Catesby Strategic Land Ltd

Land north of Moat Road, Headcorn

Flood Risk Assessment & Surface Water Drainage Strategy

680350-R1(5)-FRA
December 2023

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RSK GENERAL NOTES

Project No.: 680350-R1(5)-FRA

Site: Land north of Moat Road, Headcorn

Title: Flood Risk Assessment & Surface Water Drainage Strategy

Client: Catesby Strategic Land Ltd

Date: December 2023

Office: Hemel Hempstead

Status: Final

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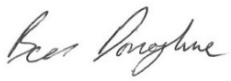
Signature		Signature	
Date:	19th December 2023	Date:	19th December 2023
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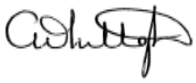
Signature		Signature	
Date:	19th December 2023	Date:	19th December 2023

Issue No	Version/Details	Date issued	Author	Reviewed by	Approved by
R1(0)	680350-R1(0)-FRA	31.10.22	JL	MC	KJ
R1(1)	680350-R1(1)-FRA	09.11.22	JL	MC	KJ
R1(2)	680350-R1(2)-FRA	03.05.23	JL	MC	MC
R1(3)	680350-R1(3)-FRA	24.07.23	JL	MC	MC
R1(4)	680350-R1(4)-FRA	11.09.23	JL	MC	MC
R1(5)	680350-R1(5)-FRA	04.12.23	BD	MC	CW

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1 INTRODUCTION

RSK Land and Development Engineering Ltd were commissioned by Catesby Strategic Land Ltd (the client) to provide a Flood Risk Assessment (FRA) to support the outline planning application at Land north of Moat Road, Headcorn (the site). Development proposals include residential development up to 120 dwellings (Use Class C3) including demolition of existing buildings, means of access into the site from Moat Road (not internal roads), associated highway works, emergency access to Millbank, realignment of the existing public right of way and associated infrastructure.

The purpose of the FRA is to establish the flood risk associated with the proposed development and to propose suitable mitigation, if required, to reduce the risk to a more acceptable level. The FRA must demonstrate that the development will be safe for its lifetime (in this case assumed to be 100 years) taking account of the vulnerability of its users, without increasing flood risk elsewhere.

This document has been produced to assess the flood risk from tidal, fluvial, surface water, groundwater, sewers, reservoirs, and artificial sources in line with the National Planning Policy Framework (NPPF)[1] and its corresponding Planning Practice Guidance (PPG)[2]. It includes a summary of the proposed surface water drainage strategy, showing how Sustainable Drainage Systems (SuDS) have been used to demonstrate surface water is appropriately managed on-site, with the aim that there is no increased risk of flooding on-site or elsewhere as a result of the development.

This assessment has been undertaken in consultation with the relevant authorities, and with reference to data, documents and guidance published by the Environment Agency (EA), the Lead Local Flood Authority (LLFA) (Kent County Council), the Local Planning Authority (LPA) (Maidstone Borough Council), the Water Authority (Southern Water) and the Upper Medway Internal Drainage Board (IDB).

This updated report version has been produced to address various objections raised by Kent County Council (ref. MBC/2023/097666).

The comments given in this report and opinions expressed are subject to RSK Group Service Constraints provided in **Appendix A**.

[1] Communities and Local Government, 'National Planning Policy Framework', published March 2012 and last updated December 2023.

[2] Communities and Local Government, 'Planning Practice Guidance - Flood Risk and Coastal Change, ID 7', published March 2014 and last updated August 2022. http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/..

2 SITE DESCRIPTION & PROPOSALS

2.1 Existing site

2.1.1 Site description

The site is located on land to the north of Moat Road on the western side of Headcorn in the county of Kent. The site can be located at National Grid Reference 582916E, 144563N and postcode TN27 9NT. A site location plan is included as **Figure 2.1**.

The site covers an area of approximately 7.3ha and currently comprises greenfield land that is split into two fields. Former farm buildings occupy an area in the southeastern part of the site.

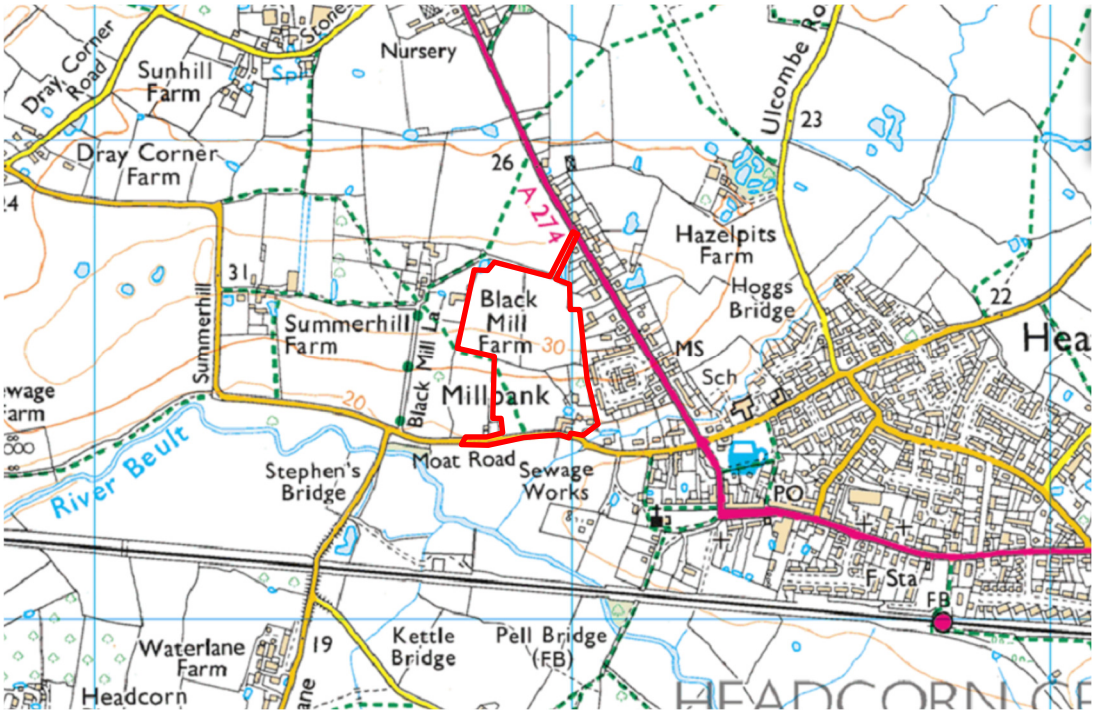


Figure 2.1: Site location plan

2.1.2 Topography

A site-specific topographic survey has been carried out by Greenhatch Group. The survey shows the existing site levels vary from 17.9 metres above ordnance datum (mAOD) in the southeast corner to 33mAOD in the northeast corner. The land generally falls away towards the south, with a small area in the northwest corner falling away to the north. Levels along the main site frontage of Moat Road fall away towards the east and the secondary northern access road falls away to the north to meet Mill Bank (A274) at approximately 29.4mAOD.

The topographic survey is included in **Appendix B**.

2.1.3 Existing drainage

2.1.3.1 Public

Southern Water sewer plans have been obtained for the site and are included in **Appendix C**. These plans indicate the following network of sewers in the vicinity of the site:

- There are no public sewers shown within the site itself;
- A 225mm diameter foul water sewer is located within Mill Bank to the east, flowing towards the southeast. An additional 150mm diameter foul water sewer is located within Bankfields to the east and a 375mm diameter foul water sewer is located within Moat Road to the southeast;
- The plan provided also appears to show a rising main, vacuum or syphon beyond Moat Road to the south, although no further information is provided; and
- There are no public surface water or combined sewers shown within the vicinity of the site.

2.1.3.2 Private

Surface water runoff is currently thought to flow overland, naturally discharging into the Main River Hogg's Stream to the southeast of the site.

The former agricultural buildings in the southeast corner of the site have a positively drained surface water outfall, which was identified during the site walkover. The network between the site and Hogg's Stream is summarised below and illustrated in **Figure 2.2** and described as follows:-

- A 150mm diameter outfall pipe discharges from farm buildings into the ditch running parallel with the northern side of Moat Road;
- A 340mm diameter pipe running beneath Moat Road between two small concrete headwalls conveys flow into the open ditch on the southern side of Moat Road; and
- The open ditch then runs to the east parallel with Moat Road and is culverted for approximately 4m beneath a field entrance (in a 300mm diameter culvert), before entering a 300mm diameter culvert that runs for approximately 17m before discharging into Hogg's Stream downstream of the culvert passing underneath Moat Road.

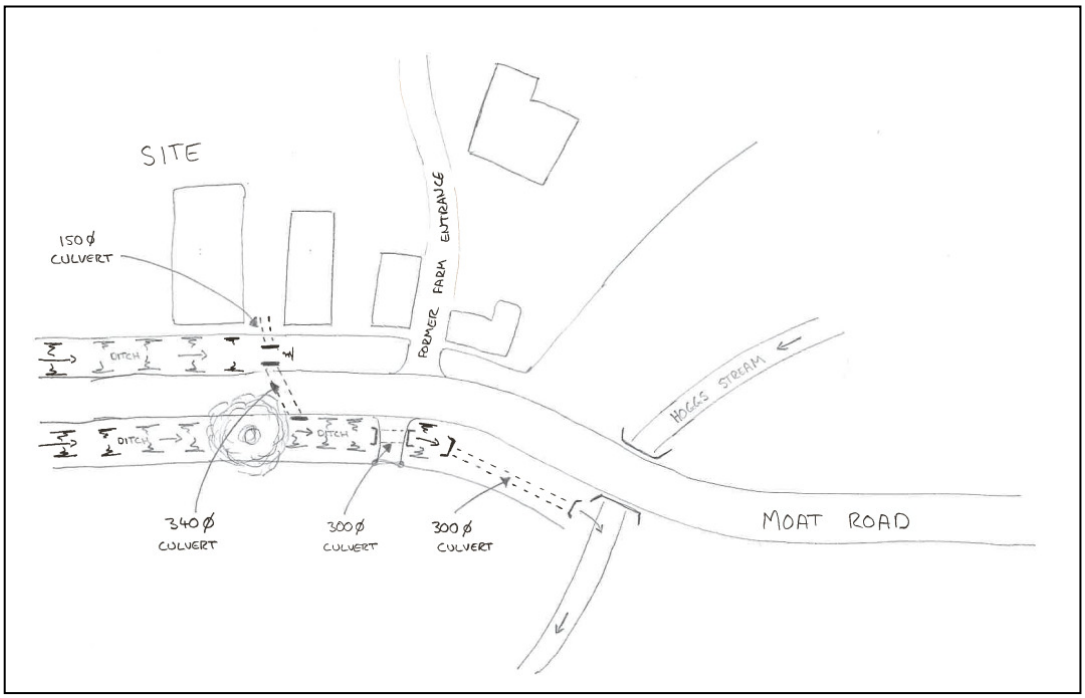


Figure 2.2: Offsite Drainage Arrangement

2.2 Development proposals

The development proposals are for *'Outline application (with all matters reserved except access) for the development of up to 120no. dwellings (Use Class C3) including demolition of existing buildings, means of access into the site from Moat Road (not internal roads), associated highway works, provision of public open space, emergency / pedestrian access to Millbank and associated infrastructure including surface water drainage (with related off site s278 highway works to Moat Road).'*

The relevant proposed site plans are included as **Appendix D**.

3 ENVIRONMENTAL SETTING

3.1 Hydrology

Reference to Ordnance Survey (OS) mapping and the EA's web-based mapping indicates that the nearest EA Main River is Hogg's Stream (a tributary of the River Beult), which is located approximately 10-12m beyond the southeast corner of the site. The main upstream catchment of Hogg's Stream lies to the northeast of the site, with the watercourse flowing towards the southwest and its downstream confluence with the River Beult approximately 200m south of the site.

A small pond is located in the southeast corner of the site, adjacent to the existing former agricultural buildings, with additional pond features just beyond the northwest and northeast corners of the site. No other formal watercourse features were identified within the vicinity of the site.

3.2 Geology

Based on published geological records for the area (British Geological Survey online mapping), the site exhibits the following geology:

- Superficial Geology: None across the majority of the site, with a very small area of Alluvium - Clay, silt, sand and peat in the southeast corner; and
- Bedrock Geology: Weald Clay Formation (Mudstone in the south and Limestone in the north).

There are no BGS Boreholes located within the vicinity of the site. The nearest BGS borehole record from Water Lane 900m to the southwest (BGS ID TQ84SW4) has no water table depth referenced; however, given the proximity of the River Beult and Hoggs Stream, the local water table is likely to be higher in the south of the site.

A Phase I Desk Study Appraisal has been produced by GRM in October 2022 (report reference P9697/DS.1/DRAFT). The report details the existing geology and hydrogeology, groundwater levels, permeability and contamination. The key points related to flood risk and drainage are highlighted below:

- Anticipated geology is Alluvium (clay, silt, sand gravel) encroaching in the southeast corner, with no other superficial deposits, overlying the Weald Clay Formation (with limestone across the northern half and mudstone across the southern half of the site) as noted above, with Topsoil and some Made Ground likely to be present. No intrusive works have been undertaken to confirm at this stage;
- No detailed information regarding the depth to groundwater is available, however, the groundwater level is likely to be subject to seasonal variations. The report suggests the Weald Clay Formation (Limestone) is anticipated to comprise permeable layers capable of supporting water supplies at a local scale and forming an important source of base flow to rivers. The Weald Clay Formation (Mudstone) is predominantly cohesive with low permeability and has negligible significance for water supply or river base flow, and therefore is not considered to be a sensitive receptor;

- There is considered to be negligible risk posed to surface waters from site derived contamination (should any be present) and the risk of ground contamination is considered to be low to very low; and
- Given the anticipated geology across the site area, a soakaway (ground infiltration) drainage system is unlikely to be feasible.

At the time of writing, no site-specific intrusive ground investigations have been undertaken for the site to confirm the underlying geology, potential contamination, permeability or groundwater levels on site.

3.3 Hydrogeology

Hydrogeological information was obtained from the online Magic Maps service. These maps indicate that the site is partially underlain by a Secondary A Bedrock aquifer associated with the underlying Limestone in the north of the site, with the Mudstone in the south categorised as Unproductive. The Alluvial deposits in the very southeast corner are considered a Secondary (undifferentiated) Superficial aquifer.

The site is not located within a Groundwater Source Protection Zone.

The site's close proximity to a watercourse may also suggest that shallow groundwater may be present beneath the site.

4 SOURCES OF FLOOD RISK

4.1 Criteria

In accordance with the NPPF and advice from the EA, an assessment of the risk associated with various flooding sources is required along with consideration of the effects of climate change over the design life of the development (in this case assumed to be 100 years).

The EA's most recent climate change guidance[3], should be referenced in order to identify the appropriate peak river flow and rainfall intensity allowances for the scheme. The appropriate allowance for peak river flow is based on the site's location in the country, the lifetime of development, the relevant flood zone and the vulnerability of the proposed end use.

The flood risk elements that need to be considered for any site are defined in BS 8533 'Assessing and managing flood risk in development Code of practice'[4] as the "Forms of Flooding" and are listed as:

- Flooding from rivers (fluvial flood risk);
- Flooding from the sea (tidal flood risk);
- Flooding from the land;
- Flooding from groundwater;
- Flooding from sewers (sewer and drain exceedance, pumping station failure etc); and
- Flooding from reservoirs, canals and other artificial structures.

The following section reviews each of these in respect of the subject site.

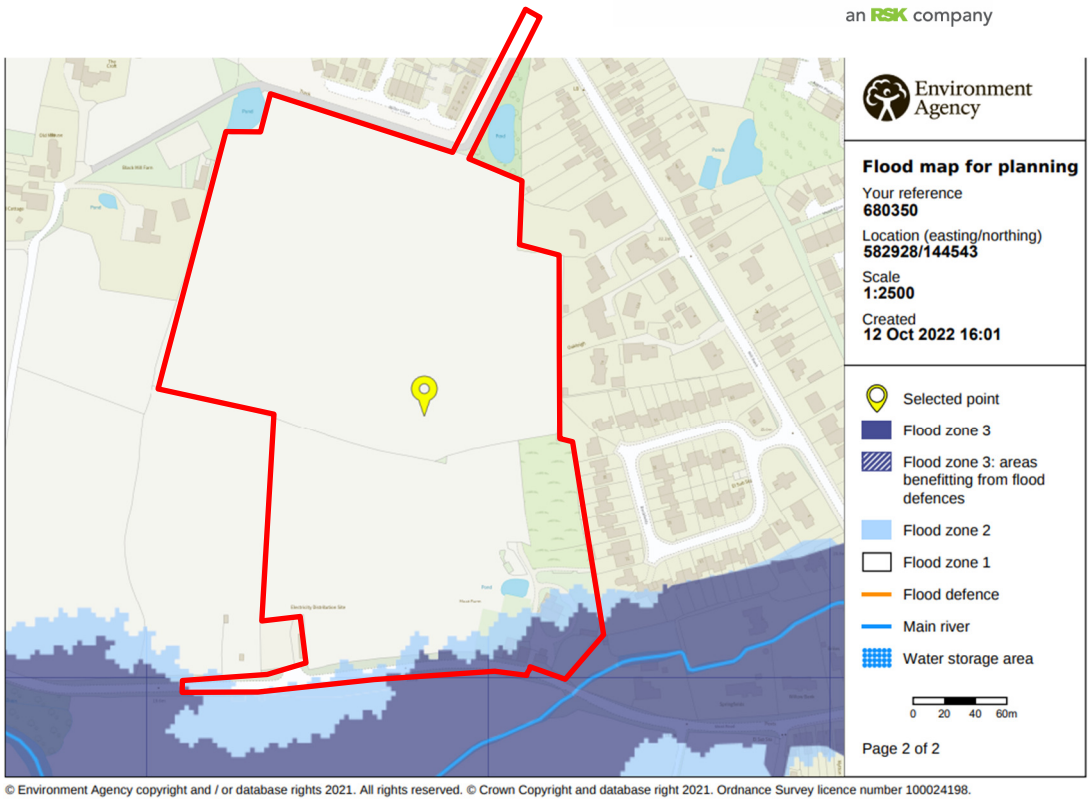
4.2 Flooding from rivers (fluvial flood risk)

The EA Flood Zone mapping study for England is available on their website at: https://flood-map-for-planning.service.gov.uk.

The latest EA published flood zone map (**Figure 4.1**) shows that the the majority of the site appears to lie within Flood Zone 1 (land assessed as having a less than 1 in 1,000 annual probability of flooding from fluvial or tidal sources). Land in the far south/southeast of the site is located within Flood Zones 2 and 3 associated with Hogg's Stream / River Beult, together with parts of Moat Road to the south.

[3] Environment Agency, 'Guidance: Flood Risk Assessments: Climate Change Allowances'. https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances, published February 2016, last updated May 2022.

[4] BSI, 'BS 8533-2017 Assessing and managing flood risk in development Code of practice', December 2017.



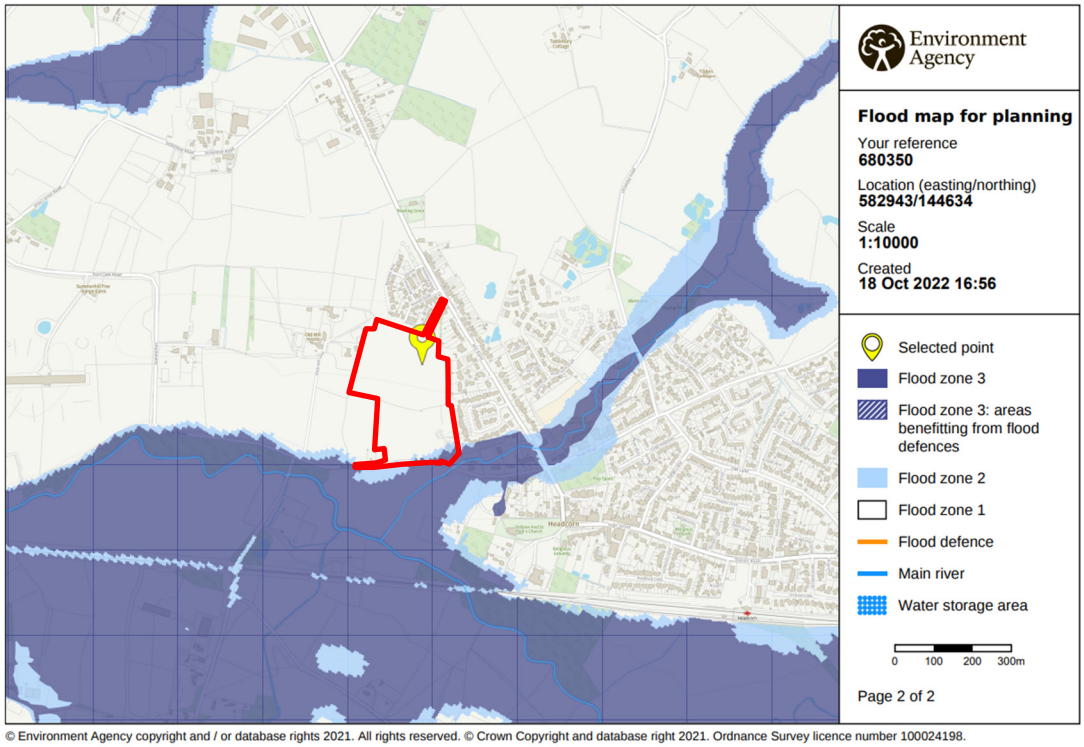


Figure 4.1: Environment Agency 'Flood map for planning' (1:2500 and 1:10000 scales)

The EA was formally consulted as part of this assessment, with request for flood related information (including flood levels) included in the consultation. Their full response to the flood data request can be found in **Appendix E**.

The EA have provided levels from their 2D flood model of the River Medway completed in 2015 by JBA. The maximum expected water levels from the 2D nodes are included in Table 4.1.

Table 4.1: EA Flood Levels

Modelled Node Id	National Grid Reference		Defended Scenario				
	Easting	Northing	5% AEP (1 in 20yr)	1% AEP (1 in 100yr)	1% AEP (+35% cc)	1% AEP (+70% cc)	0.1% AEP (1 in 1000)
various	various	various	19.45	19.65	**19.94**	20.11	20.04

The EA have confirmed there are no formal flood defences owned or maintained by the EA in the area of the site. The majority of the site is not within any historical flood outlines, although in the very southeast corner, adjacent to the existing agricultural buildings, land was shown to flood during the November 1960 and December 2013 flood events.

The Phase I Desk Study Appraisal also contains the Groundsure dataset which indicates four fluvial historical flood record events from 1960, 2000 and 2013, where the Main River channel capacity was exceeded.

Appendix F shows the delineation of the floodplain in the southern site area and overlays the pertinent climate change flood outlines on the existing and proposed site plans. The following maximum modelled flood levels are shown on the plan:

- 1 in 100-year flood event (Flood Zone 3): 19.65mAOD;
- 1 in 100-year flood event plus 35% allowance for climate change: 19.94mAOD; and
- 1 in 1000-year flood event (Flood Zone 2): 20.04mAOD.

Due to the comparison of site-specific topographic ground levels, this is considered a more accurate representation of flood risk on site. The plotted outline illustrates that the true extent of the extreme 1 in 100 year plus 35% climate change flood event encroaches along the Moat Road access and slightly onto the south-eastern corner of the site. Critically, the flood plain is contained within the proposed public open space and not within the proposed developable area.

The topographic survey shows that levels on Moat Road across the site frontage range from 19.03mAOD at the south-eastern site corner adjacent to the existing agricultural access to approximately 20mAOD at the proposed site access, up to 20.25mAOD adjacent to the southwestern site corner. A low point is located to the east of the watercourse bridge at 18.85mAOD.

Therefore, flood depths in the 1 in 100 year plus 35% climate change event (19.94mAOD) would be expected to be around 1.09m at its deepest in the vicinity of the watercourse crossing, and around 0.91m at the existing agricultural access point in the south-eastern

corner of the site. The proposed site access is shown to be above the 1 in 100 year plus 35% climate change level, although the extreme 1 in 1000 year level would encroach to shallow depths (less than 0.1m).

The site itself does not lie within the jurisdiction of any Internal Drainage Boards (IDBs), however, the courses of both Hogg's Stream and the River Beult fall under the jurisdiction of the Upper Medway IDB. The Medway IDB were consulted for any relevant flood risk and drainage information (response contained within **Appendix G**). No specific data/modelling was provided although the IDB confirmed the site would discharge straight into the district and so as a result, the development would be subject to the Boards sustainable development policy and byelaws. Further comments on drainage are discussed in Section 7.

According to the Maidstone Strategic Flood Risk Assessment (SFRA)[5], the River Medway catchment (which includes the site) has been subject to multiple historic flood events in 1927, 1960, 1968, 2000, 2013 and 2019/2020. The SFRA appears to confirm the site's predominant Flood Zone 1 classification, although the scale of mapping is too coarse for site identification.

The Maidstone Surface Water Management Plan (SWMP)[6] indicates historical records of fluvial flooding along Moat Road to the southwest of the site.

There is a possibility that flooding may result due to culverts being blocked by debris or structural failure. This can cause water to backup and result in localised flooding, as well as placing areas with lower ground levels at risk.

Various highway gullies were observed on Moat Road which discharge via a culvert to Hogg's Stream to the southeast of the site. There may also be culverts associated with the positive drainage network for the existing agricultural buildings in the southeast of the site.

4.2.1 Climate Change

Fluvial flooding is likely to increase as a result of climate change. A greater intensity and frequency of precipitation is likely to raise river levels and increase the likelihood of a river overtopping its banks.

Climate change guidance for river modelling was updated by the EA in May 2022. Based on the online guidance, the 'central' allowance should be used for sites with a 'more vulnerable' use in Flood Zones 2 and 3a. As this site lies mostly within Flood Zone 1, with the southeast corner in Flood Zones 2 and 3, this is considered the most applicable approach. For the 'Medway Management Catchment', the 'central' allowance for the 2080s timeframe is 27%. For reference, the 'higher central' allowance is 37%.

Therefore, as a worst-case but appropriate (and precautionary) scenario, the EA provided flood level for the 1 in 100 year plus 35% climate change allowance of **19.94mAOD** is

[5] JBA Consulting, 'Maidstone Borough Council Level 1 SFRA update and Level 2 SFRA Final Report', August 2020.

[6] JBA Consulting, 'Maidstone Stage 1 Surface Water Management Plan, Final Report, October 2013.

considered the most appropriate available climate change flood level to use for this assessment.

The overall risk of fluvial flooding is considered to be **low**.

4.3 Flooding from the sea (tidal flood risk)

The site is not considered to be at risk from tidal flooding due to its inland location and distance from any tidally influenced watercourses.

4.4 Flooding from the land (surface water flood risk)

If intense rain is unable to soak into the ground or be carried through manmade drainage systems, for a variety of reasons, it can run off over the surface causing localised floods before reaching a river or other watercourse.

Generally, where there is impermeable surfacing or where the ground infiltration capacity is exceeded, surface water runoff can occur. Excess surface water flows from the site are believed to drain naturally to the local water features, most likely by overland flow.

The EA's surface water flood map (**Figure 4.2**) shows that the site is mostly considered at 'very low' risk of flooding from surface water sources. There are some very minor 'low' risk flow paths created along the hedgerows running down the boundaries of the site's southern half. Moat Farm in the southeast corner has an existing pond/low point creating a medium risk zone in its centre. The two existing ponds that are located beyond the northeast and northwest site boundary, are classified as 'high' risk surface water areas, although this is likely because of the localised topographic depressions caused by the ponds. A small area of 'medium' to 'high' risk lies in the south-eastern corner closest to the watercourse.

The Phase I Desk Study Appraisal also contains the Groundsure dataset which contains the Ambiental Risk Analytics surface water (pluvial) FloodMap. The mapping indicates a small area in the very southeast corner is shown at risk of pluvial flooding with flood depths greater than 1m, even in extreme events, however, the extent of which is confirmed to the very southeast corner, away from any of the proposed development area.

The SFRA contains a map showing the Risk of Flooding from Surface Water (RoFSW) although the scale of mapping is too coarse for site identification.

The SWMP indicates that several repeated historical records of surface water are found to be located in a cluster surrounding Headcorn (as well as other places in the borough), mostly attributed to heavy rainfall overloading carriageways, drains and gullies or from blocked drains and gullies. However, mapping indicates none of which are located within the immediate site vicinity.

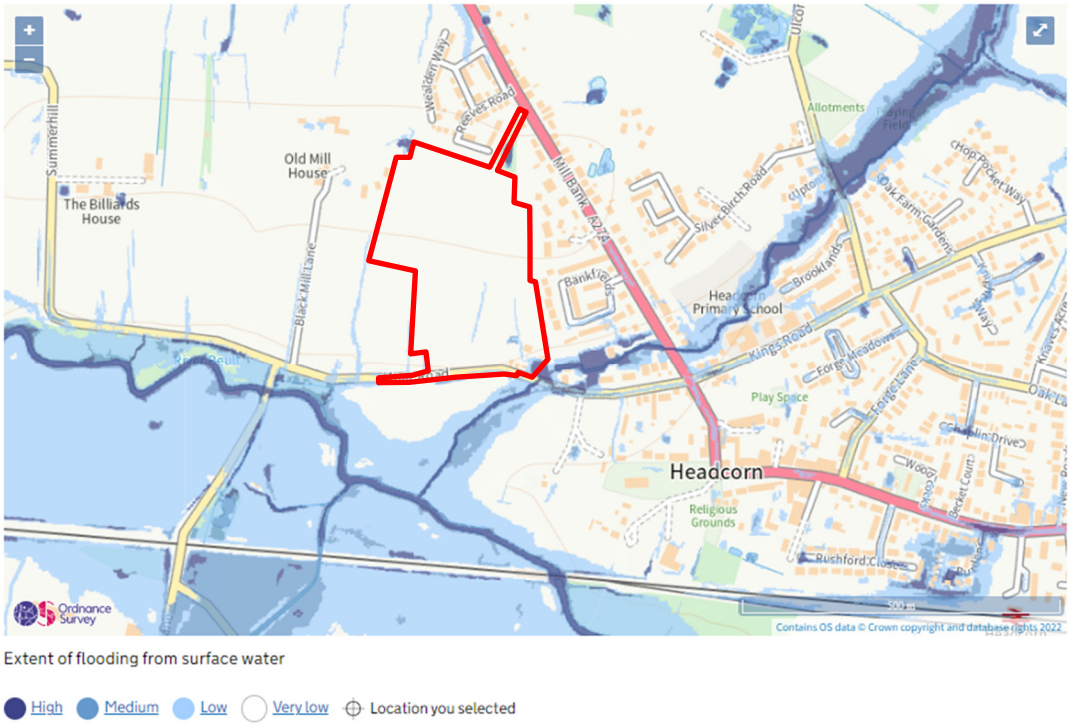


Figure 4.2: Environment Agency 'Flood risk from surface water' map (accessed Oct 2022)

The topography on site shows the site falls away towards the south and therefore any surface water runoff will likely fall away in this direction. Runoff generated by the proposed development will need to be controlled to prevent surface water flooding elsewhere. This is discussed further in Section 7.

The surrounding topography indicates that the north of the site forms a local high point and watershed. Therefore the upstream rainfall catchment is considered to be negligible, and there would be limited runoff that could flow towards the site. In addition, land beyond to the north is part of a newly constructed development which will have drainage managed on site and flow to the north, thereby not contributing to off-site runoff.

Surface water flooding is likely to increase as a result of climate change in a similar ratio to fluvial flooding. Increased intensity and frequency of precipitation is likely to lead to reduced infiltration and increased overland flow. The latest allowances for climate change have been included in the indicative drainage strategy below.

The overall risk of surface water flooding at the site is considered to be **very low**.

4.5 Flooding from groundwater

Groundwater flooding tends to occur after long periods of sustained high rainfall. Higher rainfall means more water will infiltrate into the ground and cause the water table to rise above normal levels. Groundwater tends to flow from areas where the ground level is high, to areas where the ground level is low. In low-lying areas the water table is usually

at shallower depths anyway, but during very wet periods, with all the additional groundwater flowing towards these areas, the water table can rise up to the surface causing groundwater flooding.

The SFRA contains the JBA Groundwater Flood Map, which indicates the site is not considered at risk, although land beyond Moat Road to the south is classified with groundwater levels between 0.025m and 0.5m below the ground surface.

The SWMP contains mapping of historical groundwater flooding events, none of which are located within the site vicinity.

Available geological mapping indicates that the site is underlain by the Weald Clay Formation (Mudstone and Limestone). An alluvial tract is located close to the southern site boundary associated with the valley bottom and nearby watercourses.

There is no ground investigation data available for the site to confirm the geology and groundwater levels on the site. The Phase 1 report states that Ambiental Risk Analytics data indicates a negligible risk of groundwater flooding across the site.

The proposed development does not include any basement proposals. Therefore, aside from shallow foundations works, the proposals will have no material impact on the risk of groundwater flooding both to and from the development.

Climate change could increase the risk of groundwater flooding as a result of increased precipitation filtering into the groundwater body. If winter rainfall becomes more frequent and heavier, groundwater levels may increase. Higher winter recharge may however be balanced by lower recharge during the predicted hotter and drier summers. This is less likely to cause a significant change to flood risk than from other sources since groundwater flow is not as confined. Any locally perched aquifers may be more affected, but these are likely to be isolated. The change in flood risk as a result of climate change is likely to be low.

The overall groundwater flood risk is considered to be **low**.

4.6 Flooding from sewers

Flooding from artificial drainage systems occurs when flow entering a system, such as an urban storm water drainage system, exceeds its conveyance capacity, the system becomes blocked, or it cannot discharge due to a high water level in the receiving watercourse. When exceeded, the surcharged pipe work could lead to flooding from backed up manholes and gully connections.

Sewer details have been referenced from sewer record plans obtained from Southern Water. The plans indicate there are no public sewers located on site.

The SFRA indicates that there have been historical flood records of sewer flooding in areas surrounding Headcorn. The SFRA contains historical incidents of flooding as detailed by Southern Water in their DG5 register, which indicates that for the TN27 postcode area, there were nine reports between 2016 and 2020.

The SWMP states *"Southern Water recorded recent events in 2012, on Moat Road, Headcorn, where the curtilage of five properties was described as flooded, internal flooding was not reported. This is potentially where a combination of sources may exacerbate sewer flooding."*

Climate change is likely to result in an increase in flooding from sewers. Increased rainfall and more frequent flooding put existing sewer and drainage systems under additional pressure resulting in the potential for more frequent surcharging and potential flooding. This would increase the frequency of local sewer flooding but would not be significant in terms of the proposed development.

Due to the absence of any on-site sewers, the resultant sewer flood risk is considered to be **low.**

4.7 Flooding from reservoirs

Flood events can occur from a sudden release of large volumes of water from reservoirs.

The EA reservoir flood map (reproduced as **Figure 4.3**) shows the largest area that might be flooded if a reservoir were to fail and release the water it holds. Since this is a prediction of a worst-case scenario, it is unlikely that any actual flood would be this large.

Figure 4.3: Environment Agency 'Flood risk from reservoirs' map (Accessed Oct 2022)

The EA mapping was updated in 2021 to demonstrate the potential maximum extent of flooding for two scenarios - a "dry day scenario" in which river levels are "normal", and a "wet day scenario" where the flooding from the reservoir coincides with flooding from rivers.

The map shows that the site is mostly not considered at risk of flooding from reservoirs when river levels are normal, although the southeast corner area is considered to be at residual risk should the peak fluvial event and reservoir failure occur at the same time. However, the reality is a reservoir failure is more likely to occur sometime after the peak of the event.

Reservoir flooding is extremely unlikely. There has been no loss of life in the UK from reservoir flooding since 1925. Since then reservoir safety legislation has been introduced to ensure reservoirs are maintained.

Reservoirs can be managed over time, controlling inflow/outflow of water and therefore there is the capacity to control the effects of climate change. Increased rainfall has the potential to increase base flow, but this should be minimal. It is unlikely that there will be a substantial change to the risk of flooding for this site as a result of climate change.

The resultant flood risk is considered to be **very low**.

4.8 Other sources of flooding

4.8.1 Canals

There are no Canal & River Trust owned canals within the vicinity of the site.

4.8.2 Other artificial features

No other artificial features with the potential to result in a flood risk to the site have been identified.

5 MITIGATION MEASURES AND RESIDUAL RISK

5.1 Overland flood flow

No significant overland flow routes have been identified across the site from any source of flooding. All surface water runoff up to the 1 in 100 year climate change storm generated on site will be stored on site and discharged to the nearby watercourse as detailed in Section 7. Surface flows may be generated on site due to drainage capacity exceedance, which can be conveyed into the SuDS features via surface flows along the new roads.

5.2 Watercourse Easements and Consenting

Under the Water Resources Act 1991 and associated byelaws, works in, over, under or adjacent to main rivers require the consent of the EA and works in, over, under or adjacent to ordinary watercourses will require IDB, Local Authority or LLFA consent. This is to ensure that they neither interfere with the IDB/EA/LPA/LLFA's work nor adversely affect the local environment, fisheries, wildlife, and flood defence.

Standard EA advice indicates permission will be required for any activity within 8m of the bank of a main river. Hogg's Stream is located more than 8m from the site, and therefore there will not likely be a requirement for associated easements extending onto the site.

5.3 Finished floor levels

Although the majority of the site lies within Flood Zone 1, the presence of the floodplain within close proximity indicates consideration should be given to finished floor levels.

As noted within the SFRA, finished floor levels should normally be set to whichever is higher of the following, where relevant:

- A minimum of 300-600mm above the fluvial 1% AEP + 35% climate change level.
- The fluvial 1% AEP + 70% climate change level.

Taking the worst-case scenario into account, finished floor levels should therefore be set 600mm above the 1 in 100 year plus 35% climate change level of 19.94mAOD, to a level of 20.54mAOD. As proposed development is shown within land currently above the 20.5m contour, this is considered easily achievable within the development design.

Low lying areas that could lead to ponding of surface flows should also be avoided by careful design of finished levels.

5.4 Flood compensation

The proposed development for the site does not include any buildings or land level raising within the 1 in 100 year plus 35% climate change floodplain, and therefore floodplain compensatory measures are not considered necessary. With the removal of several derelict former farm buildings in the southeast of the site located in the floodplain, the proposals will have a positive effect on floodplain storage.

5.5 Safe access/egress

As indicated in Section 4.2, during the 1 in 100 year plus 35% flood event, flood depths along Moat Road could reach up to 0.91m at the lowest point across the site frontage. According to guidance within FD2320[7], even assuming a negligible velocity, flood depths in excess of 250mm – 300mm are difficult to demonstrate as being safe to pass through, with depths up to 1m representing "danger to most".

Whilst **Appendix F** appears to show land to the west also lies outside this fluvial flood extent, **Figure 4.1** shows that the floodplain is likely to extend across Moat Road further offsite towards the west.

It is therefore considered that during the 1 in 100 year plus 35% flood event, it will be difficult to demonstrate safe access along Moat Road (either to the east or west), and therefore, a secondary access to the site that people can use has been incorporated into the development design.

The development layout includes a secondary access available onto the existing access track that serves the properties to the northwest of the site. This route runs along the entire northern site boundary and links directly onto the A274 'Mill Bank' road to the northeast. This option would provide safe dry pedestrian and vehicular access into Flood Zone 1 and provide a viable access/egress from the site in event of an emergency, in the event that the Moat Road access is inaccessible due to floodwater.

In addition, the existing public rights of way linking into the fields to the west and northwest will be maintained, which will provide safe pedestrian only access into Flood Zone 1 and provide a viable pedestrian access/egress from the site in event of an emergency.

Given the availability of a viable secondary vehicular and pedestrian access/egress route, there should be no requirement for reliance upon any Flood Management and Evacuation Plan, however, future residents should be fully briefed on the extent of the floodplain to the south and potential flood depths on Moat Road between the site and Headcorn village centre.

[7] Defra/Environment Agency "Flood Risk Assessment Guidance for New Development" Phase 2 Framework and Guidance for Assessing and Managing Flood Risk for New Development. R&D Technical Report FD2320/TR2, October 2005.

5.6 Existing drainage infrastructure/culverts

As part of the proposed works, existing culverts will need to be retained and should be adequately cleared and maintained, to demonstrate adequate capacity is available and prevent blockages.

6 PLANNING CONTEXT

6.1 Land use vulnerability

Table 2 of the PPG indicates the compatibility of various land uses in each flood zone, dependent on their vulnerability to flooding. Table 6.1 below is reproduced from Table 2 of PPG.

Table 6.1: Flood risk vulnerability and flood zone 'compatibility'

Flood Risk Vulnerability Classification		Essential Infrastructure	Water Compatible	Highly Vulnerable	More Vulnerable	Less Vulnerable
Flood Zone	Zone 1	Appropriate	Appropriate	Appropriate	Appropriate	Appropriate
	Zone 2	Appropriate	Appropriate	Exception Test Required	Appropriate	Appropriate
	Zone 3a	Exception Test Required	Appropriate	Should not be permitted	Exception Test Required	Appropriate
	Zone 3b functional floodplain	Exception Test Required	Appropriate	Should not be permitted	Should not be permitted	Should not be permitted

With reference to Annex 3 of the NPPF, the proposed development, based on its residential use, is classed as 'more vulnerable'. This classification of development is appropriate for areas within Flood Zones 1 and 2, although the Exception Test is required for Flood Zone 3a.

6.2 Sequential Test

The Sequential Test aims to direct new development to areas with the lowest probability of flooding.

The site's south-eastern corner lies within Flood Zone 3, however, there is sufficient space for all proposed building to take place on higher ground outside the zones in question. Since development can be internally classified within Flood Zone 1, with no other significant flooding issues from other sources, the development is classified as 'appropriate' and therefore the application of either the Sequential Test or the Exception Test is not required.

6.3 Exception Test

Although the proposed development is located within Flood Zone 1, Flood Zone 2 and 3 encroach on the southern portion of the site. It would therefore be prudent to demonstrate the Exception Test requirements could be met. The stipulations of the Exception Test (reproduced from Paragraph 164 within NPPF) are:

- Development that has to be in a flood risk area will provide wider sustainability benefits to the community that outweigh flood risk. In response to this requirement, it is noted:
    - The development will provide additional housing to the area in keeping with the local housing policies;
    - The development will provide controls on surface water drainage, thereby reducing the risk of flooding to the surrounding area; and
    - Community open space is to be provided on site, providing amenity to the local residents.
- 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. In response to this requirement, it is noted:
    - All proposed built development will be located within Flood Zone 1, at distance from the fluvial floodplain;
    - Minimum finished floor levels will be set a minimum of 600mm above the fluvial 1 in 100 year plus 35% climate change flood event (see Section 5.3 for details); and
    - A secondary safe access route will be provided to the north of the site, to provide appropriate safe access/egress routes in the event that the Moat Road access is inaccessible due to floodwater (see Section 5.5 for details).

7 SURFACE WATER DRAINAGE ASSESSMENT

7.1 Scope

This section discusses the potential quantitative effects of the development on both the risk of surface water flooding on-site and elsewhere within the catchment, as well as the type of potential SuDS features that could be incorporated as part of the masterplan.

The NPPF states that SuDS should be considered wherever practical. The use of SuDS is also encouraged by regional and local policy.

KCC's Drainage and Planning Policy Statement[8] sets out the requirements for sustainable drainage and how drainage strategies and surface water management provisions will be reviewed for SuDS schemes specific to Kent. The design set out below takes this into consideration.

In accordance with the Defra Non-Statutory Technical Standards[9], the surface water drainage strategy should seek to implement a SuDS hierarchy that aspires to achieve reductions in surface water runoff rates to greenfield rates. For greenfield developments, the peak runoff rate from the development to any highway drain, sewer or surface water body for the 1 in 1 year rainfall event and the 1 in 100 year rainfall event should never exceed the peak greenfield runoff rate for the same event.

In addition, Building Regulations Part H[10] requires that the first choice of surface water disposal should be to discharge to an adequate soakaway or infiltration system, where practicable. If this is not reasonably practicable then discharge should be to a watercourse, the least favourable option being to a sewer (surface water before combined). Infiltration techniques should therefore be applied wherever they are appropriate.

7.2 Pre-development situation

The existing site area is approximately 7.4ha and almost entirely permeable. A small area of approximately 400m^2 can be considered impermeable where the existing agricultural buildings are located in the southeast corner of the site.

For the purpose of the surface water drainage calculations, only the developable area that will be formally drained (4.57ha) has been considered and the site has been split into two sub catchments:

[8] Kent County Council, 'Drainage and Planning Policy', December 2019.

[9] DEFRA, 'Sustainable Drainage Systems - Non-statutory technical standards for sustainable drainage systems', March 2015.

[10] HM Government (2010 with 2013 amendments), 'The Building Regulations 2010: Approved Document H - Drainage and Waste Disposal (2002 Edition incorporating 2010 amendments)'.

- Catchment A (2.29ha) taking flows from the northern part of the site, draining south through Catchment B towards the site outfall on the southern boundary; and
- Catchment B (2.28ha) taking flows from the southern part of the site, draining east towards the site outfall on the southern boundary.

Areas of public open space along the west and south of the site are not considered part of the developable area and will continue to drain as per the current scenario.

The pro-rata IoH 124[11] method has been used to estimate the Greenfield surface water runoff for two catchments of the site, using the HR Wallingford Greenfield runoff rate estimation tool. Calculations are contained in **Appendix H** and summarised in Table 7.1.

In addition, in response to consultations with the Medway IDB (**Appendix G**), the IDB indicated they would expect to see an improvement over the existing greenfield runoff rate (approximately 7l/s/ha for the 1:100 event), ideally to 3 or 4l/s/ha. Therefore, the applicable rates have also been provided in **Table 7.1** for comparison.

Table 7.1: IOH 124 surface water runoff (greenfield)

Return period	Peak flow (l/s)		
	Catchment A (2.29ha – 1.37ha impermeable area)	Catchment B (2.28ha – 1.37ha impermeable area)	TOTAL (4.57ha – 2.74ha impermeable area)
QBar	6.1	6.1	12.3
1 in 1 year	5.2	5.2	10.5
1 in 30 year	14.2	14.2	28.4
1 in 100 year	19.7	19.7	39.3
IDB greenfield 7l/s/ha	9.6	9.6	19.2
IDB requirement to attenuate to 3l/s/ha	4.1	4.1	8.2

Note: These calculations have been based on an assumed (and precautionary) 60% impermeable area for the proposed development scenario, to provide adequate restriction of offsite flows for impermeable areas only. Updated impermeable area calculations should be confirmed at the detailed design stage once detailed development layouts are available and calculations will then be able to verify the inclusion of the 10% urban creep allowance, in line with KCC's Drainage and Planning Policy Statement.

[11] Institute of Hydrology (IoH), 'Flood Estimation for small catchments - Report 124', 1994.

In response to comments from the LLFA regarding how the undeveloped areas of the site will be drained, the areas of soft landscaping (POS, gardens etc) will continue to percolate into the surrounding soil as they do currently. The topsoil/subsoil should continue to provide the appropriate level of infiltration for such areas, and if there are areas that are poorly drained, these would follow the identified exceedance overland flows routes for the proposed development (to be identified at detailed design stage). This scenario, however, is considered unlikely to occur given the gradient of the site and ground conditions.

If the underlying ground conditions are found to be particularly low in permeability, then there is potential to install some localised land drainage in order to prevent this runoff from overloading the wider drainage strategy, but this is not considered standard practice for a typical residential development.

Whilst part of the site is considered to be previously developed (agricultural buildings), the Modified Rational Method has not been considered here as it forms only a small proportion of the site. The greenfield calculations and IDB requirements above therefore provide a worst-case scenario.

7.3 Post-development situation

The proposed development is for a residential end use. This will result in an increase in impermeable area and surface water runoff across the site. It will therefore be necessary to manage surface water on-site through conveyance towards the proposed point of discharge, whilst providing sufficient attenuation for all events up to the 1 in 100 year event inclusive of 45% climate change (based on latest climate change guidance).

Note: Latest EA guidance on peak rainfall intensity was updated in May 2022. This indicates that for the Medway Management Catchment, the 2070s epoch has an upper end allowance of 40%, however, the 2050s epoch has an allowance of 45%. Therefore, 45% has been used in this assessment as a worst-case scenario.

7.3.1 Point of discharge

Discharge options from the site have been considered in line with the SuDS hierarchy, as follows.

Infiltration

Infiltration should be considered as the primary option to discharge surface water from the site. The effectiveness of infiltration is completely dependent on the physical conditions at the site. Potential obstacles include:

- Local variations in permeability preventing infiltration - It is understood from the local geology that the site is situated on an area of Weald Clay, which is not considered suitable for the use of dedicated soakaways due to its low permeability. The Phase 1 report states *"Given the anticipated geology across the site area, a soakaway (ground infiltration) drainage system is unlikely to be feasible".*

- Shallow groundwater table - For infiltration drainage devices, Building Regulation approved document H states that these *"should not be built in ground where the water table reaches the bottom of the device at any time of the year"*. The Phase 1 report indicates that the Weald Clay Formation (Limestone) is anticipated to comprise permeable layers capable of supporting water supplies at a local scale and the Weald Clay Formation (Mudstone) is predominantly cohesive with low permeability; and
- Source Protection Zones - The study area is not located within a Groundwater Source Protection Zone.

From the information available, infiltration is not considered a viable option as part of the drainage strategy. While local surface percolation can still occur, the use of dedicated soakaway assets (soakaways/infiltration basins etc) are not considered viable at this site.

Discharge to watercourse

Discharging surface water directly to a local watercourse is considered feasible as the agricultural buildings in the southeast of the site currently discharge surface water to the adjacent ditch, which then links into the Hogg's Stream to the east of the site (as shown in **Figure 2.2**). The site drains naturally in this way, and therefore utilising/enhancing the existing gravity connection will act to mimic the current scenario.

Normally, there would be a requirement to discharge to the QBar Greenfield runoff rate However, as indicated by the IDB, the IDB expect discharge from the site to be limited to approximately 3l/s/ha for all events up to the 1 in 100 plus climate change event. It is therefore proposed to discharge to the 3l/s/ha rate of **4.1l/s** for Catchment A and **4.1l/s** for Catchment B, for all events up to the 1 in 100 year plus climate change, providing significant betterment over the existing greenfield scenario.

Discharge to surface water sewer

There will be no surface water connection into the public sewer as preferable methods are available, and there are no public surface water sewers within the vicinity of the site.

7.3.2 Network modelling

To determine whether the proposed SuDS provide sufficient attenuation storage, the WinDes ' 4-Stage Design Guide' tool has been used. The WinDes '4-Stage Design Guide' tool allows for an indicative network to be modelled based upon attenuation feature dimensions, rainfall values and permitted discharge rates, in line with CIRIA guidance. These volumes can be later revised at detail design stage by the introduction of specific flow control methods.

Calculations have been run using the FEH rainfall data and with offsite flows restricted to 8.2l/s in accordance with IDB requirements. The proposed impermeable area has been based on an assumed 60% of the developable area as specified in **Table 7.1**. No allowance is included in the calculations for infiltration as a worse-case scenario.

Calculations show the proposed system can attenuate surface water runoff without flooding during a 1 in 100 year event inclusive of 45% climate change. Further details on the storage structure and sizing of the basins can be found in the calculations included in **Appendix I**.

7.3.3 Proposed drainage strategy

The proposed SuDS for the site include a combination of permeable paving, swales and attenuation basins which have been located depending on the positions of proposed buildings and general site topography. The proposed SuDS features are designed to provide the required storage volume to retain the 1 in 100 plus 45% climate change event. The SuDS measures are outlined in the Indicative Surface Water Strategy as attached in **Appendix J**.

In principle, the indicative drainage strategy contains the following features:

- **Permeable paving** has been shown indicatively within areas of communal/private parking. Whilst not included formally within the drainage model, this feature would be incorporated to provide additional surface water attenuation and water quality benefits. Main adopted roads will not be constructed using permeable paving due to ownership and future maintenance issues, where responsibility will most likely lie with the highway authority;
- **Swales** has been shown indicatively alongside roads to convey runoff through the drainage network to the various attenuation features (again, as with permeable paving, attenuation volumes not included within the drainage model calculations at this indicative design stage). Check dams would likely be required at detailed design due to site gradients; and
- Three **detention basins** have been strategically located within the areas of open space in the southwest corner of each catchment. The topography in these areas is suitable for SuDS features, being the lowest part of each catchment, although consideration has been given to the existing gradients with approximate land take and effective volume storage area shown. Tree Root Protection Areas (RPAs) have been taken into account and basins are also shown outside the fluvial 1 in 100 year plus 35% climate change floodplain. To accommodate the required volumes, the features have been designed at 1 - 1.5m deep and have side slopes of 1:3 to generally comply with safety and maintenance guidelines as highlighted in the SuDS Manual[12]. An approximate freeboard of 200-300mm is also provided at each basin, which can be increased at the detailed design phase once pipe volumes and a detailed network model is provided.

The dimensions, volumes and location of the SuDS features will need to be revised as the masterplan develops and during the detailed planning stage. Detailed design of individual features is not part of the scope of this report. The surface water drainage calculations have now been re-run specifically using FEH rainfall data (as requested by KCC). Preliminary design criteria have been based upon guidance given in the CIRIA publication 'The SUDS Manual'[12].

Temporary drainage should be established for the construction phase of development to prevent silt mobilisation, potentially impacting on flow regimes and silt pollution downstream. The construction of SuDS should be considered in the early stages of site design.

The current outfall from the agricultural buildings passes under Moat Road through a 150mm culvert into the roadside IDB ditch on the southern side, eventually connecting to the Hoggs Stream (see **Figure 2.2**). In view of the stream's history as a source of flooding

[12] CIRIA, 'The SUDS Manual – C753', 2015.

to Moat Road the site's outfall may occasionally be surcharged during high level flood events. As a result, Kent Council have requested an analysis of the impact of a surcharged outfall.

In order to negate the need to model a surcharged outfall the revised indicative design will involve ensuring that the invert level of the lowest basin is raised appropriately, which will also involve some localised ground level re-profiling and raising in the southern site area, but all level changes are designed to ensure no ground level raising in the fluvial floodplain. The base level and flow control device levels of this basin have been specifically set at 19.75mAOD in order to raise the flow control device above the 1 in 100 year flood level of 19.65mAOD (see **Table 4.1**).

In this way the sites surface water outfall will be set above all flood events up to and including the 1 in 100 year event. The likelihood of a major rainfall event (such as the 1 in 100 year 45% rainfall event) coinciding with the 1 in 100 year climate change fluvial flood event is considered extremely unlikely, and this assessment follows best practice with regard to considering fluvial and rainfall events occurring concurrently.

7.3.4 Adoption and maintenance

Maintenance of SuDS features should be undertaken in line with maintenance schedules outlined in the SuDS Manual and, if adopted, any Southern Water maintenance guidance. An example of typical maintenance regime for the indicative suggested SuDS features can be found in **Appendix K**. Similar regimes would be applicable for all other SuDS features on site. Full maintenance schedules should be confirmed at the detailed design stage in consultation with appropriate product suppliers.

7.4 Water quality

The SUDS Manual contains guidance on how to assess water quality, stating *"Determining the hazard posed by the land use activities at a site and the extent to which underlying soil layers and/or proposed treatment components reduce the associated risk can be done using a variety of methods that vary in complexity and data requirements."*

The assessment methodology required is determined by reference to Table 4.3 of the SuDS Manual. Based on this, the quality impacts of the proposed development can be summarised with the following pollution hazard levels and management requirements for discharge to the receiving surface water (there will be no formal infiltration on site, therefore receiving groundwater is not considered here):

- Residential roofs – **Very Low** Pollution Hazard – Simple Index Approach; and
- Individual property driveways, roofs, residential car parks, low traffic roads, non-residential car parking with infrequent change (schools, offices) – **Low** Pollution Hazard – Simple Index Approach.

It is therefore considered appropriate to use the Simple Index Approach (SIA) for the purpose of this assessment. The Simple Index Approach (SIA) to assessing water quality management requirements has been developed by CIRIA to support the implementation of the water quality management design methods set out in the SuDS Manual, with

appropriate cross referencing to the relevant 'Design Conditions'. The CIRIA Susdrain website contains a spreadsheet based procedure that can be used for all the UK.

Simple Index Approach

Table 26.1 of the SUDS Manual indicates that for the Simple Index Approach:

- Simple pollution hazard indices should be based on land use (e.g. Table 26.2); and
- Risk reduction for Surface Water should be done using Simple SuDS hazard mitigation indices (e.g. Table 26.3).

Extracts of Tables 26.2 and 26.3 are replicated below, highlighting the relevant features applicable to this site:

Table 7.2: Extract of SuDS Manual Table 26.2: Pollution hazard indices for different land use classifications

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-carbons
Residential roofs	Very Low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	Low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (e.g. cul-de-sacs, home zones and general access roads) and non-residential car parking with infrequent change (e.g. schools, offices) i.e. <300 traffic movements/day	Low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (e.g. hospitals, retail), all roads except low traffic roads and trunk roads/motorways	Medium	0.7	0.6	0.7

Land Use	Pollution Hazard Level	Total Suspended Solids (TSS)	Metals	Hydro-carbons
Sites with heavy pollution (e.g. haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used, or manufactured; industrial sites; trunk roads and motorways	High	0.8	0.8	0.9

Table 7.3: Extract of Table 26.3: Indicative SuDS mitigation indices for discharges to surface waters

SuDS Technique	Mitigation Indices		
	TSS	Metals	Hydro-carbons
Filter strip	0.4	0.4	0.5
Filter drain	0.4	0.4	0.4
Swale	0.5	0.6	0.6
Bioretention system	0.8	0.8	0.8
Permeable pavement	0.7	0.6	0.7
Detention basin	0.5	0.5	0.6
Pond	0.7	0.7	0.5
Wetland	0.8	0.8	0.8
Proprietary treatment systems	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

The SuDS Manual States:

Total SuDS mitigation index ≥ pollution hazard index

(for each contaminant type) (for each contaminant type)

Taking each land type use in turn:

- Residential roofs – permeable paving alone (mitigation 0.6-0.7) is sufficient to mitigate for any of the potential pollutants (indices 0.05-0.2); and
- Individual property driveways, residential car parks, low traffic roads, non-residential car parking with infrequent change (schools, offices) – a detention basin alone

(mitigation 0.5-0.6) is sufficient to mitigate for any of the potential pollutants (indices 0.4-0.5).

In addition to these standalone features, the use of proprietary treatment systems (where applicable) will provide an additional level of treatment. All surface water runoff will pass through a treatment train of at least two features and therefore the water quality requirements are considered to be met.

In summary, the use of a combination of SuDS as outlined above should demonstrate that in line with current guidelines, runoff is limited from the site following redevelopment. The incorporation of a treatment train using permeable paving, swales and detention basins will also demonstrate significant water quality benefits.

8 CONCLUSIONS AND RECOMMENDATIONS

This FRA complies with the NPPF and Planning Practice Guidance and demonstrates that flood risk from all sources has been considered in the proposed development. It is also consistent with the Local Planning Authority requirements with regard to flood risk.

The proposed development site lies in an area designated by the EA as Flood Zone 1 and is outlined to have a chance of flooding of less than 1 in 1,000 (<0.1%) in any year. Flood Zones 2 and 3 encroach slightly on the southern portion of the site but remain well outside the proposed development area.

The proposed development is classified as 'more vulnerable' and therefore considered appropriate within Flood Zone 1 without application of the Exception Test. Notwithstanding this, evidence has been provided to demonstrate that the requirements of the Exception Test can be met, given the minor encroachment of the floodplain in the south of the site within the public open space.

This FRA has considered multiple sources of flooding and concluded the following:

Table 8.1: Flood risk summary

Source	Level of risk	Mitigation
Fluvial	Low Majority of the site lies within Flood Zone 1, with a small part of the public open space within Floods 2 and 3.	All proposed built development will be located within Flood Zone 1, outside the fluvial floodplain. Minimum finished floor levels will be set a minimum of 600mm above the fluvial 1 in 100 year plus 35% climate change flood event. A secondary safe access route will be provided to the north of the site, to provide appropriate safe access/egress routes in the event that the Moat Road access is inaccessible due to floodwater. The flow control and base level of the topographically lowest attenuation basin will be set above the EA's modelled 1 in 100yr flood extent in order to remain functioning without surcharging up to events of this magnitude.
Tidal	Very Low	None required due to distance to tidally influenced watercourses
Surface water	Very Low	The development will incorporate a surface water drainage strategy to accommodate surface water generated on site. Surface water will be attenuated on site and discharged directly to the nearby watercourse.

Source	Level of risk	Mitigation
		SuDS will be utilised to control surface water flows, designed to store the volume of water associated with a 1 in 100 year rainfall event (including an allowance for climate change), providing a betterment over the existing scenario.
Groundwater	Low	None required
Sewers	Very Low	None required
Reservoir	Very Low	None required
Other sources	Very Low	None required

Overall, taking into account the above points, the development of the site should not be precluded on flood risk grounds.

APPENDIX A
RSK GROUP SERVICE CONSTRAINTS

1. This report and the drainage design carried out in connection with the report (together the "Services") were compiled and carried out by RSK LDE Ltd (RSK) for Catesby Strategic Land Ltd (the "client") in accordance with the terms of a contract between RSK and the "client" dated September 2022. The Services were performed by RSK with the skill and care ordinarily exercised by a reasonable civil engineer at the time the Services were performed. Further, and in particular, the Services were performed by RSK taking into account the limits of the scope of works required by the client, the time scale involved and the resources, including financial and manpower resources, agreed between RSK and the client.

2. Other than that expressly contained in paragraph 1 above, RSK provides no other representation or warranty whether express or implied, in relation to the Services.

3. Unless otherwise agreed in writing, the Services were performed by RSK exclusively for the purposes of the client. RSK is not aware of any interest of or reliance by any party other than the client in or on the Services. Unless expressly provided in writing, RSK does not authorise, consent or condone any party other than the client relying upon the Services. Should this report or any part of this report, or otherwise details of the Services or any part of the Services be made known to any such party, and such party relies thereon that party does so wholly at its own and sole risk and RSK disclaims any liability to such parties. Any such party would be well advised to seek independent advice from a competent environmental consultant and/or lawyer.

4. It is RSK's understanding that this report is to be used for the purpose described in the introduction to the report. That purpose was a significant factor in determining the scope and level of the Services. Should the purpose for which the report is used, or the proposed use of the site change, this report may no longer be valid and any further use of or reliance upon the report in those circumstances by the client without RSK's review and advice shall be at the client's sole and own risk. Should RSK be requested to review the report after the date of this report, RSK shall be entitled to additional payment at the then existing rates or such other terms as agreed between RSK and the client.

5. The passage of time may result in changes in site conditions, regulatory or other legal provisions, technology or economic conditions which could render the report inaccurate or unreliable. The information and conclusions contained in this report should not be relied upon in the future without the written advice of RSK. In the absence of such written advice of RSK, reliance on the report in the future shall be at the client's own and sole risk. Should RSK be requested to review the report in the future, RSK shall be entitled to additional payment at the then existing rate or such other terms as may be agreed between RSK and the client.

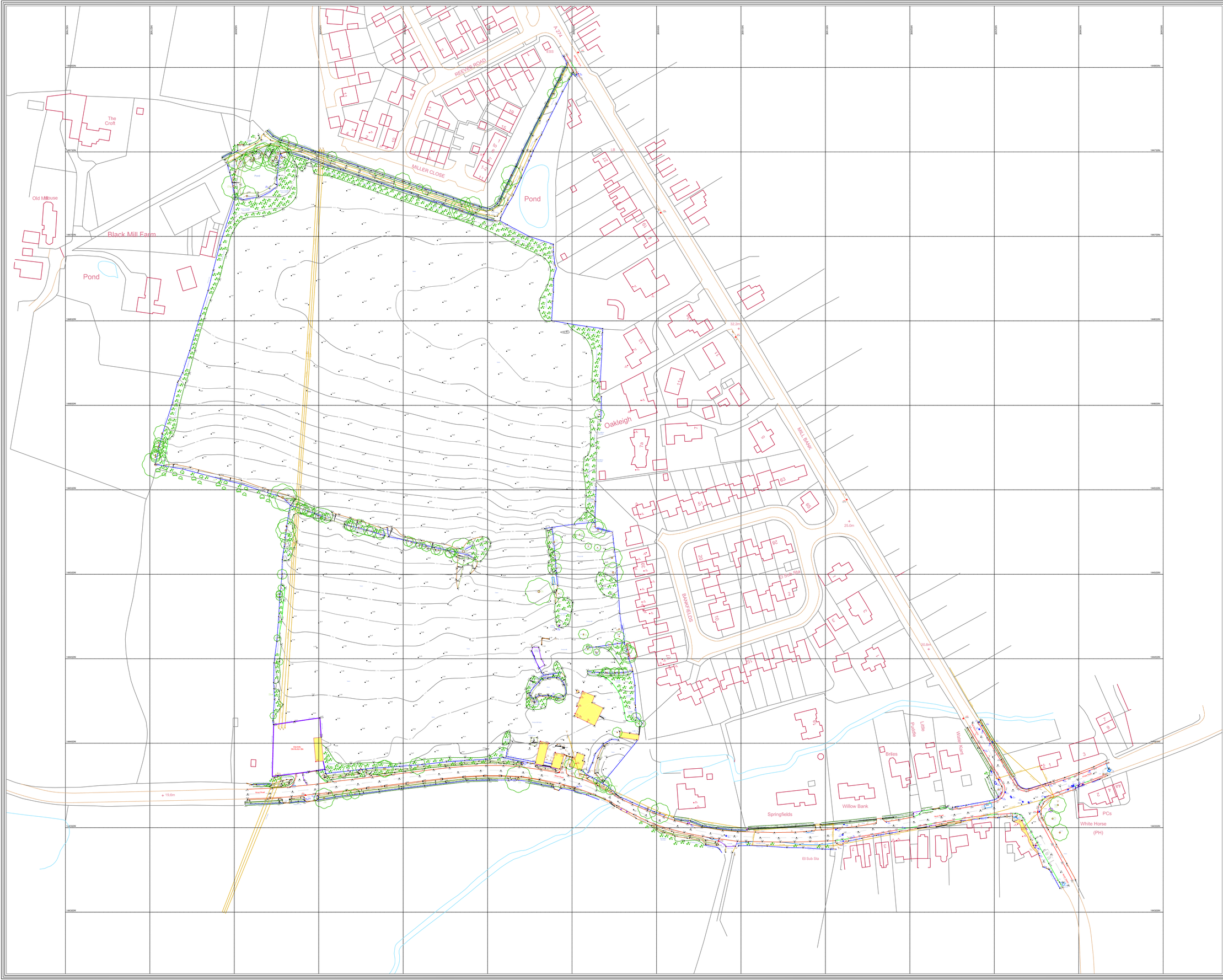
6. The observations and conclusions described in this report are based solely upon the Services, which were provided pursuant to the agreement between the client and RSK. RSK has not performed any observations, investigations, studies or testing not specifically set out or required by the contract between the client and RSK. RSK is not liable for the existence of any condition, the discovery of which would require performance of services not otherwise contained in the Services. For the avoidance of doubt, unless otherwise expressly referred to in the introduction to this report, RSK did not seek to evaluate the presence on or off the site of asbestos, electromagnetic fields, lead paint, heavy metals, radon gas or other radioactive or hazardous materials.

7. The Services are based upon RSK's observations of existing physical conditions at the site gained from a walk-over survey of the site together with RSK's interpretation of information including documentation, obtained from third parties and from the client on the history and usage of the site. The Services are also based on information and/or analysis provided by independent testing and information services or laboratories upon which RSK was reasonably entitled to rely. The Services clearly are limited by the accuracy of the information, including documentation, reviewed by RSK and the observations possible at the time of the walk-over survey. Further RSK was not authorised and did not attempt to independently verify the accuracy or completeness of information, documentation or materials received from the client or third parties, including laboratories and information services, during the performance of the Services. RSK is not liable for any inaccurate information or conclusions, the discovery of which inaccuracies required the doing of any act including the gathering of any information which was not reasonably available to RSK and including the doing of any independent investigation of the information provided to RSK save as otherwise provided in the terms of the contract between the client and RSK.

8. The phase II or intrusive environmental site investigation aspects of the Services is a limited sampling of the site at pre-determined borehole and soil vapour locations based on the operational configuration of the site. The conclusions given in this report are based on information gathered at the specific test locations and can only be extrapolated to an undefined limited area around those locations. The extent of the limited area depends on the soil and groundwater conditions, together with the position of any current structures and underground facilities and natural and other activities on site. In addition chemical analysis was carried out for a limited number of parameters [as stipulated in the contract between the client and RSK] [based on an understanding of the available operational and historical information,] and it should not be inferred that other chemical species are not present.

9. Any site drawing(s) provided in this report is (are) not meant to be an accurate base plan, but is (are) used to present the general relative locations of features on, and surrounding, the site. Features (boreholes, trial pits etc) annotated on site plans are not drawn to scale but are centred over the appropriate location. Such features should not be used for setting out and should be considered indicative only.

APPENDIX B
TOPOGRAPHIC SURVEY



N

Station Information:

Station	Easting (m)	Northing (m)	Level (m)
GH1	582842.157	144369.296	20.068
GH2	582992.345	144382.811	19.269
GH3	583086.744	144342.182	19.180
GH4	583275.730	144359.370	20.315
GH5	583231.663	144414.652	20.243
GH6	583162.616	144544.228	25.778
GH7	583096.865	144640.453	32.161
GH8	583052.437	144714.017	31.470
GH9	583003.594	144808.888	29.493

OS Note:

Some services may have been omitted due to parked vehicles. The Ordnance Survey tile is to be used as a guide only.

OS Buildings *Surveyed Buildings*

This survey has been orientated to the Ordnance Survey (O.S) National Grid OSGB36(15) via Global Navigation Satellite Systems (GNSS) and the O.S. Active Network (OS Net).

A true OSGB36 coordinate has been established near to the site centre via a transformation using the OSTN15GB & OSGM15GB transformation models.

The survey has been correlated to this point and a further one or more OSGB36 (15) points established to create a true O.S. bearing for angle orientation.

No scale factor has been applied to the survey therefore the coordinates shown are arbitrary & not true O.S. Coordinates which have a scale factor applied.

Please refer to Survey Station Table to enable establishment of the on-site grid and datum.

Legend:

Buildings, Hedge, Kerb line, Line marking, Drop kerb, Centre line, Top of bank, Overhead Cable, Composite edge, Famous edge, Grass verge, Canopy/Overhang, Verge, Bottom of bank, Station and Name, Station Level, Tree / Bush / Sapling, Area of Undergrowth, Woodland, Ridge Level, Eaves Level, Flat Roof Level, Gate

Fence types: Interwoven, Iron Railings, Wire Mesh, Post & Rail, Post & Wire, Chain Link, Wooden Panels, Close Boarded, Steel Palisade

IC	Inspection chamber	Bo	Bollard
Pipe	Pipe invert	IB	Illuminated bollard
Gy	Gully	Bin	Rubbish bin
Rg	Back gully	Vp	Vent pipe
Dp	Down pipe	Gnl	Ground light
Pipe	Pipe above ground	Lbox	Letter box
MH	Manhole	Stmp	Tree Stump
WL	Water level	Sty	Style
FI	Flood light	IFL	Internal floor level
Lp	Lamp post	THL	Threshold level
Tp	Telegraph post	Sp	Sign post
Ep	Electricity post	TH	Trapdoor
TI	Traffic light	BH	Borehole
Bus	Bus stop	ELEC	Electric
Sv	Stop valve	BT	British Telecom
St	Stop tap	Ctrov	Control box
Er	Earth rod	TT	Tactile
WM	Water meter	BP	Brick paved
Gas	Gas valve	CPS	Concrete paving slabs
Av	Air valve	CVR	Cover
ICU	Unidentified inspection	Rwall	Retaining wall
Wo	Wash out	TWL	Top of Wall Level
Re	Rodding eye	TCL	Tree canopy level
BB	Bellma beacon	Gr	Girth
CTV	Cable tv	MG	Multi girth
Mkr	Marker post	IC	Inspection chamber
Gmkr	Gas marker post	CLL	Cover level
So	Soffit	ILL	Invert level
FH	Fire hydrant	UTR	Unable to rotate

Rev	Date	Description	Drawn	Q. Ref.

greenhatch group

Topographical Surveys
Site Engineering
Utility / CCTV Surveys
Measured Building Surveys
3D Laser Scanning
Revit & BIM Models

Rowan House
Duffield Road
Little Eaton
Derby
DE21 5DR
Tel (01332) 830044 Fax (01332) 830055
admin@greenhatch-group.co.uk
www.greenhatch-group.co.uk

St Albans: Unit B, The Courtyard, Alban Park, St Albans, Hertfordshire AL4 0LA, t. (01727) 854481
Newcastle: 24 Riverside Studios, Amethyst Road, Newcastle Bus. Park, Newcastle-upon-Tyne NE4 7YL, t. (01912) 736391
London: 27, Cornwall Terrace Mews, Regents Park, London NW1 5LL, t. (02072) 241806

CLIENT
Catesby Estates Limited

PROJECT
Moat Road, Headcorn, Ashford, Kent, TN27 9NU

TITLE
Topographical Survey

SCALE	DATE
A1@ 1: 1000	24/01/22
DRAWN: DG	QUALITY REF: GH12779

Level datum	See note
Grid orientation	See note
Job number	42824
Drawing No.	Rev.
42824_T	0

Comments

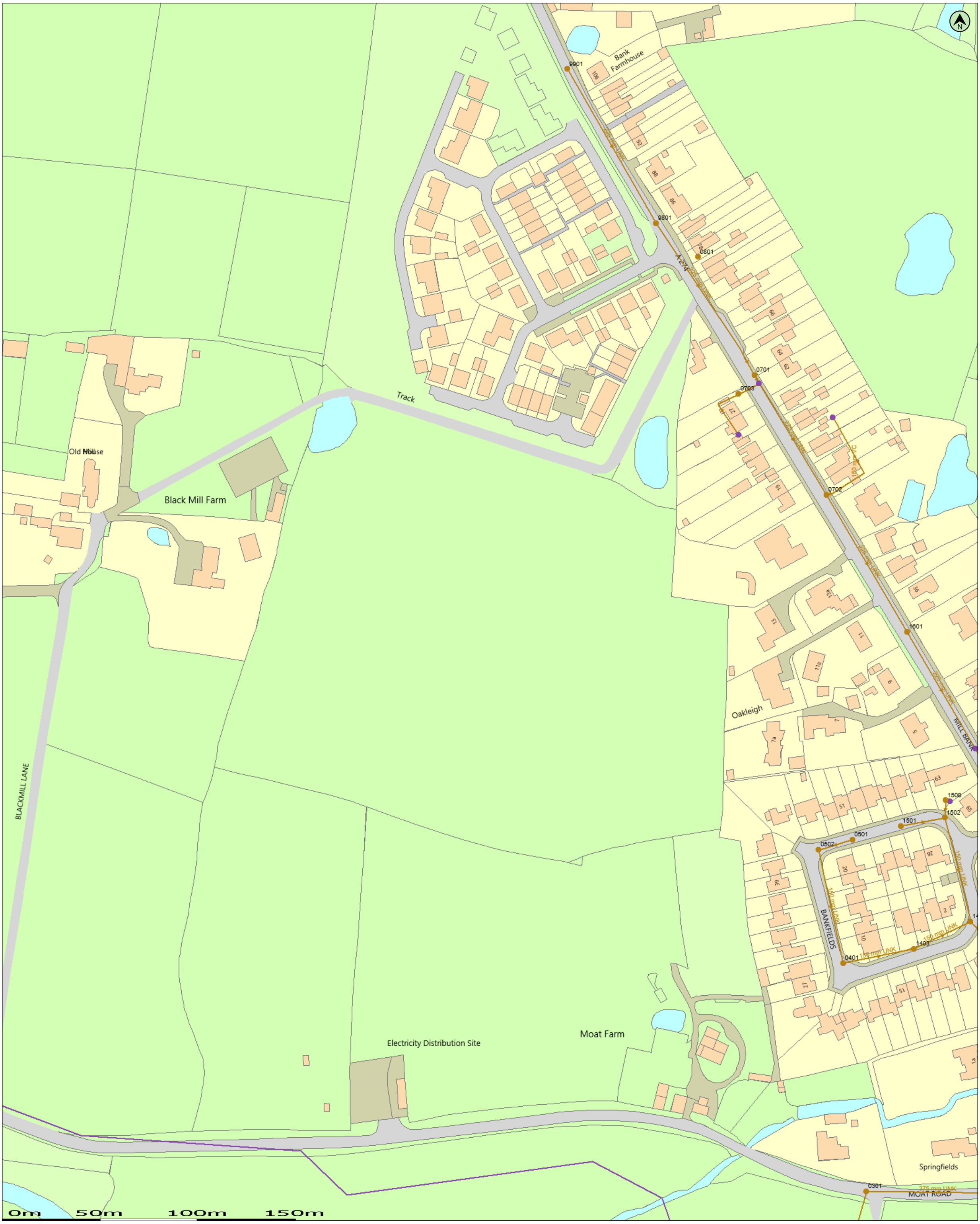
This plan should only be used for its original purpose. Greenhatch Group accepts no responsibility for this plan if supplied to any party other than the original client.

All dimensions should be checked on site prior to design and construction.

Drainage information (where applicable) has been visually inspected from the surface and therefore should be treated as approximate only.

Notes:

APPENDIX C
SOUTHERN WATER SEWER RECORDS



Data updated: 16/08/22

Scale: 1:1250 | Map Centre: 582895,144642 | Date: 23/09/22 | Our Ref: 959017 - 2 | Wastewater Plan A2 | Powered by digdat

Foul Gravity Sewer
Combined Gravity Sewer
Culverted Water Course or Treated Effluent
Surface Water Gravity Sewer
Rising Main, Vacuum or Syphon
Combined Outfall
Surface Water Outfall
Foul Outfall
Surface Water Inlet
Combined Pumping Station
Surface Water Pumping Station
Foul Pumping Station
WWTW Water Treatment Works
Section 104 Area
Building Over Agreement Area
Foul Manhole
Combined Manhole
Surface Water Manhole
Side Entry Manhole, Decarcation Chamber, Dummy Manhole or Surface Water Soakaway

lward@rsk.co.uk
680350

from Southern Water

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert
0301	F	19.07	17.03	
0401	F	21.60	20.54	
0501	F	26.89	25.52	
0502	F	26.29	24.60	
0701	F	30.48	0.00	
0702	F	31.72	24.83	
0703	F	2.00	0.00	
0801	F	0.00	0.00	
1401	F	21.36	0.00	
1403	F	0.00	0.00	
1501	F	26.80	25.37	
1502	F	26.13	24.95	
1508	F	0.00	0.00	
1601	F	31.55	24.55	
9801	F	28.44	25.35	
9901	F	26.63	25.65	

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

Manhole Reference	Liquid Type	Cover Level	Invert Level	Depth to Invert

APPENDIX D
PROPOSED SITE PLANS

A1

Romsey
T: 01794 367703
F: 01794 367276

Portishead
T: 01275 407000
F: 01794 367276

Camberley
T: 01276 749050
F: 01794 367276

www.thrivearchitects.co.uk

Rev	Description	Date	Au	Ch
A	Planning Issue	08.11.22	VL/ci	--/--
A1	Revised Layout	22.08.23	VL/HP	
A2	Amendments	29.08.23	VL/HP	

Project	Moat Road, Headcorn				
Drawing	Sketch Layout Master Plan - 01 -				
Client	CATESBY ESTATES PLC				
Job no.	CATE211030			Date	08.11.22
Dwg no.	SKMP-01			Rev.	A2
Author	VL/HP	Checked	-/-	Scale	1:1000@A0
Status	PLANNING			Office	Romsey
Client ref.	-				

thrive. architects

APPENDIX E
ENVIRONMENT AGENCY CORRESPONDENCE

Product 4 (Detailed Flood Risk) for: Land north of Moat Road, Headcorn, Kent, TN27 9NT
Requested by: Jemma Looney / LDE
Reference: KSL 281980 AC
Date: 11th October 2022

Contents

The information provided is based on the best data available as of the date of this letter.

You may feel it is appropriate to contact our office at regular intervals, to check whether any amendments/ improvements have been made to the data for this location. Should you re-contact us after a period of time, please quote the above reference in order to help us deal with your query.

Please refer to the Open Government Licence which explains the permitted use of this information.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: KSLE@environment-agency.gov.uk

Flood Map Confirmation

The Flood Map:

Our Flood Map shows the natural floodplain for areas at risk from river and tidal flooding. The floodplain is specifically mapped ignoring the presence and effect of defences. Although flood defences reduce the risk of flooding they cannot completely remove that risk as they may be over topped or breached during a flood event.

The Flood Map indicates areas with a 1% (0.5% in tidal areas), Annual Exceedance Probability (AEP) - the probability of a flood of a particular magnitude, or greater, occurring in any given year, and a 0.1% AEP of flooding from rivers and/or the sea in any given year. The map also shows the location of some flood defences and the areas that benefit from them.

The Flood Map is intended to act as a guide to indicate the potential risk of flooding. When producing it we use the best data available to us at the time, taking into account historic flooding and local knowledge. The Flood Map is updated on a quarterly basis to account for any amendments required. These amendments are then displayed on the internet at www.gov.uk/prepare-for-a-flood..

At this Site:

The Flood Map shows that parts of this site lie within the outline of the 1% (Flood Zone 3) and 0.1% (Flood Zone 2) chance of flooding from rivers in any given year.

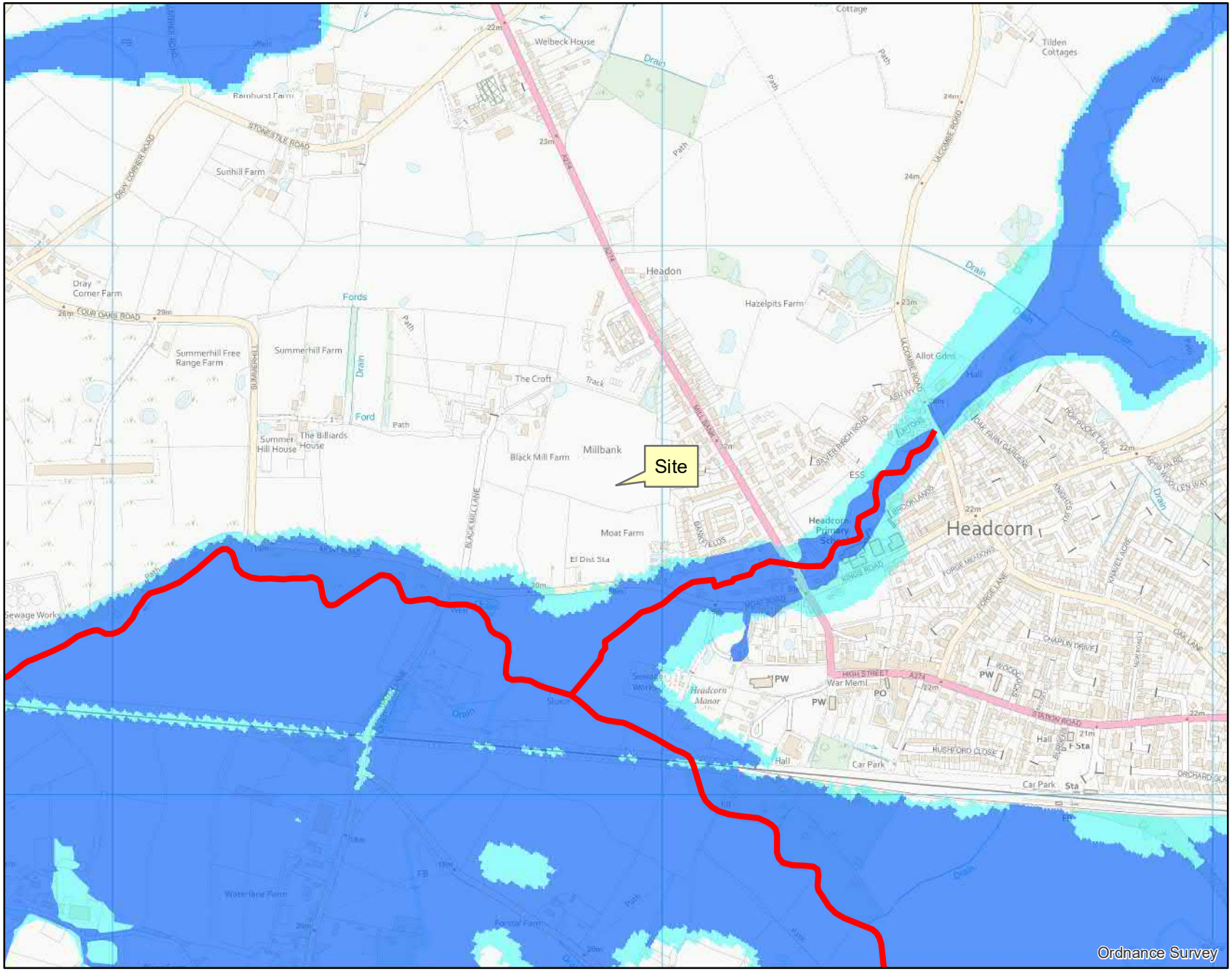
Enclosed is an extract of our Flood Map which shows this information for your area.

Method of production

The Flood Map at this location has been derived using detailed fluvial modelling of River Medway completed in 2015 by JBA.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: KSLE@environment-agency.gov.uk

Flood Map centered on Land north of Moat Road, Headcorn, Kent, TN27 9NT. Created 11/10/2022 (KSL 281980 AC)



Environment Agency

N

Legend

- Main River
- Flood Defences
- Flood Storage Area
- Areas Benefiting From Flood Defence
- 1% AEP of Fluvial Flooding
- 0.1% AEP of Flooding

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

0 250 500
Metres

Scale 1:10,000

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

Model Output Data

You have requested flood levels for various return periods at this location.

The modelled flood levels for the closest most appropriate model grid cells, any additional information you may need to know about the modelling from which they are derived and/or any specific use or health warning for their use are set out below.

Using a 2D TuFLOW model the floodplain has been represented as a grid. The flood water levels have been calculated for each grid cell.

A map showing the location of the points from which the data is taken is enclosed. Please refer to the Open Government Licence which explains the permitted use of this information.

Table 1 : Defended Levels in mAOD

Node Location ID	Modelled Flood levels for Annual Exceedance Probability shown in mAOD											
	National Grid Ref		Defended									
	Easting	Northing	20% AEP	5% AEP	3.3% AEP	2% AEP	1.3% AEP	1% AEP	1% AEP + 35CC	1% AEP + 70CC	0.4% AEP	0.1% AEP
1	582752	144378	19.25	19.43	19.48	19.52	19.69	19.64	19.93	20.10	19.84	20.03
2	582777	144378	0.00	0.00	0.00	0.00	0.00	0.00	19.93	20.10	0.00	20.03
3	582827	144378	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.11	0.00	0.00
4	582877	144378	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	582902	144378	0.00	0.00	0.00	0.00	0.00	0.00	19.94	20.11	0.00	20.04
6	582927	144378	0.00	0.00	0.00	0.00	19.71	19.65	19.94	20.11	19.85	20.04
7	582952	144378	19.28	19.45	19.50	19.54	19.71	19.65	19.94	20.11	19.85	20.04
8	582977	144378	19.28	19.45	19.50	19.54	19.71	19.65	19.94	20.11	19.85	20.04
9	583002	144378	19.28	19.45	19.50	19.54	19.71	19.65	19.94	20.11	19.85	20.04

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: KSLE@environment-agency.gov.uk

10	583027	144378	19.28	19.45	19.50	19.54	19.71	19.65	19.94	20.11	19.85	20.04
11	583052	144378	19.28	19.45	19.50	19.54	19.71	19.65	19.94	20.11	19.85	20.04
12	582752	144403	0.00	0.00	0.00	0.00	0.00	0.00	19.93	20.10	19.84	20.03
13	582927	144403	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.11	0.00	20.04
14	582952	144403	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.11	0.00	20.04
15	582977	144403	0.00	0.00	0.00	0.00	0.00	0.00	19.94	20.11	19.85	20.04
16	583002	144403	19.28	19.45	19.50	19.54	19.71	19.65	19.94	20.11	19.85	20.04
17	583027	144403	19.28	19.45	19.50	19.54	19.71	19.65	19.94	20.11	19.85	20.04
18	583002	144428	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.11	0.00	20.04
19	583027	144428	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 2 : Undefended levels in mAOD

Node Location ID	Modelled Flood levels for Annual Exceedance Probability shown in mAOD						
	National Grid Ref		Undefended				
	Easting	Northing	5% AEP	1% AEP	1% AEP +35CC	1% AEP + 70CC	0.1% AEP
1	582752	144378	19.43	19.57	19.93	20.10	19.98
2	582777	144378	0.00	0.00	19.93	20.10	19.98
3	582827	144378	0.00	0.00	0.00	20.11	0.00
4	582877	144378	0.00	0.00	0.00	0.00	19.99
5	582902	144378	0.00	0.00	19.94	20.11	19.99
6	582927	144378	0.00	19.59	19.94	20.11	19.99
7	582952	144378	19.45	19.59	19.94	20.11	19.99
8	582977	144378	19.45	19.59	19.94	20.11	19.99
9	583002	144378	19.45	19.59	19.94	20.11	19.99

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: KSLE@environment-agency.gov.uk

10	583027	144378	19.45	19.59	19.94	20.11	19.99
11	583052	144378	19.45	19.59	19.94	20.11	19.99
12	582752	144403	0.00	0.00	19.93	20.10	19.98
13	582927	144403	0.00	0.00	0.00	20.11	0.00
14	582952	144403	0.00	0.00	0.00	20.11	0.00
15	582977	144403	0.00	0.00	19.94	20.11	19.99
16	583002	144403	19.45	0.00	19.94	20.11	19.99
17	583027	144403	19.45	19.59	19.94	20.11	19.99
18	583002	144428	0.00	0.00	0.00	20.11	0.00
19	583027	144428	0.00	0.00	0.00	0.00	19.99

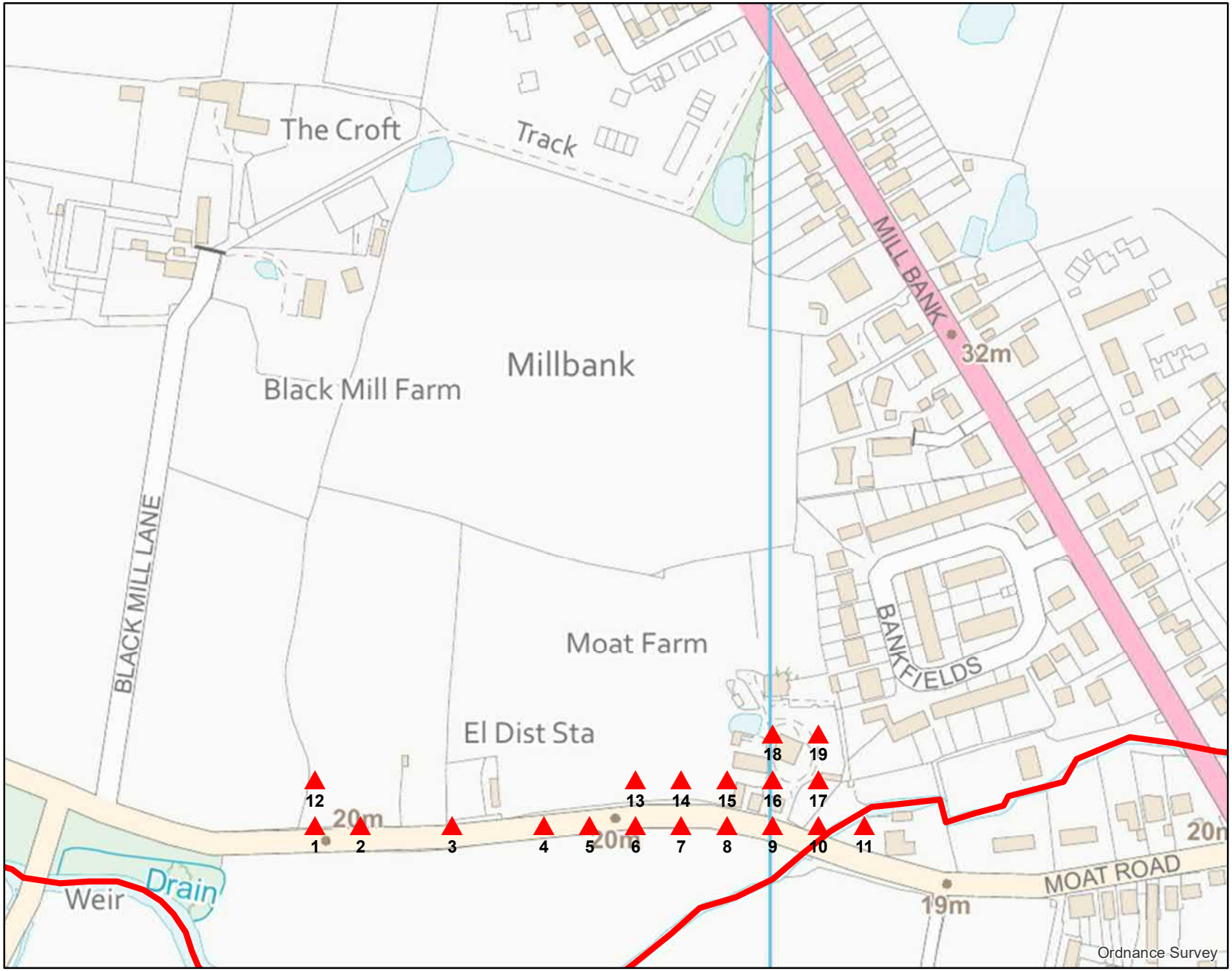
Values of 0.00 indicate locations at which the selected points lie outside of a particular modelled flood extent.

Data taken from River Medway Mapping and Modelling Study, completed by JBA, in 2015

There are no health warnings or additional information for these levels or the model from which they were produced.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: KSLE@environment-agency.gov.uk

Node Map centered on Land north of Moat Road, Headcorn, Kent, TN27 9NT. Created 11/10/2022 (KSL 281980 AC)



Environment Agency

N

Legend

- Nodes
- Main River

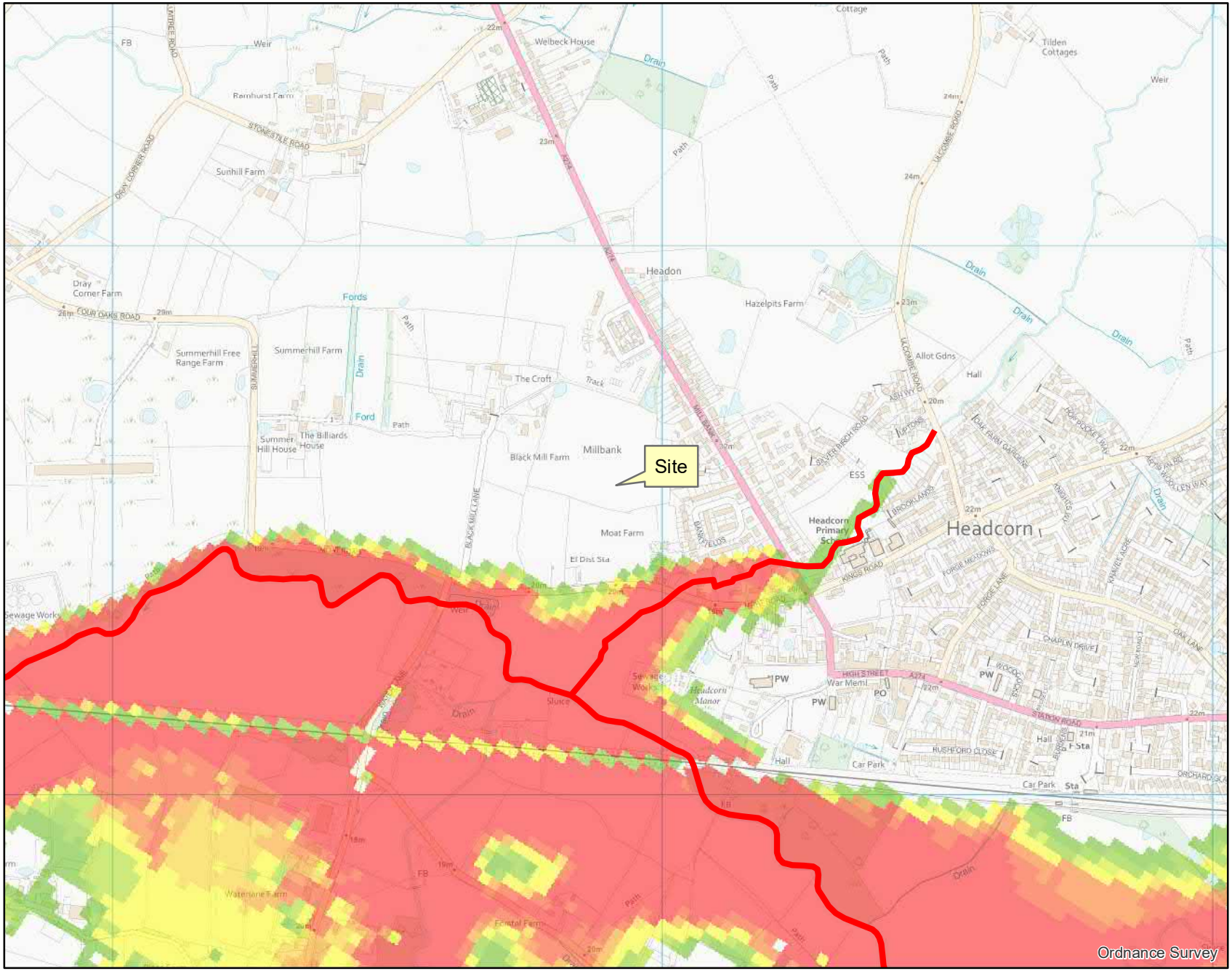
0 70 140

Metres

Scale 1:3,000

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

Modelled Maximum Defended Flood Extents Map centered on Land north of Moat Road, Headcorn, Kent, TN27 9NT. Created 11/10/2022 (KSL 281980 AC)



Environment Agency

N

Legend

Main River

Maximum Defended Flood Extents

AEP (%)

- 20% AEP extent
- 10% AEP + CC extent
- 5% AEP extent
- 3.3% AEP extent
- 2% AEP extent
- 1.3% AEP extent
- 1% AEP extent
- 0.4% AEP extent
- 1% AEP + 35%CC extent
- 1% AEP + 70%CC extent
- 0.1% AEP extent

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

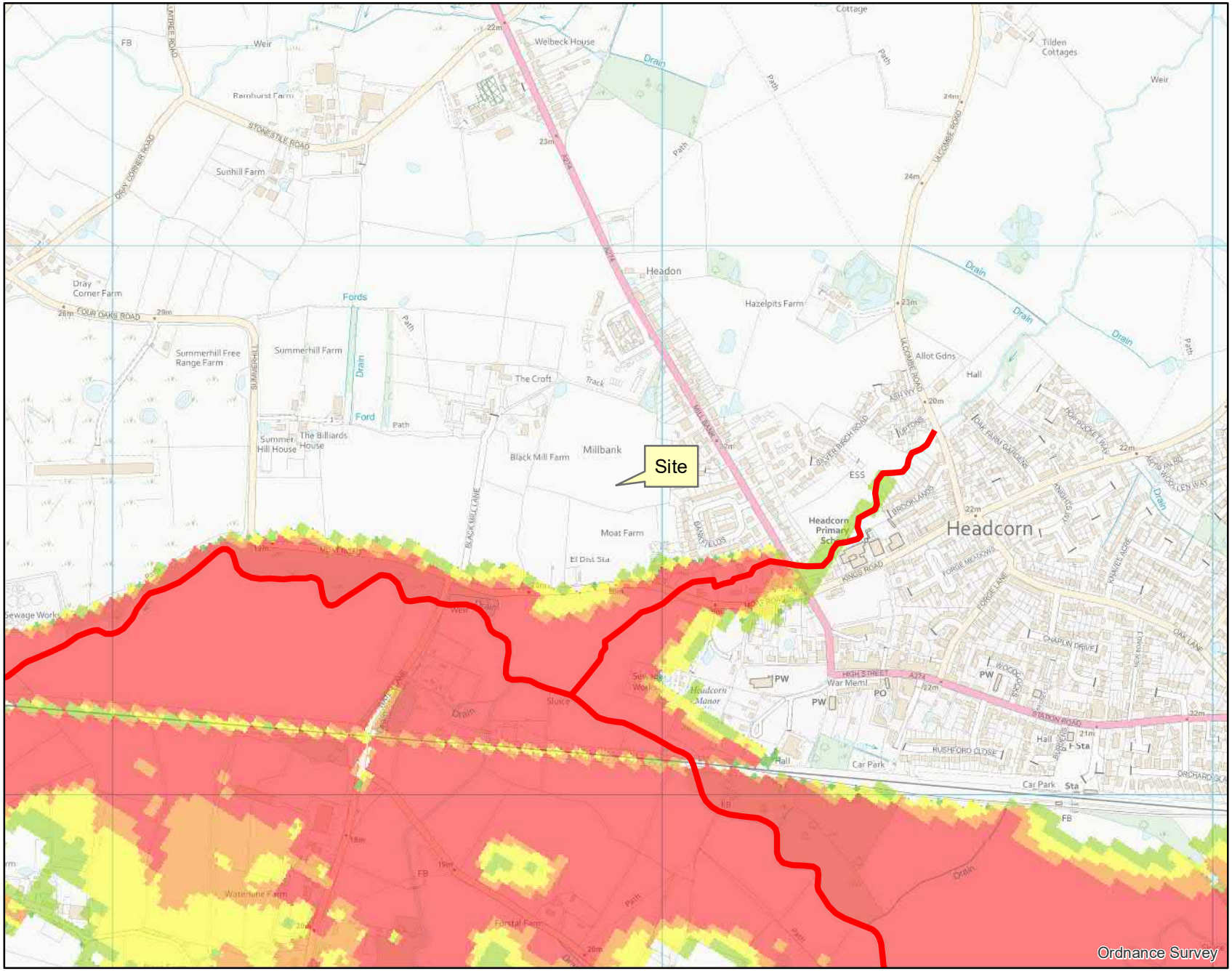
1%CC = 1% Climate Change extent
This is the 1% AEP event with an allowance for climate change (+20% on river flows).

0 250 500
Metres

Scale 1:10,000

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

Modelled Maximum Undefended Flood Extents Map centered on Land north of Moat Road, Headcorn, Kent, TN27 9NT. Created 11/10/2022 (KSL 281980 AC)



Environment Agency

N

Legend

- Main River

Maximum Undefended Flood Extents

AEP (%)

- 0.1% AEP extent
- 1% AEP + 70%CC extent
- 1% AEP + 35%CC extent
- 1% AEP extent
- 5% AEP extent

Annual Exceedance Probability (AEP) The probability of a flood of a particular magnitude, or greater occuring in any given year.

1%CC = 1% Climate Change extent
This is the 1% AEP event with an allowance for climate change (+20% on river flows).

0 250 500
Metres

Scale 1:10,000

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

Defence Details

There are no formal flood defences owned or maintained by the Environment Agency in the area of this site/ property.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: KSLE@environment-agency.gov.uk

Historic Flood Data

We hold records of historic flood events from rivers and the sea. Information on the floods that may have affected the area local to your site are provided on the enclosed map (if relevant).

Flood Event Data

Dates of historic flood events in this area – **November 1960, December 2013**

Please note that our records are not comprehensive. We would therefore advise that you make further enquiries locally with specific reference to flooding at this location. You should consider contacting the relevant Local Planning Authority and/or water/sewerage undertaker for the area.

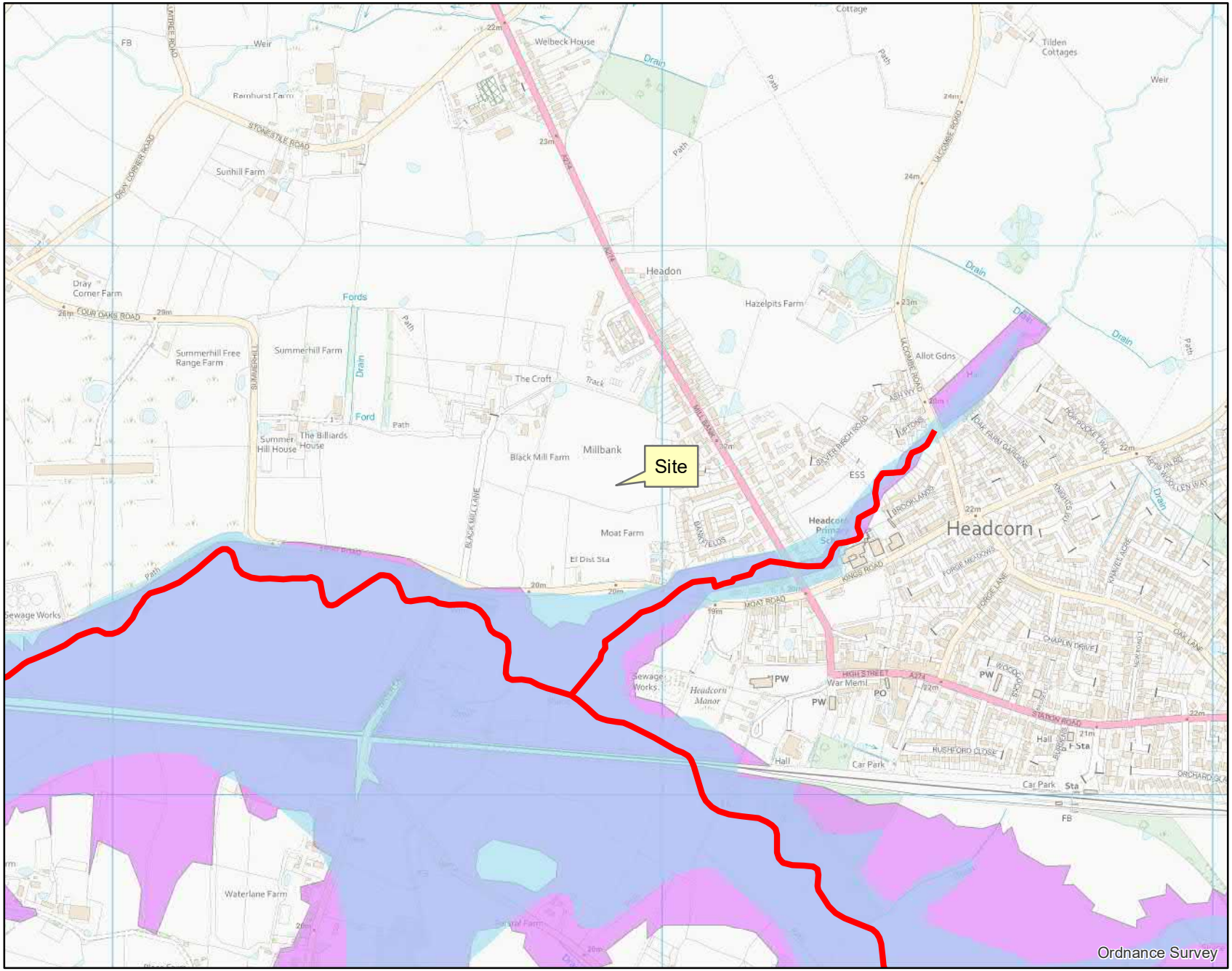
We map flooding to land, not individual properties. Our historic flood event record outlines are an indication of the geographical extent of an observed flood event. Our historic flood event outlines do not give any indication of flood levels for individual properties. They also do not imply that any property within the outline has flooded internally.

Please be aware that flooding can come from different sources. Examples of these are:
- from rivers or the sea;
- surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system);
- overflowing or backing up of sewer or drainage systems which have been overwhelmed,
- groundwater rising up from underground aquifers

Currently the Environment Agency can only supply flood risk data relating to the chance of flooding from rivers or the sea. However you should be aware that in recent years, there has been an increase in flood damage caused by surface water flooding or drainage systems that have been overwhelmed.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: KSLE@environment-agency.gov.uk

Historic Flood Extents Map centered on Land north of Moat Road, Headcorn, Kent, TN27 9NT. Created 11/10/2022 (KSL 281980 AC)



Legend

- Main River
- Nov 1960
- Dec 2013

N

0 250 500
Metres

Scale 1:10,000

Contact us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 03708 506 506. Email:enquiries@environment-agency.gov.uk

Additional Information

Information Warning - OS background mapping

The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.

Planning advice and guidance

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:
https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

Complete the form in the link and email back to kslplanning@environment-agency.gov.uk

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.
We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: KSLE@environment-agency.gov.uk

Flood Risk Assessments guidance

Flood risk standing advice for applicants

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

https://www.gov.uk/flood-risk-assessment-standing-advice

http://planningguidance.planningportal.gov.uk/

https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications

https://www.gov.uk/guidance/flood-risk-and-coastal-change

You should also consult the Strategic Flood Risk Assessment and flood risk local plan policies produced by your local planning authority.

You should note that:

1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment where one is required, but does not constitute such an assessment on its own.
2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or overland runoff. You should discuss surface water management with your Lead Local Flood Authority.
3. Where a planning application requires a FRA and this is not submitted or deficient, the Environment Agency may well raise an objection due to insufficient information

Flood risk assessments: climate change allowances

On 20/07/2021 the 'Flood risk assessments: climate change allowances' were updated and published on gov.uk. You can view the updated allowances at 'Flood risk assessments: climate change allowances'.

You will need to consider this data and factor in the new allowances to demonstrate the development will be safe from flooding.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: KSLE@environment-agency.gov.uk

It remains the applicant's responsibility to demonstrate through their proposals and flood risk assessments that a new development will be safe in flood risk terms for its lifetime. We will incorporate the new allowances into future modelling studies.

Surface Water

We have provided two national Surface Water maps, under our Strategic Overview for flooding, to your Lead Local Flood Authority who are responsible for local flood risk (i.e. surface runoff, ground water and ordinary watercourse), which alongside their existing local information will help them in determining what best represents surface water flood risk in your area.

Your Lead Local Flood Authority have reviewed these and determined what it believes best represents surface water flood risk. You should therefore contact this authority so they can provide you with the most up to date information about surface water flood risk in your area.

You may also wish to consider contacting the appropriate relevant Local Planning Authority and/or water/sewerage undertaker for the area. They may be able to provide some knowledge on the risk of flooding from other sources. We are working with these organisations to improve knowledge and understanding of surface water flooding.

Orchard House, Endeavour Park, London Road, Addington, West Malling, Kent, ME19 5SH.
Email: KSLE@environment-agency.gov.uk