# Sheringham Waste Recycling Centre
# Holt Road Norfolk

**Flood Risk Assessment and**

**Surface Water Drainage Strategy**

**November 2022**

On behalf of **Norfolk County Council**

Project Ref: 332249868/4001 | Rev: - | Date: November 2022

Registered Office: Buckingham Court Kingsmead Business Park, London Road, High Wycombe, Buckinghamshire HP11 1JU
Office Address: 50/60 Station Road, Cambridge CB1 2JH T: 01223 633 2900 E: cambridge.uk@stantec.com

# Document Control Sheet

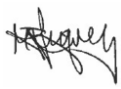
**Project Name:** **Sheringham Recycling Centre, Norfolk**

**Project Ref:** **332210167**

**Report Title:** **Flood Risk Assessment**

**Doc Ref:** **4001**

**Date:** **November 2022**

| | Name | Position | Signature | Date |
|---|---|---|---|---|
| **Prepared by:** | Tim Bateman | Senior Engineer |  | 17/11/2022 |
| **Reviewed by:** | Sam Lonsdale | Engineer |  | 10/01/2023 |
| **Approved by:** | Matthew Ingrey | Director |  | 10/01/2023 |
| **For and on behalf of Stantec UK Limited** | | | | |

| Revision | Date | Description | Prepared | Reviewed | Approved |
|---|---|---|---|---|---|
| | | | | | |
| | | | | | |

# Contents

# Figures



# Tables



# Appendices

# Executive Summary

This Flood Risk Assessment (FRA) has been prepared by Stantec on behalf of our client, Norfolk County Council, to accompany a full planning application for the relocation of Sheringham Recycling Centre in Sheringham, Norfolk. The proposal includes the construction of:

- Vehicle access road
- Associated footpaths
- Service area

In accordance with the fundamental objectives of the National Planning Policy Framework (NPPF), the FRA demonstrates that:

(i) The development is safe

(ii) The development does not increase flood risk; and

(iii) The development does not detrimentally affect third parties.

The Environment Agency (EA) Flood Zone map shows the site lies within Flood Zone 1 (as defined in NPPF Planning Practice Guidance (PPG) 'Flood Risk and Coastal Change' Table 1) as follows:

- Flood Zone 1 'Low Probability' (less than 1 in 1,000 (0.1%) annual probability of river or seas flooding)
- Flood Zone 2 'Medium Probability' (between a 1 in 100 (1%) and 1 in 1,000 (0.1%) annual probability of river flooding; or land having between a 1 in 200 (0.5%) and 1 in 1,000 (0.1%) annual probability of sea flooding)
- Flood Zone 3 'High Probability' (greater than 1 in 100 (1%) annual probability of river flooding, or greater than 1 in 200 (0.5%) annual probability of sea flooding)

The proposed relocated recycling centre and associated development are considered to be 'less vulnerable' development. A sequential approach, as advocated by national planning policy, has been followed such that all proposed development will be located in Flood Zone 1. All proposed development is considered appropriate within Flood Zone 1 (ref: National Planning Policy Framework (NPPF) Planning Practice Guidance (PPG) 'Flood Risk and Coastal Change' Table 1).

Since the proposed development is to be located entirely within Flood Zone 1 (i.e., having a 'Low Probability' of flooding), it passes the Sequential Test and does not require the Exception Test.

As such, the FRA confirms that the development is safe, it does not increase flood risk and does not detrimentally affect third parties, in accordance with the objectives of the NPPF and the requirements of national and local planning policy.

# 1 Introduction

## 1.1 Scope of Report

1.1.1 This Flood Risk Assessment (FRA) has been prepared by Stantec on behalf of our client, Norfolk County Council, to accompany a full planning application for the relocation of Sheringham Recycling Centre in Sheringham, Norfolk.

1.1.2 This FRA is based on the available flood risk information for the site as detailed in Section 1.2 and prepared in accordance with the planning policy requirements set out in Section 1.3. The scope of the FRA is consistent with the 'Site-specific Flood Risk Assessment Checklist' from the National Planning Policy Framework (NPPF) Planning Practice Guidance.

1.1.3 Stantec has many years of experience in, amongst other areas, the assessment of flood risk, hydrology, flood defence and river engineering. The authors and reviewers of the document are all experienced engineers and members of chartered institutions such as the Chartered Institution of Water and Environmental Management (CIWEM) or the Institution of Civil Engineers (ICE).

## 1.2 Sources of Information

1.2.1 The FRA has been prepared based on the following sources of information:

- Development layout proposals by Eunomia Research & Consulting (Appendix B**),**
- **Environment Agency (EA) published '**Open Data**' datasets** available online, reproduced with OS mapping under licence to Stantec (contains Ordnance Survey data © Crown copyright and database right [2019], contains Environment Agency information © Environment Agency and database right)
- The Environment Agency (EA) online flood maps at https://flood-map-for-planning.service.gov.uk/ and https://flood-warning-information.service.gov.uk/long-term-flood-risk/
- North Norfolk District Council North Norfolk Strategic Flood Risk Assessment, Final Report: Level 1 (November 2017)
- North Norfolk District Council Addendum Report for the North Norfolk Strategic Flood Risk Assessment, Version 1 (12th April 2018)
- Norfolk County Council Norfolk Local Flood Risk Management Strategy, Post Consultation Final (31st July 2015)

1.2.2 Consultation with Norfolk County Council (NCC) in its role as Lead Local Flood Authority (LLFA), the EA and Anglian Water (AW) regarding existing flood risk issues has been undertaken by means of email enquiries.

## 1.3 Relevant Planning Policy

1.3.1 This FRA has been prepared in accordance with the relevant national, regional and local planning policy and statutory authority guidance as follows:

- National policy contained within the revised National Planning Policy Framework (NPPF**)** dated February 2019, issued by Ministry of Housing, Communities and Local Government, with reference to Section 14 'Meeting the challenge of climate change, flooding and coastal change'

- The NPPF Planning Practice Guidance (PPG) released in March 2014 ('Flood Risk and Coastal Change' section) and updated in July 2020 to incorporate the EA 'Flood Risk Assessments: Climate Change Allowances' guidance

- DEFRA Non-statutory Technical Standards for Sustainable Drainage Systems (March 2015)

- The SuDS Manual (C753), CIRIA (2015)

- Sewerage Sector Guidance (SSG) (October 2019) and the associated Design & Construction Guidance (DCG) (March 2020)

- BS 8582:2013 Code of practice for surface water management for development sites (November 2013)

- Environment Agency Rainfall run-off management for developments, Report SC030219 (October 2016)

- Local planning policy contained within the North Norfolk District Council (NNDC) North Norfolk Local Development Framework Core Strategy, adopted September 2008, principally

  - Policy EN 10 – Development and Flood Risk which states:

  *"The sequential test will be applied rigorously across North Norfolk and most new development should be located in **Flood Risk Zone 1**. New development in **Flood Risk Zones 2 and 3a** will be restricted to the following categories:*

  - *water compatible uses*
  - *minor development*
  - *changes of use (to an equal or lower risk category in the flood risk vulnerability classification) where there is no operational development; and*
  - *'Less vulnerable' uses where the sequential test has been passed.*

  *New development in **Flood Zone 3b** will be restricted to water compatible uses only.*

  *The Strategic Flood Risk Assessment defines zones 2, 3a and 3b in parts of North Norfolk and this will be used to inform the application of the sequential test. Where this information is not available, the Environment Agency Flood Risk Zones and a site-specific Flood Risk Assessment will be used to apply the sequential test.*

  *A site-specific Flood Risk Assessment which takes account of future climate change must be submitted with appropriate planning applications in Flood Zones 2, 3a and 3b and for development proposals of 1 hectare or greater in Flood Zone 1.*

  *Land in Flood Zone 1 that is surrounded by areas of Flood Zones 2 or 3 will be treated as if it is in the higher risk zone and a Flood Risk Assessment will be required to prove that safe access / egress exists for the development or that the land will be sustainable for the duration of the flood period.*

  *Appropriate surface water drainage arrangements for dealing with surface water run-off from new development will be required. The use of Sustainable Drainage Systems will be the preference unless, following an adequate assessment, soil conditions and / or engineering feasibility dictate otherwise."*

- Local planning policy contained within the NNDC North Norfolk Local Plan 2016-2036, First Draft Local Plan (Part 1**)**, consultation period 7 May to 19 June 2019, principally:

- Policy SD 10 – Flood Risk & Surface Water Drainage which states:

*"All new development will:*

- *be located to minimise the risk of flooding, mitigating any such risk through avoidance, design of mitigation and include sustainable drainage (SuDS) principles*

- *not materially increase the flood risk to other areas and incorporate appropriate surface water drainage mitigation measures to minimise its own risk of flooding*

- *have regard to climate change, the NNDC Strategic Flood Risk Assessment, 2017 and subsequent updates.*

*Developers will be required to show that the proposed development:*

1. *complies with national policy including where appropriate the sequential and exceptions tests*

2. *does not increase green field run off rates and vulnerability of the site, or the wider catchment, to flooding from surface water run-off from existing or predicted water flows*

3. *wherever practicable, has a positive impact on the risk of surface water flooding on site and in the surrounding area adjacent to the development; and,*

4. *addresses the potential impact of infiltration upon groundwater Source Protection Zones and/or Critical Drainage Catchments.*

*Where SuDS are proposed, development proposals should be an integral part of the green infrastructure framework of the site and seek to provide multi-functional benefits by combining water management with open space with benefits for amenity, recreation and wildlife.*

*The approach to surface water drainage should be based on evidence of an assessment of site conditions and national guidance, reflecting best practice. Developers should provide the appropriate information required to assist in the determination of such application as issued by the LLFA. Detailed maintenance and management arrangements for the lifetime of the development should be submitted. Funding will be via planning conditions and or planning obligations.*

*Where drainage proposals are submitted which consider flood risk and proposed sustainable drainage systems, a Flood Risk Assessment, FRA and drainage strategy should be submitted. This includes the requirement to provide at the pre application and outline stage details of a drainage strategy/statement showing at least one achievable drainage solution with evidence and sketch layout plan including proposed means of adoption and maintenance of the systems over the lifetime of the development. In adherence with LLFA guidance, drainage strategies must also consider the potential increase in the volume of runoff from a development as a result of increases in the area of impermeable surfaces along with water quality and exceedance issues.*

*Surface water should be managed at the source, with reduced transfer and discharge elsewhere following the hierarchy of drainage options as reasonably practicable, firstly:*

*1. into the ground (shallow infiltration); then*

*2. to a surface water body; then*

*3. to a surface water sewer, highway drain, or another drainage system, then*

*4. to a combined sewer.*

*Evidence of how the hierarchy could be achieved is required and where it cannot be provided, evidence of an alternative plan should be submitted. Where there is no alternative option but to discharge surface water into a combined sewer, developers will need to engage with the appropriate bodies and demonstrate why there is no alternative. Clear evidence depicting the above and that the discharge of surface water will be limited to attenuation rate, including climate change allowance, will need to be submitted.*

*New residential development on sites not allocated in this Local Plan or a Neighbourhood Plan will not be permitted on sites at risk from flooding from any sources except where it can be demonstrated that wider sustainability benefits outweigh flood risk."*

## 1.4 Caveats and Exclusions

1.4.1 This FRA has been prepared in accordance with the NPPF and Local Planning Policy. The proposed flood management and surface water management strategies are based on the relevant British Standards (BS8533), the standing advice provided by the EA, or based on common practice.

1.4.2 The Construction (Design and Management) Regulations 2015 (CDM Regulations) will apply to any future development of this site which involves "construction" work, as defined by the CDM Regulations. As such it is the responsibility of the proposed developer (ultimate client) to fulfil its duties under the CDM Regulations.

1.4.3 The findings of this FRA are based on data available at the time of the study and on the subsequent assessment that has been undertaken in relation to the development proposals as outlined in Section 5**.**

1.4.4 It should be noted that the insurance market applies its own tests in terms of determining premiums and the insurability of properties for flood risk. Those undertaking development in areas which may be at risk of flooding are advised to contact their insurers or the Association of British Insurers (ABI) to seek further guidance prior to commencing development. Stantec does not warrant that the advice in this report will guarantee the availability of flood insurance either now or in the future.

# 2 Site Setting

## 2.1 Site Description

2.1.1 The existing Sheringham Recycling Centre (approximately 600m$^2$) is operated by Norfolk County Council and located south of Holt Road, East Beckham, Sheringham, NR26 8TW.

2.1.2 The proposed relocation site (the 'Site') is located immediately northeast of the existing recycling centre, on the northern side of Holt Road, as shown in Figure 2.1 below. The Ordnance Survey grid reference for the centre of the site is E616271, N341031. A site location plan is included in Appendix A.

2.1.3 The site currently comprises 0.53 hectares (ha) of cultivated agricultural land and is bound to the north, east, south, and west by woodland and agricultural land.




Figure 2.1: Location Plan

## 2.2 Hydrological Setting

2.2.1 The closest ordinary watercourse to the site is located in Sheringham Wood (Old Wood) approximately 400m to the west, as shown in Figure 2.2 below. This watercourse flows northwards towards Sheringham Wood and Sheringham further north.

2.2.2 There are no other watercourses or waterbodies within the immediate vicinity of the site.

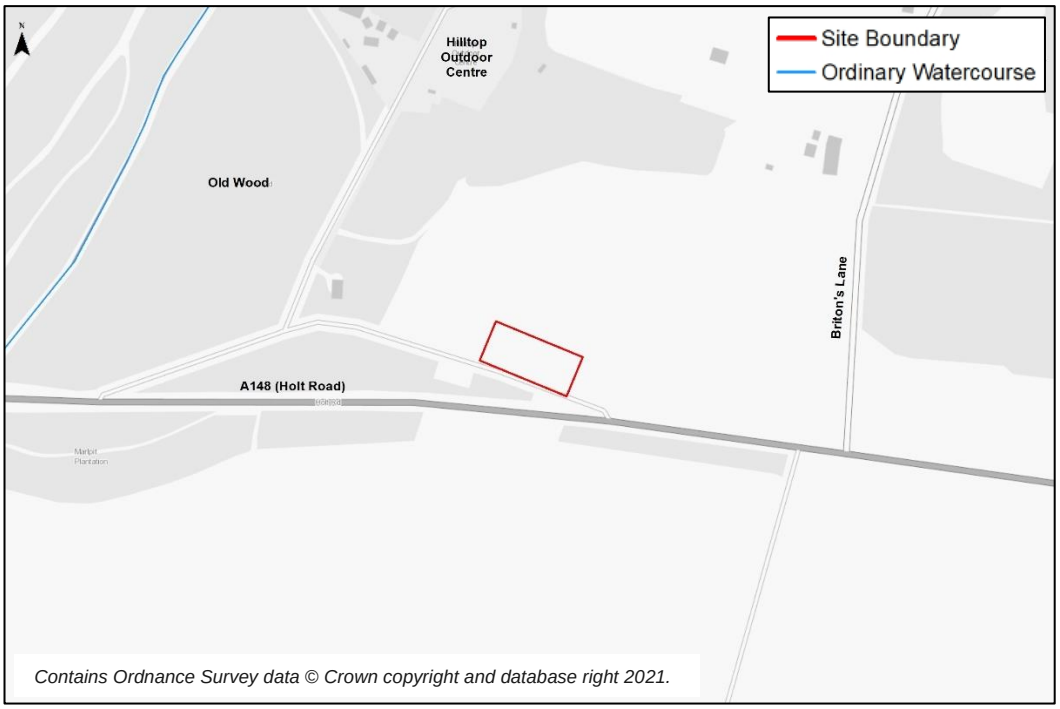



Figure 2.2: Drainage Features

## 2.3 Topography

2.3.1 LiDAR data indicates the site falls gently to the east with higher ground located to the west. Levels range between ~90m AOD at the high point to ~89m AOD along the eastern boundary.

2.3.2 A topographical plan of the site, based on opensource data, is included in Appendix A and shown in Figure 2.3 below.

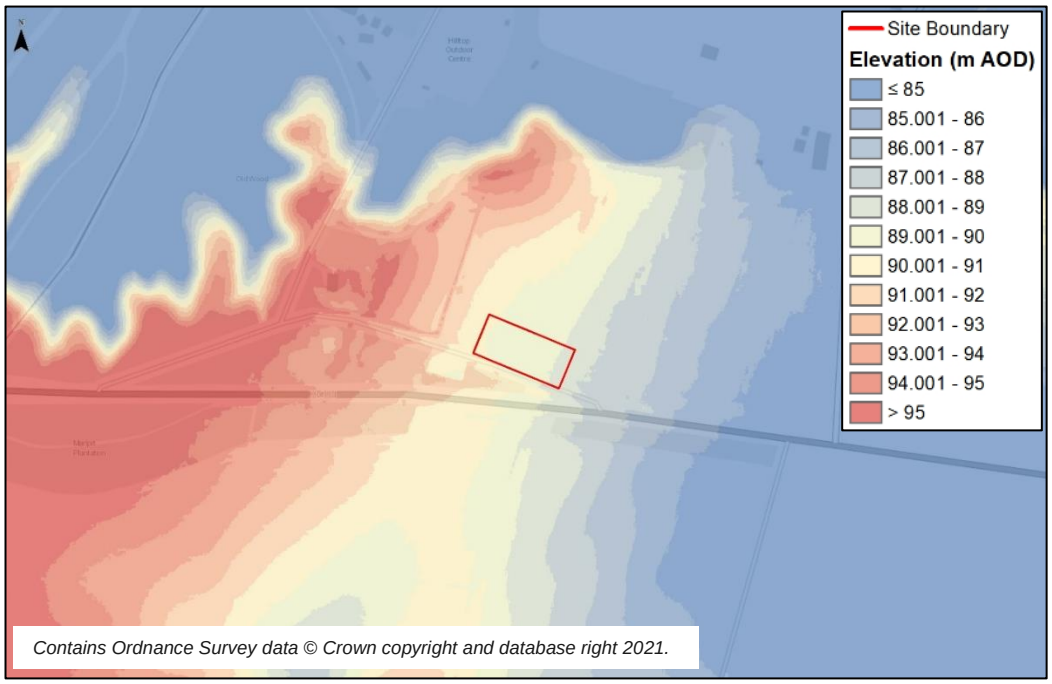



Figure 2.3: Site Topography (LiDAR)

## 2.4 Geology and Hydrogeology

2.4.1 From a review of the 1:50,000 scale geology map from the British Geological Survey (BGS) online digital viewer, the bedrock beneath the site comprises the Wroxham Crag Formation (Sand and Gravel) bedrock overlain with superficial deposits comprising the Briton's Lane Sand and Gravel Member (Sand and Gravel).

2.4.2 BGS borehole data from ~300m east of the site (borehole BGS ID. 515139 TG14SE39) gives a standing groundwater level approximately 35 metres below ground level (referenced in 2.3.1) at 46.63m Above Ordnance Datum (AOD). EA groundwater data for a borehole located approximately 1.2km north of the site (Ref. Sheringham and Beeston TG14_624) shows groundwater levels around 35.5m AOD.

2.4.3 The bedrock is designated as a 'Principal' aquifer and the superficial deposits are designated as a 'Secondary A' aquifer.

2.4.4 The National Soil Resources Institute (NSRI) 'Soilscapes for England and Wales' viewer indicates that the site is located on 'freely draining slightly acid sandy soils' with 'freely draining slightly acid loamy soils' further to the east.

2.4.5 The site is located within Source Protection Zone 3, as designated by the EA. The boundary between Source Protection Zone 3 and Source Protection Zone 2 (Outer Protection Zone) is located approximately 135m north of the site.

## 2.5 Existing Drainage Arrangements

### On-Site Drainage

2.5.1 The site consists primarily of open agricultural land, such that surface water would predominately drain via natural infiltration into the ground or would drain via overland flow to the east.

2.5.2 The existing Sheringham recycling centre site is served by a drainage system which comprises drainage pipes in the south-eastern corner discharging into an infiltration swale, further to the east (Figure 2.4). Note, this is not part of the proposed new site.

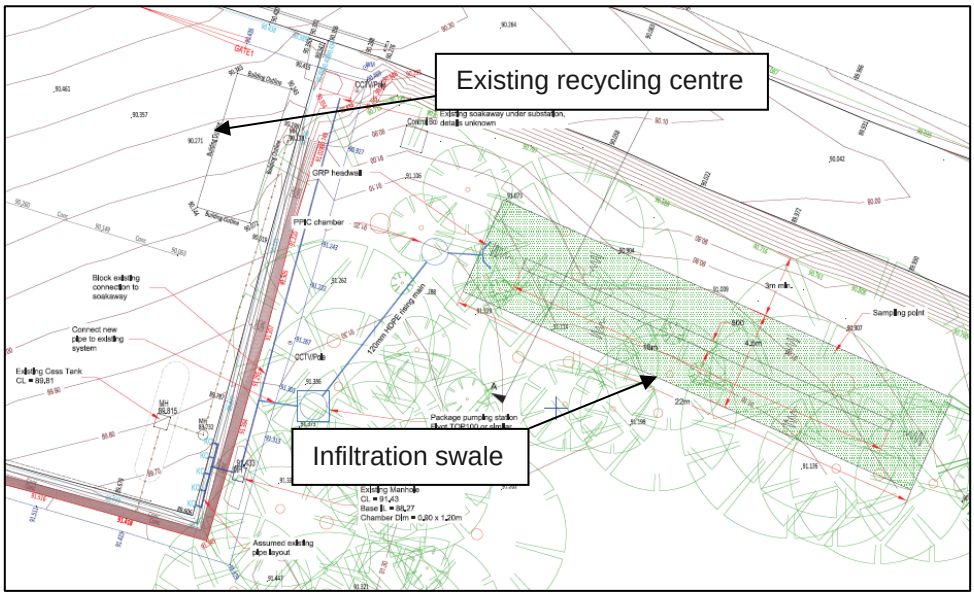



Figure 2.4: Existing Recycling Centre Drainage Arrangement

# 3 Overview of Flood Risk

## 3.1 Introduction

3.1.1 The following section has been determined with support from the Stantec GIS flood maps in Appendix A based on the EA Opendata datasets available online and reproduced with OS mapping under licence to Stantec.

## 3.2 Flood Zone Map for Planning

3.2.1 The first phase in identifying whether a site is potentially at risk of flooding is to consult the EA's Flood Zone maps, available on the EA's website. This provides an initial indication of the extent of the Flood Zones. The Flood Zones are defined in Table 1 of the NPPF PPG ('Flood Risk and Coastal Change' section) as follows:

- Flood Zone 1 'Low Probability' – land at less than 1 in 1000 (0.1%) annual probability of river or sea flooding
- Flood Zone 2 'Medium Probability' – land between 1 in 100 (1%) and 1 in 1000 (0.1%) annual probability of river flooding, or between 1 in 200 (0.5%) and 1 in 1000 (0.1%) annual probability of sea flooding
- Flood Zone 3 'High Probability' – land at 1 in 100 (1%) or greater annual probability of river flooding, or 1 in 200 (0.5%) or greater annual probability of sea flooding.

3.2.2 A copy of the current EA Flood Map (2021) for the site is included in Figure 3.1 and Figure GIS003 of Appendix A.

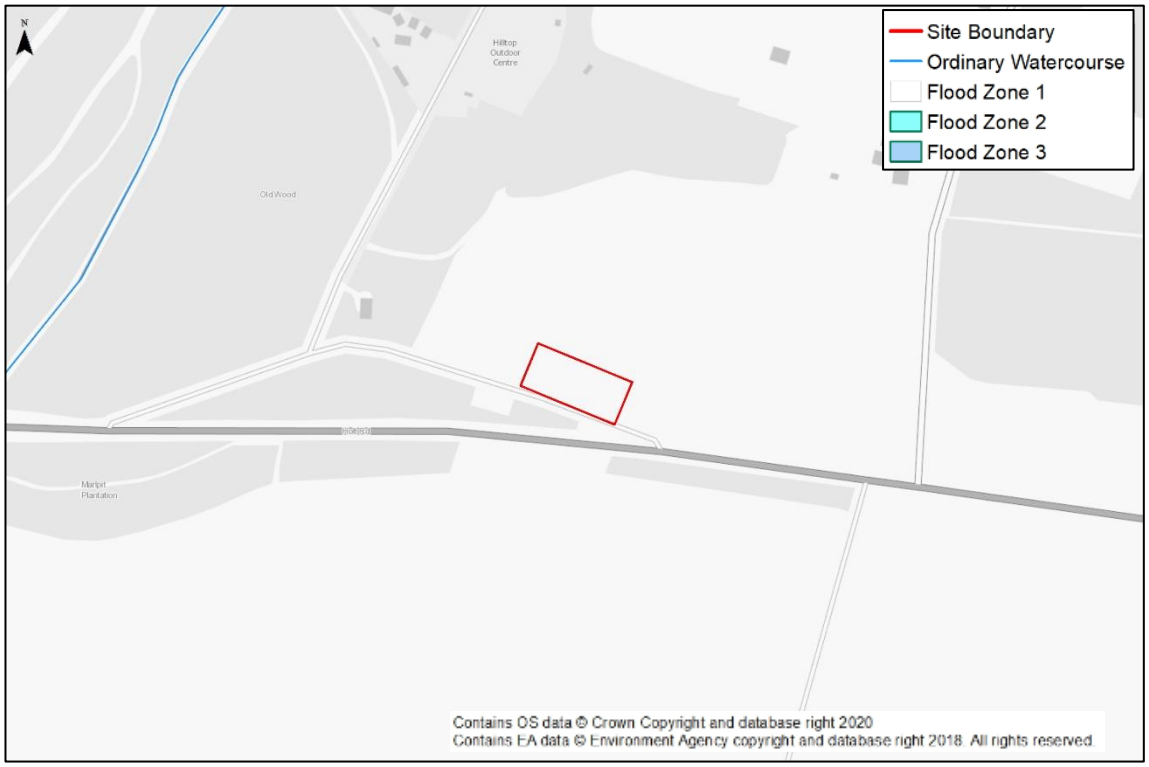



Figure 3.1: EA Flood Map for Planning

3.2.3 The site is shown by the EA's 'Flood Map for Planning' to lie wholly within Flood Zone 1 'Low probability', as can be seen in Figure 3.1 above.

## 3.3 Flood Risk from Surface Water

3.3.1 The EA 'updated Flood Map for Surface Water' ('uFMfSW') shows where areas could be potentially susceptible to surface water flooding in an extreme rainfall event. The latest mapping assesses flooding resulting from severe rainfall events based on the following three scenarios:

- 1 in 30 (3.3%) annual probability rainfall event ('High' risk)
- 1 in 100 (1%) annual probability rainfall event ('Medium' risk)
- 1 in 1000 (0.1%) annual probability rainfall event ('Low' risk)

3.3.2 Land at lower than 1 in 1000 (0.1%) annual probability of flooding is considered to be 'Very Low' risk of flooding.

3.3.3 An extract of the Updated Flood Map for Surface Water for the site is shown in Figure 3.2. A copy of the map is also included in Figure GIS004 of Appendix A, with Figures GIS005, GIS007 and GIS009 showing predicted flood depths for each of the three risk scenarios.

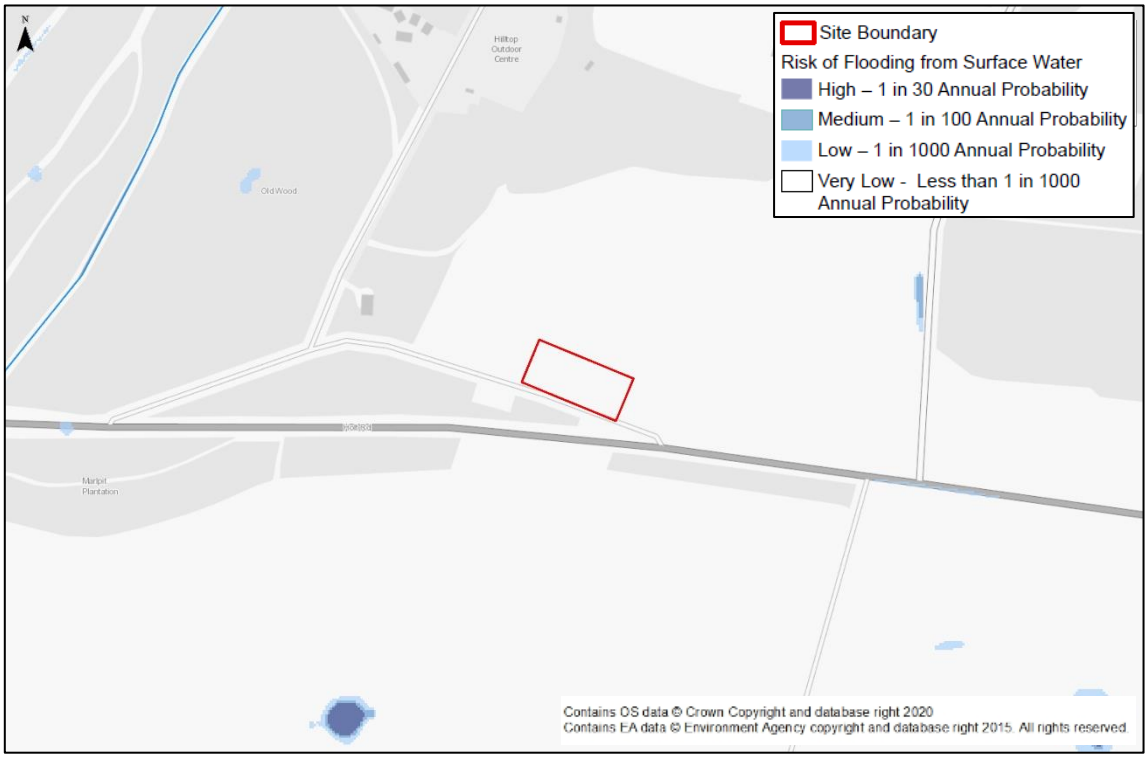



Figure 3.2: EA Updated Flood Map for Surface Water

3.3.4 It should be noted that the surface water maps are generated using a generic methodology on a national scale, whereby rainfall is routed over a ground surface model. The analysis does not take account of any specific local information on below-ground drainage infrastructure and infiltration, although an adjustment is included in urban areas to account for the impact of sewerage and a standard infiltration allowance based on soil type. Consequently, the mapping provides a guide to potentially vulnerable areas based on the general topography of an area.

3.3.5 The Surface Water Flood Map indicates that the whole site has a 'Very Low' risk of surface water flooding. Further to the south and east the maps show areas of 'Low' 'Medium' and 'High' risk with some isolated areas of risk, associated with low-lying topography.

## 3.4 Historic Flood Map

3.4.1 The EA 'Historic Flood Map' is an open-source online dataset showing the maximum extent of all individual recorded flood outlines from river, the sea and groundwater and shows areas of land that have previously been subject to flooding.

3.4.2 The mapping indicates that there have been no historic incidents of flooding on site. There are also no records of flooding on site within the NNDC SFRA (2017).

## 3.5 Groundwater Flood Risk

3.5.1 NNDC SFRA includes mapping in Appendix A which show Areas Susceptible to Groundwater Flooding (AStGWf). These maps are strategic-scale and show groundwater flood areas on a 1km square grid, where geological and hydrogeological conditions indicate that groundwater might emerge. The maps do not show the likelihood of groundwater flooding occurring, nor do they account for the chance of flooding from groundwater rebound.

3.5.2 Appendix A Index Grid: NN_14 in the SFRA indicates that the site is not susceptible to groundwater flooding, as shown in Figure 3.3 below.

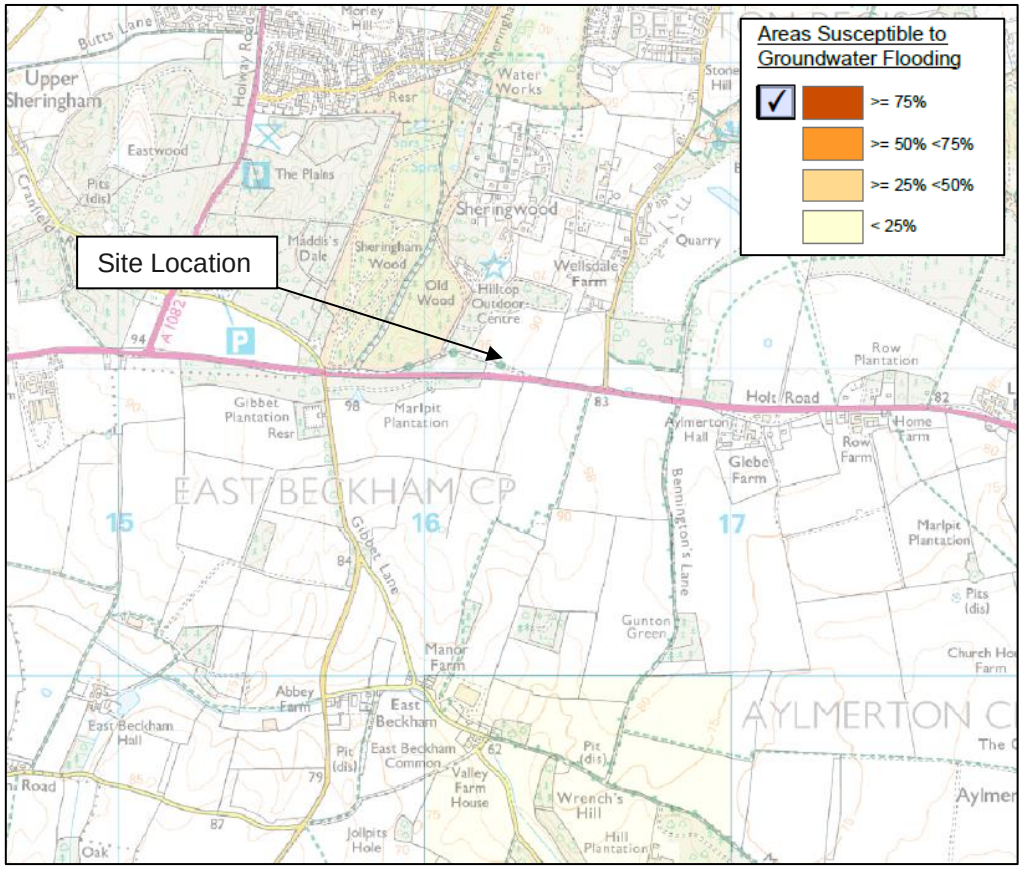



Figure 3.3: AStGWf mapping (NNDC SFRA, 2017)

## 3.6 EA Flood Risk from Reservoirs Map

3.6.1 The EA provides maps showing the risk of flooding in the event of a breach from reservoirs, based only on large reservoirs (over 25,000 cubic metres of water).

3.6.2 It should be emphasised that the likelihood of flooding from reservoir breach is very small in any case; the EA is the enforcement authority for the Reservoirs Act (1975) and all large, raised reservoirs are inspected and supervised by reservoir panel engineers. The EA's website states:

*'Reservoir flooding is extremely unlikely to happen. There has been no loss of life in the UK from reservoir flooding since 1925. All large reservoirs must be inspected and supervised by reservoir panel engineers. As the enforcement authority for the Reservoirs Act 1975 in England, we ensure that reservoirs are inspected regularly and essential safety work is carried out'.*

3.6.3 This mapping shows that the site is not in an area potentially at risk in the event of a reservoir breach.

## 3.7 Strategic Flood Risk Assessment

3.7.1 Information contained in the NNDC SFRA Final Report Level 1 (2017) and the NNDC Addendum SFRA (2018), has been reviewed as part of this study. Groundwater flood risk is highlighted in Section 6.8 of the SFRA (2017) and discussed in Section 3.5 above.

3.7.2 Appendix A of the SFRA includes interactive Flood Risk Mapping (Index Grid: NN_14) which includes:

- Fluvial Flood Zones – SFRA map indicates that the site is located within Flood Zone 1, as per the current EA maps in Section 3.2**.**
- Surface water flooding extents - SFRA map indicates that the site is wholly located within an area of 'very low' flood risk, as per the current EA maps in Section 3.3.
- Reservoir flooding – SFRA Map indicates the site is not within an area at risk of reservoir flooding, as per the current EA maps described in Section 3.6.

## 3.8 Flooding from sewers

3.8.1 Anglian Water Services (AWS) were consulted about records of historic flooding and confirmed in their response (dated 25th February 2021) "*that there have been instances of flooding within the vicinity of the proposed development*". However, AW utility plans do not show any sewers within the vicinity of the site.

3.8.2 A copy of AWS utility plans and email correspondence is included in Appendix C.

## 3.9 Summary of Flood Risk

3.9.1 Table 3.1 provides an overview of the flood risk to the site, based on the information obtained and detailed in Section 3.

| Source of Flooding | Risk of Flooding to Site | Comment/Justification | Source of data | Mitigation requirements for new development (see Section 6) | Risk of Flooding to Site after mitigation |
|---|---|---|---|---|---|
| **Fluvial** | | The whole site is located within Flood Zone 1. | SFRA<br>EA Flood Map for Planning (see Section 3.2) | n/a | |
| **Surface Water/ Pluvial)** | | The whole site has a 'Very Low' susceptibility to surface water flooding. | EA surface water flood maps (See Section 3.3)<br>SFRA | Liaise with NCC in development of surface water drainage strategy.<br>(See Section 6) | |
| **Ground water** | | The NNDC SFRA AStGWf mapping in Appendix A show the whole site has a 'negligible' risk.<br>BGS boreholes show groundwater elevations more than 10m below ground level.<br>No mention of historic groundwater flooding incidents on site in the SFRA. | SFRA<br>BGS Viewer<br>Soilscapes website | n/a | |
| **Reservoir, Canals, Ponds and Other Artificial Sources** | | The site is not within an area at risk in the event of a reservoir breach. | Flood Risk from Reservoirs Map (see Section 3.6) | n/a | |
| **Sewers** | | The SFRA does not have any information relating to flooding from sewers or water mains on site. Correspondence with AW indicates there have been incidents of flooding within the vicinity of the site but their asset maps show there are no sewers on site or within the vicinity.Therefore, the risk is considered to be 'low'. | SFRA<br>Anglian Water asset maps | n/a | |
| | | | | | |
| Key: | | **Low/Negligible Risk** – No noticeable impact to site and not considered to be a constraint to development | | | |
| | | **Medium Risk** – Issue requires consideration but not a significant constraint to development | | | |
| | | **High Risk** – Major constraint to development requiring active consideration in mitigation proposals | | | |

Table 3.1: Summary of Sources of Flood Risk

# 4 Impact of Climate Change

4.1.1 In considering flood risk to the site, it is necessary to fully consider the potential impacts of climate change for the lifetime of the development within the mitigation measures. The EA released new guidance in February 2016 (updated July 2021) on the application of climate change allowances in flood risk assessments[1].

4.1.2 Whereas the previous approach was to consider a standard +20% allowance to peak river flows to allow for potential climate change impacts – with the associated flood levels provided by the EA – the new guidance sets out a range of % allowances that require consideration. These vary according to a number of factors, including site location (river basin district), Flood Zone of the development and flood vulnerability classification of the development.

4.1.3 Based on the sites location and topography it is unlikely that climate change will have an impact on the risk of fluvial flooding.

4.1.4 The July 2021 document updates the fluvial recommendations, but tidal and pluvial recommendations are unchanged.

4.1.5 Increase in rainfall intensities has been considered in the development of the surface water drainage strategy as detailed in Table 4.1 and is discussed in Section 6**.**

| **Flood Risk Vulnerability Classification** | **Total Potential Change Anticipated for the '2080s' (2010 to 2115)** | |
|---|---|---|
| | **Central** | **Upper End** |
| Less Vulnerable | **+20%** | **+45%** |

Table 4.1: Climate Change – Peak Rainfall Intensity Allowances[1]

[1] https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances.

# 5 Proposed Development and Sequential Test

## 5.1 Proposed Development

5.1.1 The proposed development entails the relocation of an existing recycling centre that is located opposite the proposed site. The site is located immediately northeast of the existing recycling centre, on the northern side of Holt Road. The purpose of the relocation is to provide a new waste recycling facility, with the old one being decommissioned.

The new facility consists of:

- service area
- customer access road
- associated parking
- swales and landscaped areas for surface water drainage

5.1.2 A plan of the proposed development is included in Appendix B.

## 5.2 Flood Risk Vulnerability

5.2.1 NPPF PPG 'Flood Risk and Coastal Change' Table 2 confirms the *'Flood risk vulnerability classification'* of a site, depending upon the proposed usage. This classification is subsequently applied to PPG Table 3 to determine whether:

- the existing development is suitable for the flood zone in which it is located, and
- whether an Exception Test is required for the existing development.

5.2.2 The proposed development is classified as 'less vulnerable' development and will be located wholly within **Flood Zone 1**.

## 5.3 NPPF Sequential and Exception Test

5.3.1 The NPPF follows a sequential risk-based approach in determining the suitability of land for development in flood risk areas, with the intention of steering all new development to the lowest flood risk areas.

5.3.2 The Sequential Test is a planning exercise to consider whether there are 'reasonably available' alternative sites at lower probability of flooding that would be suitable for the existing development.

5.3.3 Since all development will be in Flood Zone 1 and are already located in the area at lowest probability of flooding, the Sequential Test has been passed and the Exception Test is not required.

# 6 Flood Mitigation Strategy

## 6.1 Surface Water

6.1.1 The site is located on a ridge of high ground, as described in Sections 2.3 and 2.5**,** hence there is no risk from overland flows (from offsite) as the only runoff is generated from within the site itself. As the majority of the site is being developed any existing surface water flood risk will be mitigated as all post development site runoff will be captured in the proposed surface water management strategy outlined in Section 7.

## 6.2 Sequential Approach

6.2.1 The NPPF encourages the application of the 'sequential approach' in new developments, i.e., locating the more sensitive/vulnerable elements of new development in the areas which lie at lowest probability of flooding and, conversely, reserve the areas of the site at greatest risk of flooding for the least vulnerable elements of the development (or, preferably, leave such areas undeveloped).

6.2.2 All proposed development for this site is in Flood Zone 1 and there are no other Flood Zones present on site, hence the sequential approach is achieved by default.

## 6.3 Safe Access

6.3.1 It is necessary to consider and incorporate safe access arrangements as part of the mitigation, to ensure the users/occupants of the development are safe in times of flooding.

6.3.2 As the entire site lies within Flood Zone 1, it is considered that access and egress to and from the site will be safe.

# 7 Surface Water Management Strategy

## 7.1 Overview

7.1.1 As of April 2015, the LLFA has become a statutory consultee on planning applications for surface water management. As the LLFA, Norfolk County Council are therefore responsible for the approval of surface water drainage systems within new major development. Major development consists of any of the following:

(a) the provision of dwelling houses where residential development of 10 or more units; or where the development is to be carried out on a site having an area of 0.5 hectares or more and the number of units is not known

(b) the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more, or

(c) development carried out on a site having an area of 1 hectare or more.

7.1.2 The surface water drainage proposals for the site are detailed in the separate 'Drainage Strategy Report' (Stantec, February 2021) which accompanies the planning application. This details a proposed strategy based on on-site attenuation and infiltration.

7.1.3 The proposed drainage design will discharge runoff within the site boundary; hence, there will be no increased flood risk to external receptors as part of the development proposals.

## 7.2 Context

7.2.1 The proposed development entails the relocation of an existing recycling centre that is located opposite the proposed site. The site is located immediately northeast of the existing recycling centre, on the northern side of Holt Road. The purpose of the relocation is to provide a new waste recycling facility, with the old one being decommissioned.

7.2.2 The drainage strategy proposal is to convey runoff from the proposed waste recycling facility into surrounding swales and landscaped areas around the perimeter of the hardstanding area and discharge all flows via infiltration within the boundary of the compound.

7.2.3 Runoff from the access road and car parking areas will be drained to an infiltration swale adjacent to the road. The infiltration swale will provide attenuation, treatment and discharge for the surface water runoff from this area. The service area will be drained via a series of gullies and conveyed through a piped drainage system, which will include a proprietary water management product, before discharging into the adjacent swale to infiltrate and discharge into the ground. For the proposed drainage strategy, please see Stantec drawing *49868_2001_501_P03 - Drainage Layout* (Appendix B).

## 7.3 Pollution Hazard

**Treatment Train 1 – Service Yard**

Runoff from the service yard is likely to have a high risk of pollution due to the movement and storage of household waste material in this area. Possible surface water pollution could come from the following sources.

- operational vehicles, due to exhaust products; wear and corrosion; and leaks or spillages of fuel or oil
- leaks and spillages from waste storage containers
- animal faeces from wild animals and the disposal of pet bedding (vegetarian animals)
- litter from site users

Treatment train 1 will also take some runoff from the site entrance and the staff parking spaces by the site entrance. Runoff from this area will have a low risk of pollution. Considering the pollution risk of the service yard, the overall pollution risk for treatment train 1 will be high.

**Treatment Train 2 – Customer Access Road and Car Park**

The runoff from the proposed customer access road and car parking is likely to have a low risk of pollution. Possible sources of pollution in these areas include the following.

- customer vehicles, due to exhaust products; wear and corrosion; and leaks or spillages of fuel or oil
- faeces from wild animals
- litter from site users

The Simple Index Approach, as described in the 'SuDS Manual' (CIRIA C753, 2015), has been used to assess the pollution hazard level for total suspended solids (TSS), heavy metals and hydrocarbons. Based on the descriptions provided in Table 26.2 of the 'SuDS Manual'

Therefore, the service yard is considered to have a 'high' pollution hazard level and the customer access road and associated parking is considered to have a 'low' pollution hazard level, the corresponding Pollution Hazard Indices will be taken into account (Table 7.1).

| Land use | Pollution hazard level | Total suspended solids (TSS) | Metals | Hydro-carbons |
|---|---|---|---|---|
| Residential roofs | Very low | 0.2 | 0.2 | 0.05 |
| Other roofs (typically commercial/ industrial roofs) | Low | 0.3 | 0.2 (up to 0.8 where there is potential for metals to leach from the roof) | 0.05 |
| Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day | Low | 0.5 | 0.4 | 0.4 |
| Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways[1] | Medium | 0.7 | 0.6 | 0.7 |
| Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways[1] | High | 0.8[2] | 0.8[2] | 0.9[2] |

Table 7.1: Pollution Hazard Indices as per CIRIA C753, Table 26.2

## 7.4 Pollution Mitigation

**Treatment Train 1 – Service Yard**

The proposed drainage network for the service yard includes a proprietary system (V-Septor Hydrodynamic Separator by ACO) to treat and contain pollutants before the runoff enters the bio-retention swale, which will provide additional treatment before the runoff discharge into the surrounding natural soils. Surface water runoff from the service yard will be captured by a series of gullies, providing some initial treatment by catching some pollutants in the gully sumps. See Appendix B.

To ensure that the runoff meets all the necessary water quality requirements, sampling points are to be installed at strategic locations next to the swale, so that they can be monitored.

**Treatment Train 2 – Customer Access Road and Car Park**

Runoff from the customer access road and associated parking will be drained via kerb inlets along the length of the road into the infiltration swale.

To assess the effectiveness of the proposed pollution mitigation systems, the Pollution Mitigation Indices have been calculated and compared against the Pollution Hazard Indices (as per Section 26.7 in CIRIA C753). This comparison demonstrates that the overall proposed

pollution mitigation sufficiently deals with the pollution hazard for the development (Table 7.2 and Table 7.3).

Pollution Mitigation Indices for the individual systems have been taken from Table 26.4 in the 'SuDS' Manual and information from product suppliers (Appendix C). As the management systems are used in sequence, a factor 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations (Equation 1).

***Equation 1: Total SuDS mitigation index = mitigation index$_1$ + 0.5 (mitigation index$_2$) + 0.5 (mitigation index$_3$)***

| Management Component (in Sequence) | Information Source | Pollution Mitigation Indices | | |
|---|---|---|---|---|
| | | **TSS** | **Metals** | **Hydrocarbons** |
| Hydrocarbon and contaminant filter system | ACO V-Septor Hydrodynamic Separator | 0.5 | 0.4 | 0.5 |
| Bioretention Swale | CIRIA C753, Table 26.4 (300mm min soil with good contaminant attenuation potential) | 0.8 | 0.8 | 0.8 |
| **Total Mitigation Indices (as per Equation 1)** | | **0.9** | **0.8** | **0.9** |
| **Pollution Hazard Indices** | | **0.8** | **0.8** | **0.9** |
| Pollution Mitigation Index ≥ Pollution Hazard Index | | **Yes** | **Yes** | **Yes** |

Table 7.2: Pollution Mitigation Indices – Treatment Train 1 - Service Yard

| Management Component (In Sequence) | Information Source | Pollution Mitigation Indices | | |
|---|---|---|---|---|
| | | **TSS** | **Metals** | **Hydrocarbons** |
| Infiltration Swale | CIRIA C753, Table 26.4 A layer of dense vegetation underlain by a soil with good contaminant attenuation potential of at least 300mm in depth | 0.6 | 0.5 | 0.6 |
| **Total Mitigation Indices (as per Equation 1)** | | **0.6** | **0.5** | **0.6** |
| **Pollution Hazard Indices** | | **0.5** | **0.4** | **0.4** |
| Pollution Mitigation Index ≥ Pollution Hazard Index | | **Yes** | **Yes** | **Yes** |

Table 7.3: Pollution Mitigation Indices – Treatment Train 2 - Customer Access Road and Car Park

## 7.5 Maintenance

7.5.1 This section outlines the maintenance requirements for the proposed drainage features. Further to individual drainage feature maintenance requirements, the site in general should be managed with good housekeeping to help maintain the performance of the drainage network. Suggested site wide management activities / provisions include spill kits (to be kept on site), pest control and regular litter picking.

7.5.2 The following maintenance should be programmed and undertaken for all parts of the drainage infrastructure:

**ACO V-Septor Hydrodynamic Separator (ACO)**

To ensure the reliable functioning of separators and ongoing environmental protection, the separator requires regular maintenance and servicing. ACO Service Partners work closely with the UK Environment Agency and are able to offer ongoing maintenance and service programmes, waste disposal, inspection and testing of separators. The ACO Water Management Design Service Team can be contacted on 01462 816666.

The unit should be inspected every 6 months, and the oil and floatable chamber and sludge trap emptied between 6 months and 3 years depending on pollution load.

Following the first two years of operation, the maintenance requirements for the ACO product should be reviewed and amended as required (i.e., maintenance periods can vary depending on pollutant load).

The ACO V-Septor Chamber is a Confined Space. It is not necessary to enter for routine maintenance. The flow breaker floor can be lifted using the lifting wire supplied (which should be extended according to the overall chamber depth. Local regulations must be fully observed in the event of planned or unplanned man entry. If in doubt you must consult with a Professional Engineer or other Competent Person who can advise.

**Gullies and Pipework**

The gully grates and sumps should be inspected weekly or as required. The gratings should be cleared of all material that is blocking the flow of surface water. If the gully sumps look like they are becoming full, they should be emptied using suitable sump cleaning equipment and waste material from the sumps should be disposed of offsite to an approved site.

**Spent Fire Water**

Additionally, a penstock valve has been proposed for the discharge point into the network (Stantec drawing 49868/2001/501 in Appendix B). In the case of firefighting activity, or a major pollution spill event, the penstock valve can be closed to prevent polluted water entering the infiltration basin. The penstock valve is to be closed when / if safe to do so prior to extinguishing fires. The firefighting service personnel are to collect the residual firefighting water on the site prior to reopening the penstock valves.

The following tables outline the suggested maintenance regimes for the onsite SuDS features (Tables 7.4 and 7.5)

**Table 7.4: Swales Maintenance Schedule**

| Operation and Maintenance Requirements for Swales | | |
|---|---|---|
| **Maintenance schedule** | **Required action** | **Typical frequency** |
| Regular maintenance | Remove litter and debris | Monthly, or as required |
| | Cut grass – to retain grass height within specified design range | Monthly (during growing season) or as required |
| | Manage other vegetation and remove nuisance plants | Monthly at start, then as required |
| | Inspect inlets, outlets and overflows for blockages and clear if required | Monthly |
| | Inspect infiltration surfaces for ponding, compaction, silt accumulation, record areas where water is ponding for >48 hours | Monthly, or when required |
| | Inspect vegetation coverage | Monthly for 6 months, quarterly for 2 years, then half yearly |
| | Inspect inlets and facility surface for silt accumulation, establish appropriate silt removal frequencies | Half yearly |
| Occasional maintenance | Reseed areas of poor vegetation growth, alter plant types to better suit conditions, if required | As required or if bare soil is exposed over 10% or more of the swale treatment area |
| Remedial actions | Repair erosion or other damage by re-turfing or re-seeding | As required |
| | Relevel uneven surfaces and reinstate design levels | As required |
| | Scarify and spike topsoil layer to improve infiltration performance, break up silt deposits and prevent compaction of the soil surface | As required |
| | Remove build-up of sediment on upstream gravel trench, flow spreader or at top of filter strip | As required |
| | Remove and dispose of oils or petrol residues using safe standard practices | As required |

**Table 7.5: Bioretention System Maintenance Schedule**

| Operation and Maintenance Requirements for Swales | | |
|---|---|---|
| **Maintenance schedule** | **Required action** | **Typical frequency** |
| Regular inspections | Inspect infiltration surfaces for silting and ponding, record de-watering time of the facility and assess standing water levels in underdrain (if appropriate) to determine if maintenance is necessary | Quarterly |
| | Check operation of underdrains by inspection of flows after rain | Annually |
| | Assess plants for disease infection, poor growth, invasive species etc and replace as necessary | Quarterly |
| | Inspect inlets and outlets for blockages | Quarterly |
| Regular maintenance | Remove litter and surface debris and weeds | Quarterly (or more frequently for tidiness or aesthetic reasons) |
| | Replace and plants, to maintain planting density | Quarterly to biannually |
| | Remove sediment, litter and debris build-up from around inlets or from forebays | Quarterly to biannually |
| Occasional maintenance | Infill any holes or scour in the filter medium, improve erosion protection if required | As required |
| | Repair minor accumulations of silt by raking away surface mulch, scarifying surface of medium and replacing mulch | As required |
| Remedial actions | Remove and replace filter medium and vegetation above | As required but likely to be >20 years |

# 8 Residual Risk

8.1.1 The proposed drainage design has been modelled and designed for no flooding in the 100-year (plus 45% for climate change) rainfall event. In the event of rainfall event greater that the 100-year (plus 45% for climate change) rainfall event, flood water is to be directed away from site buildings and car parking areas. Exceedance flood waters will flow towards the eastern end of the site into the service yard, landscaped area and to the open field adjacent to the site.

8.1.2 Regular inspection and maintenance of any drainage systems should also be undertaken to further mitigate this residual risk.

8.1.3 Construction methodology will be agreed at detailed design with a Construction Environmental Management Plan (CEMP) to be provided prior to any construction being undertaken.

8.1.4 As such, the residual risk is considered to be acceptable for the lifetime of the development.

# 9 Conclusion

9.1.1 This Flood Risk Assessment (FRA) has been prepared by Stantec on behalf of our client, Norfolk County Council, to accompany a full planning application for a proposed Recycling Centre, on Holt Road in Sheringham. Norfolk.

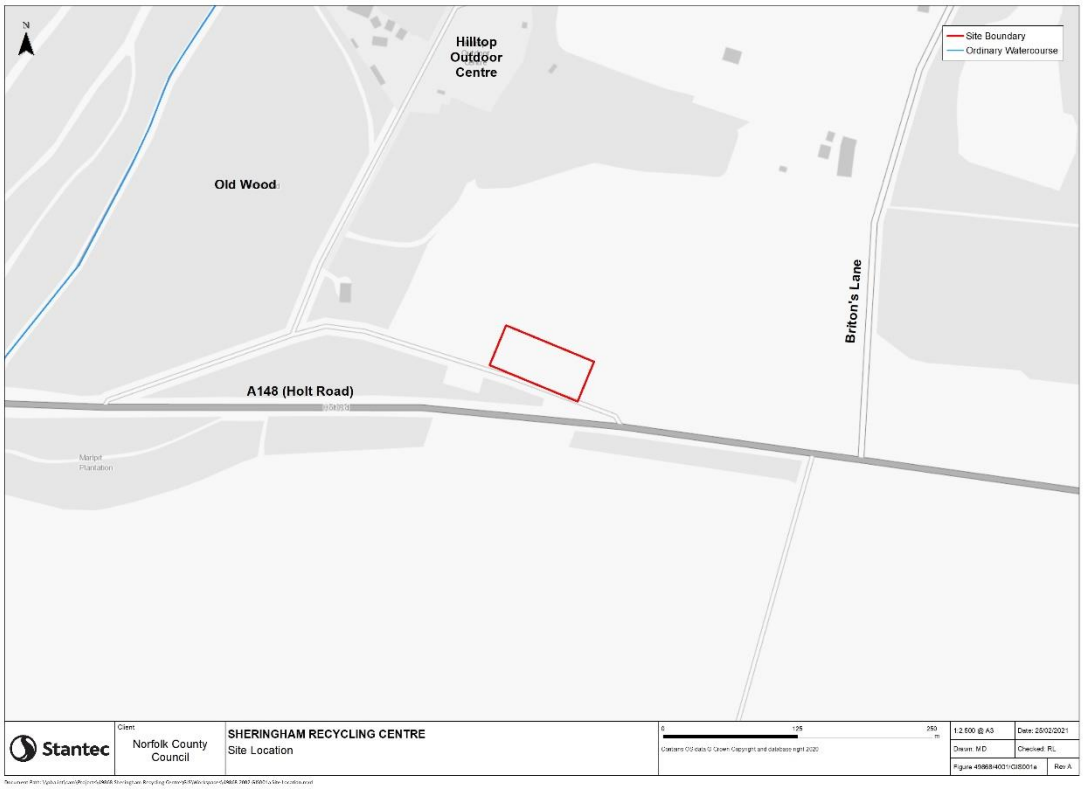
9.1.2 This FRA concludes that:

- The Environment Agency's Flood Map for Planning confirms the existing site is located within Flood Zone 1
- The proposed agricultural development is classified as 'less vulnerable' development and will be located wholly within Flood Zone 1
- The surface water drainage proposals for the site are detailed in the separate 'Drainage Strategy Report' (Stantec, February 2021) but based on on-site attenuation and infiltration within the site boundary

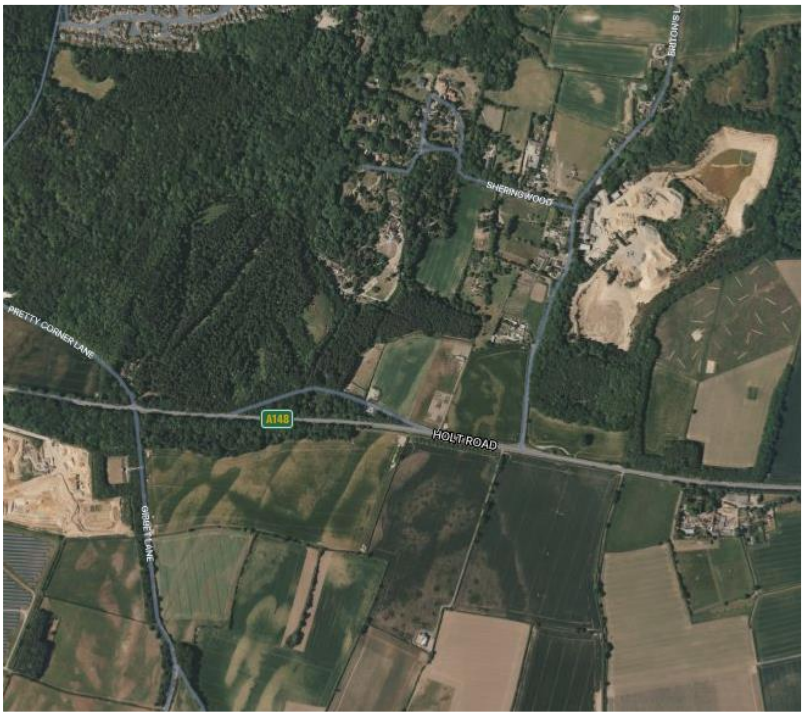
9.1.3 In conclusion, the future occupants and users of the operational site will be safe from flooding and there will be no detrimental impact on third parties. The proposal complies with the National Planning Policy Framework (NPPF) and local planning policy with respect to flood risk and is an appropriate development at this location.

9.1.4 In summary, the proposed surface water treatment systems have been assessed using the Simple Index Approach, as per the 'SuDS Manual', specifically in response to comments from Norfolk Country Council, as Lead Local Flood Authority. The proposed surface water management systems provide adequate surface water treatment for the expected pollution hazards for the proposed development based on the Simple Index Approach. In line with Table 4.3 of the SuDs Manual (Minimum water quality management requirements for discharge to receiving surface waters and groundwater) a detailed Risk Assessment and Groundwater Activity Permit will be submitted to the Environment Agency as the Environmental Regulator and should be referred to alongside this report.

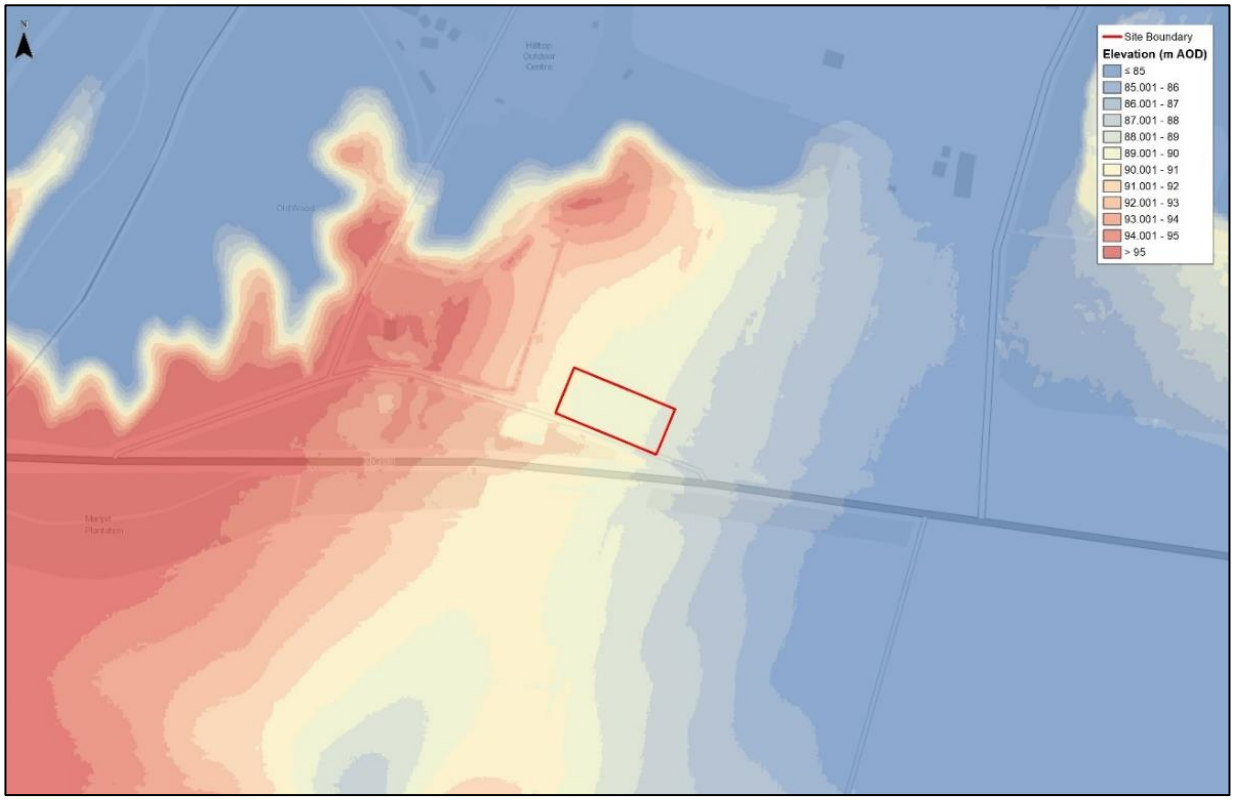
# Appendix A Location Maps



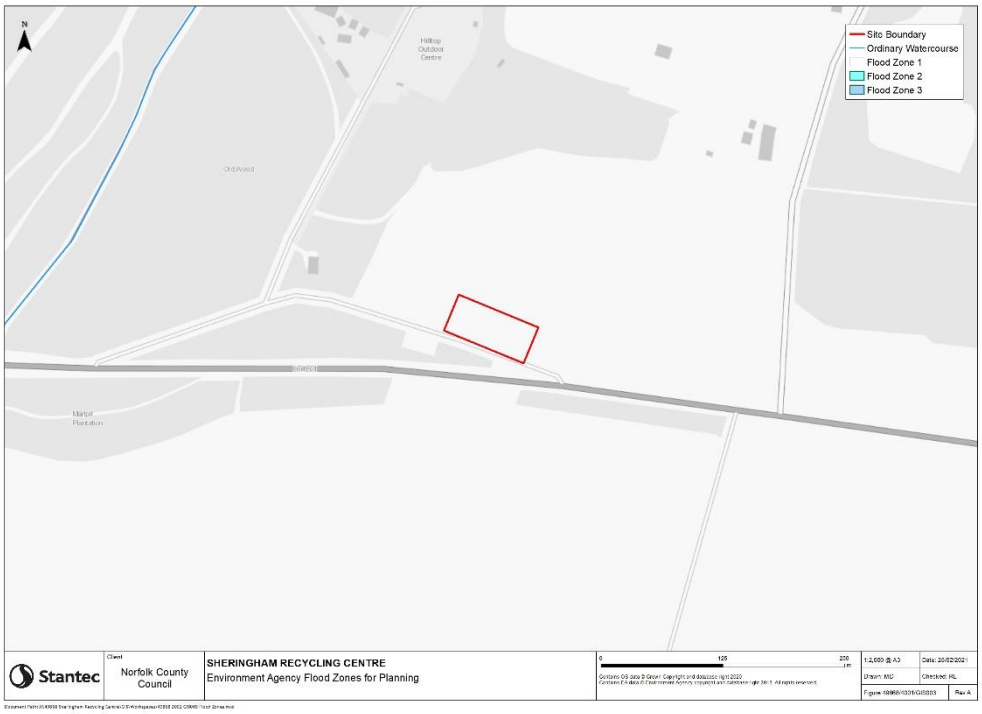

GIS001a - Site Location Plan (Aerial Photography)



GIS001b - Site Location Plan (Aerial Photography)

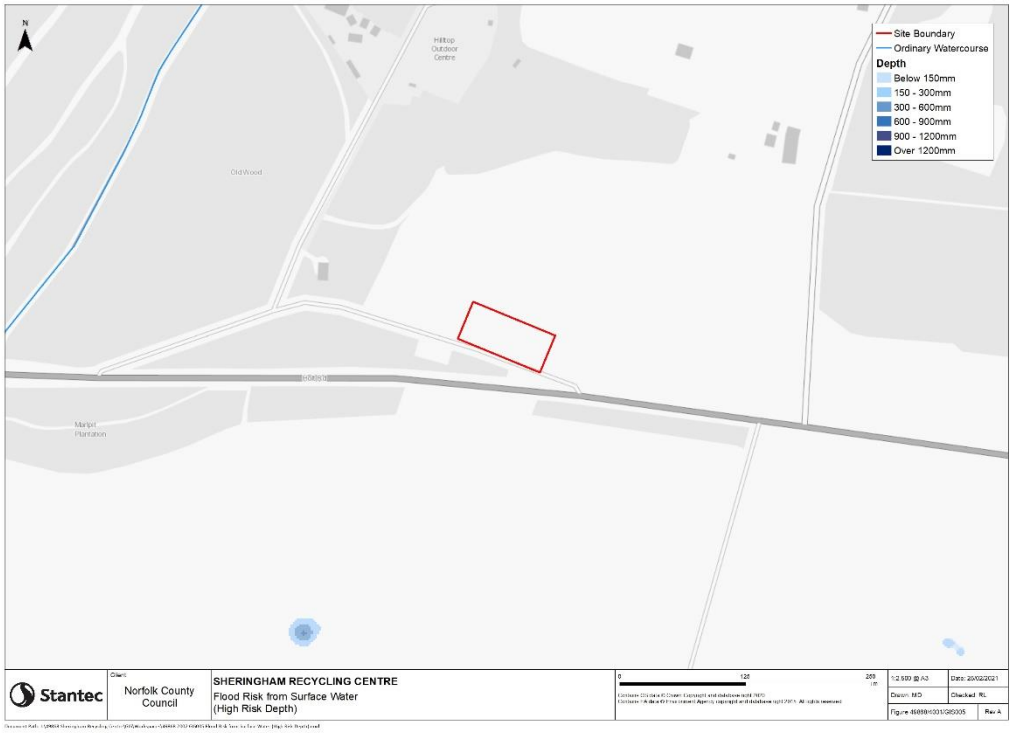



GIS002 Area Topography (LiDAR)

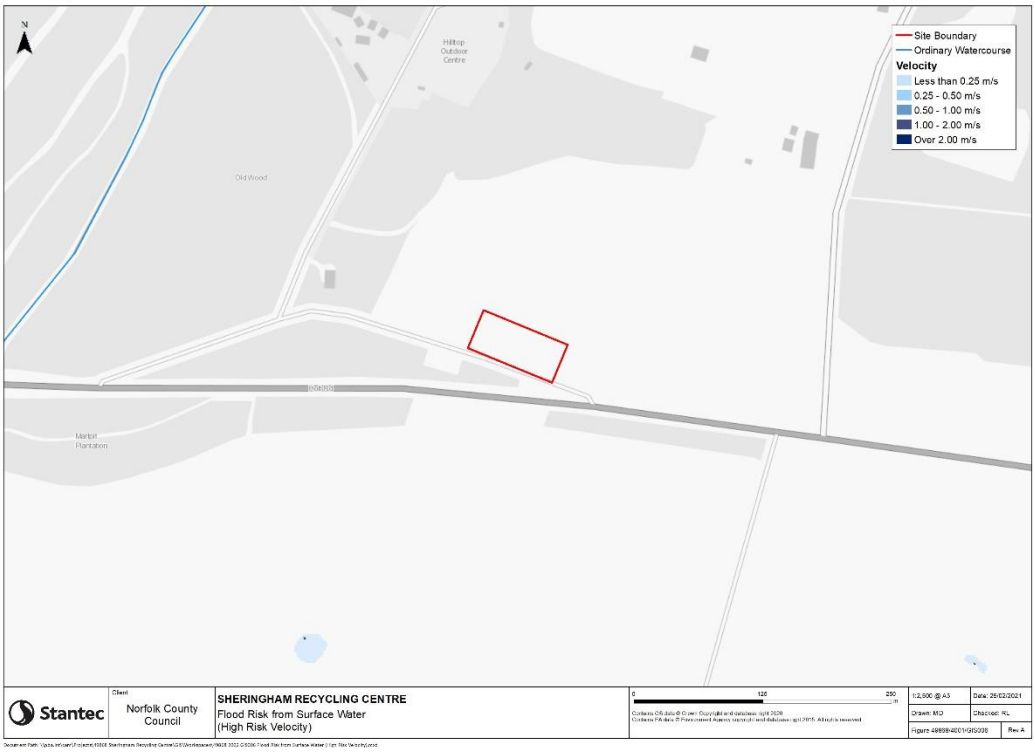



GIS003 - EA Flood Zone Map

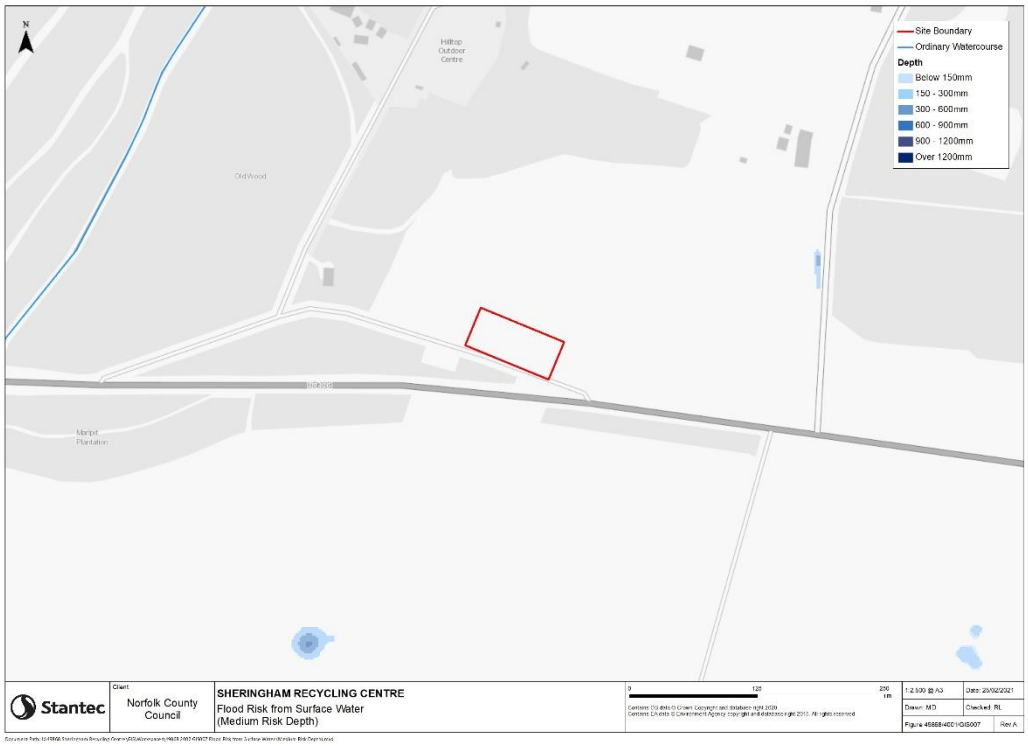

GIS004 - Flood Risk from Surface Water (Flood Extents)



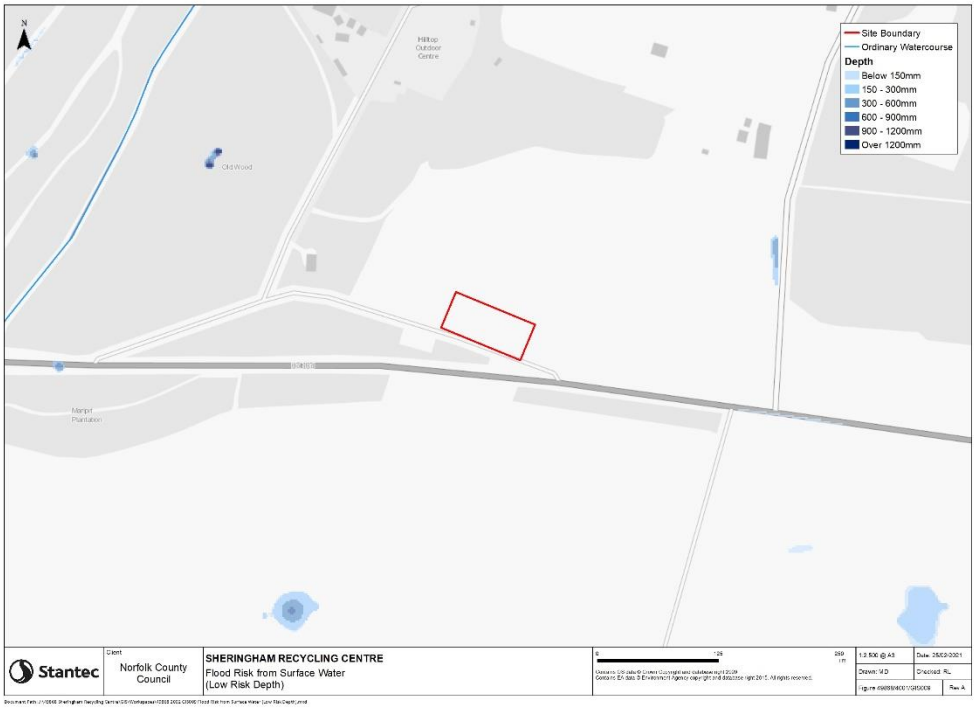

GIS005 - Flood Risk from Surface Water (High Risk Depth)



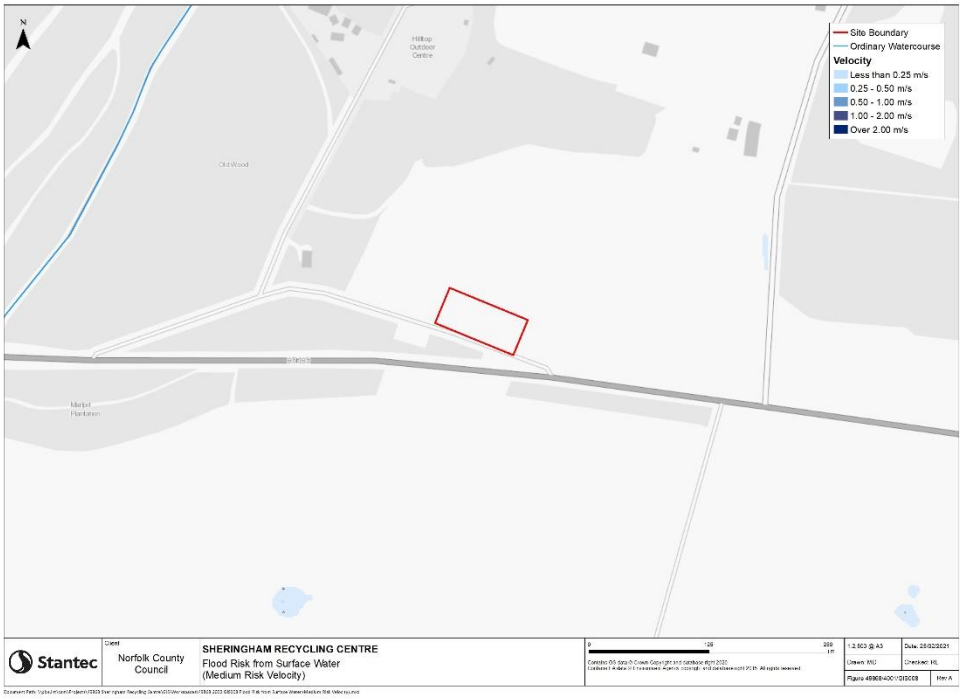

GIS006 - Flood Risk from Surface Water (High Risk Velocity)



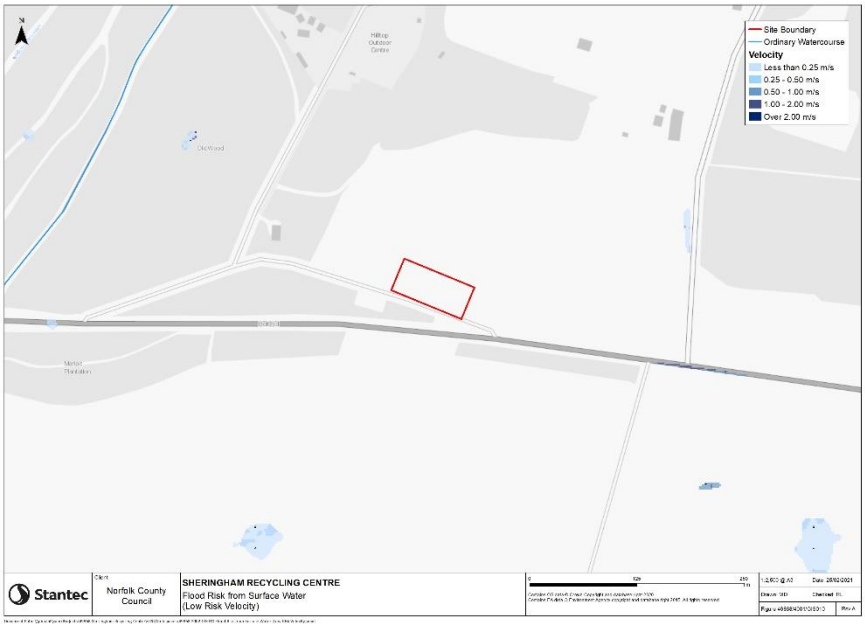

GIS007 - Flood Risk from Surface Water (Medium Risk Depth)



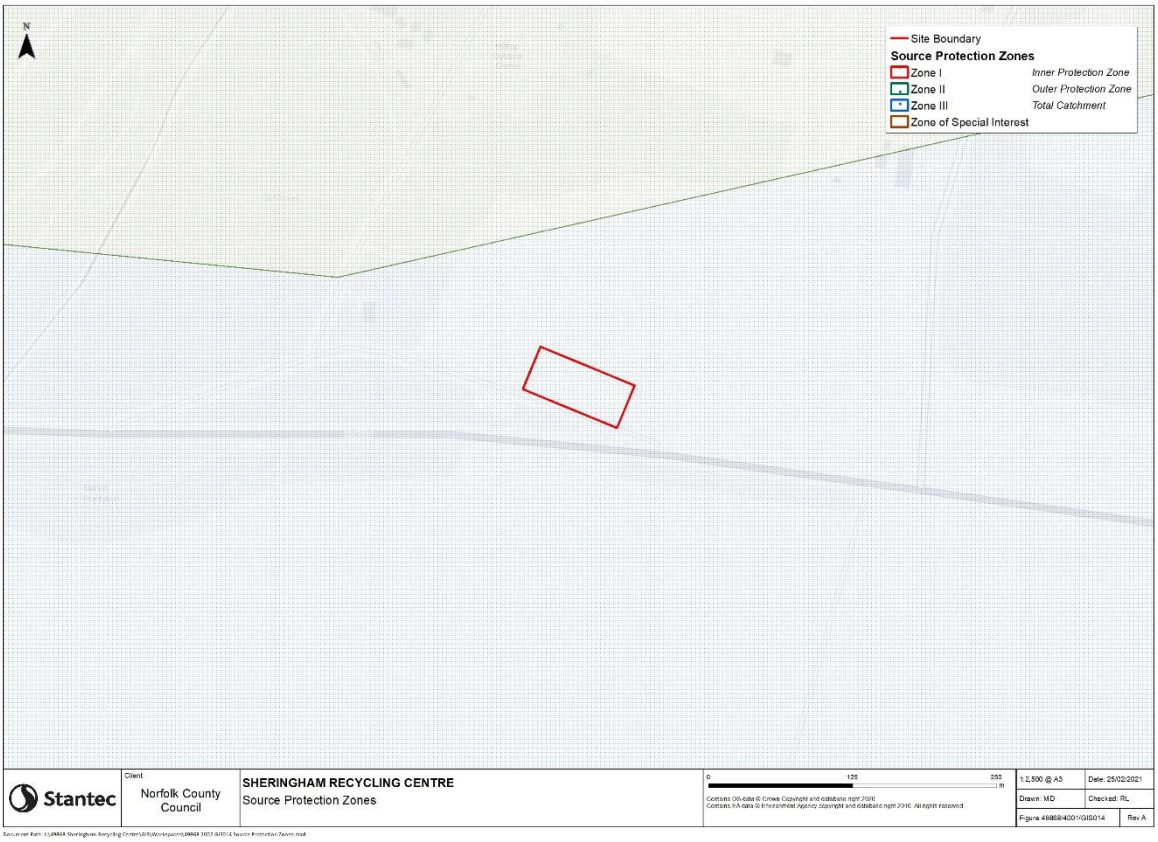

GIS009 - Flood Risk from Surface Water (Low Risk Depth)




GIS008 - Flood Risk from Surface Water (Medium Risk Velocity)

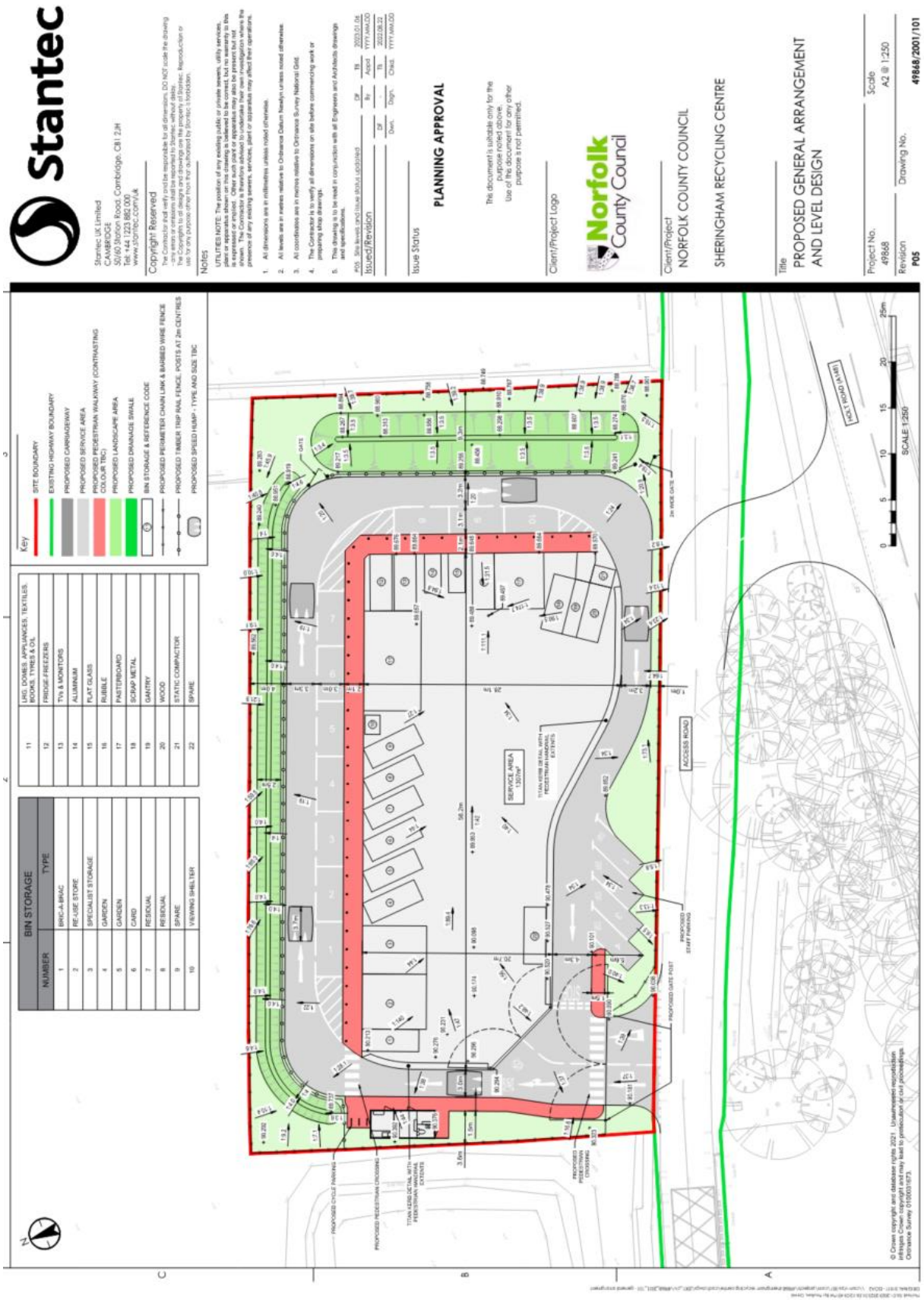



GIS010 - Flood Risk from Surface Water (Low Risk Velocity)

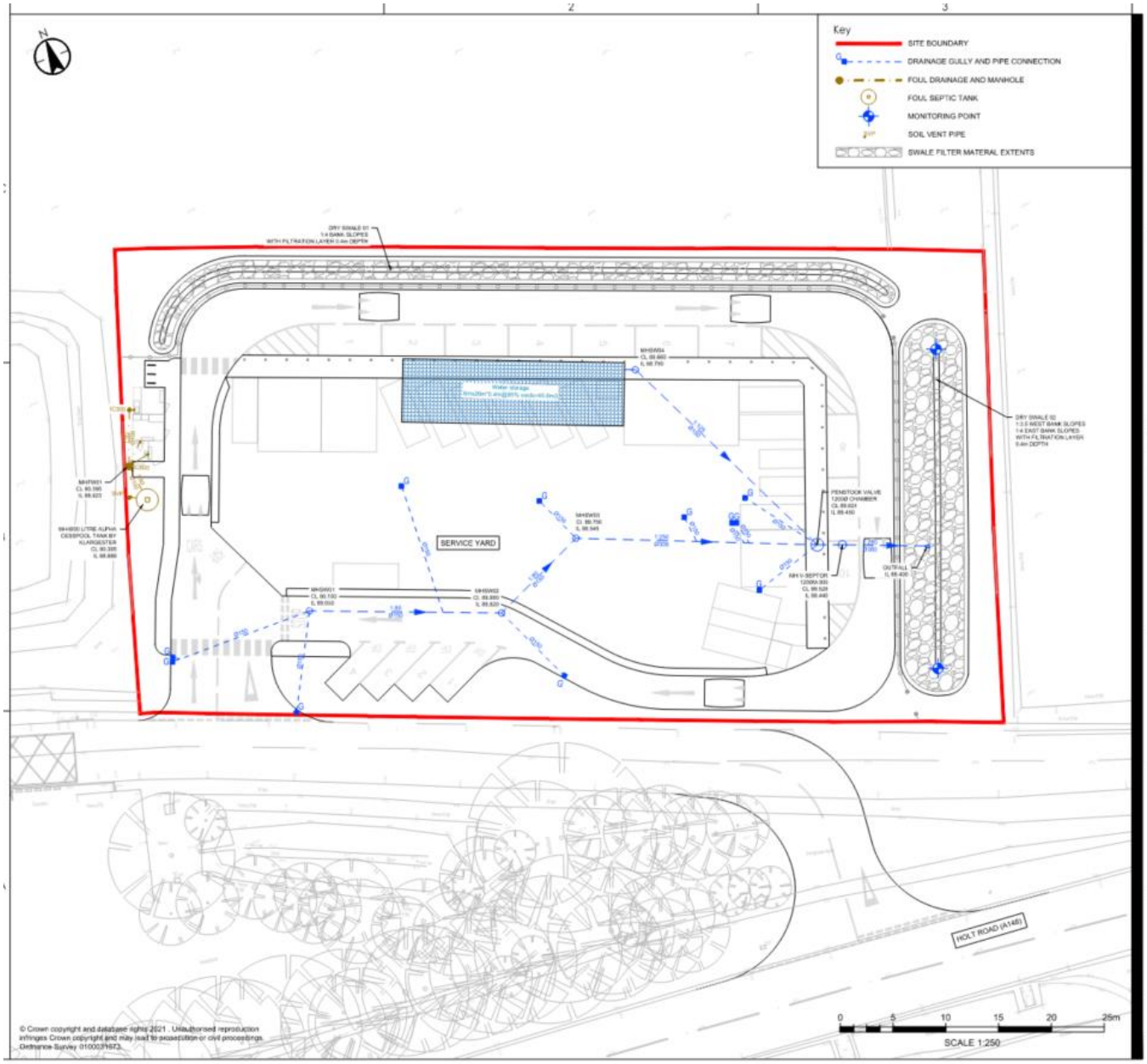



GIS0014 – Source Protection Zones

# Appendix B Proposed Development




Layout Plan




Stantec

Stantec UK Limited
CAMBRIDGE
50/60 Station Road, Cambridge, CB1 2JH
Tel: +44 1223 882 000
www.stantec.com/uk



Notes

UTILITIES NOTE: The position of any existing public or private sewers, utility services, plant or apparatus shown on this drawing is believed to be correct, but no warranty to this is expressed or implied. Other such plant or apparatus may also be present but not shown. The Contractor is therefore advised to undertake their own investigation where the presence of any existing sewers, services, plant or apparatus may affect their operations.

1. All dimensions are in millimetres unless noted otherwise.
2. All levels are in metres relative to Ordnance Datum Newlyn unless noted otherwise.
3. All coordinates are in metres relative to Ordnance Survey National Grid.
4. The Contractor is to verify all dimensions on site before commencing work or preparing shop drawings.
5. This drawing is to be read in conjunction with all Engineers and Architects drawings and specifications.

| | | | | |
|---|---|---|---|---|
| P04 DRAINAGE LAYOUT & ISSUE STATUS UPDATED | DF | TB | 2023.01.06 |
| Issued/Revision | | By | Appd | YYYY.MM.DD |
| | DF | - | TB | 2022.09.23 |
| | Dwn. | Dsgn. | Chkd. | YYYY.MM.DD |

Issue Status

**PLANNING APPROVAL**

This document is suitable only for the purpose noted above.
Use of this document for any other purpose is not permitted.

Client/Project Logo

Norfolk County Council

Client/Project

NORFOLK COUNTY COUNCIL

SHERINGHAM RECYCLING CENTRE

Title

PROPOSED DRAINAGE LAYOUT

| Project No. | Scale |
|---|---|
| 49868 | 1:250 @ A2 |
| Revision | Drawing No. |
| P04 | 49868/2001/501 |

# Appendix C Anglian Water Plans

**Laker, Richard**

**From:** Planning Liaison <planningliaison@anglianwater.co.uk>
**Sent:** 25 February 2021 12:44
**To:** Davison, Max
**Cc:** Laker, Richard
**Subject:** RE: Flood Risk Enquiry - Sheringham Recycling Centre

**Follow Up Flag:** Follow up
**Flag Status:** Flagged

Good afternoon Max

Thank you for your email regarding Holt Road south of Sheringham, Norfolk, NR26 8TW

Anglian Water is able to confirm that there have been instances of flooding within the vicinity of the proposed development. It is also possible that other flooding may have occurred that we do not have records of, other organisations such as the Local Lead Planning Authority, Local Planning Authorities Internal Drainage Board or the Environment Agency may have records. We recommend you submit a pre planning application form to enable Anglian Water to advise you of any suitable connection points for the proposed development and identify any mitigation that would be required. Further details including the application form can be found on our website https://www.anglianwater.co.uk/developing/planning--capacity/

Kind regards

Sandra

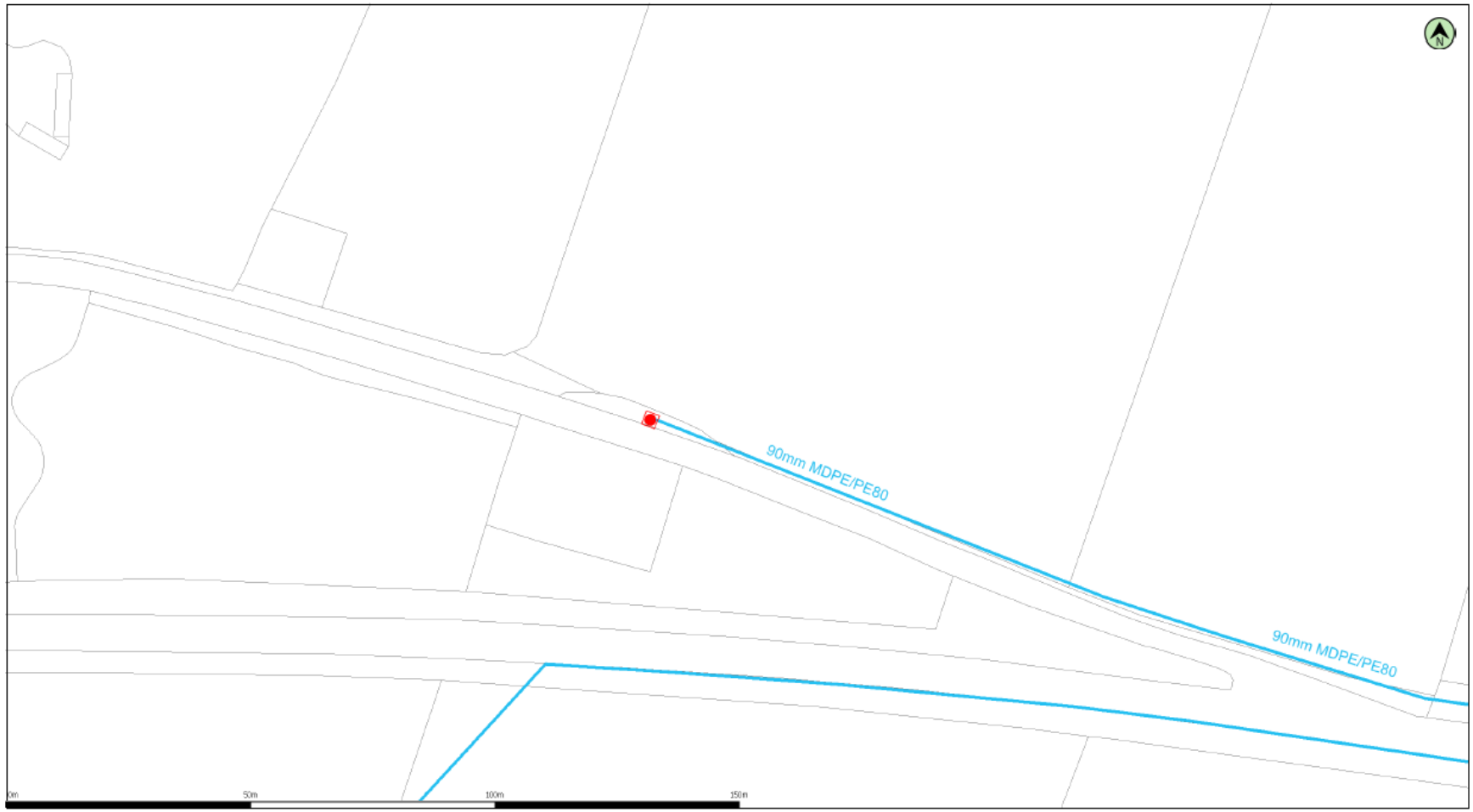
love every drop anglianwater

**Sandra De Olim**
Planning & Capacity - Development Services
Mobile: 07929804300
Telephone: 07929786955
Anglian Water Services Limited
Thorpe Wood House, Thorpe Wood, Peterborough, Cambridgeshire, PE3 6WT

From: Davison, Max <Max.Davison@stantec.com>
Sent: 24 February 2021 15:07
To: Planning Liaison <planningliaison@anglianwater.co.uk>
Cc: Laker, Richard <Richard.Laker@stantec.com>
Subject: Flood Risk Enquiry - Sheringham Recycling Centre



Dear Sir/Madam,




(c) Crown copyright and database rights 2021 Ordnance Survey 100022432 | Date: 24/03/21 | Scale: 1:748 | Map Centre: 616254,341028 | Data updated: 28/02/21 | Clean Water Plan A3

This plan is provided by Anglian Water pursuant its obligations under the Water Industry Act 1991 sections 196 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Limited (c) Crown copyright and database rights 2021 Ordnance Survey 100022432.This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death of personal injury resulting from negligence.

Potable Water
Raw Water (RAW)
Decommissioned Water
Fitting
Hydrant

victoria.mason2@norfolk.gov.uk

love every drop anglianwater


(c) Crown copyright and database rights 2021 Ordnance Survey 100022432 | Date: 24/03/21 | Scale: 1:748 | Map Centre: 616254,341028 | Data updated: 28/02/21 | Wastewater Plan A3

This plan is provided by Anglian Water pursuant its obligations under the Water Industry Act 1991 sections 198 or 199. It must be used in conjunction with any search results attached. The information on this plan is based on data currently recorded but position must be regarded as approximate. Service pipes, private sewers and drains are generally not shown. Users of this map are strongly advised to commission their own survey of the area shown on the plan before carrying out any works. The actual position of all apparatus MUST be established by trial holes. No liability whatsoever, including liability for negligence, is accepted by Anglian Water for any error or inaccuracy or omission, including the failure to accurately record, or record at all, the location of any water main, discharge pipe, sewer or disposal main or any item of apparatus. This information is valid for the date printed. This plan is produced by Anglian Water Services Limited (c) Crown copyright and database rights 2021 Ordnance Survey 100022432.This map is to be used for the purposes of viewing the location of Anglian Water plant only. Any other uses of the map data or further copies is not permitted. This notice is not intended to exclude or restrict liability for death or personal injury resulting from negligence.

- Foul Sewer
- Surface Sewer
- Combined Sewer
- Final Effluent
- Rising Main*
- Private Sewer*
- Decommissioned Sewer*
- Outfall*
- Inlet*
- Manhole*
- Sewage Treatment Works
- Public Pumping Station
- Decommissioned Pumping Station

*(Colour denotes effluent type)

victoria.mason2@norfolk.gov.uk

love every drop anglianwater


(c) Crown copyright and database rights 2021 Ordnance Survey 100019209 | Date: 24/03/21 | Scale: 1:748 | Map Centre: 616254,341028 | Data updated: 05/02/21 | Telecoms Plan A3

Important Information - please read The purpose of this plan is to identify Virgin Media apparatus. We have tried to make it as accurate as possible but we cannot warrant its accuracy. In addition, we caution that within Virgin Media apparatus there may be instances where mains voltage power cables have been placed inside green, rather than black ducting. Further details can be found using the "Affected Postcodes.pdf", which can be downloaded from this website. Therefore, you must not rely solely on this plan if you are carrying out any excavation or other works in the vicinity of Virgin Media apparatus. The actual position of any underground service must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. Accordingly, unless it is due to the negligence of Virgin Media, its employees or agents, Virgin Media will not have any liability for any omissions or inaccuracies in the plan or for any loss or damage caused or arising from the use of and/or any reliance on this plan. This plan is produced by Virgin Media Limited (c) Crown copyright and database rights 2021 Ordnance Survey 100019209.

Duct, Trench | Chamber | Cabinet

victoria.mason2@norfolk.gov.uk

Virgin media