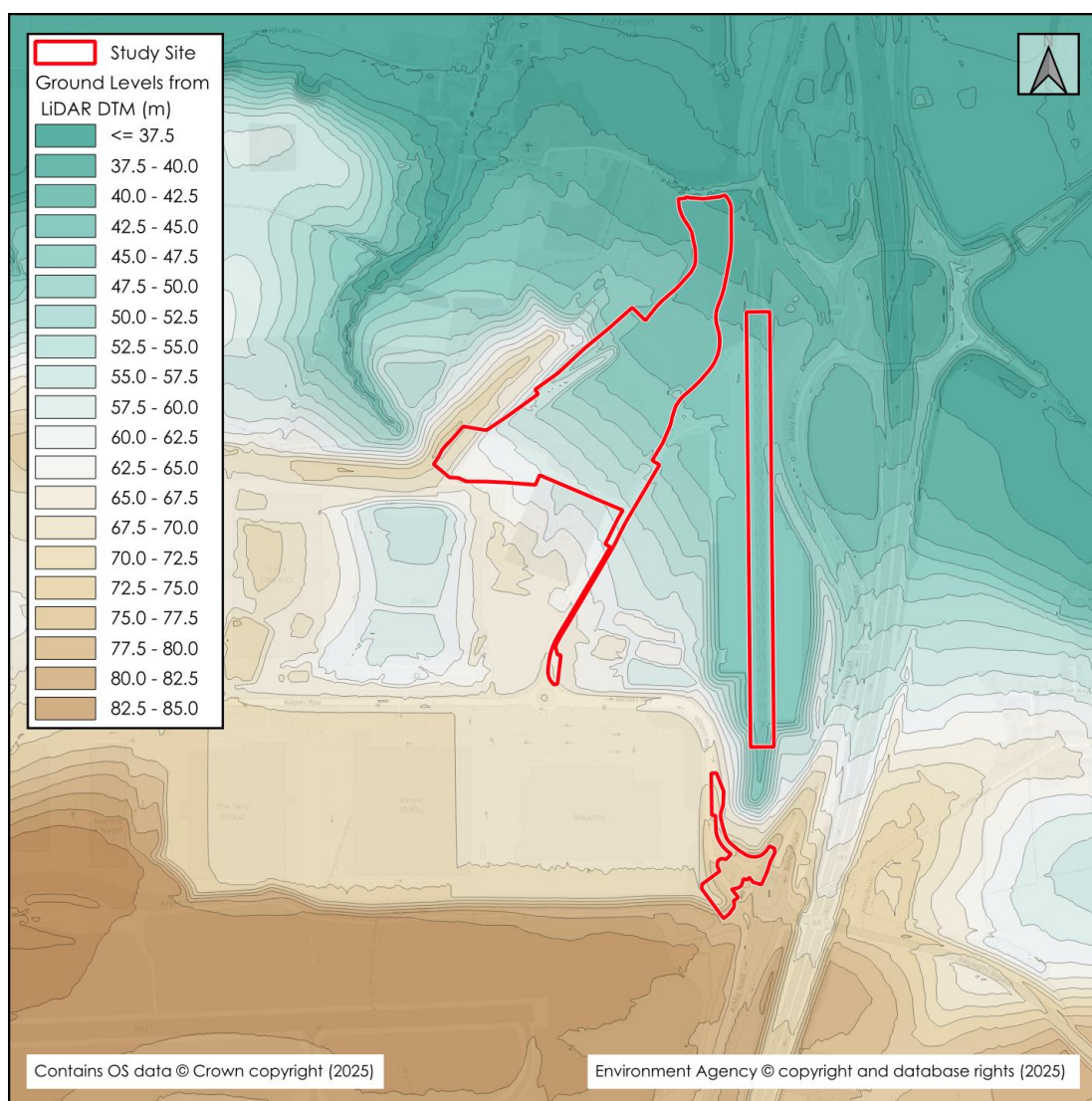


Figure 1.4: Site Topography

- 1.10 The LiDAR data identifies that the local area falls in a northerly direction, falling from a high point of approximately 80 metres Above Ordnance Datum (mAOD) at the southern entrance to EMG1 to a low point of approximately 38mAOD on the northern boundary.

2. FLOOD RISK PLANNING POLICY & GUIDANCE

National Policy Statement for National Networks

- 2.1 The NPSNN³ provides planning policy guidance for the promoters of nationally significant infrastructure projects. The NPSNN includes guidance about the generic and other impacts which should specifically be considered in assessing and designing projects. It also sets the context for the examination of proposals by the Planning Inspectorate (PINS).
- 2.2 Paragraph 5.128 highlights the requirement for a FRA to accompany a DCO application and must demonstrate that the project will be safe for its lifetime, without increasing flood risk elsewhere and, where possible, will reduce flood risk overall.
- 2.3 The NPSNN specifically refers to the NPPF for further, more detailed guidance on flood risk.

National Planning Policy Framework

- 2.4 The NPPF⁴ sets out the Government's national policies on different aspects of land use planning in England in relation to flood risk. The PPG is also available online⁵.
- 2.5 Flood risk is identified as a combination of the probability and the potential consequences of flooding:

Flood Risk = Probability x Consequences

- 2.6 The probability is the chance of a flood occurring expressed as a return period or annual exceedance probability (AEP), and the consequences are the potential impacts of the flood (for example, damage to buildings or risk to people's safety).
- 2.7 Potential sources of flood risk are rivers and the sea, direct rainfall on the ground surface resulting in surface water runoff, rising groundwater, overwhelmed sewers and drainage systems, reservoirs, canals and lakes, and other artificial sources.
- 2.8 The NPPF states that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk. Where development is necessary in such areas, the development should be made safe for its lifetime without increasing flood risk elsewhere. When considering flood risk, the NPPF requires development to account for future climate change.

National Planning Practice Guidance – Flood Risk and Coastal Change

- 2.9 The NPPF is accompanied by the Planning Practise Guidance (PPG) category entitled "Flood Risk and Coastal Change"⁶. This sets out the vulnerability to flooding of different land uses. It encourages development to be located in areas of lower flood risk where

³ National Policy Statement for National Networks, Department for Transport, March 2024

⁴ Revised National Planning Policy Framework, Ministry of Housing, Communities & Local Government, amended 2023

⁵ Planning Practice Guidance: <https://www.gov.uk/government/collections/planning-practice-guidance>

⁶ Planning Practice Guidance: <https://www.gov.uk/guidance/flood-risk-and-coastal-change>, amended 2022

possible and stresses the importance of preventing increases in flood risk off site to the wider catchment area.

2.10 The PPG requires development to be designed to include flood risk management and resilience against the “design flood” for its lifetime. The PPG also states that all potential sources of flooding should be considered when preparing an FRA.

2.11 The “design flood” is an event of a given probability generally defined as:

- river flooding likely to occur with a 1% AEP (a 1 in 100 chance each year); or
- tidal flooding likely to occur with a 0.5% AEP (1 in 200 chance each year); or
- surface water flooding likely to occur with a 1% AEP (a 1 in 100 chance each year),

plus, an appropriate allowance for climate change.

2.12 The PPG includes a series of tables that define Flood Zones (Table 1), the flood risk vulnerability classification of development land uses (Table 2) and ‘compatibility’ of development within the defined Flood Zones (Table 3).

2.13 This FRA is written in accordance with the NPPF and the associated PPG.

Flood Map for Planning

2.14 With particular reference to planning and development, the Flood Map for Planning identifies Flood Zones in accordance with Table 1 of the PPG. Further details on the Flood Zone classifications are outlined in **Table 2.1**.

Table 2.1: Flood Zone Classifications

Flood Zone	Description
Flood Zone 1 (Low Probability)	Land having less than a 1 in 1000 annual probability of river or sea flooding (<0.1% Annual Exceedance Probability). All land outside of Flood Zone 2 and 3.
Flood Zone 2 (Medium Probability)	Land having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1% AEP); or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.5% - 0.1% AEP).
Flood Zone 3a (High Probability)	Land having a 1 in 100 or greater annual probability of river flooding (>1% AEP); or land having a 1 in 200 or greater annual probability of flooding from the sea (>0.5% AEP). This is represented by “Flood Zone 3” on the Flood Map for Planning.
Flood Zone 3b (The Functional Floodplain)	Flood Zone 3b (The Functional Floodplain) is defined as land where water must flow or be stored in times of flood. This is not identified or separately distinguished from Zone 3a on the Flood Map for Planning.

2.15 The study site is shown to be located entirely within Flood Zone 1, as shown in **Figure 2.1**.

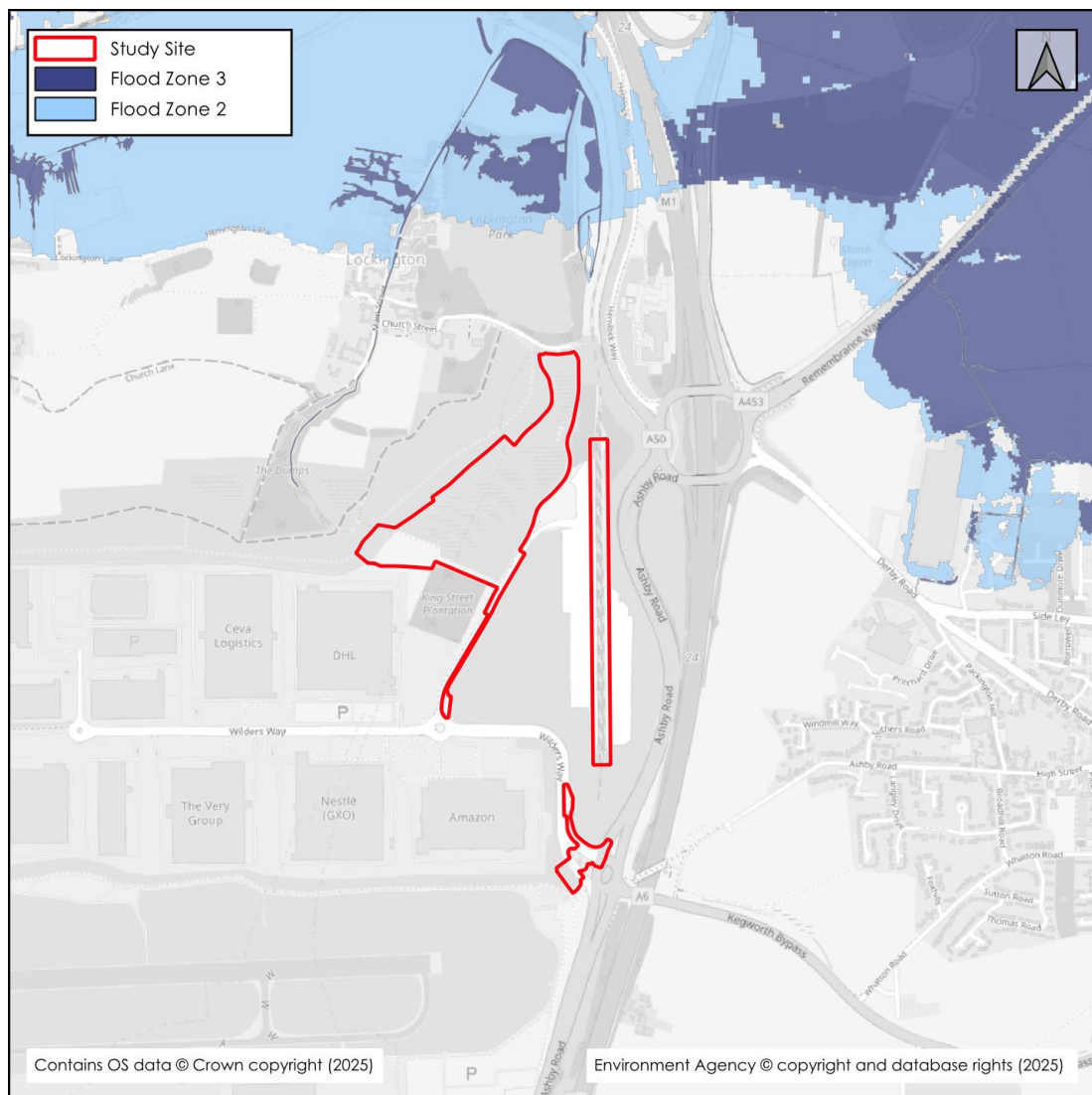


Figure 2.1: Flood Map for Planning

Climate Change

- 2.16 Predicted future changes in peak river flows caused by climate change are provided by the EA⁷, with a range of projections applied to regionalised 'River Basin Districts', which are further subdivided into Management Catchments. The site falls within the Soar Management Catchment of the Humber River Basin District.

River Flows

- 2.17 **Table 2.2** identifies the relevant peak river flow climate change allowances from this Management Catchment.

Table 2.2: Peak River Flow Climate Change Allowances for the Soar Management Catchment within the Humber River Basin District

⁷ Environment Agency, Flood risk assessments: climate change allowances: <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances>. Last Accessed March 2025.

Allowance Category	Total potential change anticipated for the '2020s' (2015 to 2039)	Total potential change anticipated for the '2050s' (2040 to 2069)	Total potential change anticipated for the '2080s' (2070 to 2125)
Upper End	28%	35%	60%
Higher Central	18%	21%	37%
Central	14%	16%	28%

- 2.18 When determining the appropriate allowance for use in a FRA the Flood Zone classification, flood risk vulnerability and the anticipated lifespan of the development should be considered. **Table 2.3** provides a matrix summarising the EA's guidance on determining the appropriate allowance(s).

Table 2.3: Application of Appropriate Peak River Flow Climate Change Allowances

Flood Zone	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
1	Use the central allowance where a location may fall within Flood Zone 2 or 3 in the future.				
2	Use the higher central allowance	Use the central allowance			
3a	Use the higher central allowance	Development should not be permitted	Use the central allowance		
3b	Use the higher central allowance	Development should not be permitted			Use the central allowance
If development is considered appropriate by the local authority when not in accordance with Flood Zone vulnerability categories, then it would be appropriate to use the higher central allowance.					

- 2.19 The study site is located entirely within Flood Zone 1 and will likely remain outside of Flood Zone 2 and 3 for its lifetime due to its distance from, and its elevated position above, the floodplain. In accordance with **Table 2.3**, this would typically not require an assessment of climate change on fluvial flows. However, in accordance with the NPSNN, the upper end allowance should be assessed as a credible maximum climate change allowance. Therefore, for the purpose of this FRA, the upper end allowance for the 2080s has been considered.

Rainfall Intensity

- 2.20 **Table 2.4** identifies the relevant peak rainfall climate change allowances from the Management Catchment.

Table 2.4: Peak Rainfall Climate Change Allowances for the Soar Management Catchment

Allowance Category	Total potential change anticipated for the '2050s' epoch (2022 to 2060)		Total potential change anticipated for the '2070s' epoch (2061 to 2125)	
	1 in 30-Year	1 in 100-Year	1 in 30-Year	1 in 100-Year
Upper End	35%	40%	35%	40%
Central	20%	20%	25%	25%

- 2.21 The future increase in rainfall will need to be considered when designing a development to ensure its drainage system is sufficient to address the local surface water flood risk for its lifetime and so that it does not increase flood risk elsewhere.
- 2.22 The local requirement is for less vulnerable developments to accommodate surface water run-off generated by a 1 in 100-year rainfall event with an uplift of 25% to allow for climate change, but to perform additional checks with a 40% uplift applied to ensure that runoff is still retained on the site, without the development or the surrounding area being placed at significant flood risk.

Local Plan

- 2.23 The North West Leicestershire Local Plan⁸ sets out policies to ensure sustainable development is achieved within the district. The plan has been reviewed and relevant objectives and policies have been summarised below.
- 2.24 The Council are currently preparing an updated Local Plan which is currently undergoing consultation.

Objective 9

- 2.25 Objective 9 states that "New developments need to be designed to use water efficiently, to reduce flood risk and the demand for water within the district, whilst at the same time taking full account of flood risk and ensuring the effective use of Sustainable Drainage Systems (SuDS)"

Policy CC2 – Flood Risk

- 2.26 The risk and impact of flooding will be minimised through:
- Directing new development to areas with the lowest probability of flooding;
 - Ensuring that all new development addresses the effective management of all sources of flood risk;

⁸ North West Leicestershire Local Plan (North West Leicestershire District Council, Adopted November 2017)

- iii. Ensuring that development does not increase the risk of flooding elsewhere; and
- iv. Ensuring wider environmental benefits of developments in relation to flood risk.

2.27 A proposal will be supported where:

- i. It is located in an area that is not at risk of flooding with reference to the EA's flood risk maps and the Council's SFRA, unless a Sequential Test, and if necessary an Exception Test, as set out in the PPG on flood risk, proves the development is acceptable;
- ii. Site-specific FRA's should consider the issues of flooding from sewers, canal infrastructure failure, groundwater rising from former coal mining areas, and watercourses;
- iii. Suitable flood protection/mitigation measure can be agreed as appropriate to the level and nature of flood risk and satisfactorily implemented and maintained; and
- iv. There will be no increase in the risk of flooding for properties elsewhere. For previously undeveloped sites the rate of runoff from the development sites should be no greater than the existing (greenfield) rate of runoff from the site.

Policy CC3 – Sustainable Drainage Systems

2.28 When assessing development proposals where it is necessary to manage surface water drainage, SuDS should be incorporated into developments in accordance with national and local standards unless it can be clearly demonstrated:

- i. That SuDS are not technically, operationally or financially deliverable or viable and that surface water drainage issues from the development can be alternatively mitigated or that the SuDS scheme will itself adversely affect the environment or safety.
- ii. Where appropriate, every effort should be made to link SuDS into wider initiatives to enhance green infrastructure, improve water quality and benefit wildlife or contribute to the provision of the ecosystem service.
- iii. Arrangements in accordance with national policy will need to be put in place for the management and maintenance of the SuDS over the whole period during which they are needed.

Strategic Flood Risk Assessment

2.29 A Strategic Flood Risk Assessment (SFRA) is a study carried out by one or more local planning authorities to assess the risk to an area from flooding from all sources, now and in the future.

- 2.30 The North West Leicestershire SFRA (2015 Update)⁹ has been reviewed in the production of this FRA. The SFRA provides information specific to the site location in the form of fluvial, surface water and groundwater flood risk mapping, as well as records of historical flooding. It also includes flood risk policy and guidance for the area. The report acts as a hybrid level 1 and 2 SFRA and is used to facilitate the application of Sequential and Exception Tests to screen allocated development sites. The study site is not referenced within the SFRA.
- 2.31 The North West Leicestershire Strategic Flood Risk Assessment Climate Change Addendum¹⁰ was produced in 2016. The purpose of the addendum was to update the site assessment and developer guidance for the potential sites for development listed in the 2015 SFRA. The proposed development sites were not allocated within the 2015 SFRA, therefore, no applicable information in relation to flood risk to the study site was identified.
- 2.32 A further update to the SFRA¹¹ was produced in 2024 to support inform the new emerging local plan for North West Leicestershire. Whilst superseded, the North West Leicestershire SFRA 2015 Update still provides relevant information specific to the site location. Therefore, information from both SFRA documents will be referenced within **Section 3** where applicable.

Preliminary Flood Risk Assessment

- 2.33 A Preliminary Flood Risk Assessment (PFRA) is an assessment of floods that have taken place in the past and floods that could take place in the future. It generally considers flooding from surface water runoff, groundwater and ordinary watercourses, and is prepared by the Lead Local Flood Authorities (LLFAs).
- 2.34 The Leicestershire County Council PFRA¹² considers flooding from surface water runoff, groundwater, ordinary watercourses and canals. It also references the historical flooding which occurred in the County between 1947 and 2007. However, no historical instances of flooding at the study site are referenced. Information from the PFRA will be referenced within **Section 3** where applicable.
- 2.35 Leicestershire County Council PFRA Addendum¹³ has also been reviewed in the production of this FRA. The PFRA addendum provides an update to the 2011 PFRA. Key findings from the addendum are outlined below:
- Historical flood records reported in the 2011 PFRA were limited due to the flood records being obtained from external sources and anecdotal evidence.
 - Since 2011, the council has developed new processes to investigate flood incidents, and as such, have a better understanding of consequences and mitigation measures to reduce the impact of repeat events.
 - Flood records within Leicestershire are mostly attributed to ordinary watercourses and surface water runoff. No records of flooding at the site are referenced.

⁹ North West Leicestershire Strategic Flood Risk Assessment (Atkins, June 2015)

¹⁰ North West Leicestershire Strategic Flood Risk Assessment Climate Change Addendum (Atkins, November 2016)

¹¹ North West Leicestershire Strategic Flood Risk Assessment (2024 Update) (Atkins, March 2024)

¹² Leicestershire County Council Preliminary Flood Risk Assessment (URS Scott Wilson, June 2011)

¹³ Leicestershire County Council Preliminary Flood Risk Assessment Addendum (Leicestershire County Council, December 2017)

- The site and surrounding area are not classified as Flood Risk Areas.

Local Flood Risk Management Strategy

- 2.36 A Local Flood Risk Management Strategy (LFRMS) is prepared by an LLFA to help understand and manage flood risk at a local level.
- 2.37 The LFRMS aims to ensure that the knowledge of local flood risk issues is communicated effectively so that they can be better managed. The LFRMS also aims to promote sustainable development and environmental protection.
- 2.38 The LFRMS for Leicestershire¹⁴ has been reviewed and no applicable information in relation to flood risk at the study site was identified.

River Basin Flood Risk Management Plan

- 2.39 Flood Risk Management Plans (FRMPs) explain the risk of flooding from rivers, the sea, surface water, groundwater and reservoirs. FRMPs set out how risk management authorities will work with communities to manage flood and coastal risk. Risk management authorities include the EA, Natural Resources Wales, local councils, internal drainage boards, Highways England and LLFAs.
- 2.40 The first FRMPs were published in March 2016 and subsequently updated in December 2022. They describe actions to manage flood risk across England between 2021 to 2027.
- 2.41 The site is located within the Humber River Basin District, and the Humber River Basin District FRMP¹⁵ has been reviewed; however, no relevant site scale objectives have been identified.

Section 19 Flood Investigation Reports

- 2.42 Under their duties of the Flood and Water Management Act 2010, LLFAs have a responsibility to publish reports of investigations of flood incidents. A Section 19 Flood Investigation Report is a public statement of the circumstances of a historical flood event and what parties have a role in managing the risks. The investigation does not always give an in-depth analysis of the flood risk or mechanisms, but it can provide a valuable record of past events.
- 2.43 Leicestershire County Council have published 36 Section 19 reports on their website, which document the flooding that occurred between 2014 and 2024. The reports have been reviewed in relation to the site's location, but no evidence of flooding at the study site was identified.

¹⁴ Local Flood Risk Management Strategy for Leicestershire (Leicestershire County Council, February 2024)

¹⁵ Humber River Basin District Flood Risk Management Plan 2021 to 2027 (Environment Agency, December 2022)

3. POTENTIAL SOURCES OF FLOOD RISK

- 3.1 Flooding can occur from a variety of sources, or combination of sources, which may be natural or artificial. **Table 3.1** below identifies the potential sources of flood risk to the study site in its current condition, and the impacts which the development could have in the wider catchment, prior to mitigation. These are discussed in greater detail in the forthcoming section. The mitigation measures proposed to address flood risk issues and ensure the development is appropriate for its location are discussed within **Section 4**.

Table 3.1: Pre-Mitigation Sources of Flood Risk

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
Fluvial				X	The study site is located entirely within Flood Zone 1.
Canals				X	The nearest canal (the Trent and Mersey Canal) is located approximately 3.2km north of the study site. There is no hydraulic connectivity between the canal and the study site.
Groundwater			X		The study site is located in a relatively elevated position set above the local floodplain, the underlying soils are cohesive, and the available borehole records did not encounter any shallow groundwater.
Reservoirs and waterbodies				X	The study site falls outside of the area at risk of reservoir failure for both 'dry-day' and 'wet-day' scenarios. There are no large waterbodies within the surrounding vicinity that would pose a risk to the study site.
Pluvial runoff			X		Surface water runoff from the surrounding EMG1 development is managed by drainage infrastructure design to manage the 1 in 100-year plus climate change storm event.
Sewers			X		
Effect of Development			X		Development will not result in impedance of surface water or loss of floodplain.

Flood Source	Potential Risk				Description
	High	Medium	Low	None	
on Wider Catchment		X			The development will increase the area of impermeable surfaces leading to a potential increase in runoff, unless mitigated.

Fluvial Flood Risk

- 3.2 Flooding from watercourses occurs when flows exceed the capacity of the channel, or where a restrictive structure is encountered, which leads to water overtopping the banks into the floodplain. This process can be exacerbated when debris is mobilised by high flows and accumulates at structures.

Historical Flood Risk

- 3.3 The EA Historical Flood Map shows there are no previously recorded flood outlines which have impacted the study site. The nearest recorded flood outline is located approximately 1km northwest, attributed to the River Trent exceeding its channel capacity when no raised defences were present in January 1932.
- 3.4 'Historical Flooding' mapping appended to the North West Leicestershire SFRA shows there are no previously recorded flood events which have impacted the study site or immediate surrounding area. No additional records of historical flooding are reported within the North West Leicestershire SFRA 2024 update.
- 3.5 The Leicestershire County Council PFRA states that there has previously been flooding attributed to the Lockington Brook; however, the date, magnitude and specific locations of flooding are not provided. Anecdotally, it is understood that the historical flooding occurred within the village of Lockington.

Flood Map for Planning

- 3.6 As shown in **Figure 2.1**, the study site is located entirely within Flood Zone 1. The nearest Flood Zones are located approximately 180m north attributed to the Lockington Brook, a designated EA Main River. A review of EA LiDAR data shows the study site is raised above the nearest Flood Zones by a minimum 8m. The route of the Lockington Brook and surrounding watercourses are shown within **Figure 3.1**.

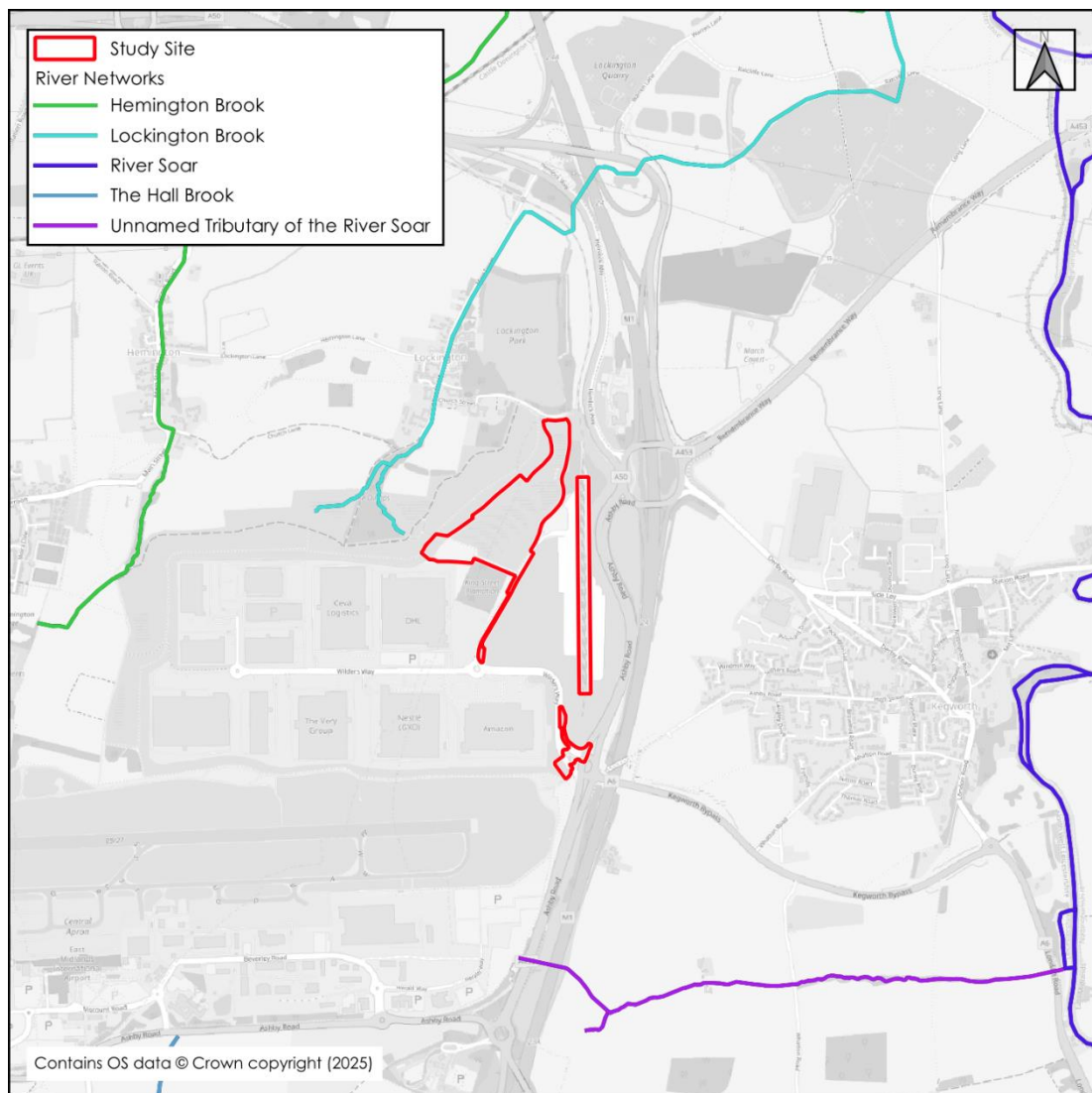


Figure 3.1: Local Watercourse Network

Risk of Flooding from Rivers and Seas

- 3.7 The EA released the new National Flood Risk Assessment (NaFRA2) dataset in January 2025 which reportedly uses the best available data from the EA and local authorities to inform current and future probability of flooding.
- 3.8 The Risk of Flooding from Rivers and Sea (RoFRS) mapping shows the probability of flooding from rivers and the sea to areas of land, taking into account the presence and condition of flood defences. The mapping considers the Central climate change allowances for the '2050s' epoch, which is the most precautionary data projections currently published by the EA. An extract of mapping is included as **Figure 3.2**.

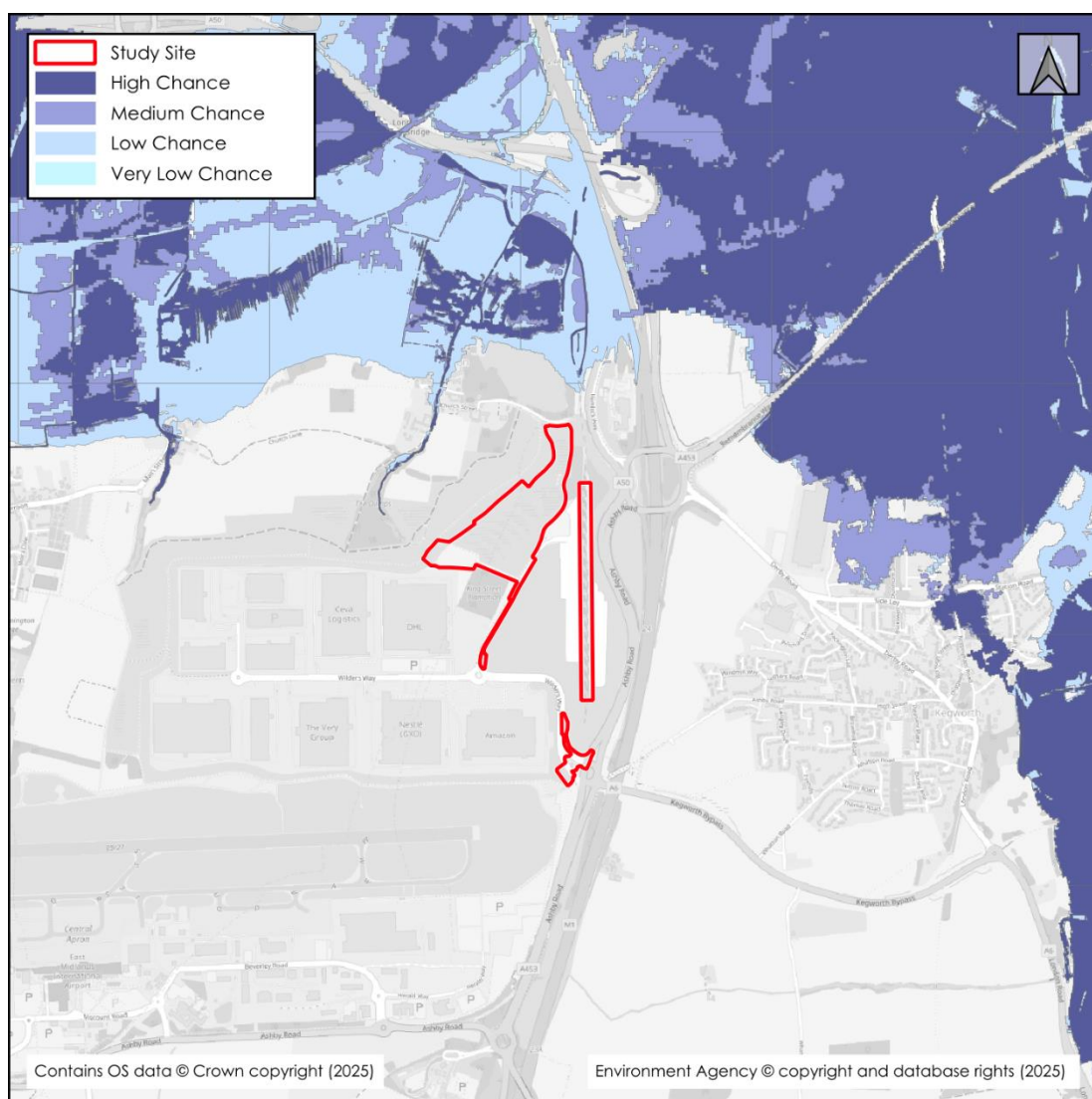


Figure 3.2: Risk of Flooding from Rivers and Sea (Yearly Chance of Flooding Between 2036 and 2069)

- 3.9 The mapping aligned with the Flood Map for Planning and shows the study site to be located outside of all modelled probabilities up to 2069.

Hemington, Lockington, Castle Donington Brooks Modelling Study (2022)

- 3.10 Hydraulic modelling information has been provided by the EA for the Hemington, Lockington, Castle Donington Brooks Modelling Study completed in 2022. The modelled fluvial flood extents, shown in **Figure 3.3**, show the study site is located outside of all modelled scenarios attributed to the Lockington Brook, including the 1 in 1000-year event and the credible maximum climate change scenario (the 1 in 100-year+60% event).

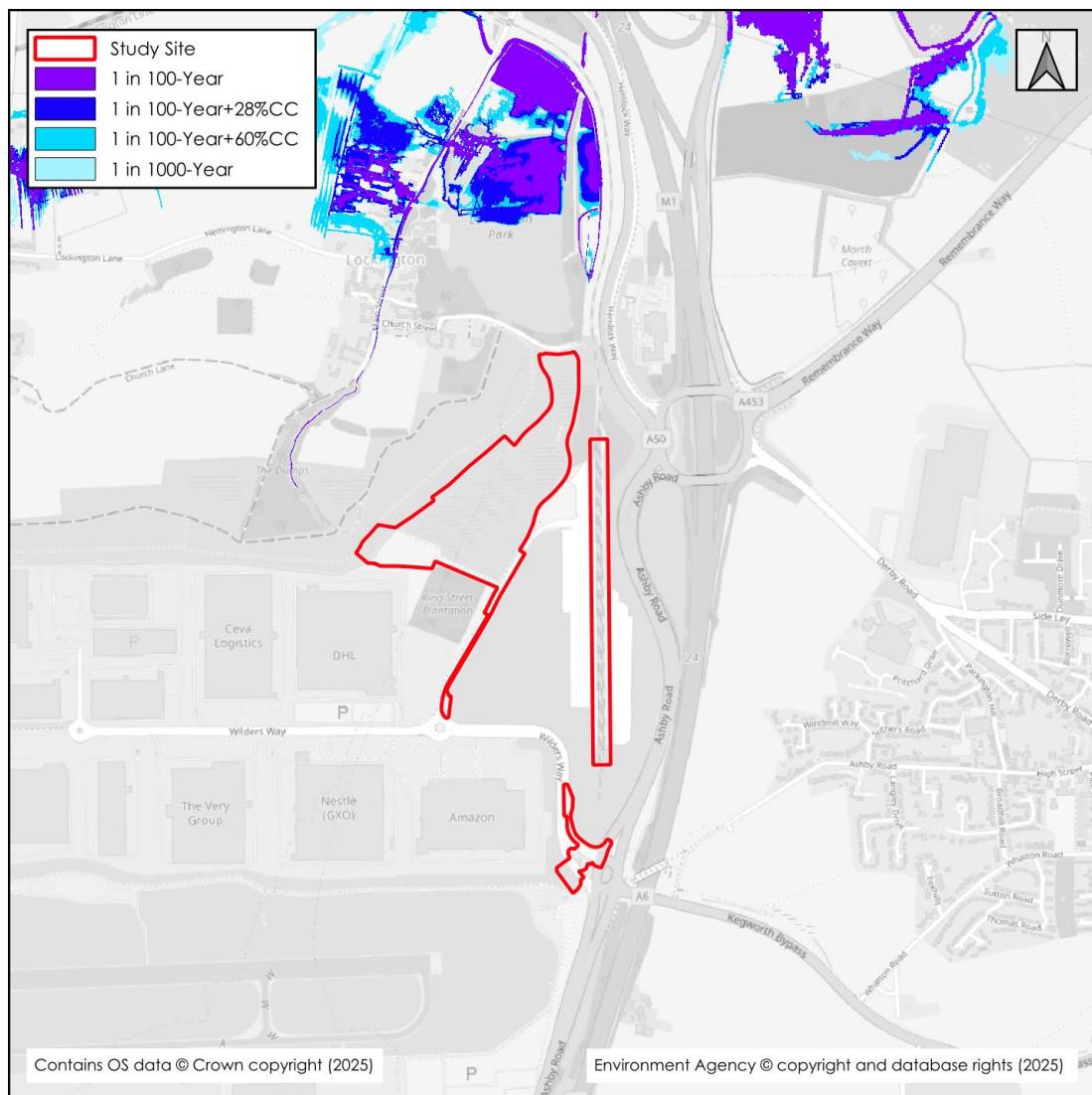


Figure 3.3: Model Floodplain Outlines (Hemington, Lockington, Castle Donington Brooks Modelling Study)

Drainage Channels

- 3.11 OS mapping identifies the presence of a number of drainage channels within the surrounding EMG1 development site. These channels are associated with the surface water drainage infrastructure for EMG1, which is designed to manage runoff from EMG1 up to and including the 1 in 100-year storm event including an allowance for climate change. Therefore, there are not expected to pose a significant flood risk to the development.

Summary

- 3.12 Therefore, it can be concluded that the study site is not at fluvial flood risk.

Groundwater Flood Risk

- 3.13 Groundwater flooding occurs when the water table rises above ground elevations, or it rises to depths containing basement level development. It is most likely to happen in low lying areas underlain by permeable geology. This is most common on regional scale chalk aquifers, but there may also be a risk on sandstone and limestone aquifers or on thick deposits of sands and gravels underlain by less permeable strata such as that in a river valley.
- 3.14 BGS mapping identifies that the study site is underlain by a number of bedrock geologies, as shown in **Figure 3.4**. These geologies are generally classified as Secondary B Aquifers, which comprise predominantly lower permeability layers that may store and yield limited amounts of groundwater through characteristics like fissures and openings or eroded layers. A small area of Helsby Sandstone Formation is located below the existing EMG1 gantry cranes. This classified as Principal Aquifer, a strategically important rock unit that has high permeability and water storage capacity.

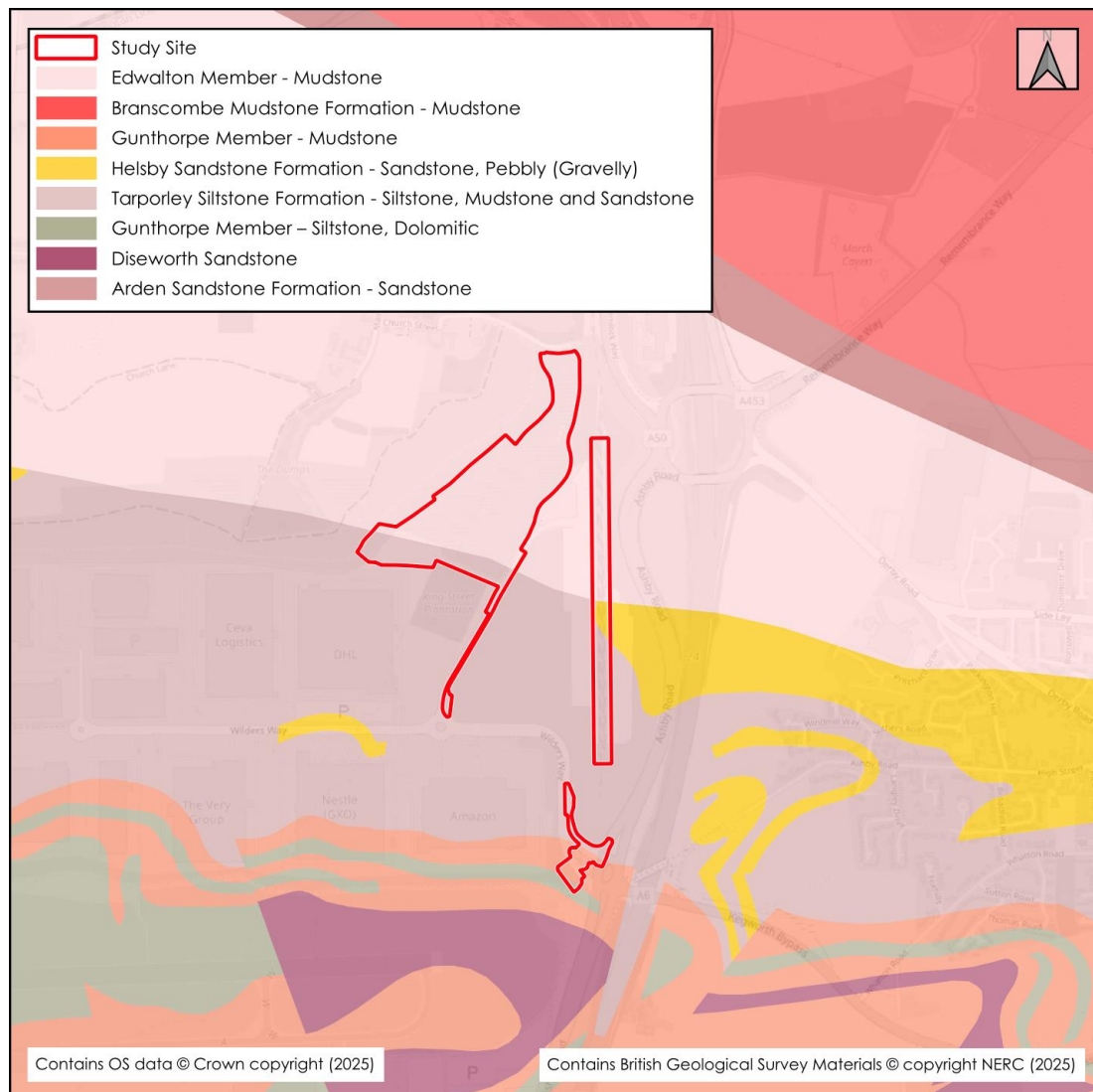


Figure 3.4: BGS Bedrock Geology

- 3.15 Superficial deposits of Head (Clay, Silt, Sand and Gravel), Egginton Common Sand and Gravel Member (Sand and Gravel) and Egale Moor Sand and Gravel Member (Sand and Gravel) are mapped across portions of the development sites; with large areas where no superficial deposits are present. An extract of mapping is included as **Figure 3.5**.
- 3.16 The EA class the Egginton Common Sand and Gravel Member and Egale Moor Sand and Gravel Member as a Secondary A Aquifers, whereas the Head deposits are classified as a Secondary (Undifferentiated) Aquifer. Secondary A Aquifers comprise permeable layers that can support local water supplies and, in some cases, forms an important source of base flow to rivers. Secondary (Undifferentiated) Aquifers are assigned in cases where it is not possible to apply either category Secondary A or B because of the variable characteristics of the rock type.

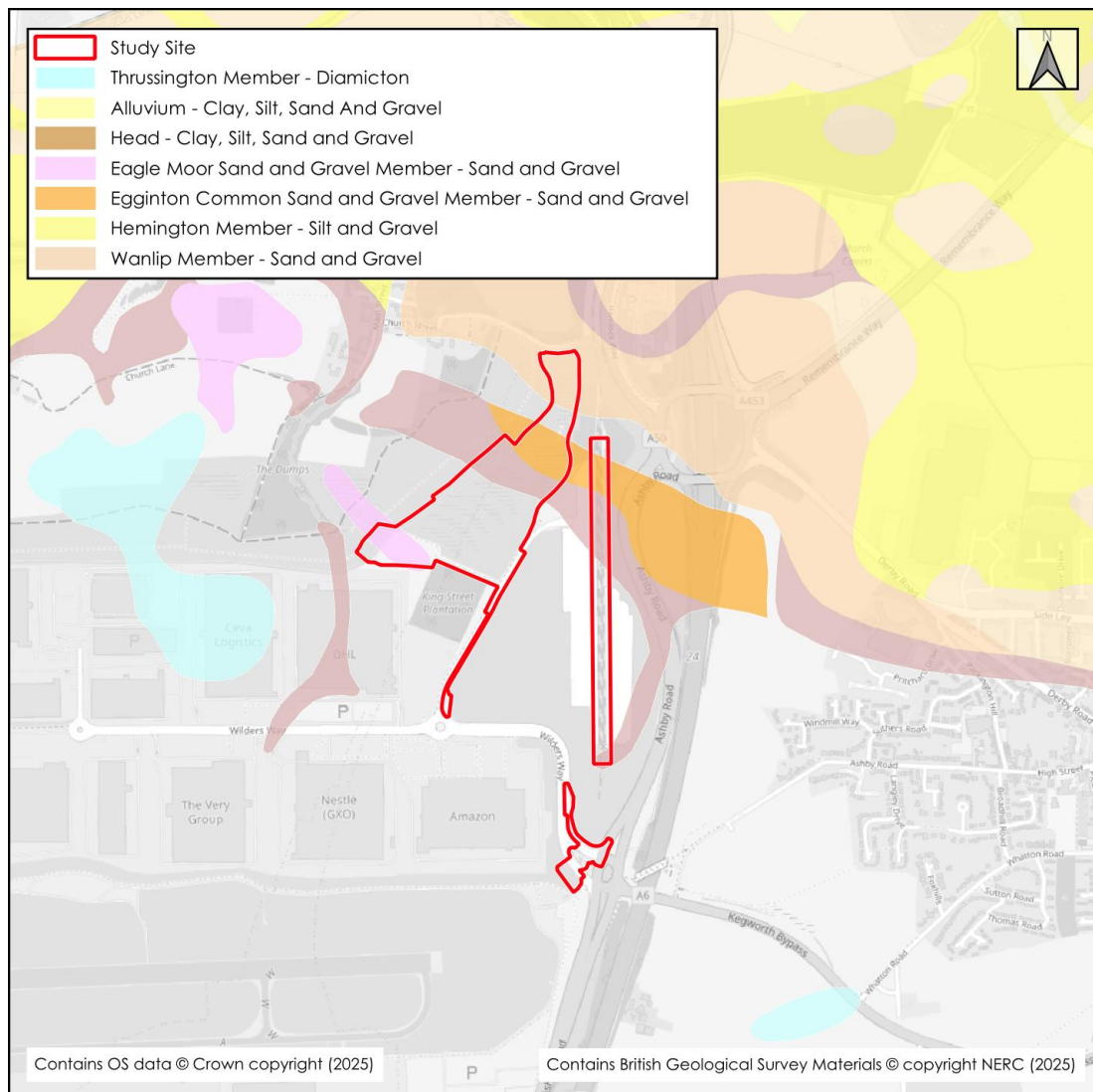


Figure 3.5: BGS Superficial Deposits

- 3.17 The Leicestershire County Council PFRA and North West Leicestershire SFRA do not report any historical groundwater flood events which have impacted the study site or immediate surrounding area.

- 3.18 'Areas Susceptible to Groundwater Flooding' mapping appended to the SFRA shows the study site is located across three cells which are shown to have between '<25%' and '≥75%' of the area susceptible to groundwater flooding. It should be noted that the mapping is based on strategic scale mapping which identifies areas susceptible to flooding from groundwater at a broad scale on the basis of geological and hydrogeological conditions. Therefore, the classification could potentially be based on another area within the particular cell. The high groundwater susceptibility is likely to be in continuity with the water levels of the Lockington Brook and are unlikely to extend beyond the extent of the fluvial floodplain.
- 3.19 There are no BGS borehole logs located within the development sites, but there are seven borehole logs located within the surrounding vicinity and underlain by similar geologies. The interrogated logs are summarised in **Table 3.2**.

Table 3.2: Summary of Interrogated BGS Borehole Records

Borehole Reference	Date Sampled	Depth of Borehole (m)	Groundwater Strike (m bgl)
SK42NE716	2006	3.1	Groundwater not encountered
SK42NE717	2006	1.9	Groundwater not encountered
SK42NE718	2006	4.0	Groundwater not encountered
SK42NE719	2006	2.6	Groundwater not encountered
SK42NE720	2006	3.5	Groundwater not encountered
SK42NE111	1984	4.1	Groundwater not encountered
SK42NE112	1984	5.9	Groundwater not encountered

- 3.20 Ground investigations undertaken by RSK have reported clayey cohesive soils across the study site which have very limited infiltration. These soils will also limit the potential for groundwater to exceed ground levels.
- 3.21 Based on the available data, the study site is considered to be at a low risk of groundwater flooding due to its cohesive soils and elevated position above the local watercourses and floodplain. Any groundwater emergence in the local area would likely occur in the low-lying floodplain located below the study site. Due to the sloping topography any groundwater emergence that did occur near the study site would be directed towards the Lockington Brook and away from the development. Mitigation measures to address any residual risk are discussed in **Section 4**.

Pluvial Flood Risk

- 3.22 Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.
- 3.23 The Leicestershire County Council PFRA does not report any historical surface water flood events which have impacted the study site or immediate surrounding area.
- 3.24 Risk of Flooding from Surface Water (RoFSW) mapping has been collated and published by the EA, this shows the potential flooding which could occur when rainwater does not drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. An extract from the mapping is included as **Figure 3.6**.

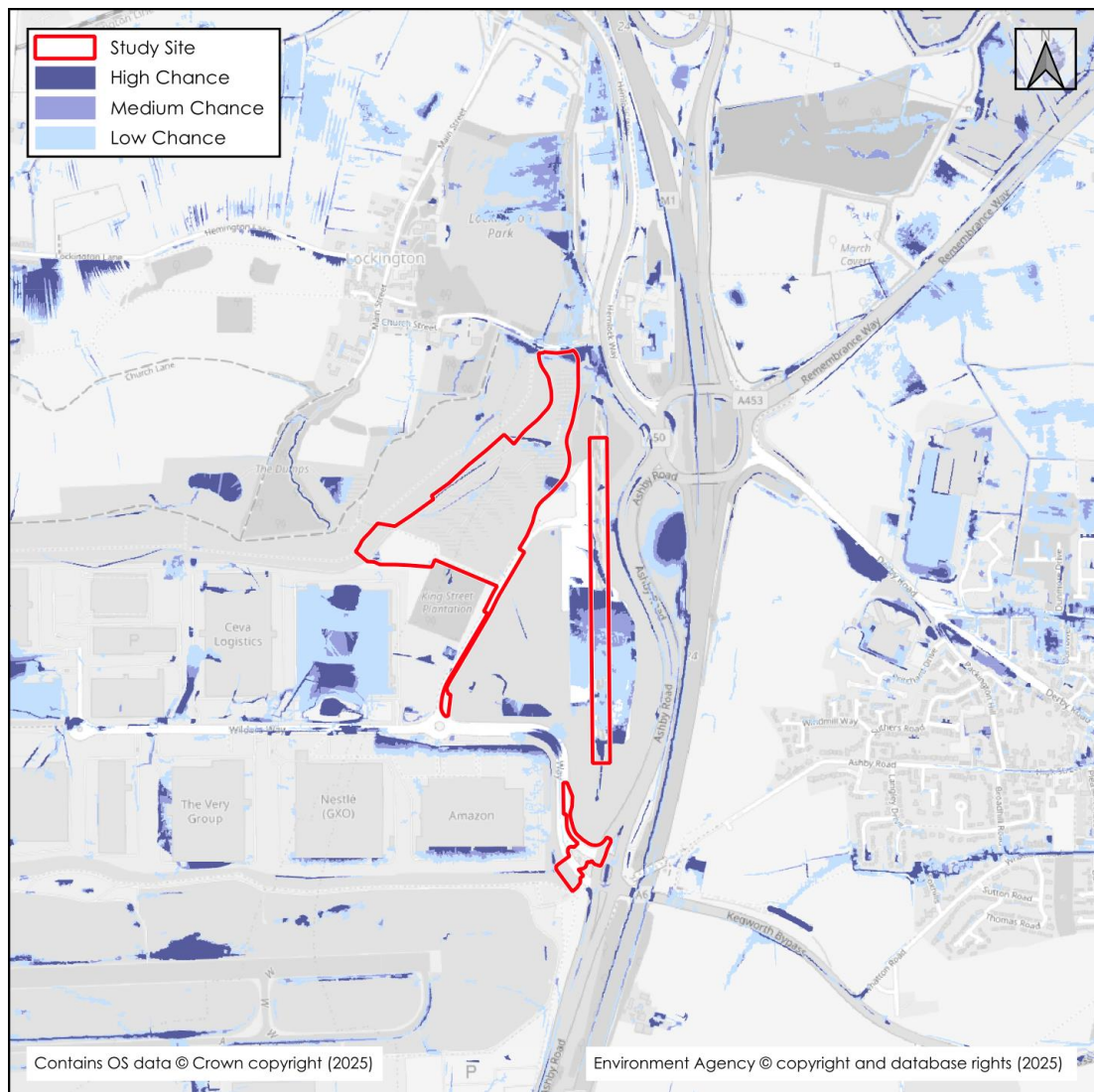


Figure 3.6: Risk of Flooding from Surface Water Flooding Mapping (Yearly chance of flooding between 2040 and 2060)

- 3.25 The mapping shows that the study site generally has a very low to low probability of surface water flooding, with the exception of isolated areas of medium to high

probability of flooding predicted at the existing rail terminal and within localised topographical depressions in landscaped areas.

- 3.26 However, the RoFSW mapping does not reflect the existing drainage infrastructure implemented as part of EMG1. As outlined within the **Fluvial Flood Risk** section, EMG1 includes drainage infrastructure that manages surface water runoff and therefore surface water flood risk within the EMG1 site.
- 3.27 The misrepresentation is most apparent within the existing rail-freight interchange, where an area of low to high probability surface water ponding is present in the EA data. In reality, drainage infrastructure is included to manage surface water runoff and direct it to a series of attenuation basins located to the north.
- 3.28 As part of the construction phase of EMG1, Plot 16 was utilised as an area for surface water treatment. EA LiDAR data shows the existing site to comprise a number of cascading terraces used to treat surface water. As the construction phase has since been completed, these terraces are now redundant and are to be removed.
- 3.29 Overall, the study site is considered to be at a low risk of surface water flooding.

Flood Risk from Sewers

- 3.30 Sewer flooding can occur when the capacity of the infrastructure is exceeded by excessive flows, or as a result of a reduction in capacity due to collapse or blockage, or if the downstream system becomes surcharged. This can lead to the sewers flooding onto the surrounding ground via manholes and gullies, which can generate overland flows.
- 3.31 As previous discussed, the study site forms part of the existing EMG1 drainage catchment. The private drainage network intercepts and conveys surface water in a northerly direction to two detention basins located within the north of the study site. The drainage infrastructure and basins are design to manage the 1 in 100-year storm event including an allowance for climate change. In the unlikely event of exceedance, overtopping flows would be directed in a northerly direction away from the development, following the general fall of the topography.
- 3.32 A foul water rising main runs along the unnamed access road to the east of Plot 16, connecting to a pumping station located immediately north of the rail-freight interchange. This pumps foul flows in a southerly direction towards the public foul network located within the A453. In the unlikely event of exceedance, overtopping flows would be directed in a northerly direction away from the development, following the general fall of the topography.
- 3.33 Therefore, the risk of either sewerage networks exceeding capacity and impacting the EMG1 Works is considered to be low.

Effect of Development on Wider Catchment

Development Land Use/Drainage Considerations

- 3.34 The introduction of development at Plot 16 and the improvements to the public transport interchange will increase the area of impermeable surfaces within EMG 1. This will result in an increase in surface water runoff, which could increase flood risk downstream unless properly mitigated. Appropriate surface water management is discussed in **Section 4**.

4. FLOOD RISK MITIGATION

- 4.1 **Section 3** has identified the sources of flooding which could potentially pose a risk to the study site. This section of the FRA sets out the mitigation measures which are to be incorporated to address and reduce the risk of flooding to within acceptable levels.

Sequential Arrangement

- 4.2 The site is located entirely within Flood Zone 1 and is shown to be at a low risk of flooding from all sources. Therefore, the site is sequentially located.

Development Levels

- 4.3 Finished floor levels of any proposed built development are to be raised a minimum of 150mm above surrounding ground levels to help mitigate against any residual flood risk from overland flows.
- 4.4 To help manage surface water runoff within the study site, ground levels will be profiled to encourage pluvial runoff and overland flows to flow away from the built development towards the nearest drainage feature.

Groundwater Considerations

- 4.5 Based on the available data, the study site is considered to be at a low risk of groundwater flooding. However, the potential to encounter local perched groundwater should be considered during the construction phase of the development, particularly during any excavations and any required reprofiling. It is recommended that groundwater levels are monitored during the construction phase, and should shallow groundwater be encountered during construction, a groundwater specialist should be consulted, and appropriate dewatering should be employed as necessary.

Safe Access and Egress

- 4.6 The existing site access routes are considered to be at a low risk of flooding from all sources, therefore, safe access and egress can be achieved.

Surface Water Drainage Strategy

- 4.7 To mitigate the development's impact on the current runoff regime, it is proposed to provide upgrades to the available surface water storage within the EMG1 drainage infrastructure so that it can accommodate the additional runoff generated by the EMG1 Works without altering the discharge rate leaving EMG1. This will ensure that surface water runoff from the EMG1 Works is managed on site, without detrimentally affecting downstream flood risk.
- 4.8 Within the study site, the road infrastructure or landscaped corridors should be used to provide drainage exceedance (overland flood flow) routes through the development and towards the downstream detention basins, for storms events that exceed the capacity of the drainage system.

- 4.9 Further information on the drainage approach is provided within the accompanying SDS by BWB Consulting (reference: EMG2-BWB-ZZ-T-CD-0002_SDS).

Foul Water Drainage Strategy

- 4.10 Foul water will be drained from the development separately to surface water.
- 4.11 There will be early and ongoing consultation with Severn Trent Water to confirm the most appropriate point of discharge for foul drainage and to allow time for any necessary infrastructure improvements to be implemented.
- 4.12 Further information on the drainage approach is provided within the accompanying SDS by BWB Consulting (reference: EMG2-BWB-ZZ-T-CD-0002_SDS).

5. CONCLUSIONS AND RECOMMENDATIONS

- 5.1 This FRA has been prepared in accordance with the requirements set out in the NPSNN. It has been produced on behalf of SEGRO (Properties) Ltd in respect of a Development Consent Order (DCO) for the proposed East Midlands Gateway Phase 2 (EMG2) and East Midlands Gateway Rail Freight Interchange Material Change Order (MCO).
- 5.2 The DCO and MCO comprises a number of elements which, due to their geographical locations, are covered by three individual assessments. This FRA focuses on three development areas falling within the existing SEGRO East Midlands Gateway Logistics Park - known as the EMG1 Works.
- 5.3 This report demonstrates that the EMG1 Works are not at significant flood risk subject to the recommended flood mitigation strategies being implemented. Moreover, the development will not increase flood risk to the wider catchment area subject to suitable management of surface water runoff discharging from the site.
- 5.4 The identified risks and mitigation measures are summarised within **Table 5.1**:

Table 5.1: Summary of Flood Risk Assessment

Flood Source	Risk & Proposed Mitigation Measures
Fluvial	The study site is shown to be located entirely within Flood Zone 1, which is land at a low risk of fluvial flooding.
Groundwater	The study site is located in a relatively elevated position set above the local floodplain, the underlying soils are cohesive, and the available borehole records did not encounter any shallow groundwater. Therefore, based on the available data groundwater flooding is considered to pose a low risk to the development. However, the potential to encounter localised shallow groundwater should be considered during the construction phase, particularly during any excavations and reprofiling required.
Pluvial & Drainage	The proposed EMG1 Works falls within the surface water drainage catchment of the existing EMG1 development. This drainage infrastructure was designed to manage surface water runoff from EMG1 up to and including the 1 in 100-year storm event including an allowance for future climate change. Therefore, the potential flood risk from surface water runoff and drainage/sewer sources is low. Ground levels in the EMG1 Works will be profiled to encourage pluvial runoff and overland flows to flow away from the built development towards the nearest drainage feature. The road infrastructure or landscaped corridors will be used to provide drainage exceedance (overland flood flow) routes through the built development and towards the downstream detention basins.
Other Sources	The sites have been assessed against other sources of flood risk including coastal, canals, and reservoirs and large waterbodies. These do not pose a risk to the site.

Flood Source	Risk & Proposed Mitigation Measures
Impact of the Development	The EMG1 Works will introduce new areas of impermeable surface to EMG1. To manage the additional surface water runoff that this will generate it is proposed to provide upgrades to the existing EMG1 drainage infrastructure in the form of additional attenuated storage and Sustainable Drainage Systems (SuDS). These will be designed to ensure surface water is restricted to the equivalent greenfield QBAR rate and are designed with capacity for the 1 in 100-year storm with an allowance for climate change.
This summary should be read in conjunction with BWB's full report. It reflects an assessment of the study site based on information received by BWB at the time of production.	

- 5.5 In compliance with the requirements of the NPSNN, and subject to the mitigation measures proposed, the developments could proceed without being subject to significant flood risk. Moreover, the development will not increase flood risk to the wider catchment area subject to suitable management of surface water runoff discharging from the site.

APPENDICES

Appendix 1: NPPF Flood Risk Vulnerability and Flood Zone Compatibility

Flood Risk Vulnerability Classifications (recreated from the NPPF Planning Practice Guidance)

Vulnerability Classification	Description
Essential infrastructure	• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including infrastructure for electricity supply including generation, storage and distribution systems; including electricity generating power stations, grid and primary substations storage; and water treatment works that need to remain operational in times of flood. • Wind turbines. • Solar farms.
Highly Vulnerable	• Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes and park homes intended for permanent residential use. • Installations requiring hazardous substances consent. (Where there is a demonstrable need to locate such installations for bulk storage of materials with port or other similar facilities, or such installations with energy infrastructure or carbon capture and storage installations, that require coastal or water-side locations, or need to be located in other high flood risk areas, in these instances the facilities should be classified as 'Essential Infrastructure'.)
More Vulnerable	• Hospitals • Residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non-residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
Less Vulnerable	• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'more vulnerable' class; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill* and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place. • Car parks.
Water-Compatible Development	• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Flood Zone Compatibility (recreated from the NPPF Planning Practice Guidance)

Flood Zone	Vulnerability Classification				
	Essential infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 1 (Low Probability)	Development is appropriate	Development is appropriate	Development is appropriate	Development is appropriate	Development is appropriate
Flood Zone 2 (Medium Probability)	Development is appropriate	To be deemed appropriate an exception test is required to demonstrate: - The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk - the sustainability benefits of the development to the community outweigh the flood risk.	Development is appropriate	Development is appropriate	Development is appropriate
Flood Zone 3a (High Probability)	To be deemed appropriate an exception test is required to demonstrate: The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk the sustainability benefits of the development to the community outweigh the flood risk. Additionally, essential infrastructure should be designed and constructed to remain operational and safe in times of flood.	Development should not be permitted	To be deemed appropriate an exception test is required to demonstrate: - The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk - the sustainability benefits of the development to the community outweigh the flood risk.	Development is appropriate	Development is appropriate

Flood Zone	Vulnerability Classification				
	Essential infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Flood Zone 3b (The Functional Floodplain)	To be deemed appropriate an exception test is required to demonstrate: - The development will be safe for its life time without increasing flood risk elsewhere, and where possible reduce overall flood risk - the sustainability benefits of the development to the community outweigh the flood risk. Additionally, development should be designed and constructed to: - remain operational and safe for users in times of flood; - result in no net loss of floodplain storage; - not impede water flows and not increase flood risk elsewhere.	Development should not be permitted	Development should not be permitted	Development should not be permitted	Development is appropriate if designed and constructed to: - remain operational and safe for users in times of flood; - result in no net loss of floodplain storage; - not impede water flows and not increase flood risk elsewhere.

