STRATEGIC FLOOD RISK ASSESSMENT

March 2022

herrington CONSULTING LIMITED

In partnership with:

Thanet District Council

Thanet District Council

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Strategic Flood Risk Assessment

Thanet District Council

Contents Amendment Record

This report has been issued and amended as follows:

Issue	Revision	Description	Date	Author(s)	Checked by
1	0	Draft report	October 2021	TV, AW, NW	SMB
2	1	Minor amendments following discussions with TDC. Second draft report issued for review.	November 2021	TV	SMB
3	2	Minor amendments to text and appendices. Third draft report issued for review.	December 2021	TV, NW	SMB
4	3	Minor amendments. Revised report issued to external consultees for review	January 2022	TV	SMB
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Executive Summary

The National Planning Policy Framework (NPPF 2021) and accompanying National Planning Practice Guidance (NPPG) both emphasise the responsibility of Local Planning Authorities (LPA's) to ensure that flood risk is understood, managed effectively and sustainably throughout all stages of the planning process. This Strategic Flood Risk Assessment (SFRA) identifies that Thanet district is at risk of flooding from a number of sources, with over 26km of coastline and low-lying marshland surrounding the rivers Wantsum and Stour. It is therefore evident that flooding must be a key consideration for any future development within the Thanet district.

Whilst the majority of the urban areas including the main towns of Margate, Broadstairs and Ramsgate are situated on high chalk cliffs and are therefore naturally defended from flooding from the sea, the cliffs are susceptible to erosion, and as such, defences are in place to protect the cliffs. In addition, the low-lying areas of Margate town centre and the marshland surrounding the river network of the river Wantsum, Stour and Minster Stream are highly reliant on flood defences and therefore, it is critical that these defences are also maintained. Priority should be given to safeguarding the standard of protection provided by the defences over the lifetime of any development.

The urban areas of the district are partially susceptible to flooding from other sources which have to be taken into consideration as part of new legislation. The focus of this SFRA update is therefore to address any changes in policy and in legislation since both the original SFRA (published in 2009) and the Thanet District Council's (TDC) 'in-house' SFRA Addendum (published in 2018) were produced. The SFRA 2021 update aims to bring the planning context and flood risk information up to date. The main objectives are to identify the risk from each source of flooding at key locations within Thanet district and to state when a Flood Risk Assessment (FRA) is required. The report outlines the latest allowances for climate change required to be considered when appraising the risk of flooding.

This report is supplemented by a series of maps, which provide the information required to appraise the risk of flooding and includes the location of the key watercourses and defences, as well as historic records of flooding.

Notwithstanding this, it should also be acknowledged that the SFRA is a living document, which should be periodically updated to ensure that the most contemporary information in relation to flood risk is considered.

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1. Scope of Appraisal

1.1. Drivers for the SFRA

The National Planning Policy Framework (NPPF 2021) requires the Local Planning Authority (LPA) to apply a risk-based approach to the preparation of development plans with respect to potential flooding. This district-wide appraisal of flood risk is to be delivered through the Strategic Flood Risk Assessment (SFRA - Level 1). Herrington Consulting has been commissioned by Thanet District Council (TDC) to update the SFRA which was originally prepared in 2009 and which pre-dated the introduction of the NPPF in 2012 (subsequently updated in 2018, 2019 and 2021). In 2018 the SFRA was updated to support the Local Plan process, with the production of the TDC SFRA addendum. This latest version of the SFRA report has been prepared in accordance with the requirements of the NPPF 2021, as outlined within Paragraphs 9 and 10 of the *Planning Practice Guidance: Flood Risk and Coastal Change*.

This study provides an up to date analysis of the main sources of flood risk across the administrative area, together with a detailed means of appraising development allocation sites and existing planning policies, against the risks posed by flooding over this coming century.

The predominant risk of flooding is from tidal sources (the River Wantsum and River Stour) and pluvial sources. The main towns of Margate, Broadstairs and Ramsgate are situated on the Isle of Thanet which is surrounded by coastline to the east and north and the Wantsum Channel to the west and south. The level of protection provided by the defence infrastructure varies across the low-lying land of the Wantsum Channel, making it susceptible to flooding from the sea and the changing topography throughout the Isle of Thanet can present a risk of surface water flooding to the urban communities. Consequently, the focus of the SFRA is to provide a strategic overview of the risk of flooding from each of the main sources of flooding to enable informed spatial planning decisions to be made.

The SFRA completed in 2009 quantified the risk of flooding for a set number of strategic sites, however, since the publication of the first SFRA many of these strategic sites have either been developed, or alternatively are no longer relevant/available. As such, the 2021 SFRA has been prepared to provide a revised view in relation to flood risk, collating information which references the physical characteristics of the district and defining the relevant planning policies relating to all forms of flooding. In addition, this revised SFRA is aimed at providing developers with clear guidance on when a flood risk assessment is required in support of planning applications.

It is acknowledged that the way in which the risk of flooding is managed is constantly changing, with improved predictions relating to climate change and new planning policy requiring development to adapt to meet these changes. As a consequence, it is imperative that the SFRA is adopted as a ‘living’ document and is reviewed periodically in consideration of emerging policy directives and an improving understanding of flood risk within Thanet.

1.2. Key Updates Since 2009

Since the latest SFRA report in 2009 there has been a number of key developments in national policy. An overview of the policies which are currently applicable is provided in Section 3.1 of this report. Since the previous SFRA report was prepared, the most notable change has been the introduction of the NPPF in 2012, which was updated in 2018, in 2019 and again in 2021. The 2009 SFRA referenced the now superseded Planning Policy Statement 25 (PPS25) and the accompanying technical guidance, both of which are now obsolete. Thanet District Council produced an Addendum to the 2009 SFRA in 2018 to reflect the 2012 NPPF. This was produced on the advice of, and in conjunction with the Environment Agency. The technical guidance which compliments the NPPF was released in 2014 (updated in August 2021) and is called the National Planning Policy Guidance Suite (NPPG). The information contained within the NPPG can be found at; https://www.gov.uk/government/collections/planning-practice-guidance.

The Flood and Water Management Act (FWMA) was introduced in 2010 and defines responsibilities for managing flood risk in England and Wales. Under the FWMA, County or Unitary Authorities were designated as 'Lead Local Flood Authorities' (LLFAs). The LLFA (in this case Kent County Council) is responsible for managing flood risk at a local scale, which includes supporting the use of Sustainable Drainage Systems (SuDS).

Following consultation on Schedule 3 of the FWMA, the Non-Statutory Technical Standards for Sustainable Drainage Systems (NTSS) were released in March 2015. Further to this, Paragraph 161 and 167 of the latest NPPF promotes the use of SuDS in areas at risk of flooding. In light of this, local guidance is also included within this SFRA to encourage all new development to manage surface water runoff sustainably.

The enactment of the EU Floods Directive (2007) and subsequent Flood Risk Regulations (2009) included the production of risk maps, which were released in December 2013. These maps identify areas which are at risk of flooding from rivers or the sea, surface water and reservoirs, and are publicly available. These maps are updated on a regular basis, and the latest version of these maps (at the time of publication) have been used within this report to appraise the risk of flooding across the district.

Finally, datasets managed by the Environment Agency (EA) are now freely available, including data from flood modelling studies and aerial height data (LiDAR). Updates in flood data in this area include a numerical flood model of the Lower Great Stour, and of the East Kent Coast and North Kent Coast, which consider the impact of climate change on fluvial and tidal flood risk. The results from these modelling studies have been considered within this report.

1.3. Objectives of the 2021 SFRA

The key objectives of this SFRA are;

- to update the SFRA report to reflect changes in planning policy, guidance and data availability since the previous SFRA was prepared in 2009;

- provide an overarching appraisal of the risk of flooding across the district from all sources;
- assess the impact of climate change in terms of flood risk and future development within the district;
- provide guidance to developers when a Flood Risk Assessment is required in support of planning applications;
- provide sufficient data and information to enable the Council to apply the Sequential Test to land use allocations and to identify whether the application of the Exception Test is likely to be necessary; and
- consider the acceptability of flood risk in relation to emergency planning capability.

2. Background

2.1. Study Area

Located to the northeast of the county of Kent, Thanet comprises a District Council covering an area of approximately 74 square kilometres with a population of greater than 141,000. A map of Thanet is provided in Figure 2.1 below, delineating the three main urban areas of Broadstairs, Margate and Ramsgate. All three towns are located on the Isle of Thanet and form a densely populated area along the north-eastern coast. The remainder of the district is dominated by lower-lying marshland and smaller towns and villages.

Thanet was previously separated from the rest of east Kent by the Wantsum Channel. However, the channel became silted up over the last 1000 years and combined with the construction of flood defences along the coastline, Thanet was joined to the mainland.

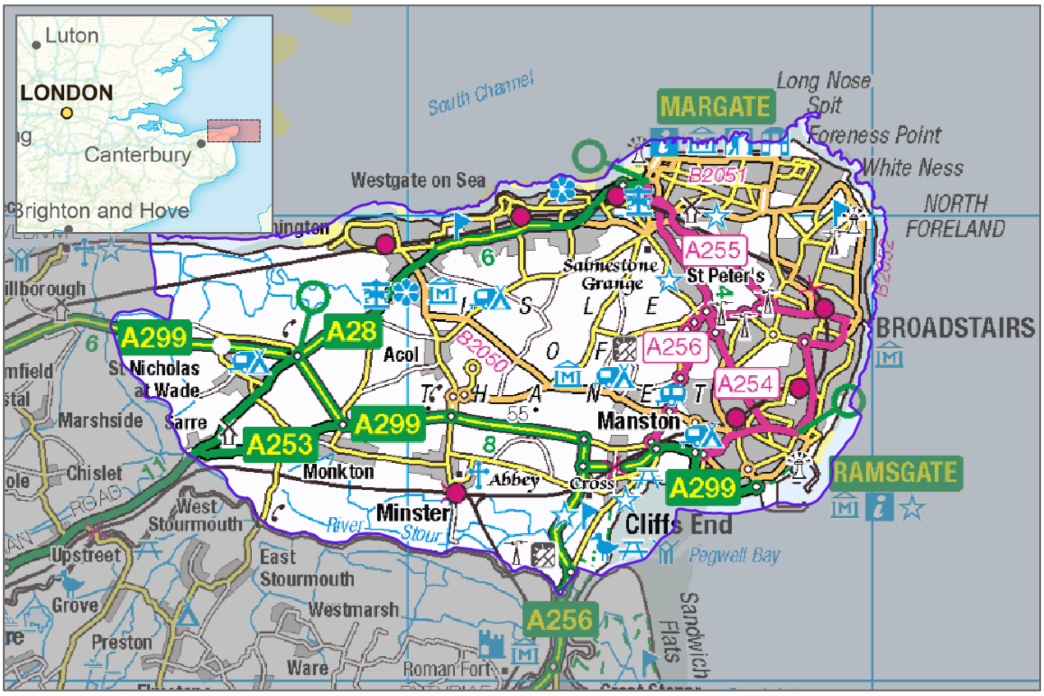


Figure 2.1 – Location map of Thanet (Contains Ordnance Survey data © Crown copyright and database right 2022).

The Thanet Coast and Sandwich Bay, which borders the district to the southeast, are a wetland of international importance due to the habitats they provide for a variety of species of flora and fauna. Both areas are classified as a Designated Special Area of Conservation (SAC) and Special Protection Area (SPA). In addition, the Thanet Coast is designated as a Site of Special Scientific Interest (SSSI) and forms part of a Marine Conservation Zone (MCZ). Sandwich and Pegwell Bay belong to Kent's largest National Nature Reserve (NNR).

The Thanet Coast consists of subtidal chalk and is the "longest continuous stretch of coastal chalk in the UK." Further information on land designations can be found at;

https://magic.defra.gov.uk/MagicMap.aspx

2.1.1. *Topography*

Land levels (Figure 2.2) across Thanet vary significantly, from the Wantsum Channel located at approximately 1.0m Above Ordnance Datum Newlyn (AODN), to 59.6m AODN in the centre of the Isle of Thanet. In general, land levels across the Isle of Thanet fall from the centre towards the coastline. There is a natural ridge which runs from Cliffsend to the east, to Monkton further to the west. The remainder of the district is low-lying and forms part of the Wantsum Channel.

2.1.2. *Geology*

Figure 2.3 shows the bedrock geology, which can be seen to follow the general topography of the area. Chalk dominates the Isle of Thanet, whilst the Wantsum Channel and immediate surrounding areas consist of a mixture of sand, silt and clay.

Superficial deposits of Head (clay and silt) are spread across the Isle of Thanet (Figure 2.4). The lower-lying areas of the Wantsum Channel mostly comprise superficial deposits of Tidal Flat Deposits (clay and silt).

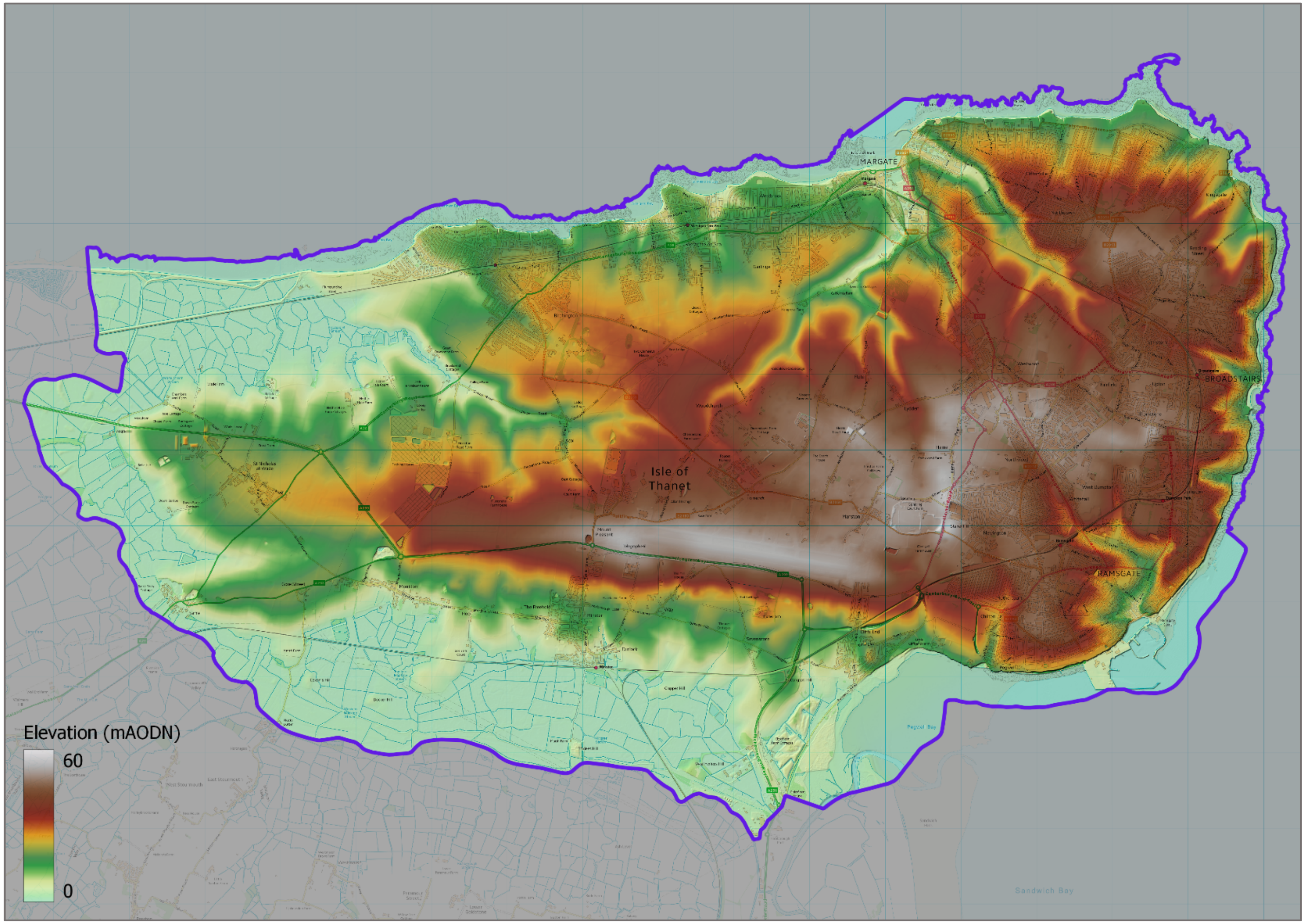


Figure 2.2 – Topography of Thanet District plotted based on 1m resolution aerial height data (© Environment Agency - contains Ordnance Survey data © Crown copyright and database right 2022).

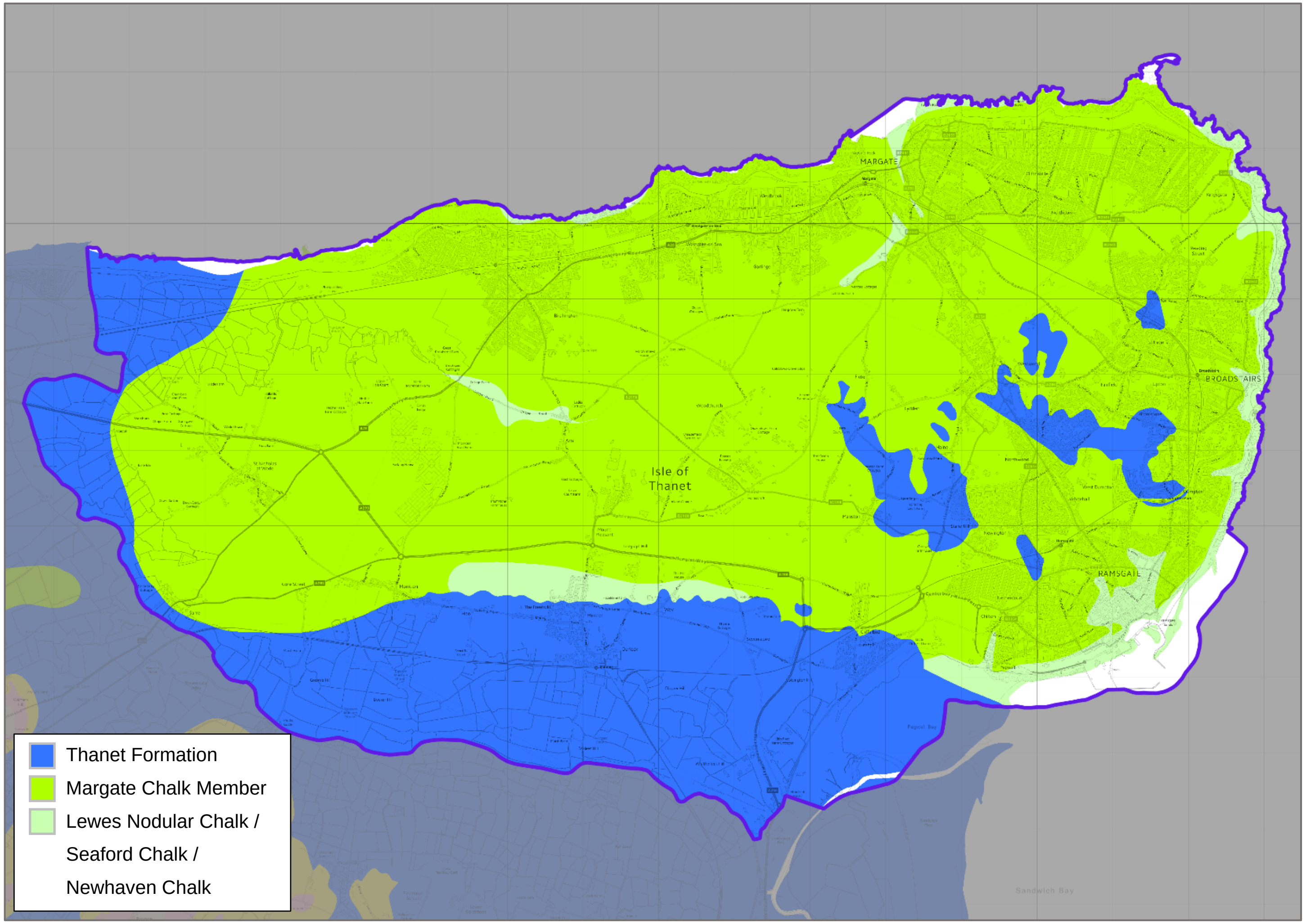


Figure 2.3 – Bedrock geology map of Thanet District (Contains British Geological Survey materials © UKRI 2021 - Mapping contains Ordnance Survey Data © Crown copyright and database right 2022).

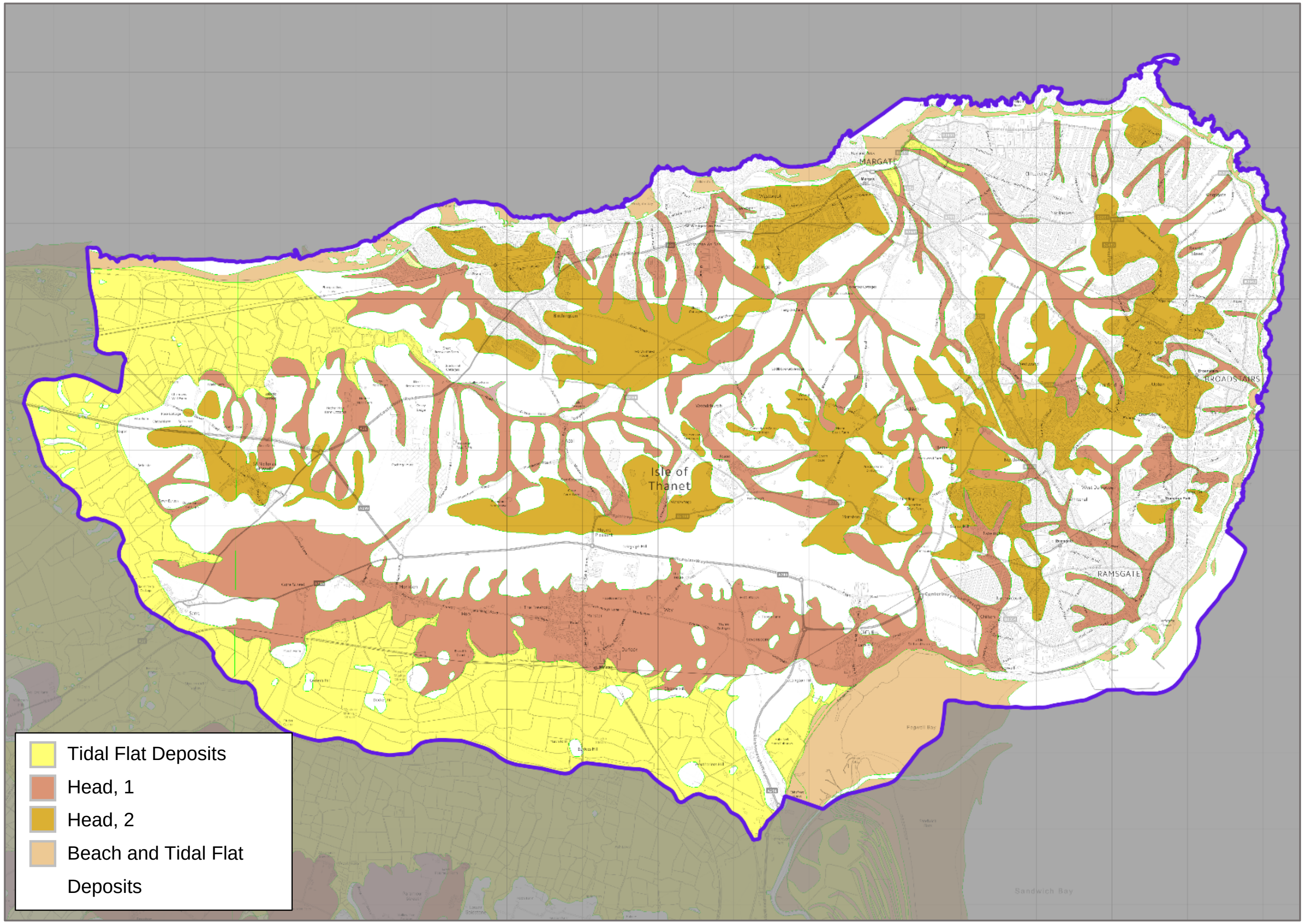


Figure 2.4 – Superficial geology map of Thanet District (Contains British Geological Survey materials © UKRI 2021 - Mapping contains Ordnance Survey Data © Crown copyright and database right 2022).

2.2. Sources of Flooding

2.2.1. Flooding from Rivers and Watercourses

There are a number of rivers and watercourses throughout Thanet and the location of these are shown on the map in Appendix A.2.

There are three rivers within the District which are classified as a 'main river'; the River Wantsum, Minster Stream and River Stour. All three rivers historically formed part of the Wantsum Channel which separated the Isle of Thanet from the remainder of Kent.

Both the Minster Stream and the River Wantsum are a tributary of the River Stour. The River Wantsum runs along the western boundary of the district in a southerly direction before it joins the River Stour north of Plucks Gutter. The Minster Stream is a relatively small main river and flows into the River Stour just south of Minster.

The River Stour continues to follow the district's boundary eastward up to Richborough Port, where it cuts into Dover District before it merges into Pegwell Bay south-east of Thanet district.

Both the River Wantsum and the reach of the River Stour which is located within the district, are predominantly tidally influenced. However, the rivers are also fed by a network of man-made drainage ditches which surround the rivers within the south of the district. The primary function of the extensive drainage network across the marshlands is to maintain groundwater levels below the surface, discharging any excess water into the Minster Stream, River Wantsum or River Stour.

The tidal influence on the rivers means that the water levels are governed by extreme sea levels and tidal surges. Sea level rise as a result of climate change presents the real risk that water levels within the rivers and connecting drainage ditches may increase overtime, thus increasing the risk of localised flooding in the low-lying areas.

In addition to the main rivers and watercourses discussed above, the Tivoli Brook flows culverted through the centre of Margate, from Tivoli Park Avenue to the outfall north of Dreamland Amusement Park. There is limited information available in relation to this watercourse, however, the culverted watercourse is known to have surface water drainage issues and has a complex flood history due to tidal interactions.

2.2.2. Flooding from the Sea

There are two main ways that the sea can cause flooding; An extreme increase in the sea level, or through wave overtopping; These two mechanisms are discussed below.

- An extreme increase in water levels, known as a surge event, can occur when an already high tide coincides with a low-pressure weather event, resulting in the surface of the sea becoming elevated. Unlike the day-to-day tide, the height of a surge event is difficult to predict. Elevated sea levels due to a surge could result in flooding in coastal locations.

- A wave overtopping event usually occurs when large powerful waves collide with the shoreline, or sea defences, forcing seawater landwards. In this event the effects can be exacerbated by strong onshore winds, which contribute to increased runup and spray from the waves, allowing water to pass over the crest of the sea defences.

Thanet district has a coastline of approximately 28km, 3.3km of which benefit from the Northern Sea Wall (formal sea defence) along the estuary of the River Wantsum to the northwest. In addition, the coastline adjacent to Pegwell Bay (which is located to the southeast of the district) benefits from formal flood defences, consisting of a sea wall and earth embankment. Furthermore, there are formal in situ flood defences in Minnis Bay, Margate, parts of Westgate Bay, St Mildred’s, Broadstairs Harbour and Granville Marina (Ramsgate). The remainder of the district is protected naturally by high chalk cliffs.

There is no development located directly behind the Northern Sea Wall, however, there is a small cluster of buildings situated behind the defences along Pegwell Bay which could be susceptible to flooding from wave overtopping or breach. This type of flooding is likely to occur when waves repeatedly strike the defence during a storm event resulting in overtopping or failure. The results provided by the EA as part of their East Kent Coast Model reveals that a small area along Sandwich Road could be subject to flooding when waves overtop the defences.

With regard to the River Wantsum and River Stour, the entire reach of both rivers located within the district is tidally influenced, meaning that the water levels within the channels rise and fall with each tidal cycle. In the event of a surge, water levels are likely to remain high within the channel and if water levels were to exceed the height of the banks, areas surrounding the river network could be inundated with floodwater. However, flooding under this scenario is likely to be confined to the marshes and is unlikely to affect any larger settlements.

2.2.3. Flooding from Surface Water

Flooding from surface water runoff typically occurs following an extreme rainfall event and is almost entirely governed by natural land levels. Water from higher ground in the catchment flows overland towards topographic depressions. This can further be exacerbated in urban areas as a result of low permeability ground conditions, or when the surface water drainage system becomes overwhelmed. Mapping provided by the EA provides an indication of areas at risk of flooding from surface water; https://flood-warning-information.service.gov.uk/long-term-flood-risk/map.

The Isle of Thanet predominantly consists of chalk bedrock, which has the capacity to infiltrate surface water runoff, thereby reducing the amount of water flowing overland. Notwithstanding this, surface water flooding has been recorded in the area due to a combination of steep valleys crossing the Isle and impermeable surfacing throughout the urban towns located along the coastline. Following a heavy rainfall event, the capacity of the drainage system can be exceeded, and any excess water is typically channelled along the highways towards the valleys, before it is discharged into the sea.

In the southern and western half of the district surrounding the Wantsum Channel, land levels fall towards the River Wantsum and River Stour. Consequently, any surface water runoff will be directed towards the extensive drainage network in this area and discharged into the river network. Whilst there is the potential for the drainage network to exceed its capacity as a result of elevated water levels within the rivers, any excess water is likely to remain within the lower-lying marshland. Nevertheless, localised flooding has been recorded in other rural towns due to rainwater ponding within localised depressions.

2.2.4. Flooding from Groundwater

The majority of Thanet consists of chalk which forms a large principle aquifer and holds a large volume of groundwater. The migration of water through the chalk primarily occurs through fissures and fractures within the rock. Water held within the chalk is extracted via a number of mechanisms; human activity, wells and pumping stations. The Isle of Thanet is naturally elevated above sea levels and as such, groundwater is naturally drained to surface waters by springs or towards the sea.

Groundwater flooding has the potential to occur at the base of dry valleys, however, the majority of these valleys are located within town centres, where impermeable surfaces as a result of urbanisation could partially hinder the emergence of groundwater.

The influence of human activity of abstracting groundwater may also need to be considered, especially as in recent years the reduction in groundwater extraction for industry has contributed to groundwater rebound. This is where water levels within aquifers return to a level which is higher than the natural levels.

Groundwater flooding is also possible across the low-lying marshland to the south of the district, where there is a high potential for elevated groundwater levels and flooding to occur in proximity to the River Wantsum and River Stour. The drainage network in this area consists of a network of ditches designed to maintain low groundwater levels. As a result, groundwater emergence in this part of the district is normally directly linked to high water levels within the river network.

2.2.5. Flooding from Sewerage Infrastructure

Sewer flooding within the district is most likely to occur in the urban extents of Margate, Broadstairs and Ramsgate, due to the reliance on the extensive sewerage infrastructure. Although typically confined to these urban areas, sewer flooding is still possible within more rural locations where the sewer network is not so extensive and therefore, may have less capacity available.

Flooding from sewers can occur when the sewer is overwhelmed by heavy rainfall, becomes blocked, or is of inadequate capacity. Sewer networks are typically designed to accommodate the water generated under a storm with 1 in 30 year return period and as such, higher return period rainfall evens can cause sewers to surcharge. As a result, water may back up through pipework, flooding properties, or water can exit the sewer system via gullies and manholes.

When this happens to a combined sewer (which is designed to manage both surface water and wastewater), there is a risk of floodwater being contaminated by foul effluent. The hazards associated with untreated foul effluent can increase the risks associated with sewer flooding, although generally the effects are relatively localised.

Although sewers may be designated for draining surface water, foul water, or combined waste, it is recognised that misconnections can occur, and this can result in insufficient capacity being available within the wider network, which ultimately increases the risk of above ground flooding. The removal of unauthorised misconnections is therefore a priority for minimising the risk of sewer flooding and pollution within the district.

From Birchington to Margate (including the surrounding areas), the sewers are predominantly foul sewers. Historic flooding has occurred as a result of the sewer network becoming overwhelmed following an extreme rainfall event. This flooding can in part be attributed to the natural topography, where rainwater running off the steep slopes of the surrounding hills accumulates within the valleys in which the towns are located.

The sewer network in Broadstairs and Ramsgate mainly consists of combined sewers. Similar to the northern urban areas, the sewer network is susceptible to overloaded as a result of heavy rainfall. Due to the history of flooding from combined sewers within the district, it is recommended that where new connections to any part of the sewer network are proposed, Southern Water is consulted to discuss their requirements.

The low-lying areas surrounding the Wantsum Channel are predominantly drained by a series of combined sewers within the villages, including Manston, Monkton and St Nicholas at Wade. These sewers direct flows to Minster IOT Wastewater Treatment Works and subsequently, discharge into a drainage ditch which connects directly to the River Stour.

2.2.6. Flooding from Reservoirs

Non-natural or artificial sources of flooding can include; reservoirs, canals and lakes. Where water is retained above natural ground level, or in areas where there are operational and redundant industrial processes (including mining, quarrying, sand and gravel extraction etc.), the risk of flooding can increase, with the potential for floodwater depths and velocities to be higher in the adjacent areas. The potential effects of flood risk management infrastructure and other structures also need to be considered. Reservoir or canal flooding may occur as a result of the facility being overwhelmed and/or as a result of dam or bank failure.

There are no potable water reservoirs within the district, nor are there any artificial waterways such as canals. However, the EA's 'Risk of Flooding from Reservoirs' website does identify two unnamed storage reservoirs which form part of 'Thanet Earth'. Whilst the risk of these privately owned and well maintained structures failing is low, there is still a minor risk of flooding from this source.

If the reservoir located further to the north of the facility was to fail, the risk of flooding would mainly be confined to rural areas, with the potential for some farmhouses in Upper Hale Court to be affected. Failure of the southern reservoir could result in water partially flowing across Monkton towards the River Stour.

2.3. Historic Flooding

A number of stakeholders have been consulted to obtain historic flood records around the Thanet District. The historic records provided by Southern Water and Kent County Council (KCC) are presented on the map in Appendix A.1.

The EA has also provided information on historic flooding in the form of the 'Recorded Flood Outlines' GIS layer, which is presented in Appendix A.1. The main events shown by the EA's mapping are:

- **1953 (Tidal Flooding):** During the 1953 storm event, the marshland areas surrounding the River Wantsum in the west of the district were subject to flooding. Areas of Birchington and Margate were also flooded as a result of waves overtopping the defences during this event.

- **2000 (Fluvial Flooding):** The low lying area along the southern border of the district were flooded by the Lower Stour.

- **1980 (Pluvial Flooding):** An area of Belmont Road and Quex Road in Westgate-on-Sea was subject to flooding from surface water/local drainage infrastructure.

In addition to the records provided above, discussions with TDC has also identified areas within the district which have been subject to flooding in the past. A list of these areas is provided below:

- 'The Dip' in Minnis Bay, the Parade and Daryington Avenue have been subject to flooding from waves overtopping the defences.

- Highway flooding in Minnis Road near to the railway bridge, due to inadequate surface water/highway drainage.

- Flooding in the junction adjacent to Quex park, as a result of blocked surface water drainage.

- Nash Road, leading to Westwood Cross, is susceptible to surface water flooding.

- Flooding at the Manston Road / Spitfire Way highway junction by Manston Airport.

- Flooding has been recorded along Manston Road and Vincent Road.

- Flooding has been recorded in a low point within Manston Road, close to the Margate Refuse and Recycling Centre.

- Shottendane Road (by ABY Electrical) across the adjacent fields towards Manston Road.

- Surface water flooding has been noted in the low spots between the villages of Acol and Brooksend. Floodwater drains into the fields adjacent to the highway.

- Flooding has been recorded within All Saint's Avenue, Margate in the past. KCC has built flood alleviation measures within George Park and Hartsdown Park to manage flooding in the area.

- Dreamland and the industrial estate on the south side of the railway line are susceptible to surface water flooding.

- King Street, Dane Road and Upper Dane Road in Margate are located in a valley susceptible to surface water flooding.

- Northdown Park, Cliftonville has been subject to regular shallow flooding.

- Dane Valley Road industrial park has been subject to flooding. Two deep bore soakaways have been installed to alleviate this flooding.

- Flooding has occurred in College Road (adjacent to St Lawrence College), Ramsgate.

- Topographic low points in Dane Court Road (A255) are susceptible to flooding.

- Harbour Parade (Ramsgate) has flooded from a number of sources; surface water, tidal and sewage.

A list of the stakeholders which have contributed historical records of flooding as part of this SFRA are presented in Appendix A.6.

2.4. Design Flood Event

The magnitude of a flood event is expressed as its probability of occurrence. This can be defined as the average number of years expected before another event of the same magnitude will occur (termed the 'recurrence interval'). This is more commonly referred to as the return period and is expressed as the '1 in X year return period' event. Alternatively, events are defined as the probability that an event with a greater magnitude will occur in any one year, this is referred to as the 'Annual Exceedance Probability' and is expressed as a percentage, (i.e. X% AEP).

The NPPF requires that the risk of flooding is appraised for the 'design flood' event. For most sources of flooding this is defined as the 1 in 100 year return period or 1% AEP event. The exception is tidal flooding, where the design flood criteria is typically based on the 1 in 200 year return period, or 0.5% AEP event. In all circumstances, an allowance for climate change over the expected lifetime of the proposed development is also required to be considered.

The design event is used to appraise the suitability of a development and should inform the design of any mitigation measures.

2.5. Actual Risk and Residual Risk

The NPPF requires the **'actual risk'** of flooding to a development to be appraised. The actual risk considers the likelihood of flooding under extreme conditions (e.g. the design flood event), whilst considering the influence of any defence infrastructure, or drainage systems, which may provide a level of protection to the site.

The presence of such defences, or drainage system, does not necessarily imply a low risk of flooding, as locations where the design standard is low can still result in flooding under the design flood event.

Examples of actual risk are as follows:

- A combination of a storm surge and extreme waves resulting in waves overtopping the sea wall;
- The in-channel river level exceeding the crest height of the flood embankment which has a low standard of protection (e.g. 1 in 20 year standard);
- Surface water ponding in a topographic depression following a heavy rainfall event;
- Flooding from the emergence of groundwater due to a rising water table following prolonged rainfall;
- The capacity of the public sewer being exceeded, due to its low design standard (typically 1 in 30 years);
- Flooding within the highway due the highway gullies becoming overwhelmed, as these gullies are typically designed to manage the 1 in 2 year return period event.

The NPPF requires development to be appraised against the actual risk of flooding under design flood event conditions. The majority of the developed areas are situated on the Isle of Thanet, which benefits from natural flood defences. Nevertheless, the urbanisation means that sites are dependent on the influence of on-site drainage systems to ensure that the actual risk of flooding under the design event is reduced. Furthermore, areas within the Wantsum channel are solely reliant on existing flood defences.

As such, properties could be at risk of inundation by floodwater under the following conditions:

- If the defences were to fail (e.g. due to a breach).
- If the drainage system was to become overwhelmed, or blocked.
- The occurrence of an event greater than the design flood event (termed an exceedance event), causing water to overtop the defences.

The above risk is termed the **'residual risk'** of flooding.

Residual risk is a particular issue within the low-lying town centre of Margate and the low-lying areas surrounding the Rivers Wantsum and Stour.

When impacts of climate change are taken into consideration, the potential impact of residual risk is further exacerbated. Much of the channel and immediate surrounding areas are situated below the predicted extreme sea level in the future and unless the defences are upgraded in line with increasing water levels, the likelihood of the defences failing and the water level exceeding the crest height of the wall will increase into the future.

Given the rapid rate of inundation and extensive flooding which is likely to result from a residual risk flood event, the use of hydrodynamic numerical flood modelling is required to appraise the depth, extent and velocity of flooding under such scenarios. Such modelling has been undertaken by the EA for Thanet as part of the East Kent Coast Modelling Study.

The EA has also completed similar modelling for the reservoirs across England, to provide information on the expected depth and velocity of flooding in the event or a reservoir failure. The 'Flood Risk from Reservoirs' mapping identifies that there are no major reservoirs located within Thanet, although floodwater from a failure of two unnamed storage reservoirs which form part of 'Thanet Earth' could affect a number of houses in Upper Hale Court and Monkton. The EA's 'Flood Risk for Reservoirs' mapping can be accessed at; https://flood-warning-information.service.gov.uk/long-term-flood-risk/map

It is also necessary to consider the residual risk of flooding if the drainage system was to become surcharged. Flooding typically occurs during a pluvial event which exceeds the design criteria of sewer, or alternatively, as the result of a failure of the drainage system (i.e. due to a blockage). Consequently, these two scenarios should be considered when designing any new drainage systems to minimise the risk of flooding to properties. Potential overland flow routes should be considered to establish the area where floodwater is most likely to pond following an exceedance event. Any analysis undertaken will need to demonstrate that the proposed drainage system does not increase the risk of above ground flooding to the development, or to the surrounding area.

2.6. Flood Defences

The location and extent of the existing defence infrastructure network maintained by TDC and the EA within the district is shown in Appendix A.3.

Thanet has a coastline of approximately 26km, 18km of which benefit from flood defences to protect the natural high chalk cliffs behind, which are subject to coastal erosion. In addition, lower lying areas within Margate town have been shown to be at risk of flooding from wave overtopping and in 2013 the Margate Coastal Scheme was completed to limit the risk of coastal flooding. The works included the strengthening of the chalk core along the harbour arm (which acts as a primary breakwater), a concrete-stepped revetment, new seawalls and new flood gates. Further works were recently undertaken between Westbrook Groyne to Nayland Rock to restore the existing groynes and sea wall, and a new sea defence wall has been installed to protect Granville Marina in Ramsgate. The defences along the Isle of Thanet are primarily maintained by TDC, whilst the defences along the River Wantsum and River Stour are maintained by the EA.

The estuary of the River Wantsum is protected by the Northern Sea Wall, which provides a 1 in 100 year Standard of Protection (SoP). The crest level of the defence located within the district varies between 6.00m AODN and 7.00m AODN The condition of the defence is classified as "3 – satisfactory".

The tidal reaches of the River Stour, which are located within the Thanet district, are defended by existing earth embankments. In addition, Sandwich and Pegwell Bay is part of the Isle of Grain to Beachy Head Shoreline Management Plan in which the policy states "hold the line" for the area into the foreseeable future. Consequently, new defence infrastructure was built in 2012 which comprised the construction of a new sea wall and improvements to the existing earth embankment at the Bay, to ensure that a minimum 1 in 20 year standard of protection is *sustained* within the next 100 years (i.e. up to the year 2112). In their current condition, the crest height of the wall and the embankment are both situated above the predicted extreme sea level at Cliffsend for the 1 in 200 year event. Nevertheless, due to climate change and the resultant increase in extreme sea level rise, the protection of the defence infrastructure is likely to decline over time and the area could be at risk of flooding by the future year 2115. As such, investment in flood defence infrastructure will become more important in the future at this location.

2.7. Climate Change

The global climate is constantly changing, but it is widely recognised that we are now entering a period of accelerating change. Over the last few decades there have been numerous studies into the impact of potential changes in the future and there is now an increasing body of scientific evidence which supports the fact that the global climate is changing as a result of human activity. Past, present, and future emissions of greenhouse gases are expected to cause significant global climate change during this century.

The nature of climate change at a regional level will vary: for the UK, projections of future climate change indicate that more frequent short-duration, high-intensity rainfall and more frequent periods of long-duration rainfall could be expected.

These effects will tend to increase the size of Flood Zones associated with rivers, and the amount of flooding experienced from other inland sources. The rise in sea level will change the frequency of occurrence of high water levels relative to today's sea levels. It will also increase the extent of the area at risk should sea defences fail. Changes in wave heights due to increased water depths, as well as possible changes in the frequency, duration and severity of storm events are also predicted.

To ensure that any recommended mitigation measures are sustainable and effective throughout the lifetime of the development, it is necessary to base the appraisal on the extreme flood level that is commensurate with the planning horizon for the proposed development. The NPPG states that residential development should be considered for a minimum of 100 years, but that the lifetime of a non-residential development depends on the characteristics of the development. For commercial development, a 60 year design life is *typically* assumed, although the LPA and EA should be consulted to determine the most appropriate design life for each development.

2.7.1. *Extreme Sea Level*

Global sea levels will continue to rise, depending on greenhouse gas emissions and the sensitivity of the climate system. The relative sea level rise in England also depends on the local vertical movement of the land, which is generally falling in the south-east and rising in the north and west.

Since the previous SFRA, the EA has published new guidance on sea level rise allowances for climate change. Reference to guidance published by the EA specifies allowances for different regions across England. The predicted rates of relative sea level rise for the 'South East' region, relevant to Thanet, are shown in Table 2.1. These values correspond with the Higher Central and Upper End percentiles (the 70th and 95th percentile respectively).

Administrative Region	Allowance Category	Net Sea Level Rise (mm/yr) (Relative to 2000)			
		2000 to 2035	2036 to 2065	2066 to 2095	2096 to 2125
South east	Higher Central	5.7	8.7	11.6	13.1
	Upper end	6.9	11.3	15.8	18.2

Table 2.1 – Recommended contingency allowances for net sea level rise. Adapted from the EA guidance 'Flood risk assessments: climate change allowances'

When these values are applied to the current day predicted extreme sea levels, it can be seen that the increase in sea level is significant and is not linear. The extreme water levels under a 1 in 200 year event have therefore been calculated for time steps between the current day and the year 2125 for the 'Higher Central' and 'Upper End' scenarios. These values are summarised in Table 2.2 below.

Year	1 in 200 year extreme water level (m AODN)					
	North of River Wantsum Outfall		Kingsgate		Pegwell Bay	
	Higher Central	Upper End	Higher Central	Upper End	Higher Central	Upper End
Current day (year 2017)	4.40	4.40	4.22	4.22	4.62	4.62
2035	4.50	4.52	4.32	4.34	4.72	4.74
2065	4.76	4.86	4.58	4.68	4.98	5.08
2080	4.94	5.10	4.76	4.92	5.16	5.32
2095	5.11	5.34	4.93	5.16	5.33	5.56
2115	5.37	5.70	5.19	5.52	5.59	5.92
2125	5.64	6.07	5.46	5.89	5.86	6.29

Table 2.2 – Climate change impacts on extreme flood levels

2.7.2. *Offshore Wind Speed and Extreme Wave Height*

As a result of increased water depths resulting from changes in the climate, wave heights may change. The following allowances in Table 2.3 for offshore wind speed and wave height are applicable around the entire English coast and are relative to a 1990 baseline. These figures also include a sensitivity allowance, to show that the potential impact of climate change.

Parameter	2000 to 2055	2065 to 2125
Offshore wind speed allowance	+5%	+10%
Offshore wind speed sensitivity test	+10%	+10%
Extreme wave height allowance	+5%	+10%
Extreme wave height sensitivity test	+10%	+10%

Table 2.3 – Recommended climate change allowance and sensitivity ranges for offshore wind speed and extreme wave height (relative to 1990 baseline). Adapted from the EA guidance 'Flood risk assessments: climate change allowances'

2.7.3. *Peak River Flow*

Since the previous SFRA, the EA has published new guidance (initially published on the 19th February 2016, and last updated on 6th October 2021) on the peak river flow allowances for climate change. Recognising that the impact of climate change will vary across the UK, the allowances show the anticipated changes to peak flow by management catchment. Management catchments are sub-catchments of river basin districts. Thanet District is covered by the South East River Basin District, as defined by the EA 'River Basin District' maps, and is located in the Stour Management Catchment, as defined on the EA's 'Peak River Flow' map.

For each Management Catchment, a range of climate change allowances are provided for three different time epochs over the next century, which correlate with the planning horizons for the varying classifications of development.

For each epoch there are three climate change allowances defined. These represent different levels of statistical confidence in the possible emissions scenarios on which they are calculated. The three levels of allowance are as follows:

- Central: based on the 50th percentile
- Higher Central: based on the 70th percentile
- Upper End: based on the 95th percentile

With reference to this methodology, it is recognised that although the higher percentile allowances are possible, these events are less likely to occur.

The EA has provided guidance regarding the application of the climate change allowances and how they should be applied in the planning process, which can be seen in Table 2.4 below.

Flood Risk Vulnerability Classification	Flood Zone 2	Flood Zone 3a	Flood Zone 3b
Essential infrastructure	↗	↗	↗
Highly vulnerable	→	X	X
More vulnerable	→	→	X
Less vulnerable	→	→	X
Water compatible development	→	→	→

Key:

↑	Upper End	→	Central
↗	Higher Central	X	Development should not be permitted

Table 2.4 – Recommended Climate Change allowance percentile based on flood risk vulnerability and flood zone compatibility. Adapted from the EA guidance 'Flood risk assessments: climate change allowances'

The allowances for Thanet cover the South East River Basin District, and Stour Management Catchment. The allowances for the Stour Management Catchment are shown in Table 2.5 below.

Management Catchment Name (River Basin District)	Allowance Category	2015 to 2039	2040 to 2069	2070 to 2115
Stour (South East)	Upper End	40%	55%	101%
	Higher Central	25%	30%	55%
	Central	18%	20%	38%

Table 2.5 – Recommended peak river flow allowances for each epoch for the Stour Management Catchment (1981 to 2000 baseline). Adapted from the EA guidance 'Flood risk assessments: climate change allowances'.

The guidance further states that where the dominant source of flooding is from a neighbouring management catchment, the climate change allowances for this catchment should be used when appraising the risk of flooding.

2.7.4. *Peak Rainfall Intensity*

The recommended allowances for increase in peak rainfall intensity have also been updated since the completion of the previous SFRA. Although the allowance is applicable nationally, there is a range of values provided which correspond with the central and upper end percentiles (the 50th and 90th percentile respectively) over three-time epochs. The recommended allowances are shown in Table 2.6 below.

Allowance Category (applicable nationwide)	Total potential change anticipated for epoch		
	2015 to 2039	2040 to 2069	2070 to 2115
Upper End	10%	20%	40%
Central	5%	10%	20%

Table 2.6 – Recommended peak rainfall intensity allowance for small and urban catchments (1961 to 1990 baseline). Adapted from the EA guidance 'Flood risk assessments: climate change allowances'

For large (>5km^2) rural catchments, the allowances for peak river flow (Table 2.5) should be used. The EA guidance goes on to state that '*Where on-site flooding for the upper end allowance presents a significant flood hazard (for example, depths and velocities of surface water runoff cause a significant danger to people), you will need to take further mitigation measures to protect people and property (for example, raising finished floor levels). As a minimum, there should be no significant flood hazard to people from on-site flooding for the central allowance'.*

When designing Surface Water Drainage Systems, the EA currently advises that there should be no increase in the rate of runoff discharged from the site for the 'Upper End' Allowance.

2.7.5. *Credible Maximum Scenarios for Nationally Significant Infrastructure Projects, New Settlements or Urban Extensions*

Whilst the allowances for climate change listed above are typically considered sufficient for appraising the risk of flooding as part of a Flood Risk Assessment, there are projects which require further consideration. For Nationally Significant Infrastructure Projects (NSIPs), the EA states further that the flood risk should be assessed from a 'credible maximum climate change scenario'. The relevant national policy statement should be checked for further details depending on the type of project.

For other projects which include new settlements or significant urban extensions amongst others, the following allowances should be used:

- Extreme Sea Level: 'H++' climate change scenario should be used, which is an increase of 1.9m for the total sea level rise to 2100.
- Peak River Flow: The 'Upper End' allowance should be assessed.
- Offshore Wind Speed and Extreme Wave Height: The sensitivity test allowances should be used and an additional 2mm for each year on top of sea level rise allowances from 2017 should be applied for storm surges.

The climate change allowances listed above have been prepared in accordance with the latest guidance published by the EA. However, it should be noted that the EA is constantly reviewing their recommendations on how climate change should be considered and as such, all of the above recommended allowances for climate change should be used as a guideline and can be superseded.

Additionally, in the instance where flood mitigation measures are not considered necessary at present but will be required in the future (as a result of changes in climate), a "managed adaptive approach" may be adopted where development is designed to allow the incorporation of appropriate mitigation measures in the future.

2.7.6. *Impacts of Climate Change on Thanet*

Climate change will inevitably result in an increased risk of flooding from all sources. Consequently, the potential impacts of climatic change will require careful consideration before sites for development are allocated.

The EA's Flood Zone maps are based on current day sea levels and climate conditions. However, these maps do not take into consideration the impact of flood defences or climate change. The majority of the district is on higher ground and therefore, for the urban areas along the Isle of Thanet the impact of climate change will be comparatively small. However, Margate town centre is relatively low-lying compared to the surrounding area. In addition, to the west and southwest of the district, the impact will be more pronounced due to the relatively flat topography of the low-lying land. Both the River Wantsum and the River Stour are tidally influenced along the district's boundary and thus, an increase in sea level would also result in a larger area further inland becoming at risk of flooding. Therefore, it is necessary to ensure that new development is designed so that these residual risks are mitigated.

For the small villages located within and along the low-lying areas (such as Cliffsend, Minster and Monkton), the reliance on tidal flood defence infrastructure will increase over the next century as sea levels increase. The consequences of such structures failing (i.e. a breach), or becoming overtopped, will therefore increase too. When the dynamics of a breach are considered, the increase in sea level over the next 100 year period will result in a significant increase in the volume of water which is able to flow through the breach during the peak of an extreme event. Higher water levels can promote larger wave heights along the coastline, as waves are sustained closer inshore through a combination of increased water levels and increases in offshore wind speed.

In addition to the risk of tidal flooding, consideration should also be paid to the impact of climate change associated with pluvial flooding. Due to the topography and urbanised character, the town centres of Margate, Broadstairs and Ramsgate are prone to flashy responses during intense rainfall, which has historically caused problems. Consequently, an increase in peak rainfall intensity is also likely to increase the risk of flooding from surface water.

By managing surface water in a sustainable manner, through the use of SuDS for example, it is possible to ensure that new development does not exacerbate flood risk on site, or elsewhere within the catchment. In particular, by reducing the amount of rainfall entering the sewer system, there will be greater capacity for foul water within the network, and by moving towards measures which capture and slow rainfall runoff at source, it will reduce the reliance on the drainage infrastructure. Taking climate change into consideration at the planning stage will ensure that the impacts are mitigated, thus the risk of flooding can be managed throughout the lifetime of the development.

3. Policy Requirements

3.1. Applicable Policies and Studies

The purpose of this section is to highlight the important and applicable policies which inform the flood risk management process. This includes reference to both Local and National planning policy (e.g. Local Plan and NPPF respectively) relating to flood risk.

Flood and Water Management Act (FWMA - 2010)

In response to the Pitt Review which followed the summer 2007 floods, and the requirements of the EU Flood Directive, the Flood and Water Management Act was implemented in England and Wales in April 2010. The act outlines the responsibilities for managing flood risk and drought, with an increased focus on the risk of flooding from local sources. An important outcome of the act is that County or Unitary Authorities are now classified as *'Lead Local Flood Authorities'* and have the responsibility for managing flood risk at a local scale. Additionally, it aims to encourage the use of SuDS, and promotes resolution of sewer misconnections.

National Planning Policy Framework (NPPF - 2021)

The National Planning Policy Framework (NPPF) was published on the 27th March 2012, and updated in 24th July 2018, 19th February 2019 and 20th July 2021. This Framework is a key part of the Government's reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth. The NPPF sets out the Government's planning policies for England and is used in the preparation of local plans, as well as in decision making with respect to planning. The framework is executed by means of the accompanying Planning Policy Guidance Suite (March 2014) which supersedes PPS25: Development and Flood Risk Practice Guide (2009).

Paragraphs 7 to 217 contain policy that represents the Government's view of sustainable development. In order to achieve sustainable development within different districts, local circumstances need to be taken into consideration. Each Local Planning Authority is required to complete a SFRA to assess the risk of flooding from all sources, following criteria set out in the NPPF. The overarching use of SFRAs is to implement the Sequential Test, and where necessary the Exception Test, when determining land use allocation.

Non-Statutory Technical Standards for Sustainable Drainage Systems (NTSS - 2015)

As part of the Government's continuing commitment to protect people and property from flood risk, the Department for Environment, Food and Rural Affairs (Defra) consulted on a proposal to make better use of the planning system to secure sustainable drainage systems (2014).

National Standards for design, construction, maintenance and operation of SuDS came into effect from the 6th April 2015 and relate to Schedule 3, Paragraph 5 of the Flood and Water Management Act 2010.

These Non-Statutory Technical Standards for SuDS (NTSS) provide additional detail and requirements not initially covered by the NPPF, through specifying criteria to ensure sustainable drainage is included within applications classified as major development.

Kent County Council Local Flood Risk Management Strategy

Kent County Council (KCC) is the Lead Local Flood Authority (LLFA) and has the duty to manage local flooding. KCC has developed the Local Flood Risk Management Strategy to provide a countywide framework to manage risks of local flooding following the Flood and Water Management Act (2010). The strategy covers the risk of flooding from surface water, groundwater and ordinary watercourses and sets out how the risk from these sources can be reduced for people and businesses in Kent. In addition, it provides information and guidance on roles and responsibilities and how authorities will co-operate to manage flood risk. The 2017 to 2023 strategy builds upon knowledge and understanding resulting from delivering the previous strategy (2013-2016).

KCC Drainage and Planning Policy Statement (2019)

The Drainage and Planning Policy Statement outlines how KCC will review drainage submissions for all applications classified as major development in accordance with the objectives of the Local Flood Risk Management Strategy. The statement outlines the policy requirements for SuDS and other considerations which could impact the drainage design for a scheme.

River Stour Catchment Flood Management Plan (CFMP – 2007)

The Stour CFMP, relevant to the district, was completed and published by the EA in March 2007. A CFMP is a high-level strategic planning tool through which the EA seeks to work with other decision-makers within a river catchment to identify and agree policies for sustainable flood risk management. The primary objectives of the CFMP are to:

- Develop complementary policies for long-term (50-100 years) management of flood risk within the catchment that take into account the likely impacts of changes in climate, land use and land management.

- To undertake a strategic assessment of current and future flood risk from all sources within the catchment and quantify the risk in economic, social and environmental terms.

- Identify opportunities and constraints within the catchment for reducing flood risk through strategic changes and identify how these benefits could be delivered.

- Identify opportunities to maintain, restore or enhance the total stock of natural and historic assets from flooding.

- Identify the relative priorities for the catchment and assign responsibility to the EA and other operating authorities, local authorities, water companies and other key stakeholders for further investigations or actions to be taken to manage and reduce flood risk within the catchment.

Isle of Grain to South Foreland Shoreline Management Plans (SMP)

The Shoreline Management Plan is a large-scale assessment of the risk associated with coastal erosion and flooding, which seeks to set out high-level management options over three time epochs; 0 to 20 years, 20 to 50 years, and 50 to 100 years. The SMP is a non-statutory document used to inform the coastal planning and each management policy was derived taking into account social, environmental, technical and economic drivers over the next 100 years.

Whilst the SMP is not formally embedded within the planning system, it is used to inform the coastal change management area process outlined within Paragraph 170 to 173 of the NPPF.

The SMP Reviews were completed and approved by the EA's Regional Director in 2010 for the Isle of Grain to South Foreland SMP. A 'SMP Refresh' is currently ongoing (commenced in 2019) to review and revise the existing policy units. Whilst the 'refresh' has not yet been concluded, it should be recognised that the policy units may be subject to change in the future. At present, there are seven SMP policy units within the district, ranging from policy 4a14 (Reculver Towers to Minnis Bay) to policy 4b20 (Ramsgate Harbour (west) to north of the River Stour).

The policy unit covering Reculver Towers to Minnis Bay is assigned a 'hold the line' management policy for 20 years (i.e. up to 2025) and 'managed realignment' thereon, allowing the shoreline to move in a controlled manner in the future. The remainder of the policy units in the district have two management policies which comprise; 'hold the line' for areas which benefit from coastal defences, and 'no active intervention' for areas which are not currently defended. The latter is a result of the natural high chalk cliffs which are subject to coastal change, specifically erosion. The NPPF states that action must be taken to manage the development activities in areas subject to coastal change.

Each SMP has been examined as part of the SFRA process and the relevant policies are listed in Table 3.1.

Location	Policy Unit Reference	SMP Policy		
		2006 to 2025	2025 to 2055	2055 to 2105
Reculver Towers to Minnis Bay	4a 14	Hold the Line	Managed Realignment and Hold the Line	Managed Realignment and Hold the Line
Minnis Bay to Westgate-on-Sea	4a 15	Hold the Line and No Active Intervention	Hold the Line and No Active Intervention	Hold the Line and No Active Intervention
Margate	4a 16	Hold the line	Hold the line	Hold the line
Cliftonville	4a 17	Hold the Line and No Active Intervention	Hold the Line and No Active Intervention	Hold the Line and No Active Intervention
White Ness to Ramsgate	4b 18	Hold the Line and No Active Intervention	Hold the Line and No Active Intervention	Hold the Line and No Active Intervention
Ramsgate Harbour	4b 19	Hold the line	Hold the line	Hold the line
Ramsgate Harbour (west) to north of the River Stour	4b 20	Hold the Line and No Active Intervention	Hold the Line and No Active Intervention	Hold the Line and No Active Intervention

Table 3.1 - Summary of SMP policies for frontages within the district.

South East Inshore Marine Plan (2021):

Thanet is located within the South East Inshore Marine Plan area and a marine plan for this area has been prepared in June 2021. The South East Marine Plan has been prepared following Section 51 of the Marine and Coastal Access Act 2009. The aim of the South East Marine Plan is to provide a framework to inform decision making on how the waters are enhanced whilst allowing sustainable economic growth over the next 20 years. A copy of the Marine Plan can be found at;

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004493/FINAL_South_East_Marine_Plan__1_.pdf

Kent County Council Flood Risk to Communities – Thanet (DRAFT)

Similar to the Local Flood Risk Management Strategy summarised above, The Kent County Council Flood Risk to Communities identifies the main risk of flooding across the district and outlines strategies and plans on how to manage the risk identified.

Thanet Surface Water Management Plan (SWMP - 2013)

The Surface Water Management Plan for Thanet was released in May 2013. The report provides an assessment of the risk of surface water flooding in Thanet based on available data. The results of the analysis have been used to recommend suitable surface water management strategies which could reduce the risk of flooding. This was primarily aimed at high risk areas within the urban confines of the towns situated on the Isle of Thanet, mainly Birchington and Margate.

Due to the high risk in Margate, a Surface Water Management Plan has been undertaken specifically for Margate as a 'Stage 2', with the aim of gaining a better understanding of the key flood risks and to provide more detailed solutions and actions to manage these risks. In the SWMP for Margate, the existing drainage systems in parts of Margate have been identified as 'Tidally Sensitive Areas'. This is on account of the impact of tidal water levels on the drainage at this location, which will require further consideration when designing new infrastructure. A map of these areas can be found in Appendix F.1 of the SWMP;

https://www.kent.gov.uk/__data/assets/pdf_file/0004/49576/Margate-SWMP.pdf

Local Plan (adopted 2020)

The current Local Plan was adopted in July 2020 and covers the period up to 2031. The Local Plan sets out policies and proposals which are aimed at aiding the Council's decision making on sustainable development in the district.

Within the Local Plan, there are three policies which are relevant to flood risk. Policy CC01 relates to requirements for development in fluvial and tidal flood risk areas. Policy CC02 sets out the requirements for new development to manage surface water through the use of sustainable drainage systems (SuDS). Policy CC03 relates to new development within 40m of the coastline or cliff top and what is required to ensure that there will be no adverse effect on people or coastal erosion.

3.2. Definition of Development Types

There are a number of development classifications which are referenced throughout this SFRA. Applications submitted to TDC will be classified as either 'householder', 'minor' or 'major' development depending on the scale of development. However, such development may also fall under a second definition which is relevant to the management of flood risk and surface water. The definitions of these development types are provided below for reference;

Classifications for New Applications (Town and Country Planning Act)		
Householder	Minor	Major
Other Classifications relevant to Flood Risk and Surface Water Management:		
Minor development (in relation to flood risk)		

Table 3.2 – Classifications of development relevant to the SFRA.

3.2.1. Householder Development

Householder development is applicable for planning applications for internal changes and extensions to existing dwellings.

3.2.2. Minor Development

Minor development is applicable for planning applications which are not classified as householder development, but are not large enough to be considered as major development.

3.2.3. *Major Development*

Major development is defined within the Town and Country Planning (Development Management Procedure) (England) Order 2010 as development involving one or more of the following;

a) the winning and working of minerals or the use of land for mineral-working deposits;

b) waste development;

c) the provision of dwelling houses where:

(i) the number of dwelling houses to be provided is 10 or more; or

(ii) the development is to be carried out on a site having an area of 0.5 hectares or

(iii) more and it is not known whether the development falls within sub-paragraph (c)(i);

d) 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

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

3.2.4. *Permitted Development*

The Town and Country Planning (General Permitted Development) Order 1995 was amended in May 2013 to allow householders to undertake a wide scope of enlargements, improvements, and other alterations to their properties. This allowed for greater flexibility under permitted development for the change of use of commercial premises, without the need for a full planning permission. In April 2016, the Order was revised to incorporate the change of use of other use classifications to residential use; including (but not limited to) laundrettes and light industrial use buildings. Further amendments to the categories of use change which are permitted have been made on an annual basis. An up-to-date summary of the class use changes which are allowed under *permitted development rights* can be found at:

https://www.planningportal.co.uk/info/200130/common_projects/9/change_of_use/2

3.2.5. *'Minor Development' in Relation to Flood Risk*

The NPPG outlines a definition of minor development in relation to flood risk. This definition is used by the EA to define development which is subject to different guidance on the management of flood risk (Refer to Flood Risk Standing Advice), and is used within the NPPF to identify developments which are not subject to the Sequential Test or Exception Test. The NPPG definition of minor development in relation to flood risk is not to be confused with the Council's definition of minor development (see above). **Minor development in relation to flood risk** is defined as;

- *minor non-residential extensions: industrial/commercial/leisure etc extensions with a footprint less than 250 square metres.*
- *alterations: development that does not increase the size of buildings e.g. alterations to external appearance.*

- *householder development: For example; sheds, garages, games rooms etc within the curtilage of the existing dwelling, in addition to physical extensions to the existing dwelling itself. This definition excludes any proposed development that would create a separate dwelling within the curtilage of the existing dwelling e.g. subdivision of houses into flats.*

3.3. Requirements for a Flood Risk Assessment

The NPPF (2021) requires a site-specific FRA to be submitted for **all development located within Flood Zones 2 and 3**. In addition, development situated within **Flood Zone 1** will also require an FRA if the application meets one or more of the following criteria;

- The development site (red line boundary) is **greater than 1 hectare.**
- The development site is located within an area known to have **critical drainage problems***.
- The development site is located within an area identified by the SFRA as being at increased flood risk in the future (including the impacts of climate change).
- The development site introduces more vulnerable uses in an area shown to be at risk of flooding from other sources.

(*) It is recognised that there are no areas designated by the EA as Critical Drainage Areas within Thanet. Nevertheless, the LLFA may request that an FRA is submitted in support of an application, for example, for sites where there is a history of flooding.

For some minor development and change of use, the NPPF states that the above criteria for preparing a site-specific flood risk assessment still apply. However, such applications are not subject to the Sequential Test or Exception Test.

A site-specific FRA is also required to be submitted in support of applications for **a change of use,** where the proposals are subject to **permitted development rights (PDR).** Such applications are subject to a notification procedure with the LPA, referred to as a prior approval application (PAA). The applicant is required to submit details of the proposals, site details, and any other information deemed necessary for the LPA to assess the potential impact with regard to: transport and highway; contamination; flood risk; and noise impact. The FRA should demonstrate how the risk of flooding will be managed to ensure that the development remains safe through its lifetime.

To determine which Flood Zone the development site is located, the EA's 'Flood Maps for Planning' should be referenced:

https://flood-map-for-planning.service.gov.uk/

Further to the requirements set out in the NPPF, TDC's Local Plan Policy CC02 requires all sites located within a 'Tidally Sensitive Area' (as outlined within TDC's SWMP) to submit a Flood Risk Assessment as part of the planning application process.

3.3.1. *What should an FRA include?*

This section provides guidance on managing flood risk for developments which are required to submit a Flood Risk Assessment (see *'Requirements for a Flood Risk Assessment')*

A site-specific FRA should be prepared in accordance with the requirements set out in Paragraphs 30 - 32 and 68 of the *Planning Practice Guidance: Flood Risk and Coastal Change*. A checklist of the points to be included within a site-specific FRA can be found at the following web address:

https://www.gov.uk/guidance/flood-risk-and-coastal-change#Site-Specific-Flood-Risk-Assessment-checklist-section

The FRA must be appropriate to the scale, nature and location of the development and consider all possible sources of flood risk including the effects of flood risk management infrastructure and the vulnerability of those that could occupy and use the proposed development.

To assist in navigation through the report, the relevant sections which are applicable for each classification of development are presented in Table 4.1 below.

	Permitted Development (Change of use)	**Householder**	**Minor**	**Major**
Sequential Test required?	*Not Required*		*Yes, for sites in Flood Zone 2 and/or 3. The Sequential Test should also be considered for sites in Flood Zone 1 at risk of flooding from other sources.*	
Exception Test	*Not Required*		*Yes, dependant on vulnerability and Flood Zone classification. Sites in any flood zone where ≥ 40% of the site is at 'medium' to 'high' risk from surface water (as per the EA's 'Risk of Flooding from Surface Water' map) will also require the Exception Test to be applied.*	
Analysis and management of Flood Risk*	*Yes - for all sites which require an FRA to be submitted*			
Management of Surface Water Runoff*	*Refer to Section 5.1 'Requirements for Surface Water Runoff'*			

*Table 3.3 – Quick reference for the appropriate section for each classification of development. (*not included within this document)*

3.3.2. *Sequential Test*

LPAs are encouraged to take a risk-based approach to proposals for development in areas at risk of flooding through the application of the Sequential Test. The objectives of this test are to steer new development away from high risk areas, towards those at lower risk of flooding. The Sequential Test therefore requires the applicant to demonstrate that the development cannot be located in an area at lower risk of flooding by searching for alternative opportunities. In some areas, where developable land is in short supply, it may be demonstrated that there are no alternative sites at lower risk of flooding, and that there is overriding need to build in areas that are at risk of flooding.

Paragraph 161 of the 2021 NPPF states;

> *All plans should apply a sequential, risk-based approach to the location development – **taking into account all sources of flood risk** and the current and future impacts of climate change – so as to avoid, where possible, flood risk to people and property. They should do this, and manage any residual risk, by:*
>
> *a) Applying the sequential test and then, if necessary, the exception test as set out below;*
>
> *b) Safeguarding land from development that is required, or likely to be required, for current or future flood management;*
>
> *c) using opportunities provided by new development and **improvements in green and other infrastructure** to reduce the causes and impacts of flooding, (making as much use as possible of natural flood management techniques **as part of an integrated approach to flood risk management**); and*
>
> *d) where climate change is expected to increase flood risk so that some existing development may not be sustainable in the long-term, seeking opportunities to relocate development, including housing, to more sustainable locations.*

Paragraphs 162 goes on to state;

> *The aim of the sequential test is to steer new development to areas with the lowest risk of flooding **from any source**. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower risk of flooding. The strategic flood risk assessment will provide the basis for applying this test. The sequential approach should be used in areas known to be at risk now or in the future from any form of flooding.*

The following developments are **exempt** from the Sequential Test;

- Development classified as 'minor development' in relation to flood risk.
- A change of use application whereby the lawful planning use is changed. For example, Part 3, Class M: changing a Class A1 (shops) to Class C3 (dwelling houses). The exception is for applications for a change of use to a caravan, camping or chalet site, or to a mobile home or park site.

Based on the above criteria, development sites which are determined to be subject to the Sequential Test will be required to submit supporting information to the LPA to accompany the planning application.

In consideration of this, the EA's Flood Zones have been used in conjunction with the EA's 'Flood Risk from Surface Water', the EA's 'Flood Risk from Reservoirs' mapping and the modelling undertaken by Herrington Consulting in Broadstairs in 2021 to produce a combined 'Potential Risk of Flooding' map provided in Appendix A.4.

The 'Potential Risk of Flooding' map does not indicate areas which are at risk of flooding from other sources such as sewers, groundwater or ordinary watercourses, although the Local Flood Risk Management Strategy does provide some indicative groundwater flood risk mapping, and Surface Water Management Plans appraise the risk of surface water flooding including detailed surface water sewer flooding.

The 'Potential Risk of Flooding' map can be used in the first instance to identify sites which are potentially at risk of flooding from all sources and therefore, are required to apply the Sequential Test. However, the 'Potential Risk of Flooding' map does not include allowances for climate change (refer to Section 2.7), which should be considered when applying the Sequential Test. It is acknowledged that detailed modelling including the latest appropriate allowance for climate change is not always available for all sources, and therefore it is recommended that the Sequential Test is applied by comparing like for like sites (in relation to flood risk) with the impacts of climate change considered on a site-by-site basis.

3.3.3. Exception Test

If following the application of the Sequential Test it is not possible, or consistent with wider sustainability objectives, for the development to be located in an **area** at lower risk of flooding, the Exception Test can be applied.

As part of this process it is necessary to consider the type and nature of the development. Table 2 of the *Planning Practice Guidance: Flood Risk and Coastal Change* (Paragraph 66) defines the type and nature of different development classifications in the context of their flood risk vulnerability. This has been summarised in Table 3 of the *NPPG: Flood Risk and Coastal Change*, which highlights the combinations of vulnerability and flood zone compatibility that require the Exception Test to be applied.

It should be acknowledged that Paragraph 67 of the *NPPG: Flood Risk and Coastal Change* states the following about Table 3:

"This table does not show the application of the Sequential Test which should be applied first to guide development to Flood Zone 1, then Zone 2, and then Zone 3; nor does it reflect the need to avoid flood risk from sources other than rivers and the sea";

Therefore, it is necessary to consider the risk of flooding to development sites from all sources to determine whether the development would require, and pass the Exception Test.

As with the Sequential Test, applications for 'change of use' or 'minor development' (in relation to flood risk) are exempt from the Exception Test.

Flood Zone 3 as delineated by the EA's Flood Maps for Planning is further sub-divided into Zone 3a and 3b (referred to as the *functional floodplain*). Clarification between Flood Zone 3a and 3b is an important distinction that needs to be made when determining when the Exception Test is applicable. Table 3 identifies that no development, other than essential transport and utilities infrastructure, will be permitted within the functional floodplain.

To determine whether a development is located within the functional floodplain, it will be necessary to consult the EA to obtain additional information on the likelihood of flooding at the application site. Based on this information (where available) the following Test should be applied;

- *Do predicted flood levels show that the site will be affected by an event with a return period of 1 in 20 years or less?*
- *Is the site defended by flood defence infrastructure that prevents flooding under events with a return period of 1 in 20 years or greater?*
- *Does the site provide a flood storage or floodwater conveyance function?*
- *Does the site contain areas that are 'intended' to provide transmission and storage of water from other sources?*

The NPPG states that '*the identification of functional floodplain should take account of local circumstances and not be defined solely on rigid probability parameters'*. The functional floodplain has been defined using the area of land which naturally flood during a 1 in 20 year return period event or greater in any year (5% AEP) taken from the EA's East Kent Coast modelling study (2018), the EA's Lower Stour Modelling (2010 – the EA has confirmed an update to this modelling is in progress and is due to be completed in 2023) and Herrington Consulting's modelling in Broadstairs (2021). Mapping showing the Functional Floodplain can be found in Appendix A.5.

Sites which are identified to be subject to the Exception Test cannot be permitted or allocated until the Exception Test is passed. There are two criteria which make up the Exception Test, both of which must be satisfied;

Part A: It should be demonstrated that the development provides wider sustainability benefits to the community that outweigh flood risk

Part B: The development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and where possible, will reduce flood risk overall.

Development sites which have been allocated will still be required to meet the objectives of the Exception Test before permission can be granted.

3.4. Requirements for a Surface Water Management Strategy

In addition to addressing the risk of flooding to a development, it is necessary to ensure that the development does not increase the risk of flooding offsite as a result of an increase in surface water runoff from the development. A Surface Water Management Strategy (SWMS) is therefore required to be submitted to address this. A SWMS can be a standalone document or form part of a Flood Risk Assessment where one is required. The SWMS sets out how local flood risk (flooding from sewers, drains, groundwater, ordinary watercourses, heavy rainfall) can be managed over the lifetime of the development. The requirements for managing surface water runoff from the development are dependant on the scale of development and are discussed below.

Householder Applications, Permitted Development and Minor Development

There are no specific requirements to provide additional supporting documentation in relation to SuDS at this time for the development types listed above. Nevertheless, Paragraph 167 of the NPPF does require *all* development applications (which are required to be accompanied by a Flood Risk Assessment) to incorporate SuDS, unless there is clear evidence that this would be inappropriate. Notwithstanding this, all development will be subject to Building Regulations requirements for drainage and waste disposal (Part H).

Major Applications

For all **major** applications, the LLFA (KCC) are the statutory consultee with respect to surface water management. The LLFA require a detailed **Surface Water Management Strategy** report to be submitted alongside the planning application, which should evidence how SuDS can be incorporated within the proposed development. The SWMS must demonstrate compliance with the Non-Statutory Technical Standards for SuDS as well as all local planning policies related to drainage. Guidance on the completion of a detailed SWMS is set out within KCC's Drainage and Planning Policy Statement.

Other Considerations

Local Plan Policy CC02 states that all sites which have been identified as a Tidally Sensitive Area will need to incorporate SuDS at the design stage of the planning application, including a maintenance schedule where appropriate.

Southern Water, as the sewer undertaker, also strongly encourage that developments include SuDS to help reduce the pressure on the existing sewer network.

4. Conclusions and Recommendations

The National Planning Policy Framework (NPPF 2021) published by the Department for Communities and Local Government, requires Local Planning Authorities (LPA) to apply a risk-based approach to the preparation of their development plans in respect of potential flooding. In simple terms, the NPPF requires LPAs to review the variation in flood risk across their district, and to steer vulnerable development (e.g. housing) towards areas of lowest risk.

Where development is to be permitted in areas that may be subject to some degree of flood risk, the NPPF requires the LPA to demonstrate that there are sustainable options for mitigation available, which will ensure that the risk to property and life is minimised should flooding occur.

In accordance with the NPPF's requirements, this SFRA report provides an evidence base and builds upon the original SFRA which was prepared in 2009, and the TDC addendum written in 2018. This latest iteration addresses changes to planning policy and introduces updated mapping, which is designed to assist with the appraisal of flood risk to support better spatial planning. The SFRA includes an overview of the risk of flooding to the district and is intended to provide information to the LPA and developers with respect to current flood risk policy requirements.

This appraisal has identified that coastal flooding within the district is limited to the low-lying areas surrounding the Wantsum Channel and the town centre of Margate. Both areas currently benefit from existing flood defence infrastructure which protect the low-lying areas and the town centre from flooding from the sea for the foreseeable future (i.e. the next 50 years). The presence of the defences significantly reduces the actual risk of flooding at these coastal locations. Nevertheless, the risks associated with the future impact of climate change and/or a residual risk event, (such as a failure of the defences), means that both the Wantsum Channel and town centre of Margate could be at risk of flooding in the future. As such, investment in flood defence infrastructure will become more important and future planning for such defences is recommended.

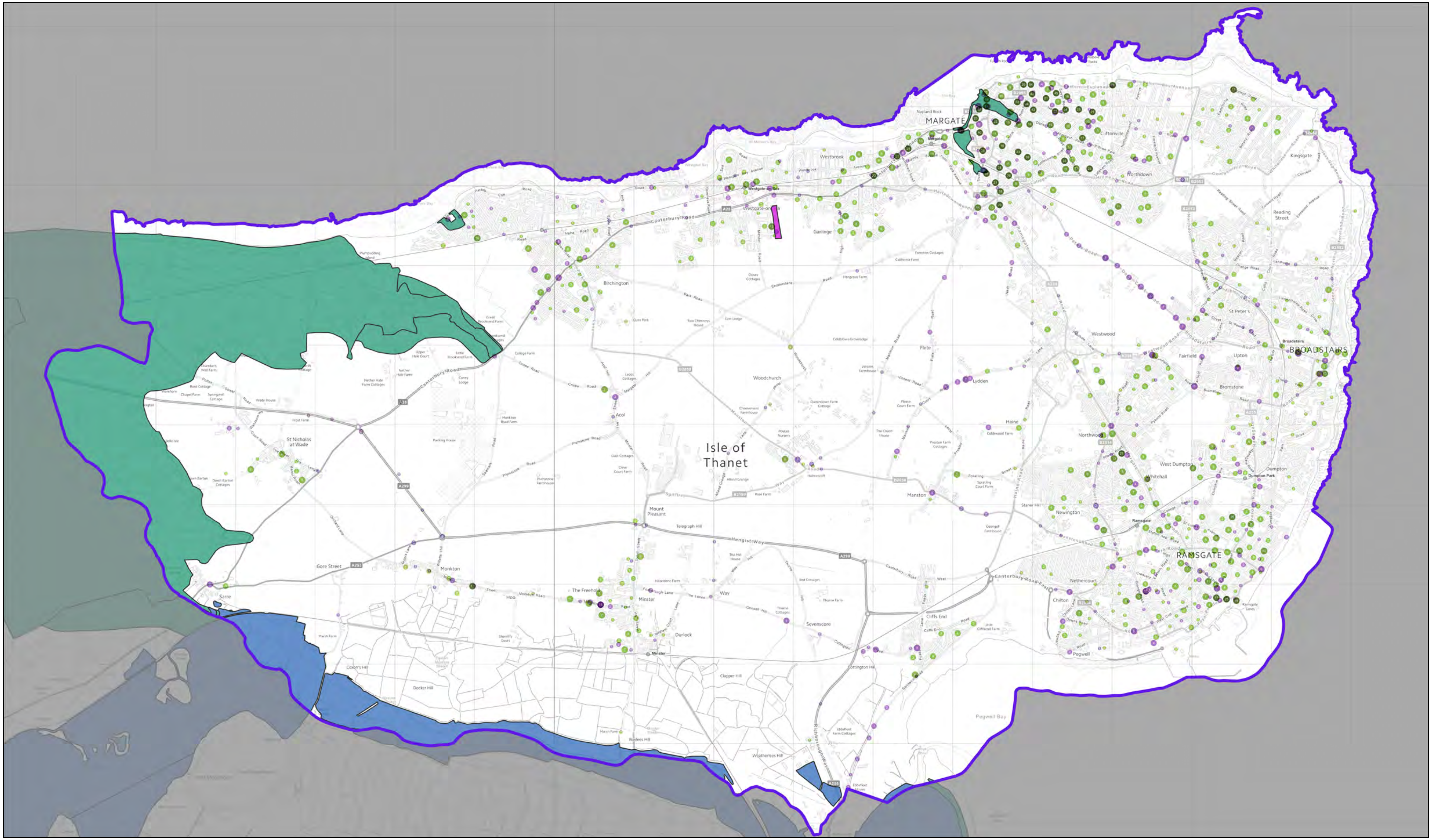
In addition to coastal flooding, it is recognised that the potential risk of flooding from other sources also exists throughout the district. The risks include the risk of the sewer network becoming overwhelmed within the urban areas and the risk of surface water flooding, as a result of heavy rainfall (pluvial flooding). If an extreme rainfall event was to coincide with high water levels within the river network of the River Wantsum, River Stour and/or Minster Stream, the capacity of the drainage network within the low-lying marshland of the Wantsum Channel could be exceeded, which has the potential to result in localised flooding.

Where flooding could be experienced within the district, Section 3 of the report provides the reader with some additional context with respect to the current flood risk policy. Section 3 of the report includes both national and local policies relating to flood risk and provides clear information on *why* the flood risk information is required to be submitted. This section also defines what information is required to be submitted relating to flood risk and surface water management in support of planning applications.

In summary, the SFRA provides a clear, up-to-date, picture of the potential risks associated with flooding within the Thanet district and outlines the requirements with regard to ensuring that these risks are managed in a sustainable way into the future.

A. Appendices

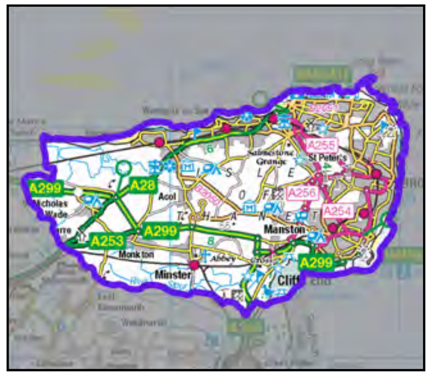
Appendix A.1 – Historic Flooding



Records of Historic Flooding

Thanet District Council
Strategic Flood Risk Assessment

DRAWN NW	REVISION No. Original	DATE 08/10/2021	SCALE 1: 43,000
CHECKED TV			ORIGINAL A3
APPROVED SMB			SHEET 1 of 1
DRAWING NUMBER 3184/NW/01			STATUS 1st ISSUE



Records of Historic Flooding

Extent of flooding recorded by the EA

- Main river
- Other
- Sea
- Floods recorded by Southern Water
- Floods recorded by Kent County Council

These historic flood records are a combination of data from remote sensing, ground surveys and staff observations provided by Thanet District Council, Kent County Council and the Environment Agency. Validated third party data and anecdotal evidence are also included. The datasets used may have been designed to be viewed at a range of map scales, and therefore this map is not intended to be viewed at a site-specific scale. These records are the best available at the time of collation, but should not be considered comprehensive. An area without a flood outline does not necessarily imply that there is no risk of flooding. Queries with regard to the recorded flood extents should be directed to the Environment Agency.

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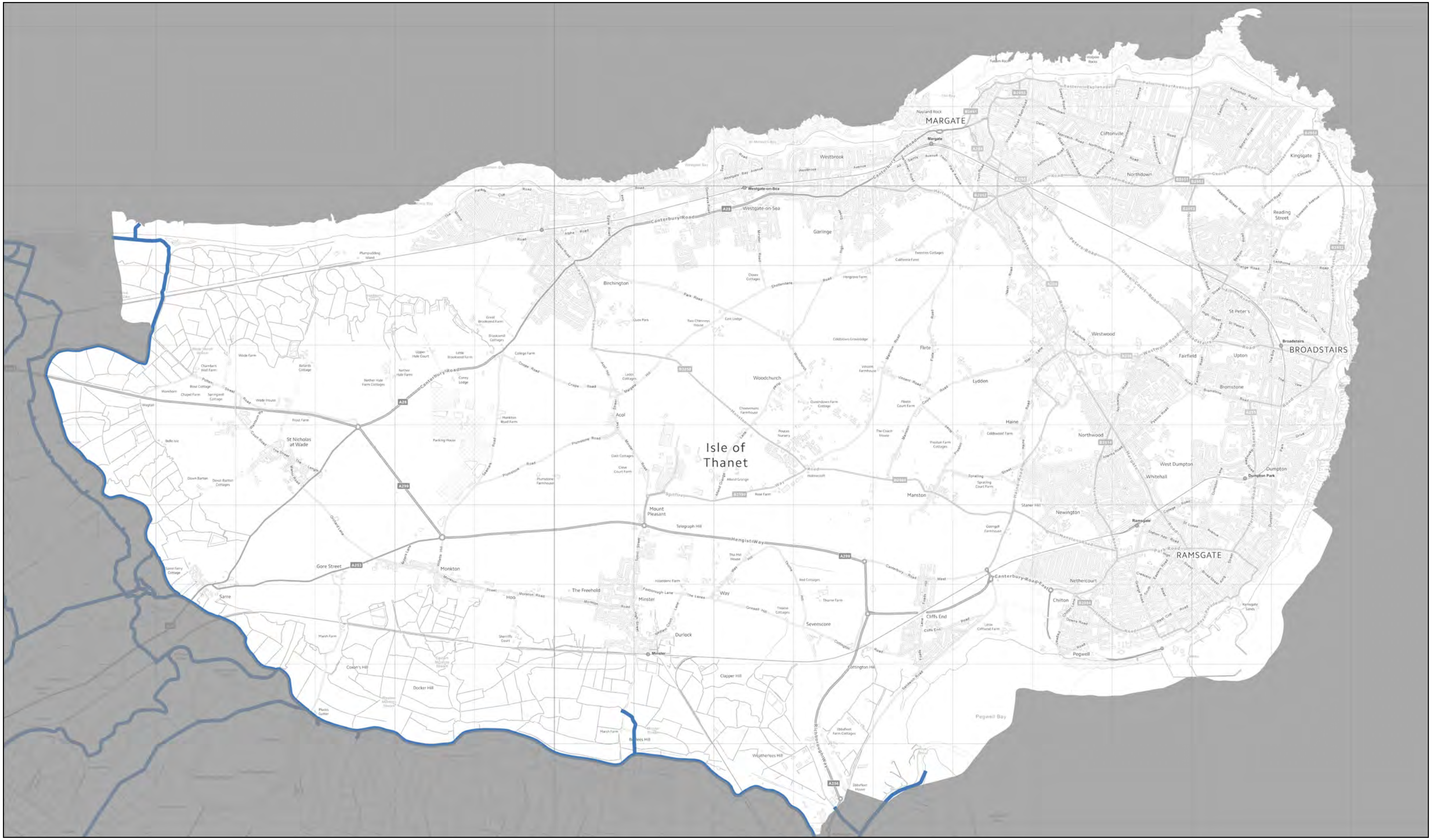
Appendix A.2 – Watercourses



Main Rivers

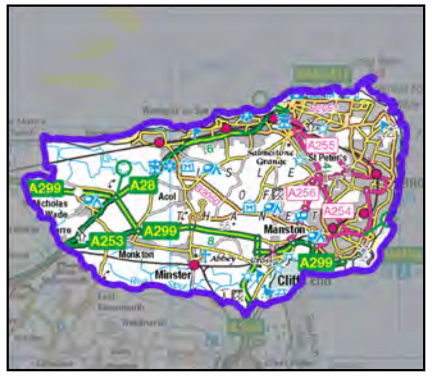
Thanet District Council
Strategic Flood Risk Assessment

DRAWN	REVISION No.	DATE	SCALE
NW	Original	08/10/2021	1: 43,000

CHECKED	ORIGINAL
TV	A3

APPROVED	SHEET
SMB	1 of 1

DRAWING NUMBER	STATUS
3184/NW/02	1st ISSUE



Main Rivers

EA designated Main River

Several datasets have been used in the derivation of the mapped extents. The datasets used may have been intended to be viewed at a range of map scales, and therefore this map is not designed to be viewed at a site-specific scale. However, due to the methods used in deriving these extents, a more accurate assessment of the distance from a watercourse may be required by the Environment Agency.

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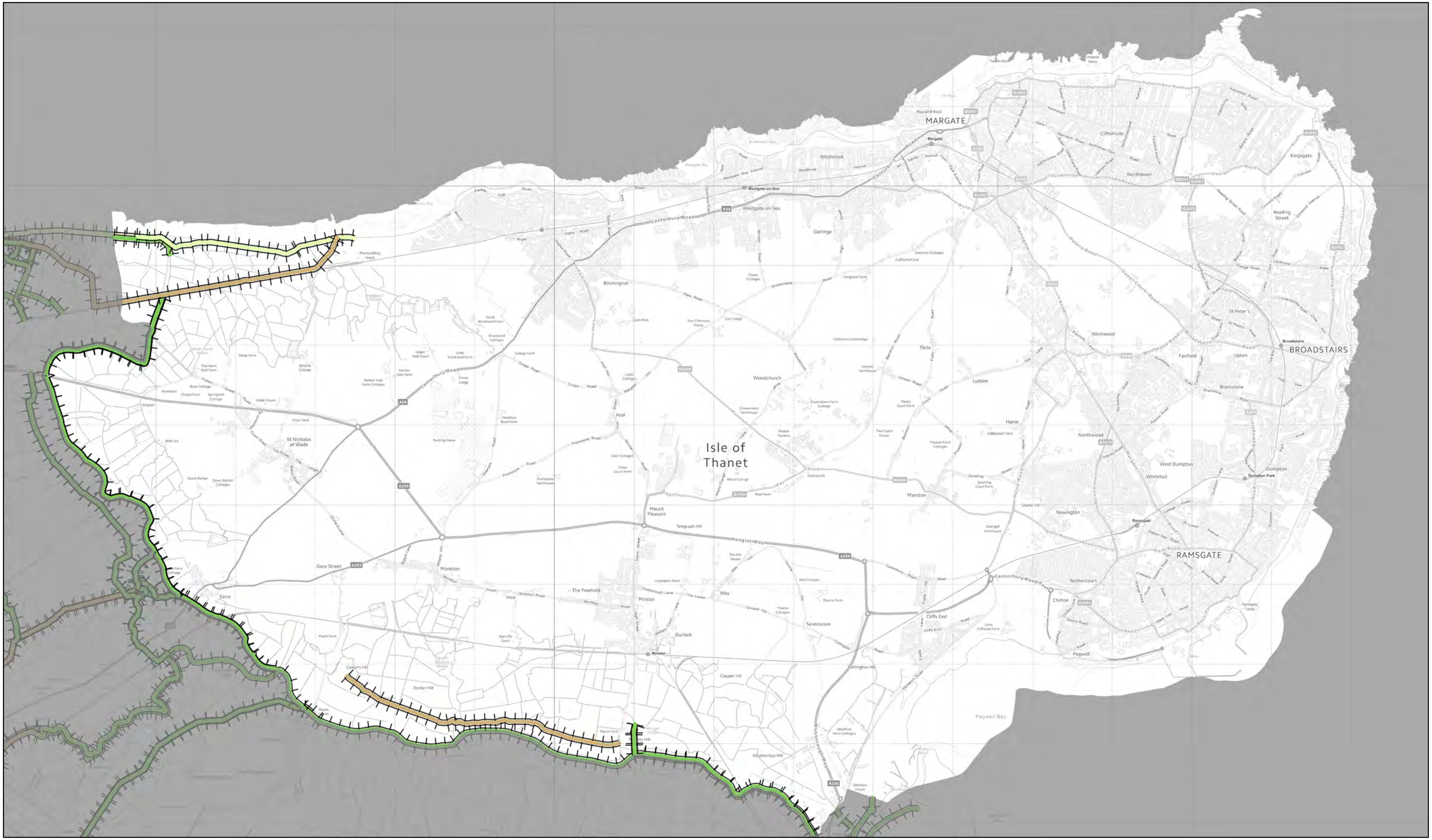
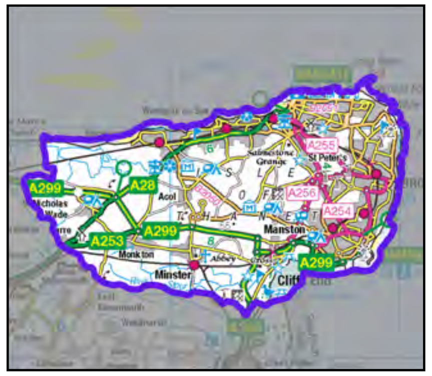
Appendix A.3 – Defence Infrastructure





Flood Defence Infrastructure

Thanet District Council
Strategic Flood Risk Assessment

DRAWN	REVISION No.	DATE	SCALE
NW	Original	08/10/2021	1: 43,000
CHECKED			ORIGINAL
TV			A3
APPROVED			SHEET
SMB			1 of 1
DRAWING NUMBER			STATUS
3184/NW/03			1st ISSUE

Flood Defences

- Bridge Abutment
- Embankment
- High Ground
- Wall

Several datasets have been used in the derivation of the mapped extents. The datasets used may have been intended to be viewed at a range of map scales, and therefore this map is not designed to be viewed at a site-specific scale. However, due to the methods used in deriving these extents, a more accurate assessment of the distance from a defence may be required by the Environment Agency.

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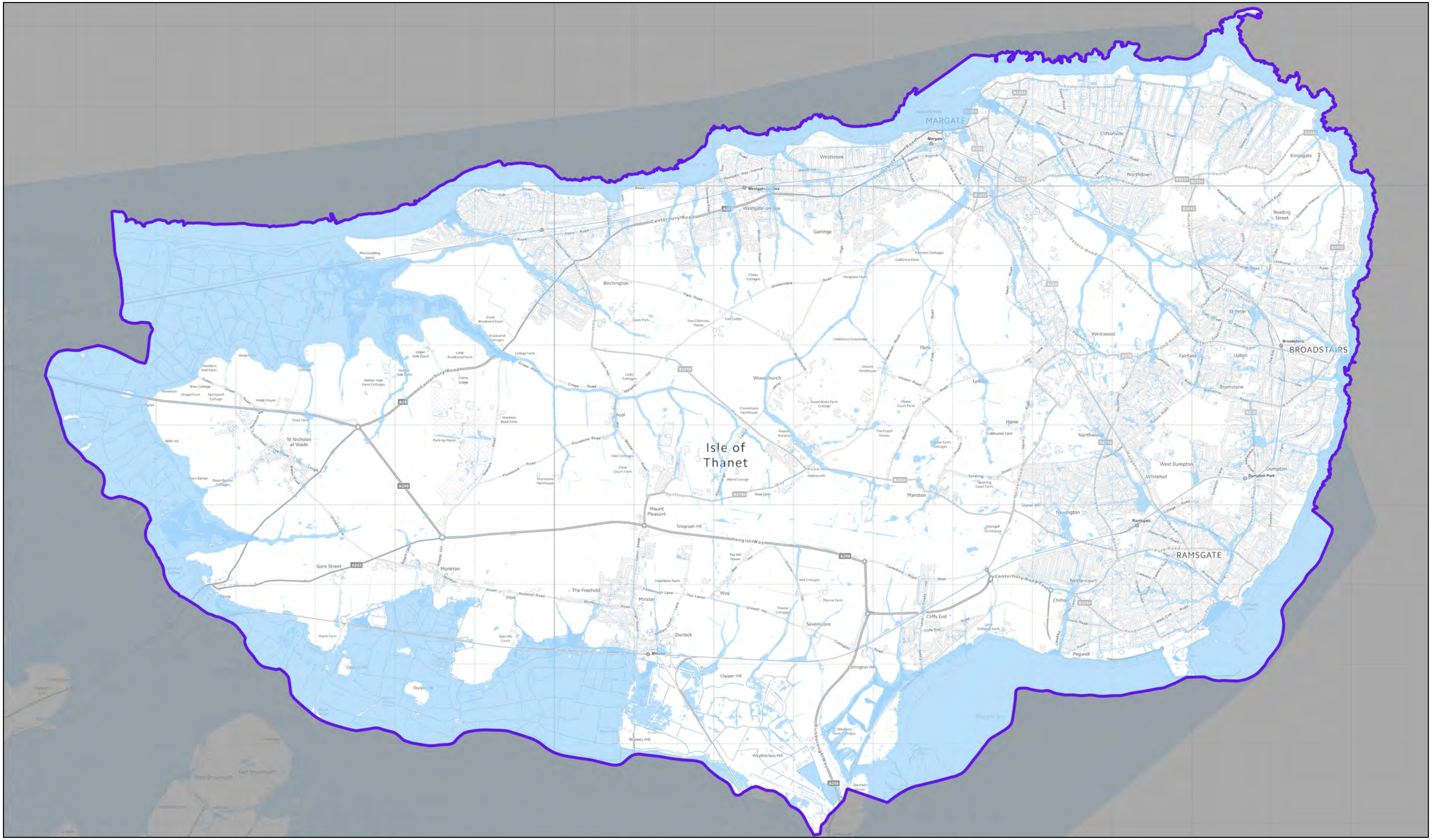
Appendix A.4 – Potential Risk of Flooding Map

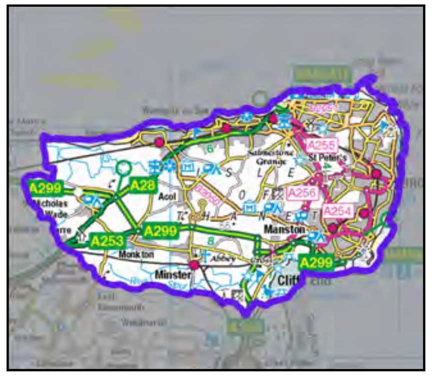


All Sources of Flood Risk

Thanet District Council
Strategic Flood Risk Assessment

DRAWN	NW	SCALE	1: 43,000
CHECKED	TV	ORIGINAL	A3
APPROVED	SMB	SHEET	1 of 1
DRAWING NUMBER	3184/NW/04	STATUS	1st ISSUE

REVISION No.	DATE
Original	21/12/2021



All Sources of Flooding

Risk of Flooding

These historic flood records are a combination of data from remote sensing, ground surveys and staff observations provided by Thanet District Council, Kent County Council and the Environment Agency. Validated third party data and anecdotal evidence are also included. The datasets used may have been designed to be viewed at a range of map scales, and therefore this map is not intended to be viewed at a site-specific scale. These records are the best available at the time of collation, but should not be considered comprehensive. An area without a flood outline does not necessarily imply that there is no risk of flooding. Queries with regard to the recorded flood extents should be directed to the Environment Agency.

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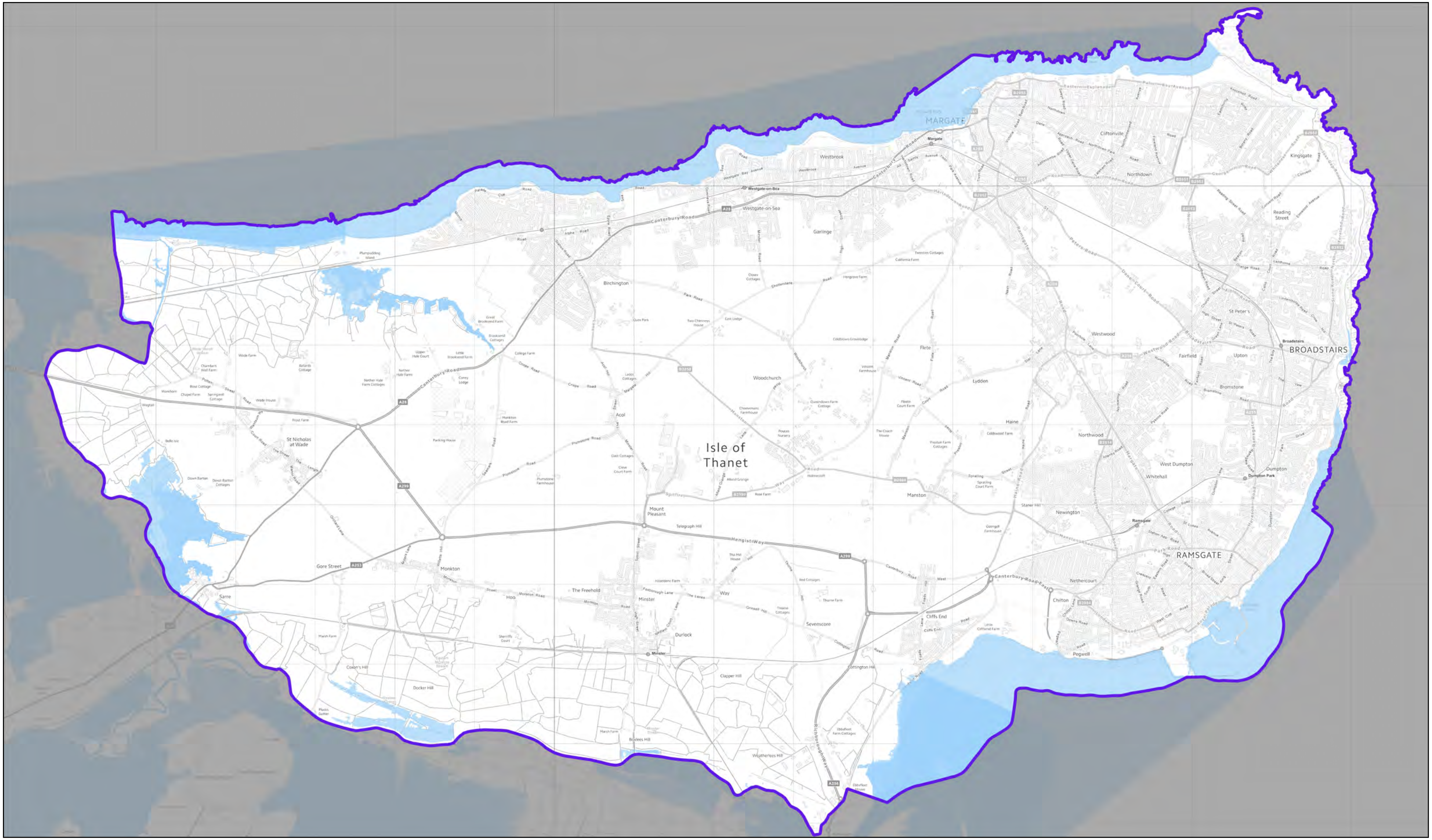
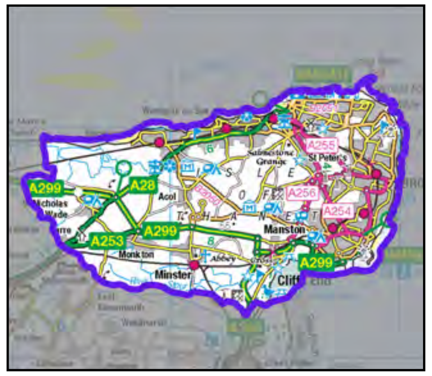
Appendix A.5 – Functional Floodplain





Functional Floodplain (Flood Zone 3b)

Thanet District Council
Strategic Flood Risk Assessment

DRAWN	NW	REVISION No.	DATE	SCALE	1: 43,000
CHECKED	TV	Original	21/12/2021	ORIGINAL	A3
APPROVED	SMB			SHEET	1 of 1
DRAWING NUMBER	3184/NW/05			STATUS	1st ISSUE

Functional Floodplain

Functional Floodplain (fluvial and tidal sources)

A number of datasets have been used in the derivation of the mapped extents (refer to section 3.3.3). These maps have been provided in accordance with the NPPF. As the information is indicative rather than specific, the LPA will need to consult the EA on individual planning applications. Users should note that floodplain extents are mapped at 1:10,000 scale, as appropriate to the level of investigation and are based on information available at the time. Amendments will be required in future to account for information gather subsequently e.g. changes in sea levels, hydrological river response or observations following flood events. When in doubt, the EA should be consulted.

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Appendix A.6 – Data Sources

Data Layer	Source
OS MasterMap Topo	Thanet District Council
OS 1:250 000 colour raster mapping	Ordnance Survey
Historic flood extents	Environment Agency
Historic flood records	Thanet District Council Kent County Council Southern Water
Flood Zones 2	Environment Agency
Flood Zone 3	Environment Agency
Flood Risk from Reservoirs	Environment Agency
Flood Risk from Surface Water	Environment Agency
1 in 20 year flood extents	Environment Agency
Broadstairs Coastal Modelling (1 in 20 year and 1 in 200 [year 2120] flood extents)	Herrington Consulting Ltd
Geology	British Geology Survey
Spatial Flood Defences	Environment Agency
District boundary	Thanet District Council