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Plot 8 Norfolk Road, Gravesend, Kent Flood Risk Assessment

Final Report for:



March 2026

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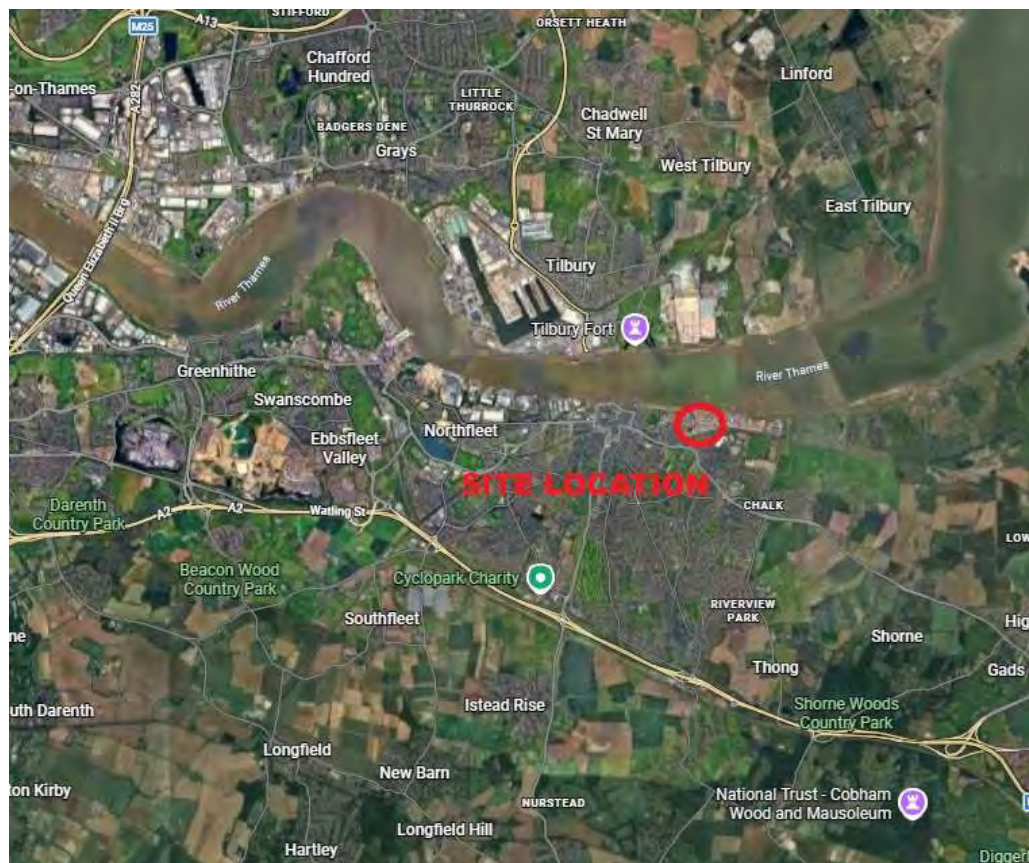
APPENDIX E – GREENFIELD DISCHARGE RATE

1.0 INTRODUCTION

1.1 Overview

- 1.1.1 Following initial consultation with the Environment Agency, a holding objection was subsequently received which requested a suitable FRA be submitted, with this in mind Cora IHT have been instructed by RT Drafting Solutions to prepare a Flood Risk Assessment [FRA] to support proposals for the demolition of an existing industrial/commercial unit and reconstruction of new commercial unit, including removal of existing containers. **Figure 1.1** illustrates the site location.
- 1.1.2 This report presents the findings of an FRA, which has been carried out in accordance with the National Planning Policy Framework (NPPF), Flood Risk and Coastal Change Technical Guidance, Environment Agency (EA) interactive maps and Kent County Council Preliminary Flood Risk Assessment (SFRA).

Figure 1.1: Site Location



- 1.1.3 This FRA aims to identify and assess the risks of all forms of flooding to and from the site and demonstrate how these flood risks will be managed, taking climate change into account.
- 1.1.4 In accordance with the NPPF, site development should not increase the risk of flooding elsewhere and this FRA has therefore also been prepared to demonstrate that this has been achieved. Consideration has also been given to minimising the risk of pollution to controlled waters and the site conditions prior to, during and after development.

- 1.1.5 As the proposed site resides within an area designated as flood zone 3 with an approximate site area within the application boundary of 0.184 hectares (1,849m²) an FRA will be required see **figure 1.2** below.

Figure 1.2: Requirements within Flood zone 3

This location is in flood zone 3

In your proposed development site there is a risk of flooding from:

- rivers and the sea
- surface water

Flood risk assessments

Based on our flood risk data, you need to carry out a flood risk assessment (FRA) as part of the planning application for this development.

If the flood risk to your site is affected by flood defences, you will also need to assess *residual risk* from flood defence breach in this location. If available, we will provide breach hazard mapping data to help you do this.

Review the flood risks for your location then complete the next steps for your planning application.

1.2 Scope of Strategy

- 1.2.1 The following information details the measures that the developer will take to ensure the development proposed satisfies the EA requirements for developments that are in Flood Zone 3.

- 1.2.2 The content of the flood risk assessment will be delivered in line with the objectives contained within paragraph 20 of the Flood risk and coastal change guidance which indicates:

- *whether a proposed development is likely to be affected by current or future flooding from any source;*
- *whether it will increase flood risk elsewhere;*
- *whether the measures proposed to deal with these effects and risks are appropriate;*
- *the evidence for the local planning authority to apply (if necessary) the Sequential Test, and;*
- *whether the development will be safe and pass the Exception Test, if applicable.*

- 1.2.3 Although a flood risk assessment is necessary, following the guidance within Paragraph 21 of the Flood risk and coastal change guidance (Extract below):

A flood risk assessment needs to be appropriate to the scale, nature and location of the development. For example, where the development is an extension to an existing house (for which an application for planning permission is required) which would not significantly increase the number of people present in an area at risk of flooding, the local planning authority would generally need a less detailed assessment to be able to reach an informed decision on the planning application.

- 1.2.4 Given the proposal is to only reconstruct a new commercial unit in place of an existing one, the development is not anticipated to significantly increase the number of people who will frequent the unit due to its previous use, as such this document has been produced accordingly.

2.0 SITE DESCRIPTION

2.1 Site Description

- 2.1.1 The site forms circa 0.184 hectares (1,849m²) of Brownfield land previously occupied by Reliance Coaches. The site is located approximately 1.47km to the east of Gravesend centre. National Grid reference 566286, 174109 is located at the central point of the proposed site area with the nearest postcode is identified as DA12 2PS.
- 2.1.2 A site location and block plan is presented in **Appendix A**.
- 2.1.3 The River Thames is located approximately 245m to the North of the site.
- 2.1.4 The Thames and Medway Canal is located 127m to the east of the site.
- 2.1.5 A main river is visible both to the east and the west of the site which could potentially be culverted along the site's northern boundary.
- 2.1.6 A body of water assumed to be a balancing pond is located 350m to the west of the site.
- 2.1.7 The existing coach depot unit is currently understood to benefit from an existing connection to the Thames Water adopted sewer network for foul water with the surface water flows accommodated by the network rail asset above.

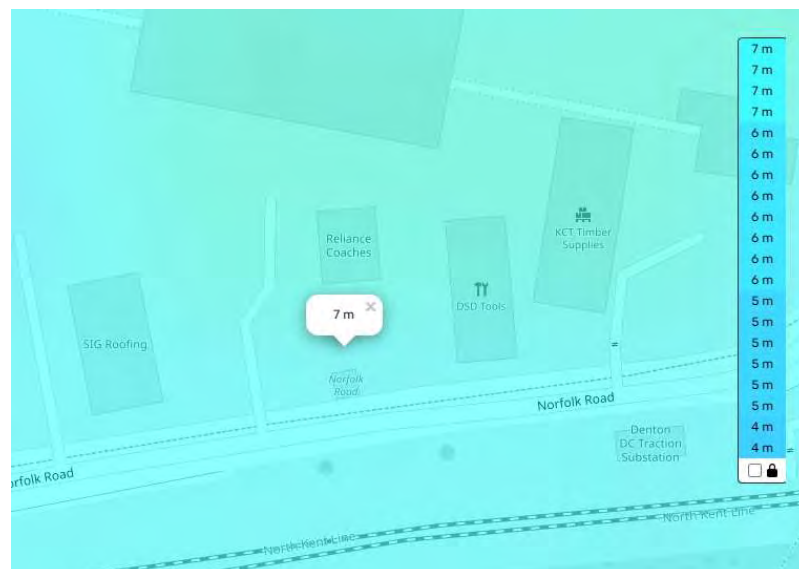
2.2 Proposed Future Use

- 2.2.1 The demolition of an existing industrial/commercial unit and reconstruction of new commercial unit, including removal of existing containers

2.3 Site Levels

- 2.3.1 A topographical survey is not yet available however, following assessment of online topographical information See **figure 2.1** below the site has been identified as having a level of 7m AOD.

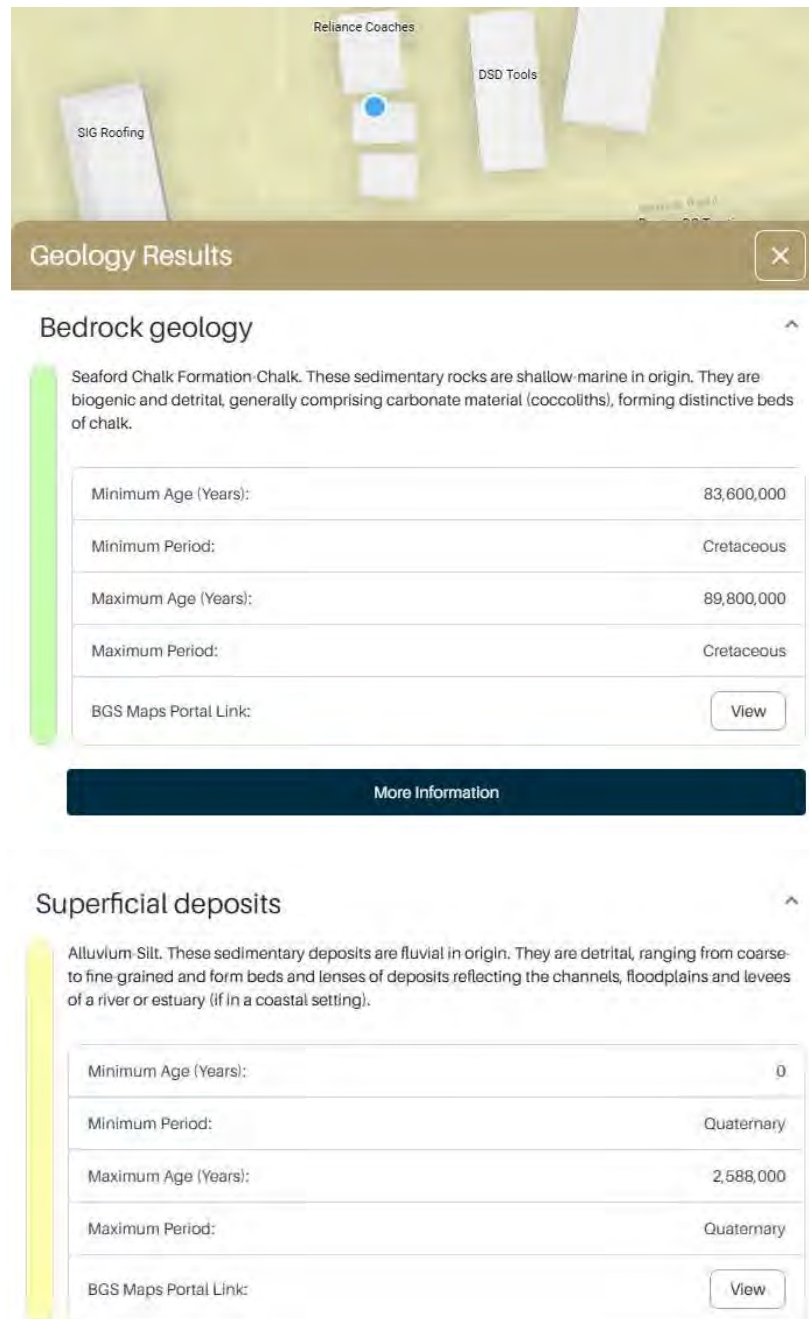
Figure 2.1: Topography



2.4 Geology

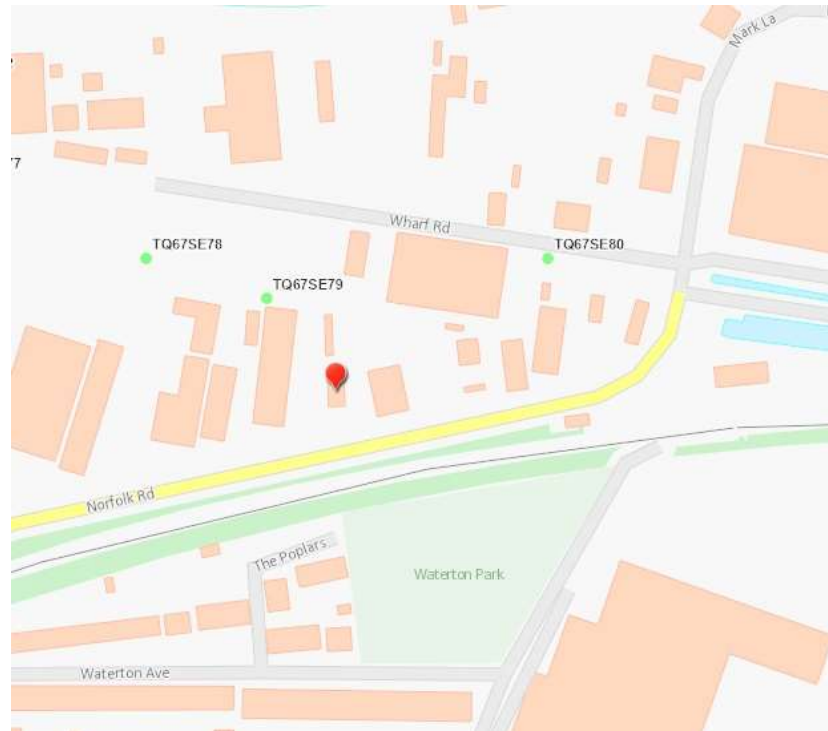
- 2.4.1 British Geological Survey (BGS) superficial geology has been identified as - Alluvium-Silt, with bedrock geology identified as Seaford Chalk Formation-Chalk. See **Figure 2.2** Below.

Figure 2.2: BGS Geology



- 2.4.2 A number of boreholes are located in the immediate vicinity of the site with the nearest borehole log, identified as reference TQ67SE79 shown in **Figure 2.3**, With the full Borehole log included within **Appendix B**.
- 2.4.3 The existing borehole was excavated on behalf of Livesay, Henderson and Partners dated 23rd July 1970 with the maximum observed water levels reported as 3.93m (12' 9" deep)

Figure 2.3: Borehole Location Plan



3.0 FLOOD RISK and FLOOD ZONES

3.1 Brief

3.1.1 The vulnerability of the site to flooding from rivers, sea and other sources has been considered, along with the potential to increase flooding elsewhere through the addition of impermeable areas and the effect on surface water run-off. Typical sources of flooding include fluvial, tidal, surface water, groundwater, sewers and anthropogenic sources; these are considered below.

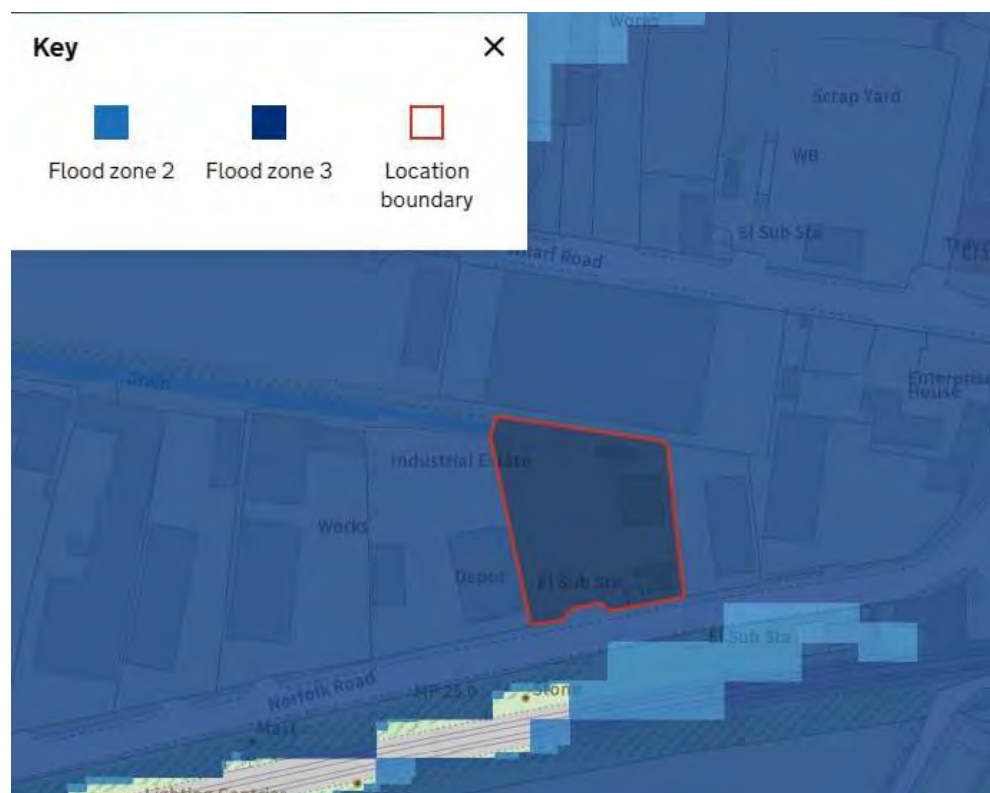
3.1.2 The local SFRA has also been consulted.

3.2 Fluvial, Tidal

3.2.1 Flood maps are produced by the EA for the whole of the UK to highlight areas at particular risk of flooding by categorising them into different Zones. These maps are based on a broad assessment of areas using digital mapping techniques and extracts from the EA flood maps for the site and its surroundings are included in the figures below.

3.2.2 The EA flood map for planning, extract in **Figure 3.1**, full report provided in **Appendix C**, shows that the development area and its immediate surroundings are wholly located within EA Flood Zone 3 (Dark blue shaded areas).

Figure 3.1 - Environment Agency Flood Map (Flood Zone)



3.2.3 From the Environment Agency flooding from rivers and seas map:

- *Locations in flood zone 3 have a high probability of flooding. This means in any year land has a 1% or more chance of flooding from rivers, or a 0.5% or more chance of flooding from the sea.*

3.2.4 Flood zone 3 developments need to submit a flood risk assessment as part of their planning application.

3.2.5 Annex 3 within the National Planning Policy Framework Technical Guidance (NPPF) indicates that the proposed use as a commercial unit is designated as less vulnerable see **Figure 3.2** below.

3.2.6 Table 2 within paragraph 079 of the Flood Risk and Coastal Change Guidance shown in **Figure 3.3** below, indicates that all less vulnerable uses are acceptable within all areas up to and including Flood Zone 3a.

Figure 3.2 – Annex 3: Flood Risk Vulnerability Classification

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.

Figure 3.3 – Table 2 Flood Risk Vulnerability and Flood Zone ‘Incompatibility’

Table 2: Flood risk vulnerability and flood zone ‘incompatibility’

Flood Zones	Flood Risk Vulnerability Classification				
	Essential infrastructure	Highly vulnerable	More vulnerable	Less vulnerable	Water compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	X	Exception Test required	✓	✓
Zone 3b *	Exception Test required *	X	X	X	✓ *

Key:

✓ Exception test is not required

X Development should not be permitted

3.2.7 The proposed development is acceptable in the identified flood zone.

3.3 Surface Water

- 3.3.1 Surface water flooding occurs when rainwater or other precipitation does not drain to the subsoil/watercourse but lies on or flows over the ground surface instead. Surface water flooding is often associated with all other sources of flooding but is often related to exceedance of existing highway and public drainage networks within the existing carriageway.
- 3.3.2 The EA’s surface water flood map shown in **Figure 3.4 and 3.5** identifies the surface water flood risk for the proposed site. The surface water flood zone for the site has been identified as Very low with instances of flooding highlighted in the adjacent plot, this area of flooding is potentially linked to a reduction in ground level from the proposed site to the adjoining site by in excess of a metre.

Figure 3.4 - Environment Agency Flood Map (Surface Water)

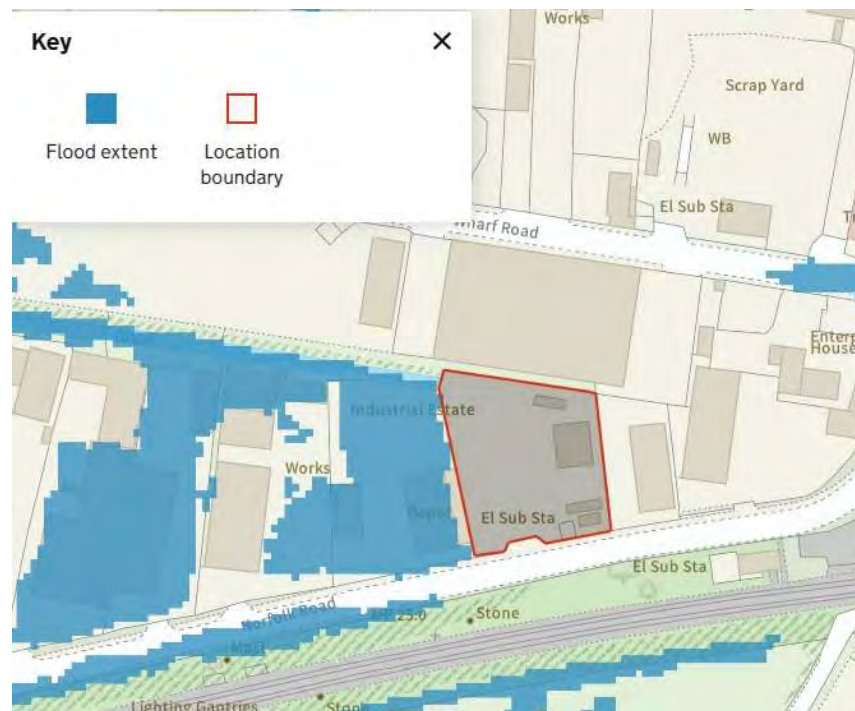
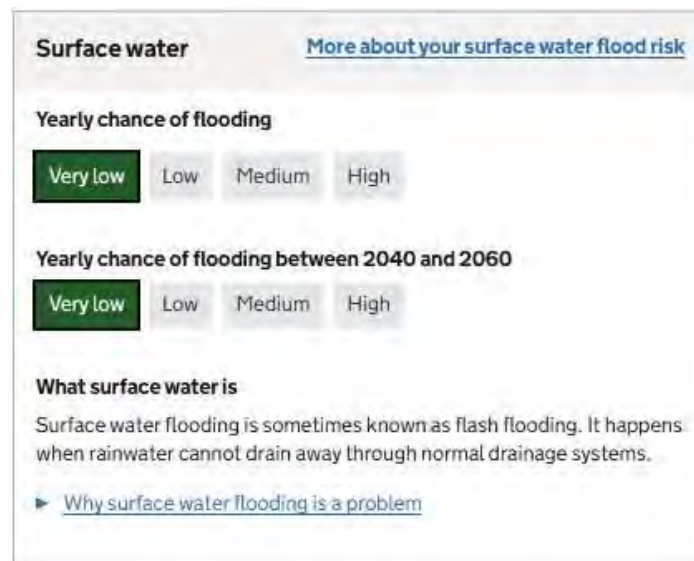


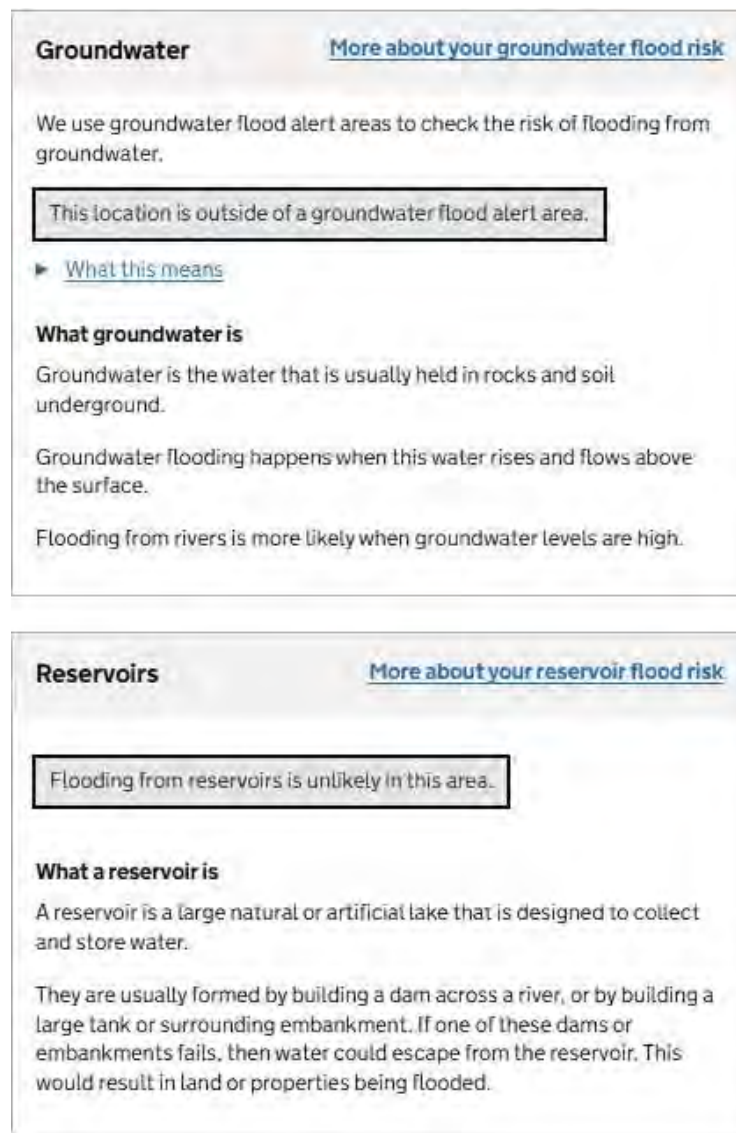
Figure 3.5 - Environment Agency Flood Map (Surface Water)



3.4 Other Flood Risks

- 3.4.1 The EA also identifies the potential for flooding from both reservoir and groundwater flooding. The extract below shown in **Figures 3.6** indicates that the proposed site is unaffected from both sources of flooding.
- 3.4.2 Groundwater flooding typically results from heavy/prolonged rainfall causing the level of the groundwater table to rise, which may lead to emergence of groundwater at the surface or into underground features such as basements. Low lying areas of land with permeable underlying strata may be particularly susceptible.
- 3.4.3 **Figure 3.6** below shows the site to not be affected from either reservoir or groundwater flooding

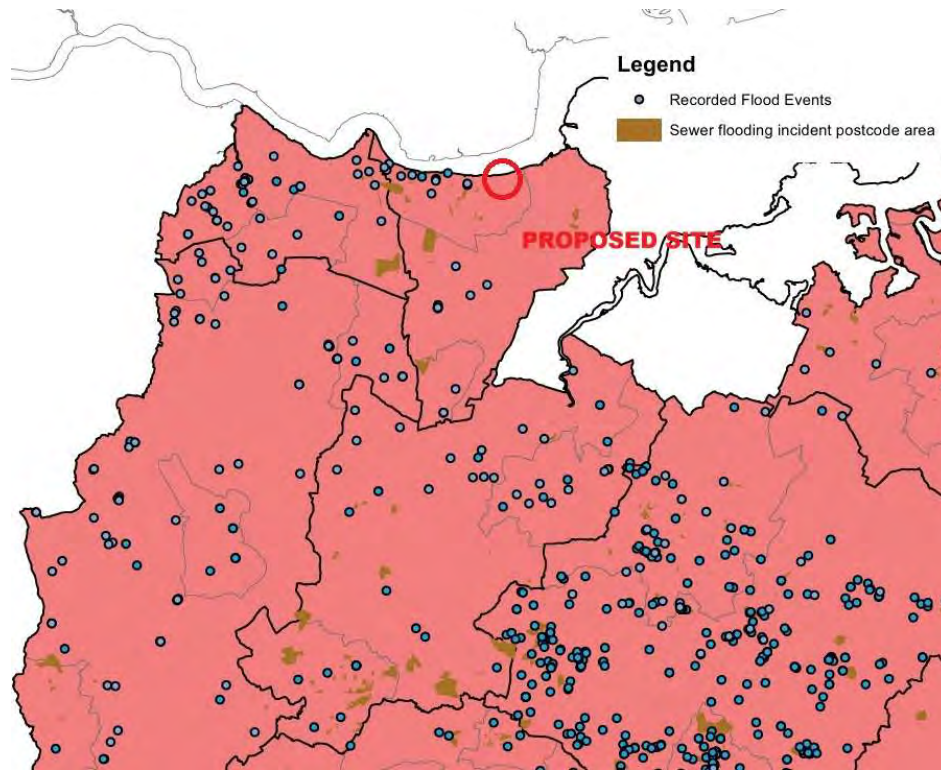
Figure 3.6 Flood Map Other Sources



3.5 Historic Flooding

- 3.5.1 Figure 4 of the SFRA included within **Appendix D** indicates recorded flood incidents in the vicinity of the proposed site, with the proposed site lying outside of any areas affected by previous events.

Figure 2.11 Recorded Flood Outlines



4.0 MANAGING SURFACE WATER

4.1 Brief

- 4.1.1 In accordance with the NPPF and SFRA, consideration should be given to natural water flows at the site. The development should not adversely affect flow or increase flood risk elsewhere, including increasing run-off rates. The disposal of surface water should be dealt with in a sustainable way and climate change should also be accounted for.

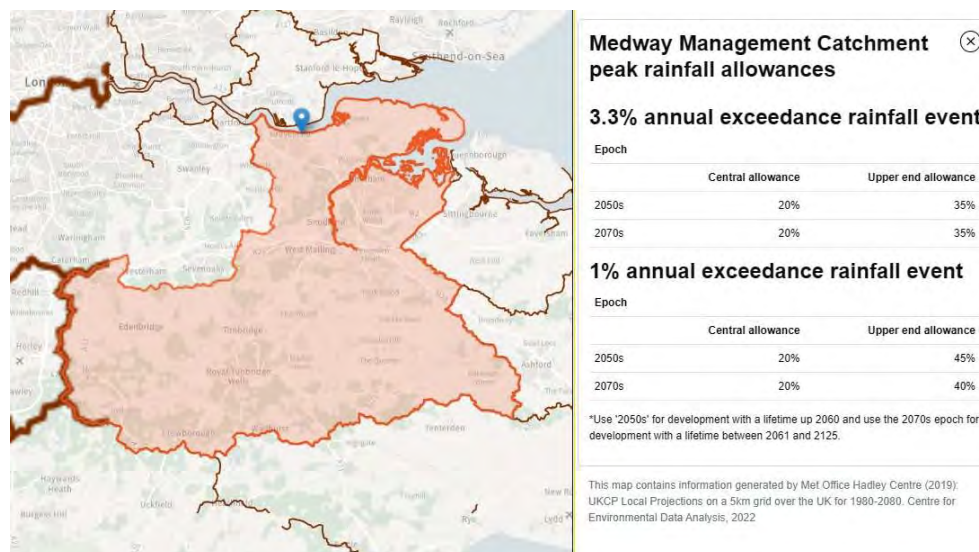
4.2 Previous Situation and Development Proposals

- 4.2.1 The existing plot has already been in use and had previously been trading for a number of years as a coach depot.
- 4.2.2 Proposals for the demolition of an existing industrial/commercial unit and reconstruction of new commercial unit, including removal of existing containers.

4.3 Climate Change

- 4.3.1 There is evidence to suggest that the climate is changing with sea levels predicted to continue to rise along with more frequent short-duration, high-intensity rainfall and more frequent periods of long-duration rainfall. The NPPF recommends that the effects of climate change be accounted for in FRA, with consideration of the EA flood maps and local authority SFRA.

Figure 4.1 – Medway Management Catchment Peak Rainfall Allowances



- 4.3.2 Increased rainfall or higher intensity short-duration rainfall may increase as a result of climate change. Following assessment of the peak rainfall allowances for the [Medway Management Catchment](#) a climate change increase of 45% is identified for the upper allowance 1 in 100 year event and 35% for the 1 in 30 year event. Climate change may also lead to variations in groundwater level which will also be considered during the drainage design.

5.0 Sustainable Drainage Systems (SUDS)

- 5.1.1 Although the existing site has been identified at Brownfield, all flows will be restricted to as close to greenfield run off rates as possible.
- 5.1.2 the HR Wallingford estimation tool has been used for the development area indicating that the commercial development site area of 0.184 hectares currently generates a greenfield run off rate for the 1 in 100-year storm of 1.3 l/s shown in **Appendix E**.
- 5.1.3 The maximum flow from the site will be strictly limited to no more than 1.3 l/s for the 1 in 100-year storm plus 45% allowance for climate change, through both sustainable and traditional flow control features.

Figure 5.1 Standard 1

Standard 1: runoff destinations

1.1 A 'SuDS approach' shall be adopted to address the management of surface water by the development and where it should be discharged. Runoff shall be treated as a resource and managed in a way that avoids negative impacts of the development on flood risk, the morphology and water quality of receiving waters and the associated ecology.

1.2 Runoff from the development shall be discharged to the following final destinations, to the maximum extent practicable, in accordance with the below hierarchy:

- priority 1: collected for non-potable use
- priority 2: infiltrated to ground
- priority 3: discharged to an above ground surface water body
- priority 4: discharged to a surface water sewer, or another piped surface water drainage system
- priority 5: discharged to a combined sewer

Note 1: priority 1 is the highest priority and priority 5 is the lowest.

Note 2: for the purposes of this standard, a combined sewer is a sewer intended to receive both foul sewage and surface runoff and does not include a sewer intended to receive only foul sewage, even if it has the capacity to accommodate additional flows or has an element of surface water in it already.

1.3 To utilise a lesser priority final destination, appropriate evidence shall be provided that demonstrates all higher priority final destinations have been utilised to the maximum extent practicable. Higher cost alone shall not be a reason to utilise lower priority final destinations.

1.4 Where more than one final destination is utilised, each final destination's ability to accept runoff shall be maximised in order of priority.

5.1.4 Standard 1 of the National standards for sustainable drainage systems (SuDS) shown in **Figure 5.1** above highlights the preferred final run off destinations from proposed developments where practicable.

5.1.5 The proposed site will address the new guidance as follows:

- **Priority 1 – Non-Potable Uses** – Although the site does not have a significant demand for non-potable uses, the site should consider the introduction of rainwater butts at downpipe locations to intercept the initial 5mm of flow and use the water for irrigation purposes.
- **Priority 2 – Infiltration** – Due to the proximity and scale of the surrounding development together with the identified resting water level within the nearest borehole, the opportunity for infiltration as a standalone discharge methodology has been unfortunately ruled out
- **Priority 3 – Discharge to above ground Surface Water Body** – Although the site is considered to be potentially serviced by a direct connection to the offside public sewer network, due to the presence and proximity of a main river, the proposed outfall from the development should look to communicate with this feature.

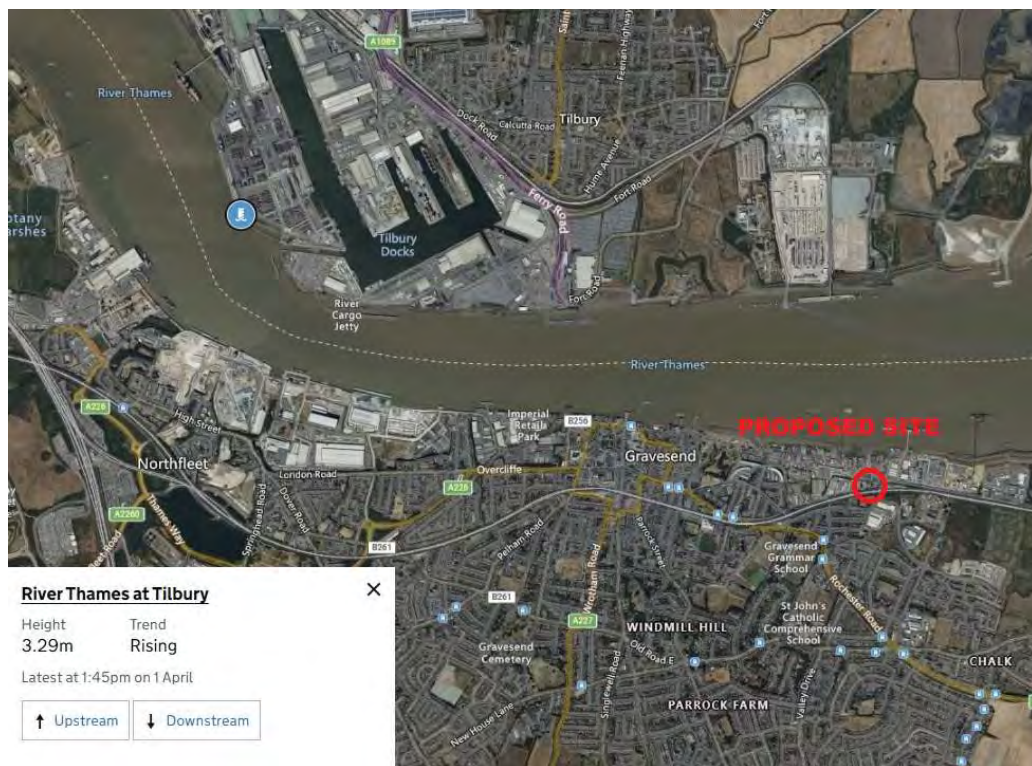
Any proposed connection will be subject to identification of the presence of any 3rd party land together with the number of mature trees.

- **Priority 4 – discharge to a surface water sewer** – Should the above connection under priority 3 not be possible the existing network should be subject to a CCTV survey to confirm the existing connection is suitable for reuse.
- **Priority 5 – Discharge to combined sewer** – Should the above connection under priority 3 not be possible the existing network should be subject to a CCTV survey to confirm the existing connection is suitable for reuse.

6.0 ANTICIPATED WATER LEVELS

- 6.1.1 For sites located with areas identified as Flood Zone 3, it is possible to request anticipated flood level data from the Environment Agency referenced as Product 4 information, following our recent request, the usual timescales incurred to receive the information is ordinarily 20 working days.
- 6.1.2 With the above in mind, As receipt of the product 4 information has not yet been obtained, we have unfortunately had to exclude this information at this time and have instead used the water level information contained within the nearby monitoring station.
- 6.1.3 In order to establish the maximum water level to be experienced at the existing site from the River Thames, we have interrogated the information obtained from the Sea Level at River Thames at Tilbury Monitoring Station, this is the closest monitoring station to the site, The Location is shown in **Figure 6.1**.

Figure 6.1 – Monitoring Station Position



- 6.1.4 The current water level was identified as 3.29m taken at 1.45pm on the 1st April, with the maximum recorded level shown in **Figure 6.2**.

Figure 6.2 – Monitoring Station Recorded Levels

River Thames level at Tilbury

[Map](#) [Upstream](#) [Downstream](#) [Nearby levels](#)

Latest at 2:00pm on 1 April ⓘ

Height
3.29m ⓘ

Trend
Rising ⓘ

Height in metres over the last 5 days



How levels here could affect nearby areas ⓘ

5.05m

Water reaches the highest level recorded at this measuring station

3.29m

Latest level

- 6.1.5 The current recorded level at the monitoring station is 3.29m AOD with the highest recorded level at the station being reported as 5.05m AOD.
- 6.1.6 The maximum recorded level of 5.05m appears to be approximately 1.95m lower than the topographical level for the site (7m AOD).
- 6.1.7 With the maximum water level experienced at the nearest monitoring station recorded as 5.05m and the anticipated site topographical level being identified as 7m AOD it would suggest that even when water levels are at the highest levels, the existing site may not be significantly affected due to existing topography.

7.0 FLOOD MITIGATION PROPOSAL

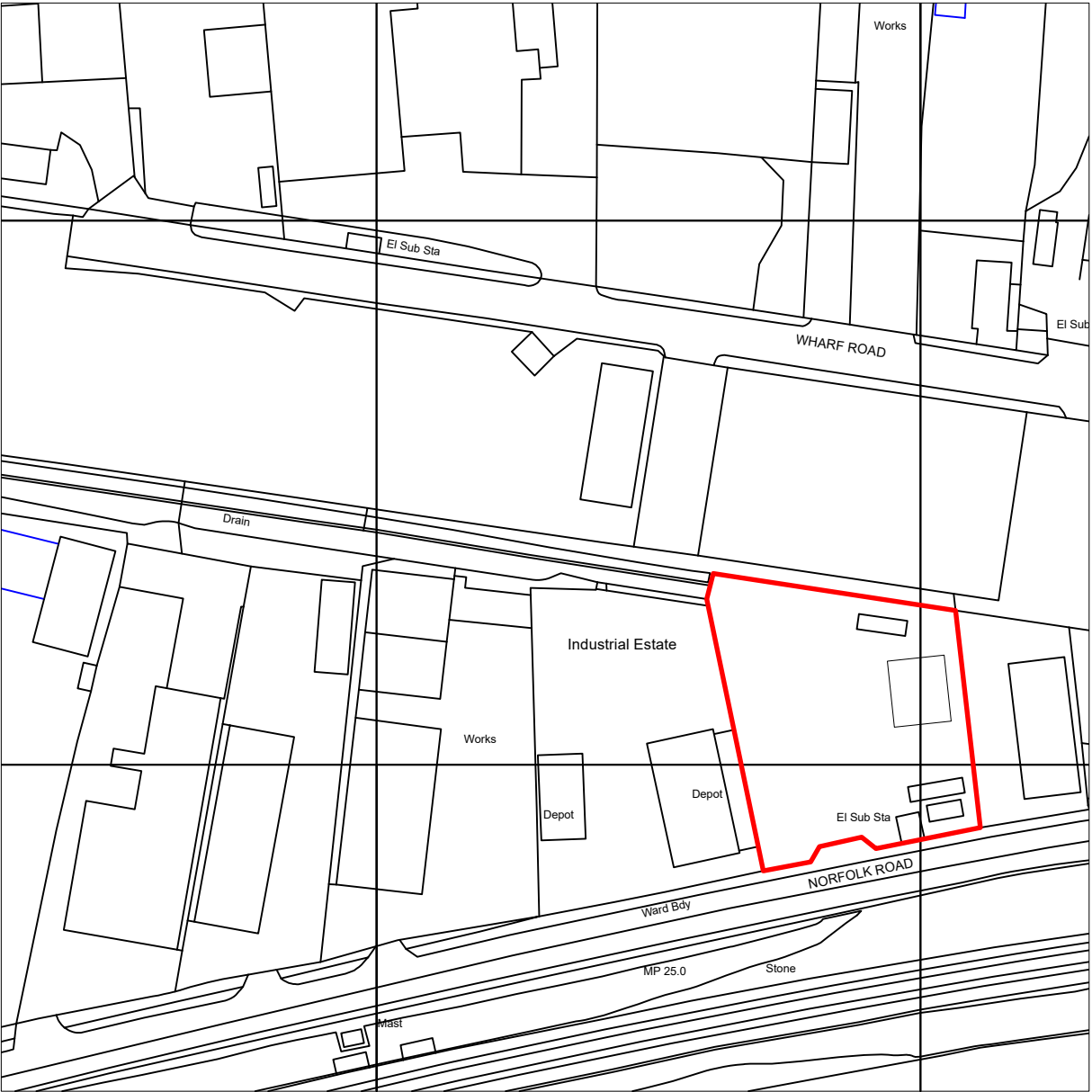
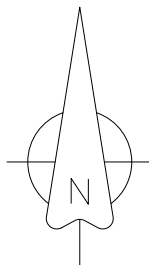
- 7.1.1 The end user must sign up to the Environment Agency Flood Warning service providing the existing site address, email address and contact number which will allow warnings to be received via call or text at any time of the day or night.
- 7.1.2 As it will not be possible to significantly amend site finished floor levels, the appropriate flood resistant measure should be included as part of the change of use according to the anticipated depth of water experienced:
- 7.1.3 Water depth up to 0.6m
- *using materials with low permeability to at least 0.3m*
 - *using flood resilient materials (for example lime plaster) and design (raised electrical sockets)*
 - *making sure there's access to all spaces to enable drying and cleaning*
- 7.1.4 Water depth above 0.6m
- *using materials with low permeability to at least 0.3m*
 - *making it easy for water to drain away after flooding*
 - *making sure there's access to all spaces to enable drying and cleaning*
- 7.1.5 The occupant should complete a business flood plan contained within the Environment Agency document "*would your business stay afloat?*" Copy included within **Appendix E**
- 7.1.6 Any flood plan should include:
- *A list of important contacts, including Floodline, building services, suppliers and evacuation contacts for staff*
 - *A description or map showing locations of key property, protective materials and service shut-off points.*
 - *Basic strategies for protecting property, preventing business disruption and assisting recovery.*
 - *Checklists of procedures that can be quickly accessed by staff during a flood.*
- 7.1.7 An emergency escape plan is to made available to the end user to indicate that in the event of a flood warning any individual onsite must make their way to higher ground or the nearest flood zone 1 area.

8.0 CONCLUSION

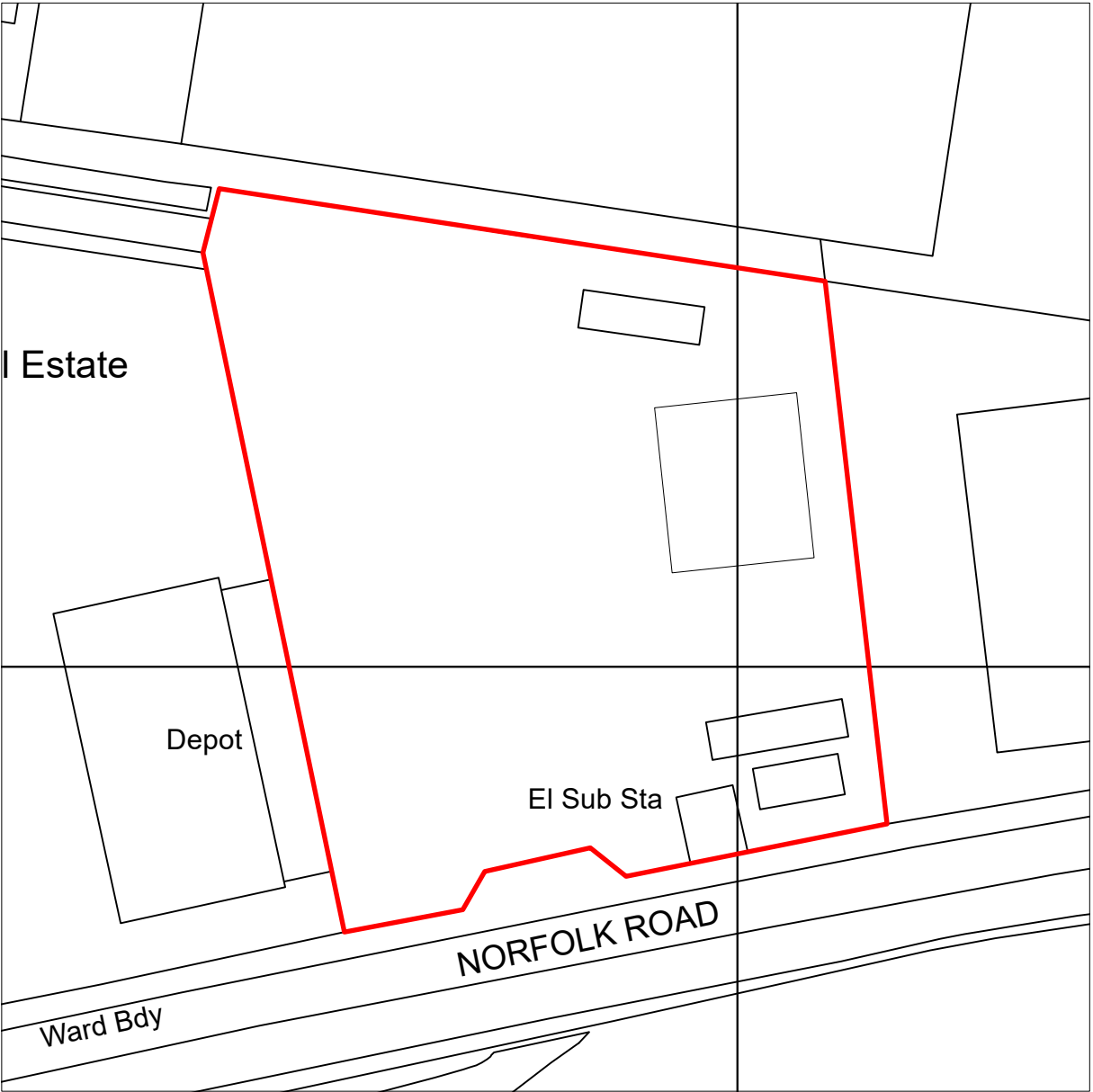
- 8.1.1 The existing site is Wholly contained within in Environment Agency (EA) Flood Zone £.
- 8.1.2 Reference to table 2 of the NPPF states Less Vulnerable uses are acceptable within all areas up to and including flood zone 3a.
- 8.1.3 The proposed use is acceptable within the identified flood zone.
- 8.1.4 The site has been identified as being at a very low risk of surface water flooding, considered to be linked with the existing topography.
- 8.1.5 Infiltration as a standalone discharge methodology is not considered an option due the density of existing development and the presence of groundwater within the existing borehole.
- 8.1.6 The risk of flooding elsewhere should not be increased as a result of the development.
- 8.1.7 A maximum permissible discharge rate of 1.3 l/s for the 1 in 100-year storm event plus 45% allowance for climate change will be used to inform the proposed development drainage design.
- 8.1.8 Attenuation will be provided on the development site to ensure that the reduction to only 1.3 l/s which is significantly below the calculated brownfield run off rate is not exceeded during a 1 in 100-year storm event, inclusive of a 45% allowance for climate change.
- 8.1.9 The predevelopment brownfield discharge rate has been estimated using the Rational Method of
$$Q = 2.78 \times C \times i \times A$$

Where:
Q = flow rate (litres/second)
C = runoff coefficient
i = rainfall intensity (mm/hr)
A = area (hectares)
$$Q = 2.78 \times 0.4 \times 80 \times 0.184 = 16.4 \text{ l/s}$$
- 8.1.10 The proposed flow represents a reduction in flow over the brownfield rate of 92%.
- 8.1.11 The proposed site drainage will be designed with sufficient capacity not to flood during a 1 in 30-year storm event as well as to contain flood water generated from a 1 in 100 year plus climate change storm event (+45%) within the site. The risk of off-site flooding would not increase as a result of the development and safe access, and egress will be maintained.
- 8.1.12 Although not specifically required, the use of Flood resilient measures should be considered to reduce the effect of any flooding that may be experienced over the design life of the development.
- 8.1.13 Foul flows generated by the proposed development are anticipated to communicate with the adopted Thames Water network.
- 8.1.14 Discharge restrictions/charges may apply for connections to the public drainage network and for discharge of surface waters into the adjacent watercourse.
- 8.1.15 The potential for pollution of controlled waters is considered to be low provided best practice procedures are following during development. Drainage systems should be maintained to ensure that they do not become blocked and unable to discharge.

Appendix A



LOCATION PLAN
Scale: 1:1250 @ A3



BLOCK PLAN
Scale: 1:500 @ A3



REV	DESCRIPTION	DATE	INIT	CHKD
STATUS	FOR INFORMATION			

Client
Mitchell Thurbin

Project
**Plot 8, Norfolk Road, Gravesend,
Kent DA12 2PS**

Title
Existing Location & Block Plan

Scale	Date	Drawn	Checked
N/A @ A3	04.10.2025	N/A	N/A
N/A @ A1			

Project No:	Drawing No.	Revision
2025-085	001	

Appendix B



TQ67SE

79

6620 7414

HOLST & CO. LTD. SITE INVESTIGATION DEPT. PARKSIDE LANE LEEDS LS115SX.									
Contract No. <u>T3770/F1622</u>				Borehole No. <u>7</u>					
Location <u>Gravesend</u>				Ground Level <u></u>					
Client <u>Livesey, Henderson & Partners</u>				Date <u>23rd July, 1970</u>					
BOREHOLE LOG									
STRATA	Legend	Depth below Ground Level	Thickness of Strata	Type of Sample	c lb/sq. ft.	ϕ deg.	m.c. %	y lb/cu. ft.	N
MADE GROUND:- Soil & Stones		1'0"	1'0"						
MADE GROUND:- Gravel				3'0"					
chalk and clay		1'9"	9"	□	1000	0	34.6	107	
Firm dark brown stony clay		3'6"	1'9"	□	560	0	41.8	95	
Firm, light brown mottled silty clay		5'9"	2'3"	□					
Very soft dark grey silty organic clay			14'9"	□	100	0	69.0	83	
				17'6"	260	0	54.5	96	
		20'6"		□					
Dark brown Peat		23'0"	2'6"	□	480	0	75.6	73	
Soft dark grey silty clay		25'0"	2'0"	□					
Brown peat		26'0"	1'0"	□	200	0	20.6	107	
Soft light grey silt		28'3"	2'3"	□					
Compact sand and gravel with flints			7'9"	I					17
		36'0"							
Compact light grey silt		39'0"	3'0"	□	3200	17	10.7	136	
Compact gravel and flints			11'0"	I					25
				48'6"					18
		50'0"		I					

Water Struck at	Slight at 7'0"	Maximum Observed Water Level	12'9"
Undisturbed Sample	□	c = Cohesion	
Disturbed Sample	o	ϕ = Angle of Internal Friction	
Water Sample	Δ	m.c. = Moisture Content	
Penetration Test	I	y = Bulk Density	
		N = Standard Penetration Value	

on account of tidal variation and should not be taken as constant

Appendix C

Flood map for planning

Your reference
Unspecified

Location (easting/northing)
566285/174108

Created

Your selected location is in flood zone 3, an area with a high probability of flooding.

This means:

- you must complete a flood risk assessment for development in this area
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (see <https://www.gov.uk/guidance/flood-risk-assessment-standing-advice>)

Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.

This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

Flood risk data is covered by the Open Government Licence which sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3>

Use of the address and mapping data is subject to Ordnance Survey public viewing terms under Crown copyright and database rights 2026 AC0000807064. <https://flood-map-for-planning.service.gov.uk/os-terms>



Flood map for planning

Your reference

Unspecified

Location (easting/northing)

566285/174108

Scale

1:2,500

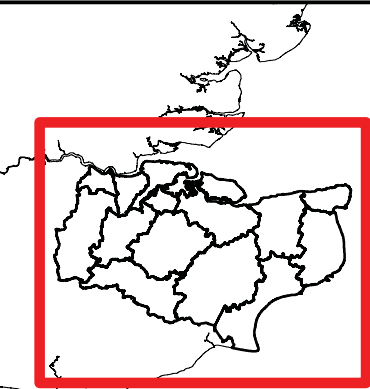
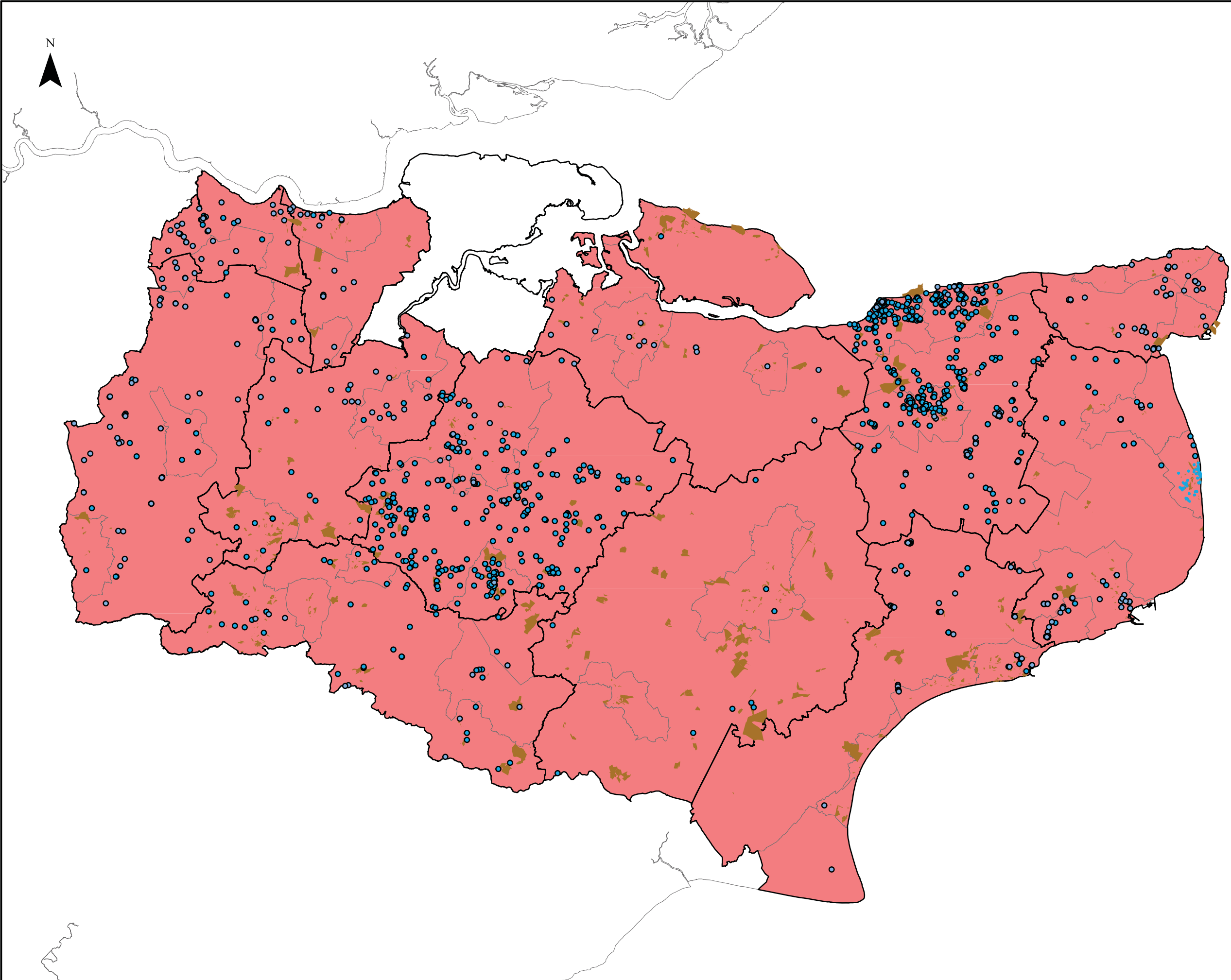
Created

-  Selected area
-  Flood zone 3
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Water storage area



0 20 40 60m

Appendix D



- Legend**
- Recorded Flood Events
 - Sewer flooding incident postcode area

Note:
The size of the sewer flooding incident areas represents the size of the postcode area the incident occurred in not the scale of the flood event.

Drawing Title:

Recorded Past Flood Events

Drawing Number:

Figure 4

0 2.5 5 10
Kilometers



Appendix E

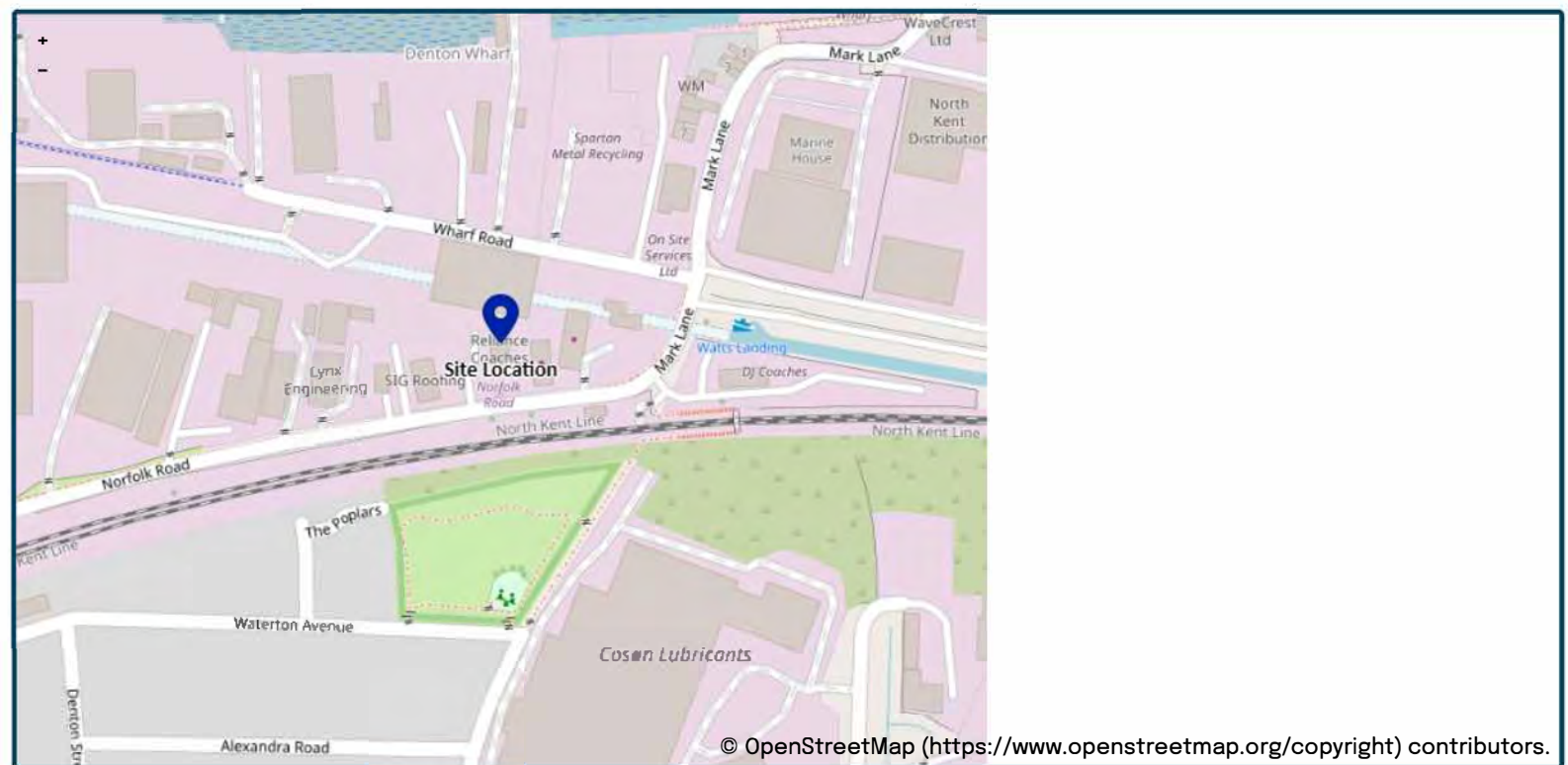
This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance “Rainfall runoff management for developments”, SC030219 (2013), the SuDS Manual C753 (CIRIA, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Project details

Date	
Calculated by	Garry Eyres
Reference	Plot 8
Model version	2.2.3

Location

Site name	Norfolk Road
Site location	



Site easting (British National Grid)	566301
Site northing (British National Grid)	174104

Site details

Total site area (ha)	0.184	ha
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Greenfield runoff

Method

Method	IH124
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IH124

	<u>My value</u>		<u>Map value</u>
SAAR (mm)	551 mm	☒	551
How should SPR be derived?	WRAP soil type		
WRAP soil type	3	☐	3
SPR	0.37		
QBar (IH124) (l/s)	0.4 l/s		

Growth curve factors

	<u>My value</u>		<u>Map value</u>
Hydrological region	7	☒	7
1 year growth factor	0.85		
2 year growth factor	0.88		
10 year growth factor	1.62		
30 year growth factor	2.3		
100 year growth factor	3.19		
200 year growth factor	3.74		

Results

Method	IH124	
Flow rate 1 year (l/s)	0.3	l/s
Flow rate 2 year (l/s)	0.4	l/s
Flow rate 10 years (l/s)	0.6	l/s
Flow rate 30 years (l/s)	0.9	l/s
Flow rate 100 years (l/s)	1.3	l/s
Flow rate 200 years (l/s)	1.5	l/s

Please note runoff estimation is subject to significant uncertainty. Results are therefore normally reported to only 1 decimal place. Where 2 decimal places are provided, this does not indicate accuracy to this level, it has been adopted to prevent 'zero' figures from being reported. Outputs less than 0.01 l/s are reported as 0.01 l/s.

Disclaimer

This report was produced using the Greenfield runoff rate estimation tool (2.2.3) developed by HR Wallingford and available at [uksuds.com](https://www.uksuds.com) (<https://www.uksuds.com/>). The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at [uksuds.com/terms-conditions](https://www.uksuds.com/terms-conditions) (<https://www.uksuds.com/terms-conditions>). The outputs from this tool have been used to estimate Greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, Centre for Ecology and Hydrology, Wallingford Hydrosolutions or any other organisation for the use of these data in the design or operational characteristics of any drainage scheme.

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