Site Name: Land between Vernon Street and Stoke Quay (west)					
Site ID:	IP039a	**Location:**	Land between Vernon Street and Stoke Quay (west)	**Area (ha):**	0.48
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification:**	More Vulnerable

Tidal and Fluvial Flood Risk				
Flood Zone 1 (<0.1% AEP): 16%	**Flood Zone 2 (0.1% AEP):** 9%	**Flood Zone 3 (1% AEP):** 76%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 72%

Flood Zones and Flood Defences

The tidal River Orwell flows south east just to the east of the site. Most of the site is identified as Flood Zone 3, high probability of flooding from the tidal River Orwell, in the absence of flood defences. The site is shown to benefit from the presence of defences; there is a flood defence wall along the edge of the channel to the west of the site, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk of fluvial or tidal flooding,* in the event of a failure of these defences.

Refer to Map 1 below for Flood Zone outlines

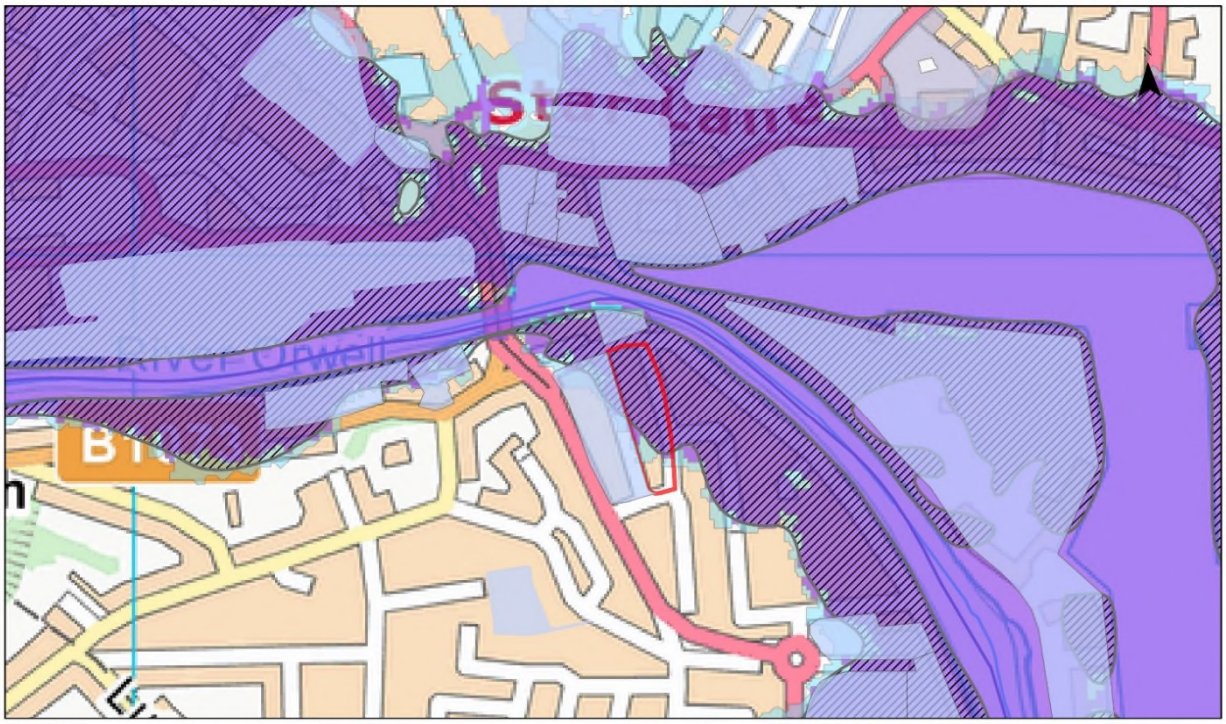
Climate Change

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change. (These modelled scenarios take account of the presence of defences).

Historic Records

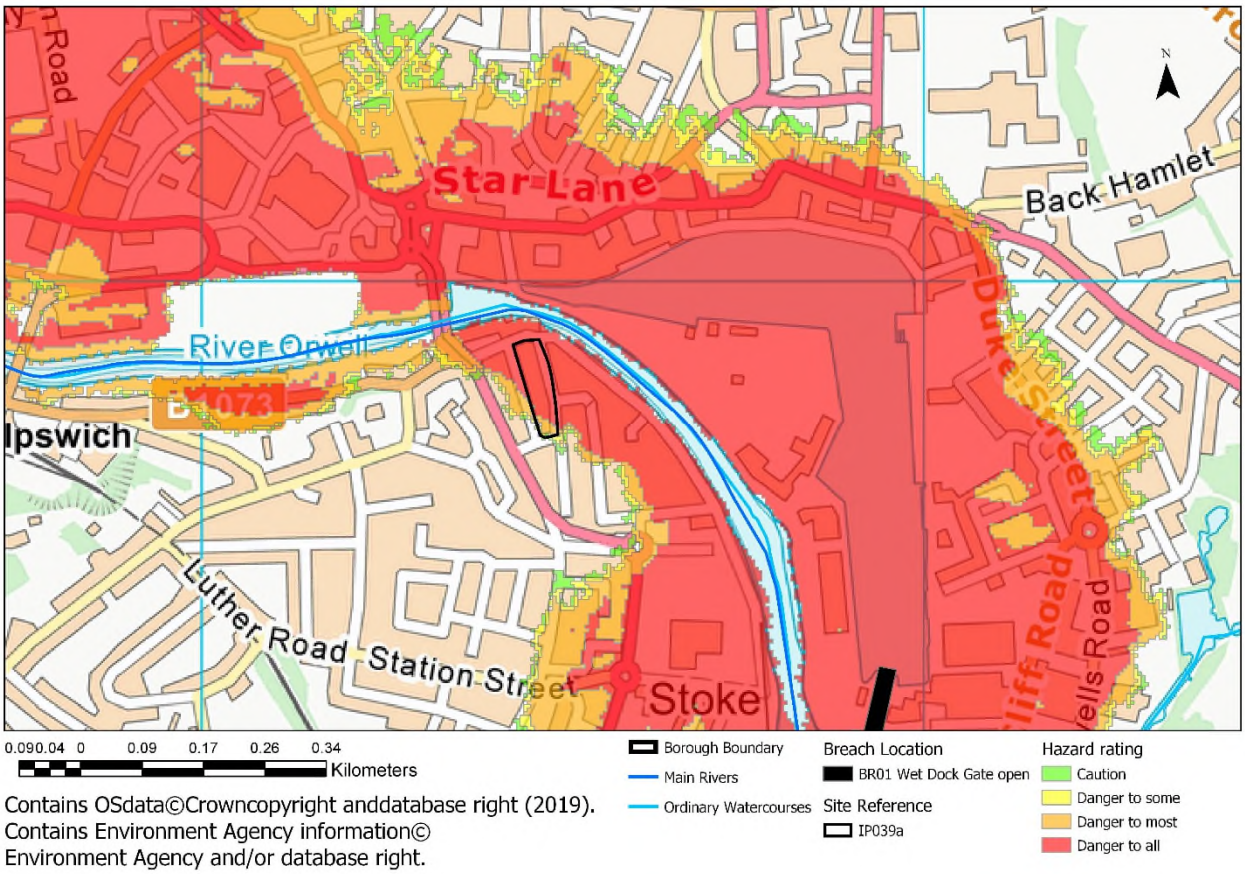
The Level 1 SFRA Figure 10 shows that this area has historically experienced flooding in 1953. Ipswich BC also hold records of flooding to the north of site where Vernon Street meets Bridge Street, associated with the surface water network being blocked or overwhelmed.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Land between Vernon Street and Stoke Quay (west)

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

The site is on the edge of the hazard extents therefore, safe access likely to be achievable to the south along Vernon Street.

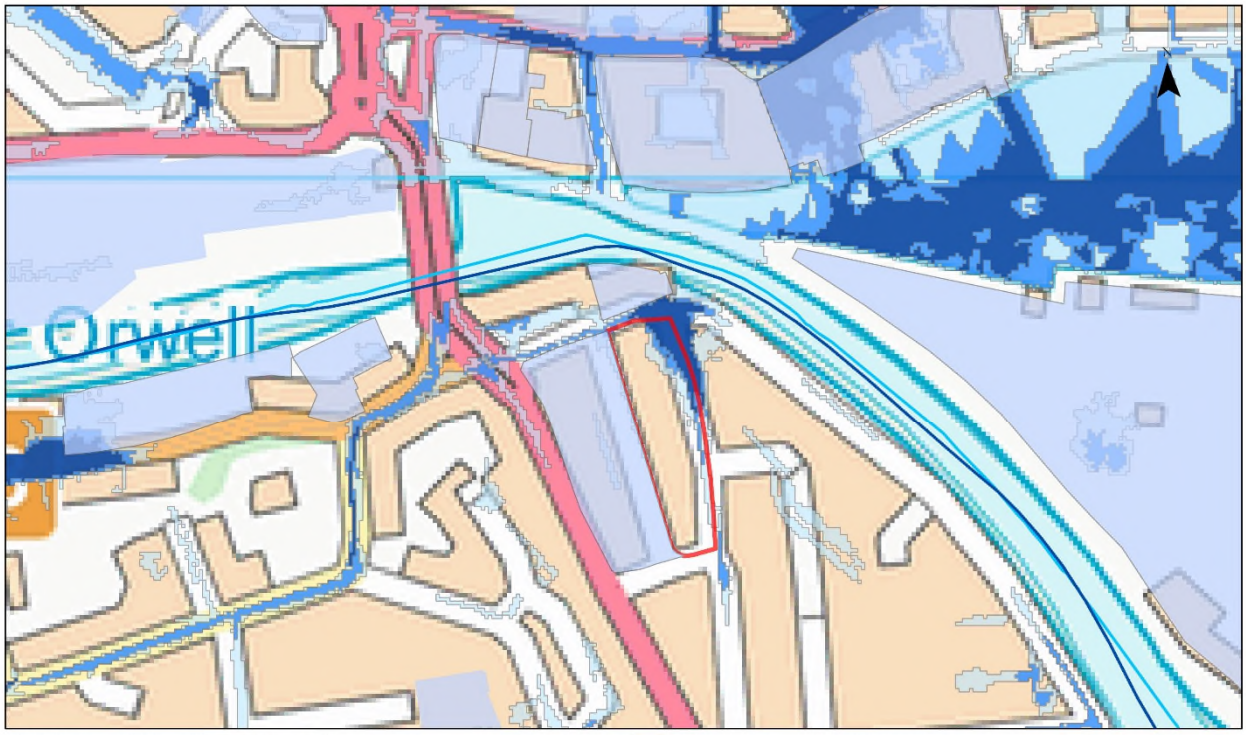
Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The RoFSW mapping identifies the site to be at high risk of surface water flooding.

Site Name: Land between Vernon Street and Stoke Quay (west)

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.
Due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Set-back Distance

All development should be set back 16m from the edge of the River Orwell. The Environment Agency need to be consulted and an Environmental Permit obtained for any works within 16m of a Main River.

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to consider the current risk of surface water flooding particularly in the northern part of the site, to ensure adequate inclusion of SuDS and adequate provision for the management of surface water during high tide conditions. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event

Site Name: Land between Vernon Street and Stoke Quay (west)

including an allowance for climate change, or 300mm above the maximum water level 3.5m AOD in Compartment C (Table 7-1), whichever is greater.

Access / Egress

The main access to the site is from Stoke Quay, which is adjacent to the River Orwell, and therefore also at residual risk of tidal flooding. The egress route away from the site could be west onto Vernon Street and then west towards Stoke Street and Belstead Road; this route would lead away from the floodplain to an area within Flood Zone 1.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Site Name: Commercial Buildings, Star Lane					
Site ID:	IP043	**Location:**	Commercial Buildings, Star Lane	**Area (ha):**	0.7
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification:**	More Vulnerable

Tidal and Fluvial Flood Risk				
Flood Zone 1 (<0.1% AEP): 64%	**Flood Zone 2 (0.1% AEP):** 16%	**Flood Zone 3 (1% AEP):** 21%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 18%

Flood Zones and Flood Defences

The tidal River Orwell is located approximately 100m to the south of the site. The southern part of the site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. This area is shown to benefit from the presence of defences; there is a flood defence wall and embankment along the edge of the River Orwell to the south of the site, and there is a tidal barrier further downstream on the River Orwell. The southern edge of the site is therefore at *residual risk of tidal flooding,* in the event of a failure of these defences.

Refer to Map 1 below for Flood Zone outlines

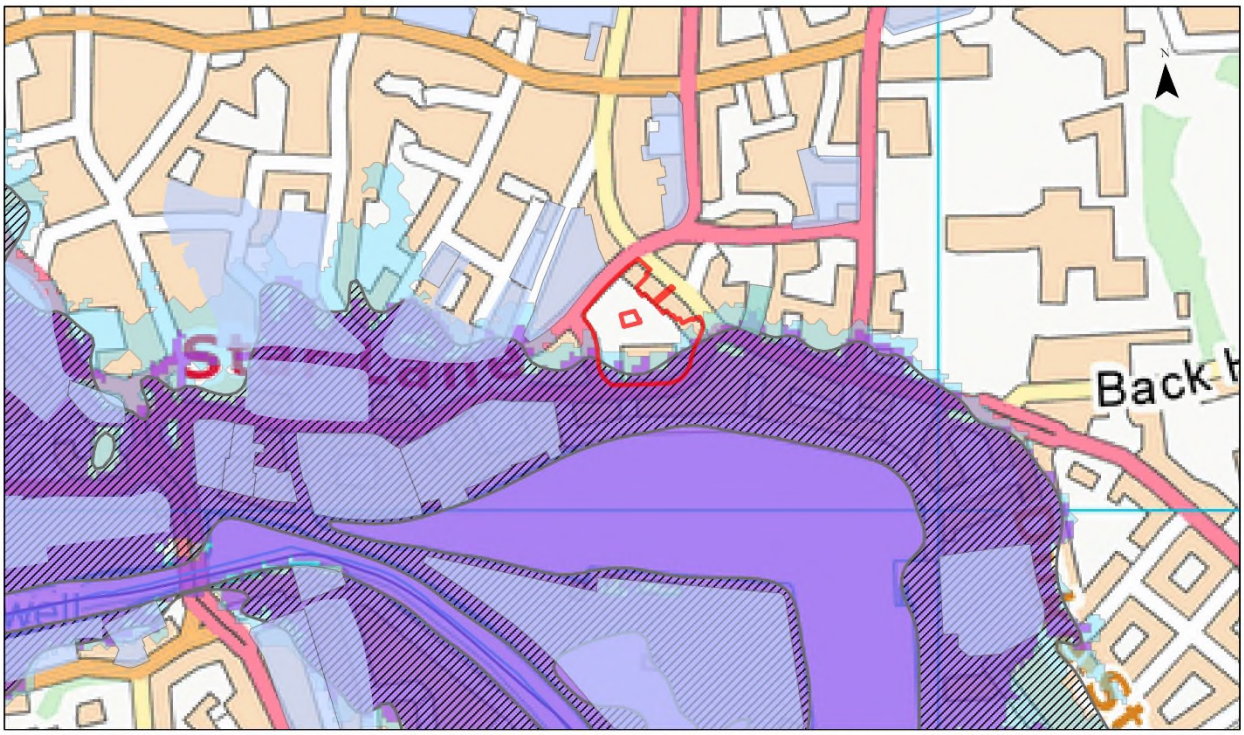
Climate Change

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change. (These modelled scenarios take account of the presence of defences).

Historic Records

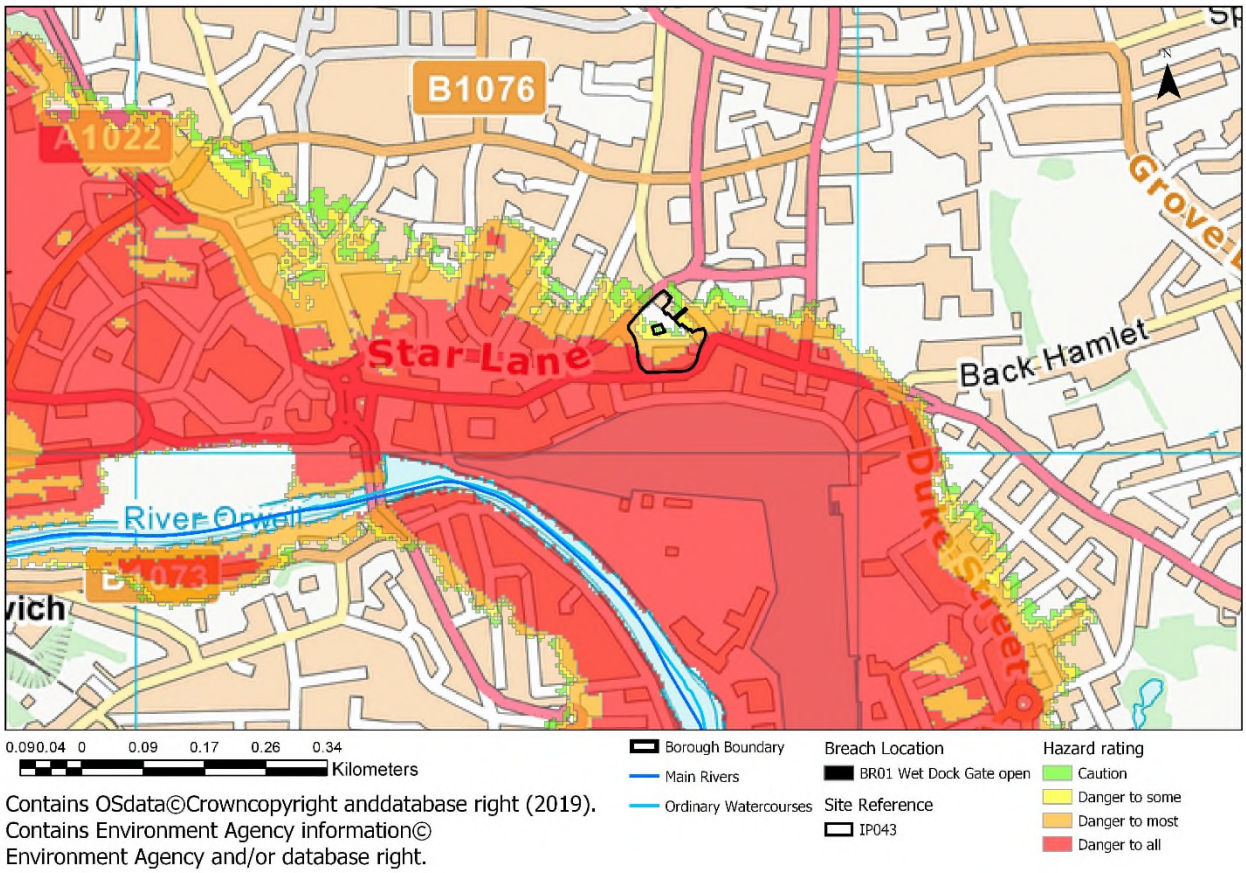
The Level 1 SFRA Figure 10 shows that this site is on the edge of the area that experienced flooding in 1953. Ipswich BC also hold a number of records of flooding to the east of the site close to Bridge Street associated with the surface water drainage system being blocked or overwhelmed.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Commercial Buildings, Star Lane

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

Site is located on the edge of Flood Zone 3 and at the edge of hazard extent. Safe access is achievable along Star Lane.

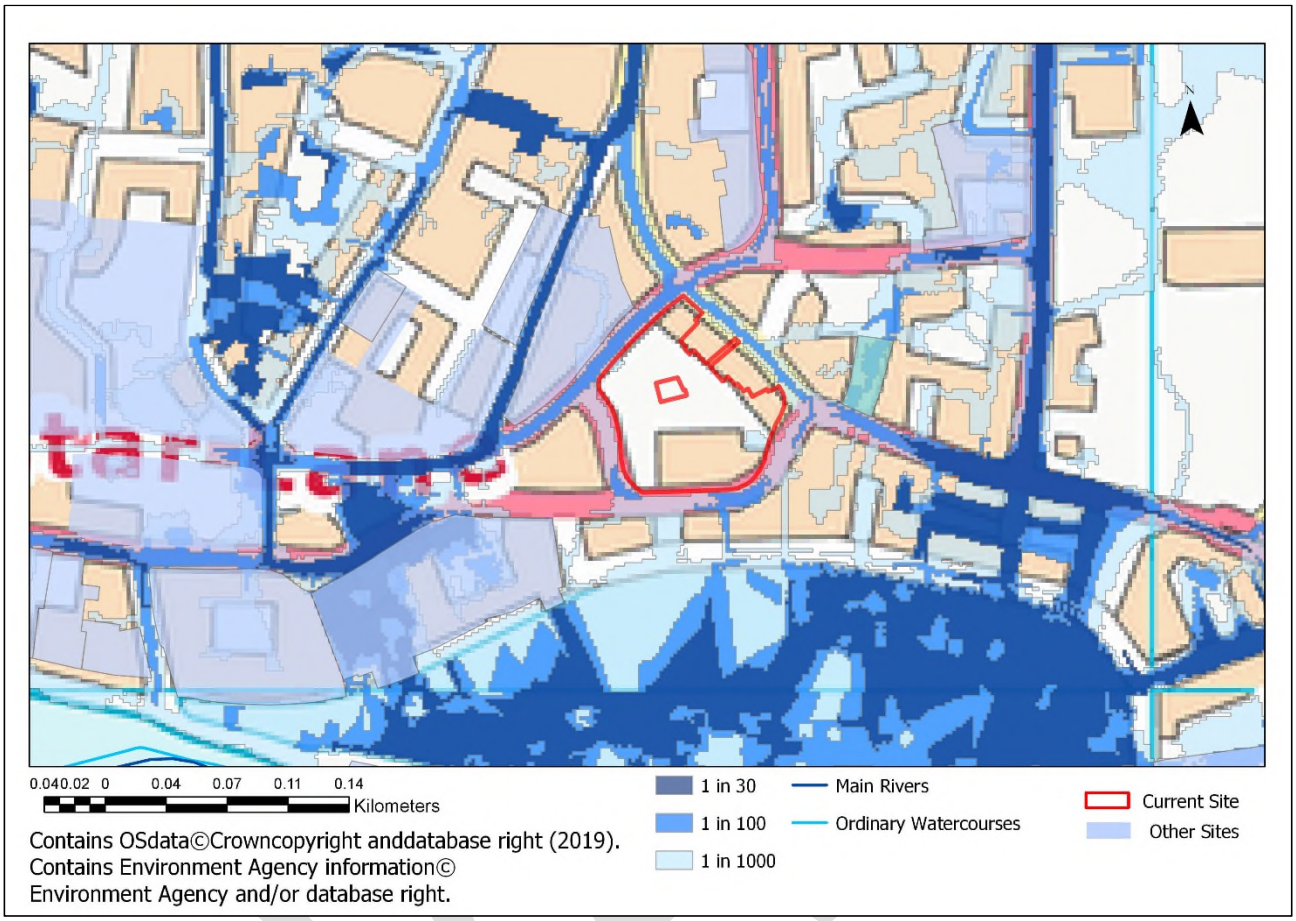
Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The RoFSW mapping shows that the roads in this area are susceptible to overland flow and ponding. Whilst the site itself is shown to have a low risk of surface water flooding, the surrounding routes are at high risk.

Site Name: Commercial Buildings, Star Lane

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

Due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water, especially given the risk of surface water flooding in the area surrounding the site. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change, or 300mm above the maximum water level 4m AOD in Compartment H (Table 7-1), whichever is greater.

Site Name: Commercial Buildings, Star Lane

Access / Egress

Access to the site may be from Key Street, Fore Street or Star Lane (A1022). The routes that pass northwards are within Flood Zone 1 and therefore lead out of the tidal floodplain.

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the southern part of the site may not be possible. It will therefore be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Site Name: Holywells Road (West)/Toller Road and Land between Holywells Road & Holywells Park ('Holywells East')					
Site ID:	IP045 & IP064	**Location:**	Holywells Road /Toller Road	**Area (ha):**	West - 2.06 East - 1.2
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification :**	More Vulnerable

Tidal and Fluvial Flood Risk				
Site IP045				
Flood Zone 1 (<0.1% AEP): 0%	**Flood Zone 2 (0.1% AEP):** 17%	**Flood Zone 3 (1% AEP):** 83%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 100%
Site IP064				
Flood Zone 1 (<0.1% AEP): 52%	**Flood Zone 2 (0.1% AEP):** 19%	**Flood Zone 3 (1% AEP):** 29%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 30%

Flood Zones and Flood Defences

The tidal River Orwell is located approximately 300m to the west of the sites.

Most of the West site and almost half of the East site are identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. This area is shown to benefit from the presence of defences; there is a flood defence wall along the edge of the River Orwell to the south of the site, and there is a tidal barrier on the River Orwell. The site is therefore at *residual risk of tidal flooding,* in the event of a failure of these defences.

Refer to map 1 below for an illustration of the extent of flood zones local to the site.

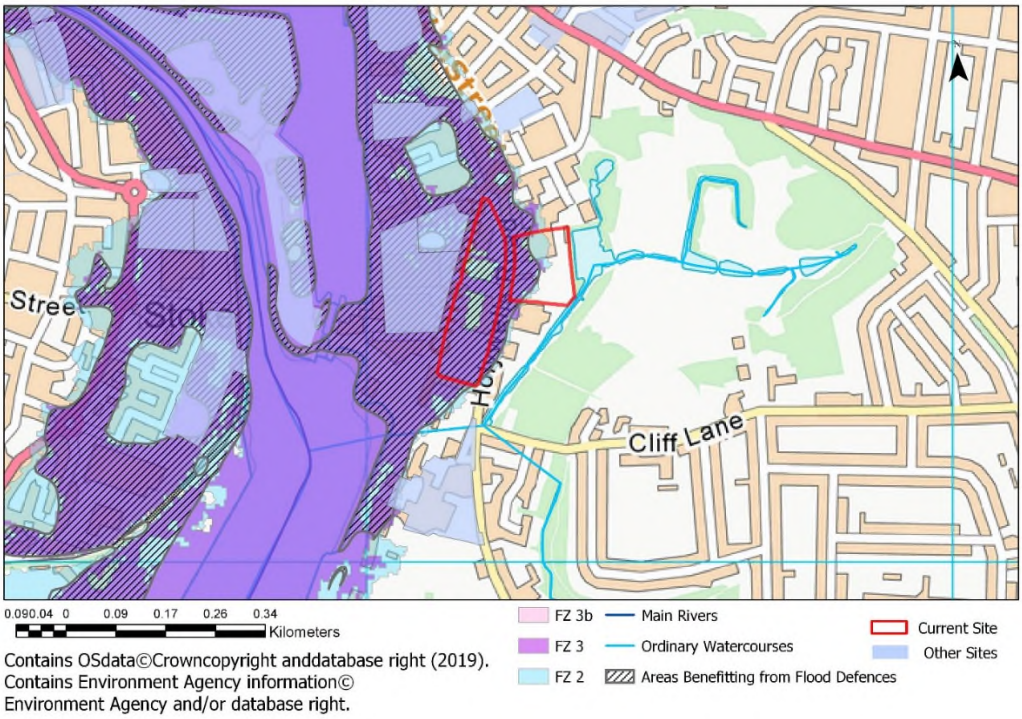
Climate Change

Modelling of the River Orwell shows that tidal flood water remains in bank in this location during the 0.5% AEP event including an allowance for climate change i.e. overtopping does not occur in this scenario (These modelled scenarios take account of the presence of defences).

Historic Records

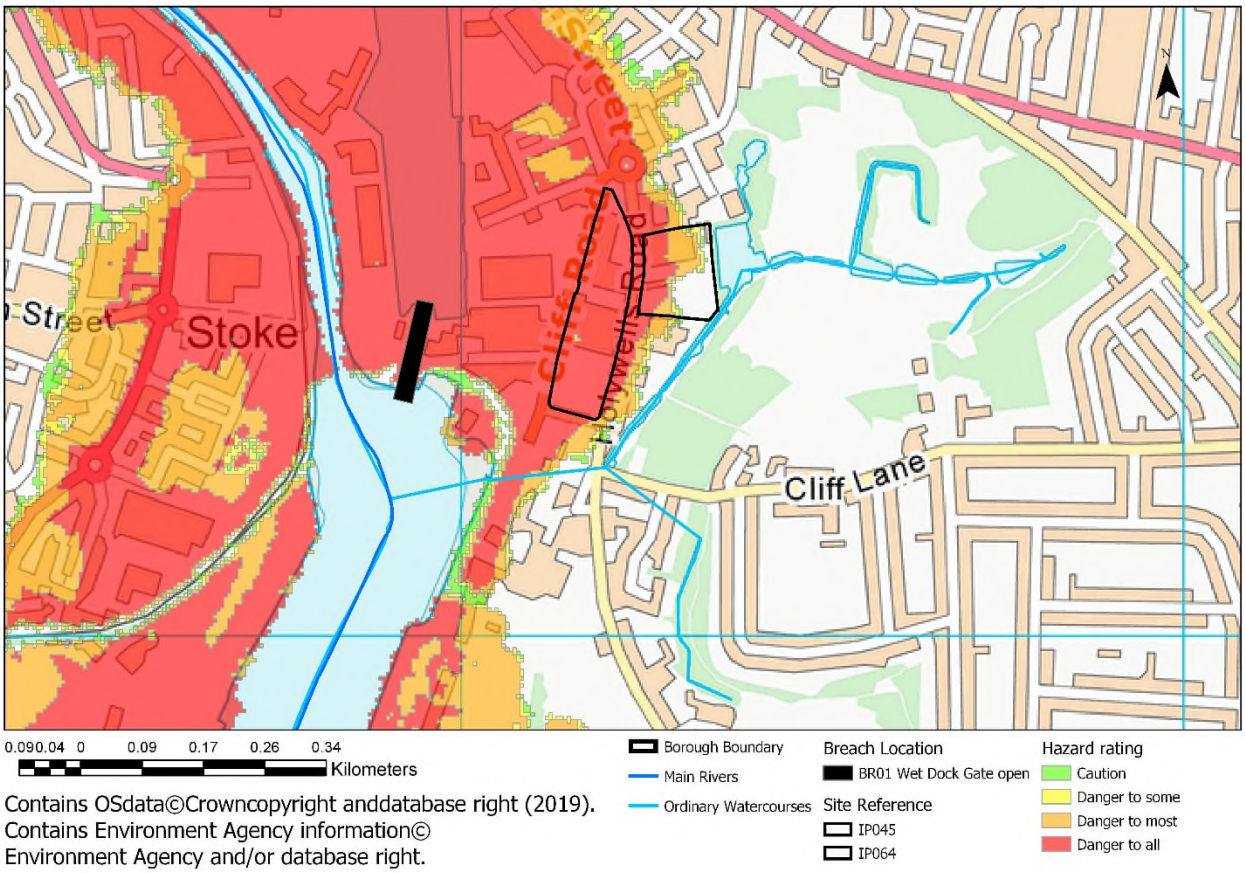
The Level 1 SFRA Figure 10 shows that this site is on the edge of the area that experienced flooding in 1953. Ipswich BC also hold records of road and pavement flooding in this location.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Holywells Road (West)/Toller Road and Land between Holywells Road & Holywells Park ('Holywells East')

Map 2 – Residual Risk - Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.
Hazard mapping illustrated in Map 2 shows ratings with the Wet Dock gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

Holywells Road west site is at higher residual flood risk as it is located 100% in Flood Zone 2 and 3. The site is entirely within the defended floodplain with limited opportunities for safe access in the event of a breach. Safe refuge should be provided above 5.3m AOD.

Holywells Road east is at a lower risk as it is on the boundary of Flood Zone 3, 2 and 1. Therefore, safe access may be achievable along Holywells Road in the event of a breach, depending on the time of the breach and the warning period. Safe refuge should be provided above 5.3m AOD.

There is a history of flooding from the canal in the vicinity of the site due to blockages in the canal outlet. In addition, there is a risk of failure of the privately owned embankment should trees fall.

There may be opportunities to complete some land raising to enable egress to the south east corner of the site, however, consideration of the potential impact on surface water flood risk to others needs to be included.

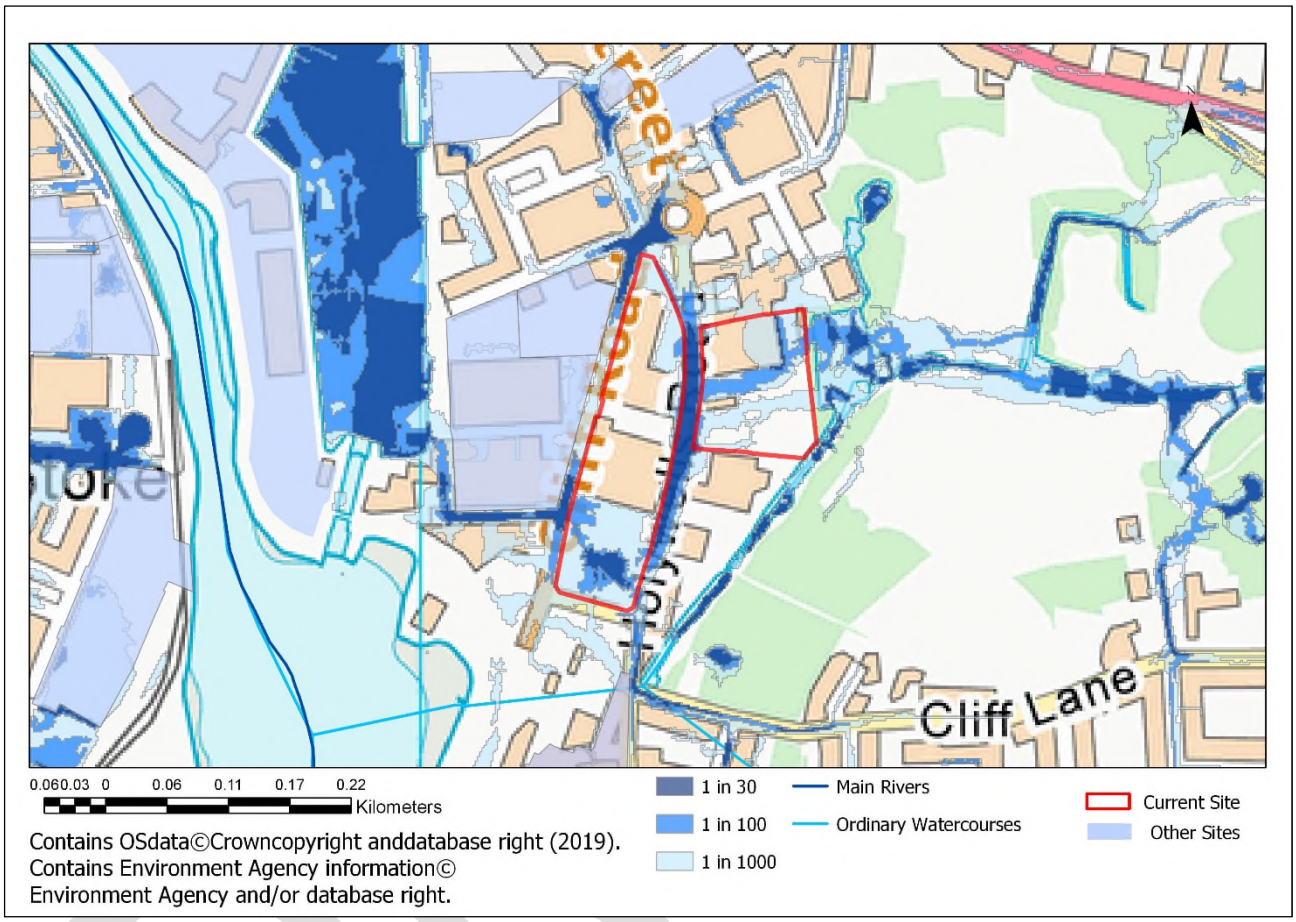
Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

Site Name: Holywells Road (West)/Toller Road and Land between Holywells Road & Holywells Park ('Holywells East')

The RoFSW mapping identifies that the site and surrounding area are at high risk of surface water flooding and ponding.

Map 3 – Environment Agency RoFSW mapping



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which <25% is susceptible to groundwater emergence. There have been historic records of groundwater flooding at this location. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

The underling geology in this location is White Chalk subgroup and Lambeth Group which may be permeable and suitable for infiltration techniques within SuDS. However, ground water flood records indicate the potential for a high water table which would likely prevent the use of infiltration SuDS on site.

Due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk from reservoir flooding.

There is a past history of frequent deep local flooding as described in the SFRA. This flooding is likely to be due to overloading of the Anglian Water combined Sewerage system and lack of drainage serving sites to the East.

Site Name: Holywells Road (West)/Toller Road and Land between Holywells Road & Holywells Park ('Holywells East')

There is a history of flooding from the canal in the vicinity of the site due to blockages in the canal outlet. In addition, there is a risk of failure of the privately owned embankment should trees fall.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water, especially given the risk of surface water flooding in the area surrounding the site. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

An Anglian Water trunk high level sewer crosses the site and will require careful consideration for diversion (if viable).

It would be difficult to alleviate the sewer flooding without worsening flooding elsewhere as the road is very low and the low level trunk sewer is very shallow.

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change, or 300mm above the maximum water level, 5.3m AOD (Table 7-1) whichever is greater.

Access / Egress

Holywells Road west site is at higher residual flood risk and is entirely within the defended floodplain with limited opportunities for safe access in the event of a breach.

Holywells Road east is at a lower risk as it is on the boundary of Flood Zone 3, 2 and 1. Therefore, safe access may be achievable along Holywells Road in the event of a breach, depending on the time of the breach and the warning period.

In the event of a failure of the flood defence measures protecting this area, safe dry egress for the West site may not be possible. It will therefore be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change or 5.3m AOD, whichever is greater.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Flood Risk Assessment

The site is located within an area of residual risk from various sources. At the site level a flood risk assessment should obtain breach modelling data from the Environment Agency and interpret flood depth and velocity along with hazard to inform site layout and design through the planning process.

Site Name: Land at Commercial Road					
Site ID:	IP047	**Location:**	Land at Commercial Road	**Area (ha):**	3.12
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification**	More Vulnerable

Tidal/Fluvial Source:				
Flood Zone 1 (<0.1% AEP): 0%	**Flood Zone 2 (0.1% AEP):** 0%	**Flood Zone 3 (1% AEP):** 100%	**Flood Zone 3b (5%AEP): 0**%	**Area Benefiting from Defences:** 100%

Flood Zones and Flood Defences

As it flows through Ipswich, the River Gipping becomes the River Orwell. The watercourse flows east through Ipswich along the southern edge of the site. At this location the watercourse is tidally influenced. The site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. The site benefits from the presence of defences; there is a flood defence wall along the edge of the River Orwell channel, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk of fluvial or tidal flooding,* in the event of a failure of these defences.

Refer to Map 1 below for Flood Zone outlines

Functional Floodplain

The site is located adjacent to, but not within, the functional floodplain.

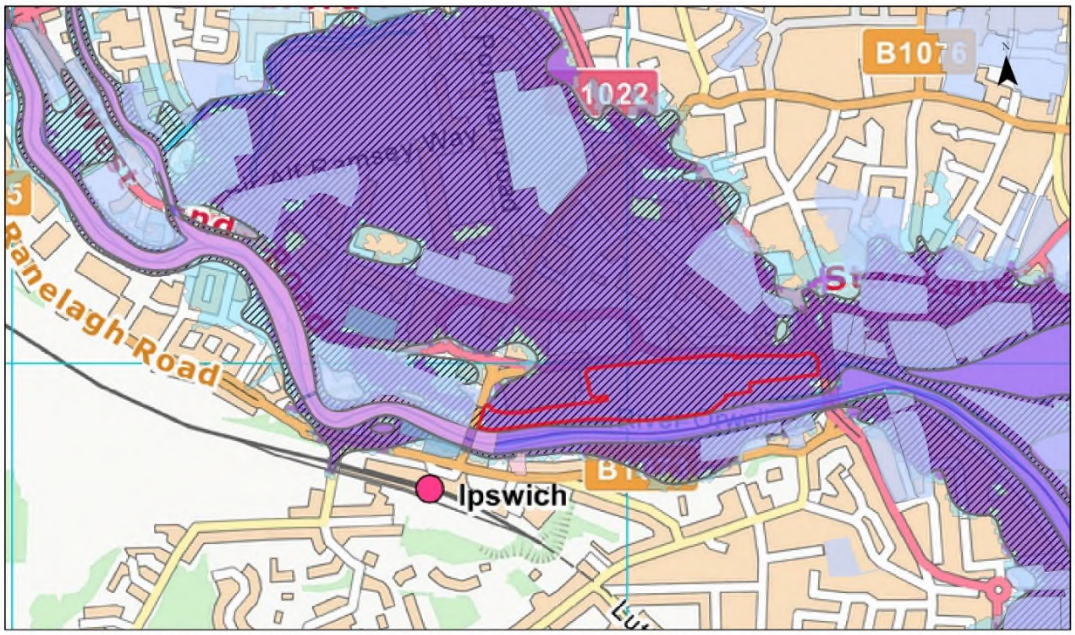
Climate Change

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change i.e. there is no overtopping. (These modelled scenarios take account of the presence of defences).

Historic Records

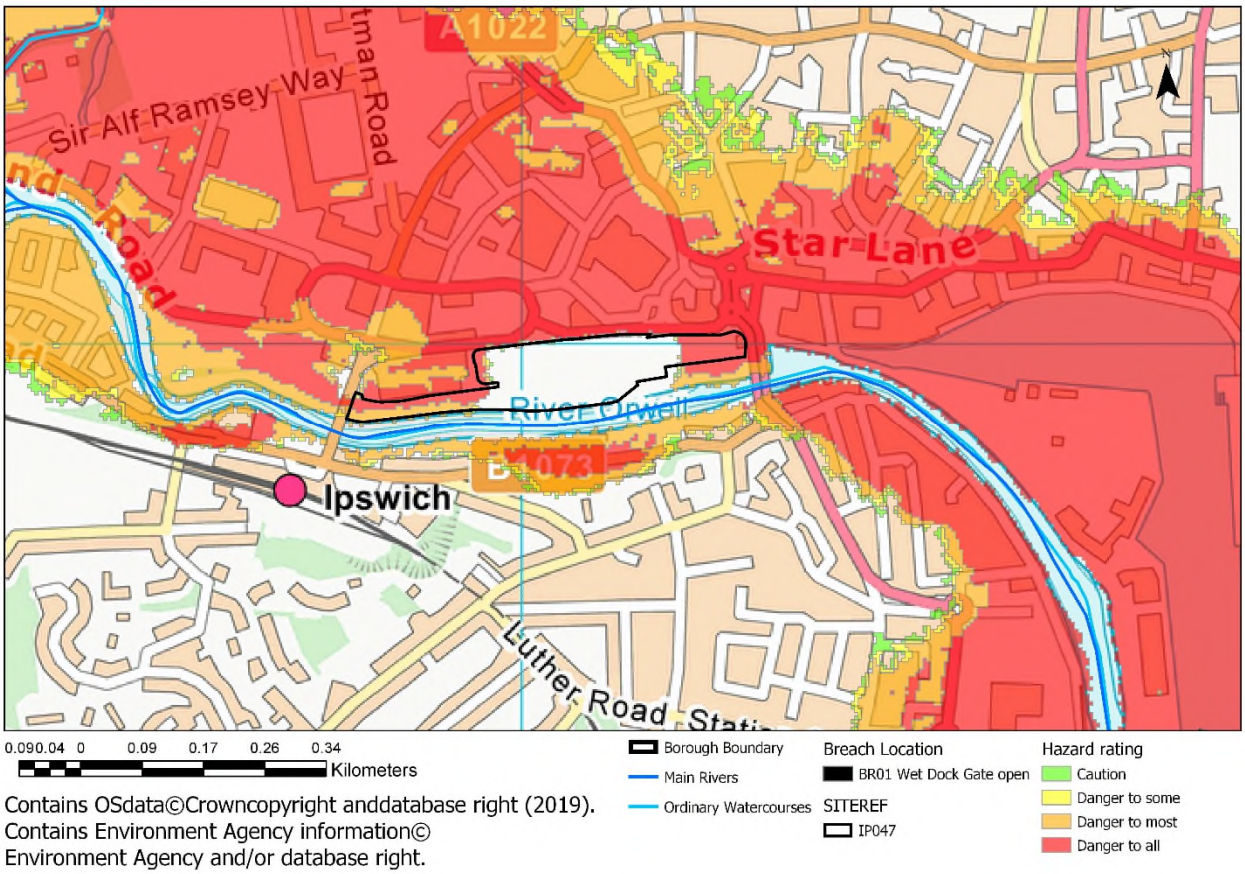
The Level 1 SFRA Figure 10 shows that this area has historically experienced flooding in 1939 and 1953 which is recorded on the Environment Agency Historic Flood Map. Ipswich BC also hold records of flooding on the pavements and roads in this location associated with the surface water drainage network being blocked or overwhelmed.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Land at Commercial Road

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

It should be noted that the model grid in this location includes a major development on the north bank, upstream of Stoke Bridge which is planned to raise the existing defence to 6mAOD. This development has not yet progressed to construction phase. Therefore, there is potential for the flow paths and flood storage capacity shown by these breach scenarios to be modified from the current situation.

However, this data remains the best available data at the time of writing and Map 2 provides a good indication of potential flood hazard at the site.

Given that the flood defence raising has not been completed, and with reference to the location of the site and the surrounding hazard rating, it is safe to assume that the site will be a mix of danger to all and danger to most.

The site is entirely within the defended floodplain with limited opportunities for safe access in the event of a breach. Safe refuge should be provided above 4m AOD in Compartment J.

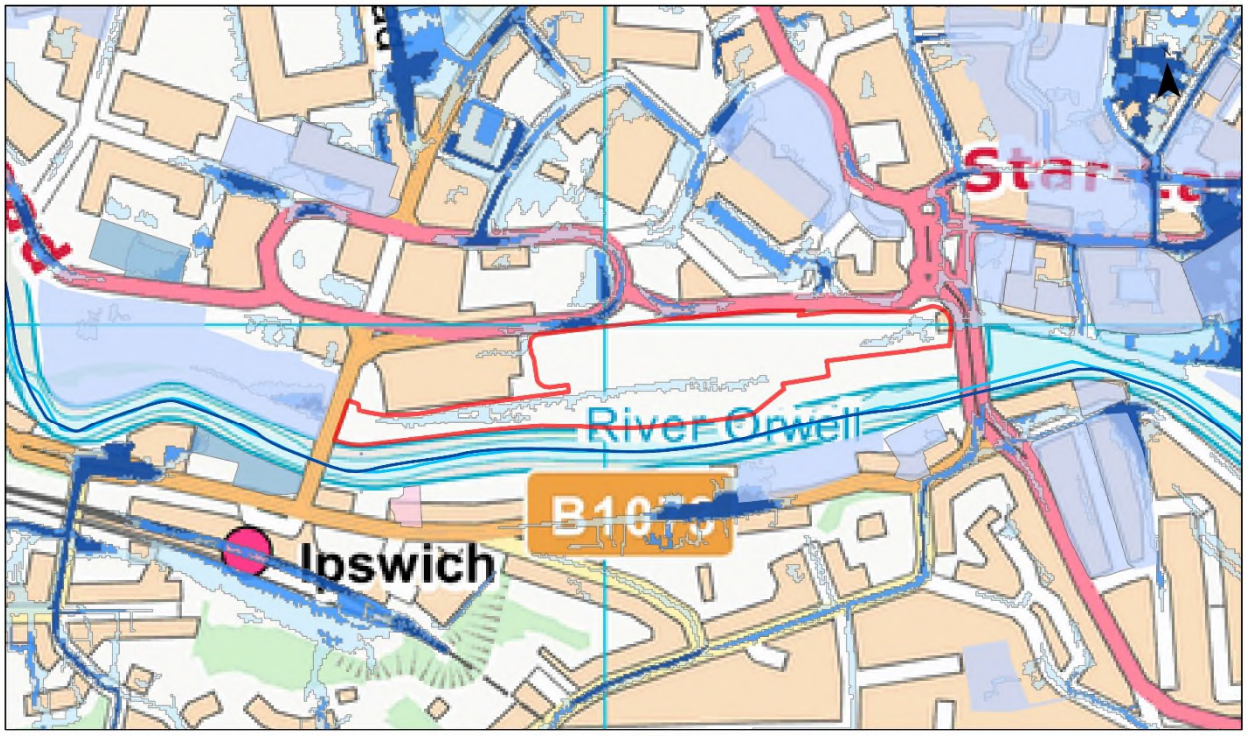
Surface Water Source

Risk of Flooding from Surface Water (RoFSW)

Site Name: Land at Commercial Road

The RoFSW mapping indicates that the site is at low risk of surface water flooding. The site is slightly elevated compared to the surrounding land, and there is just one area, in the east of the site, where the mapping suggests that surface water may pond, adjacent to Princes Street.

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located across two 1km squares of which <25% and between 25-50% are susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

The underling geology in this location is White Chalk subgroup and Lambeth Group which may be permeable and suitable for infiltration techniques within SuDS. However, due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Set-back Distance

All development should be set back 16m from the edge of the River Orwell. The Environment Agency need to be consulted and an Environmental Permit obtained for any works within 16m of a Main River

Site Layout and Design

Site Name: Land at Commercial Road

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water during high tide conditions. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

SW drainage would drain to the Orwell and provision of tide lock storage may be required.
The potential impact of Anglian Water surface water sewers which cross the site and an Anglian Water underground storage tank/pumps/kiosk/culvert and penstock located at Stoke Bridge (East of the site) need to be considered further as part of a site specific flood risk assessment.

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change, or 300mm above the maximum water level 4m AOD in compartment J, whichever is greater.

Access / Egress

The main access to the site is from Commercial Road which is also shown to be at residual risk of tidal flooding from the River Orwell. The egress route away from the site is likely to north towards Commercial Road, Grey Friars Road and into an area of Flood Zone 1. An alternative may be via Princes Street to the West, however, this would require some land raising.

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the site may not be possible. It will therefore be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood level including an allowance for climate change.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Flood Defences

The life expectancy of the existing steel sheet pile flood defence walls in this location is limited increasing the risk of breaching. Land raising behind the defences would reduce this risk, however the EA would have to agree to such a proposal. The defences upstream of the barrier need to be retained even now that the barrier is operational.

Note
In the absence of accurate flood hazard and flood depth information at this location should raising of flood defences not be completed or incorporated within a development proposal, it would be expected that a site specific FRA includes re-running of the Environment Agency breach modelling to create an accurate representation of risk posed to the site.

Site Name: Old Cattle Market site, Portman Road (South)					
Site ID:	IP051	**Location:**	Old Cattle Market site, Portman Road (South)	**Area (ha):**	2.21
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification:**	More Vulnerable

Tidal and Fluvial Flood Risk				
Flood Zone 1 (<0.1% AEP): 0%	**Flood Zone 2 (0.1% AEP):** 0%	**Flood Zone 3 (1% AEP):** 100%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 100%

Flood Zones and Flood Defences

As it flows through Ipswich, the River Gipping becomes the River Orwell. The site is identified as Flood Zone 3, high probability of flooding from the Gipping / Orwell, in the absence of flood defences. The site benefits from the presence of defences; there are embankments and flood defence walls along the edge of the River Gipping / Orwell channel, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk of fluvial or tidal flooding,* in the event of a failure of these defences.

Refer to Map 1 below for Flood Zone outlines

Climate Change

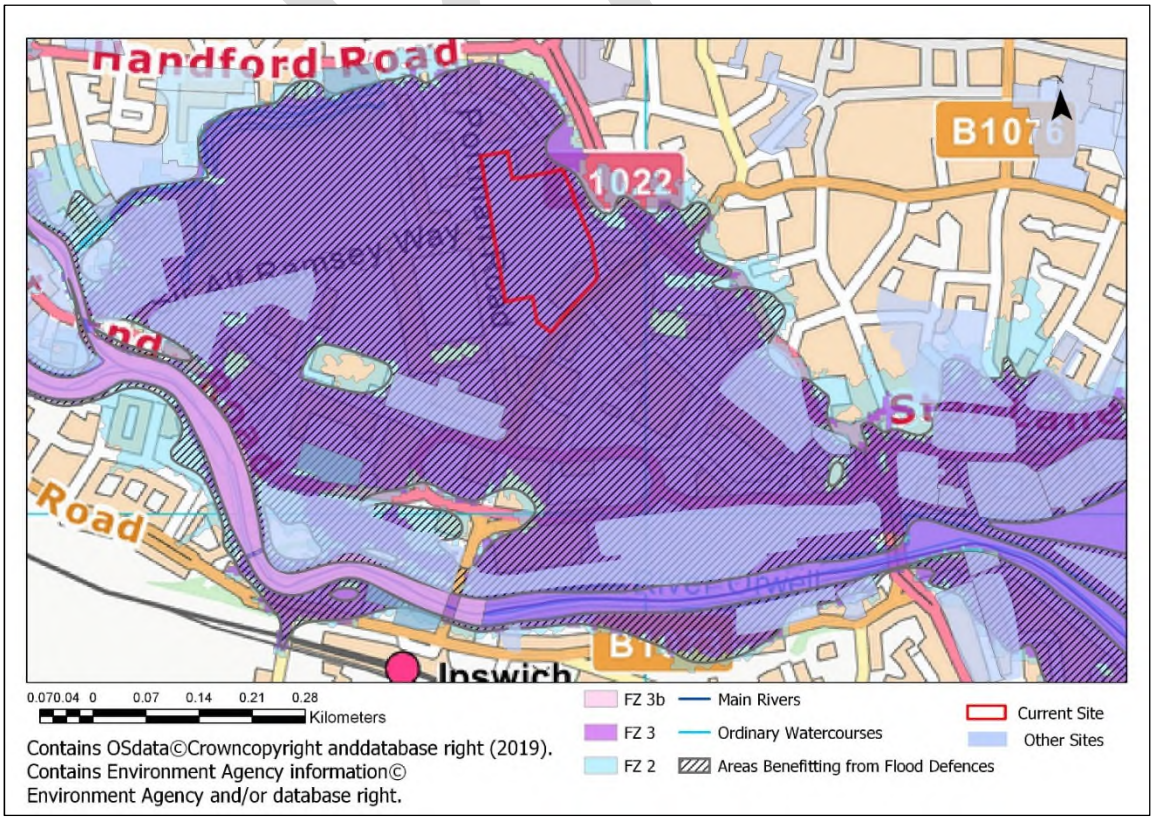
Modelling of the River Gipping shows that water remains in bank in this location during the 1% AEP event including a 20% allowance for climate change. An addendum to the SFRA report will be created early 2020 to include updated climate change model runs for the River Gipping which are currently being prepared by the Environment Agency.

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change i.e. there is no overtopping. (These modelled scenarios take account of the presence of defences).

Historic Records

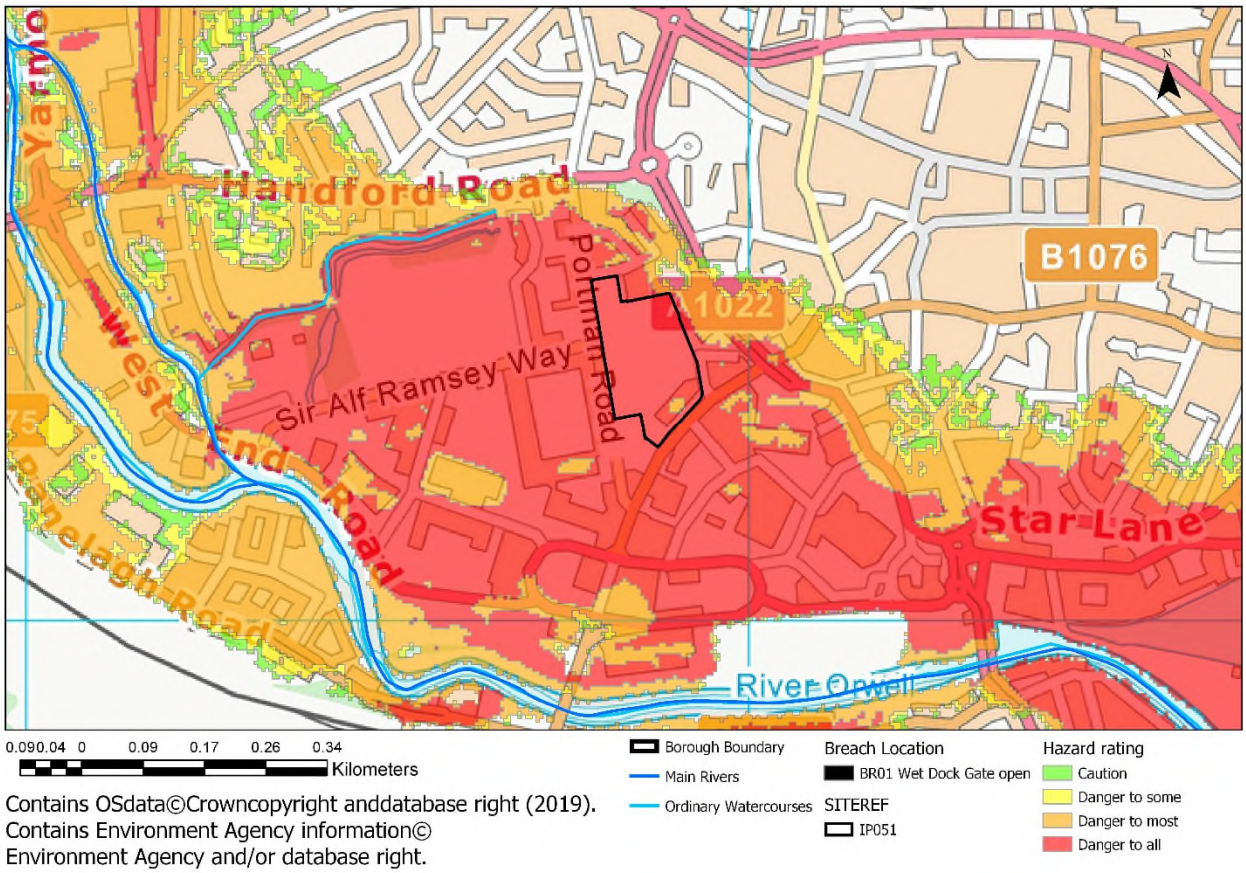
The Level 1 SFRA Figure 10 shows that this area has historically experienced flooding in 1939 and 1953 which is recorded on the Environment Agency Historic Flood Map. Ipswich BC also hold records of flooding along Portman Road associated with blocked or overwhelmed drainage systems.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Old Cattle Market site, Portman Road (South)

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



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Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

Hazard mapping above shows hazard rating of danger to all with Wet Dock Gate open at BR01. Site is located on the edge of Flood Zone 3 and at the edge of hazard extent. Safe access may be achievable in a northerly direction to the A1071 Handford Road which is in Flood Zone 1.

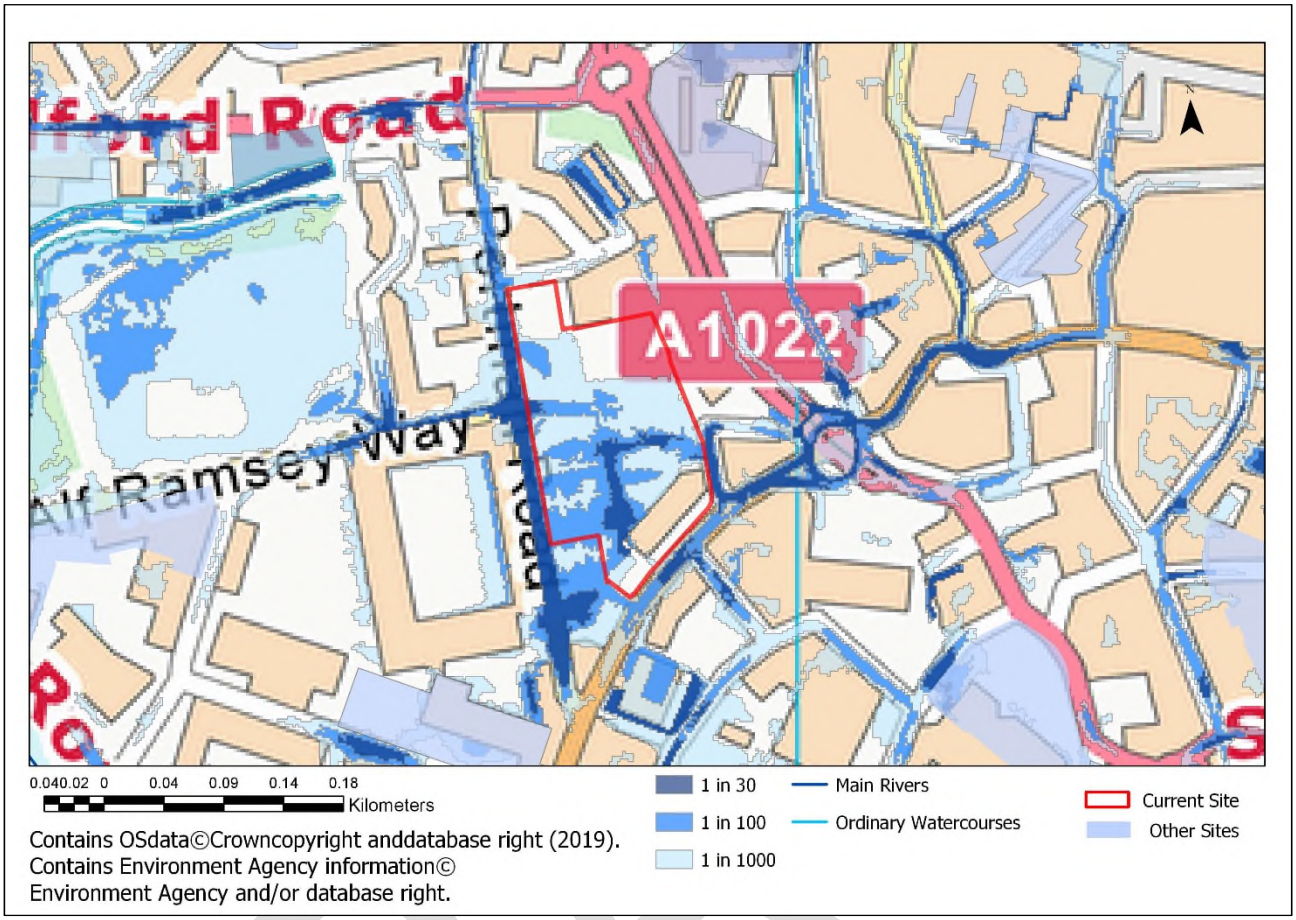
Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

This is a low lying site and the RoFSW mapping identifies there is a high risk of surface water flooding to the site and the surrounding area. Portman Road is shown to be a noticeable surface water flow path and area susceptible to surface water ponding. There may also be a risk of flooding from the low level combined trunk sewer located in the vicinity of the site – this should be investigated further as part of a site specific flood risk assessment.

Site Name: Old Cattle Market site, Portman Road (South)

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 50%-75% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

The underling geology in this location is White Chalk subgroup and Lambeth Group which may be permeable and suitable for infiltration techniques within SuDS. However, due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water particularly considering the level of surface water flood risk posed to the site. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Site Name: Old Cattle Market site, Portman Road (South)

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change.

Access / Egress

In the event of a failure of the flood defence measures protecting this area, safe access may be achievable in a northerly direction to the A1071 Handford Road which is in Flood Zone 1. If safe access cannot be achieved, it will be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change. The site is also at risk of surface water flooding, the possibility of land raising has been raised in the past, however, it would have to be ensured that any land raising would not increase flood risk elsewhere.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Site Name: Land between Lower Orwell Street and Star Lane					
Site ID:	IP052	**Location:**	Land between Lower Orwell Street & Star Lane	**Area (ha):**	0.39
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification:**	More Vulnerable

Tidal and Fluvial Flood Risk				
Flood Zone 1 (<0.1% AEP): 94%	**Flood Zone 2 (0.1% AEP):** 5%	**Flood Zone 3 (1% AEP):** 1%	**Flood Zone 3b (5%AEP):** 0%	**Area Benefiting from Defences:** 0%

Flood Zones and Flood Defences

The tidal River Orwell is located approximately 250m to the south of the site. The southern edge of the site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. This area is shown to benefit from the presence of defences; there is a flood defence wall and embankment along the edge of the River Orwell to the south of the site, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk of tidal flooding,* in the event of a failure of these defences.

Refer to Map 1 below for Flood Zone outlines

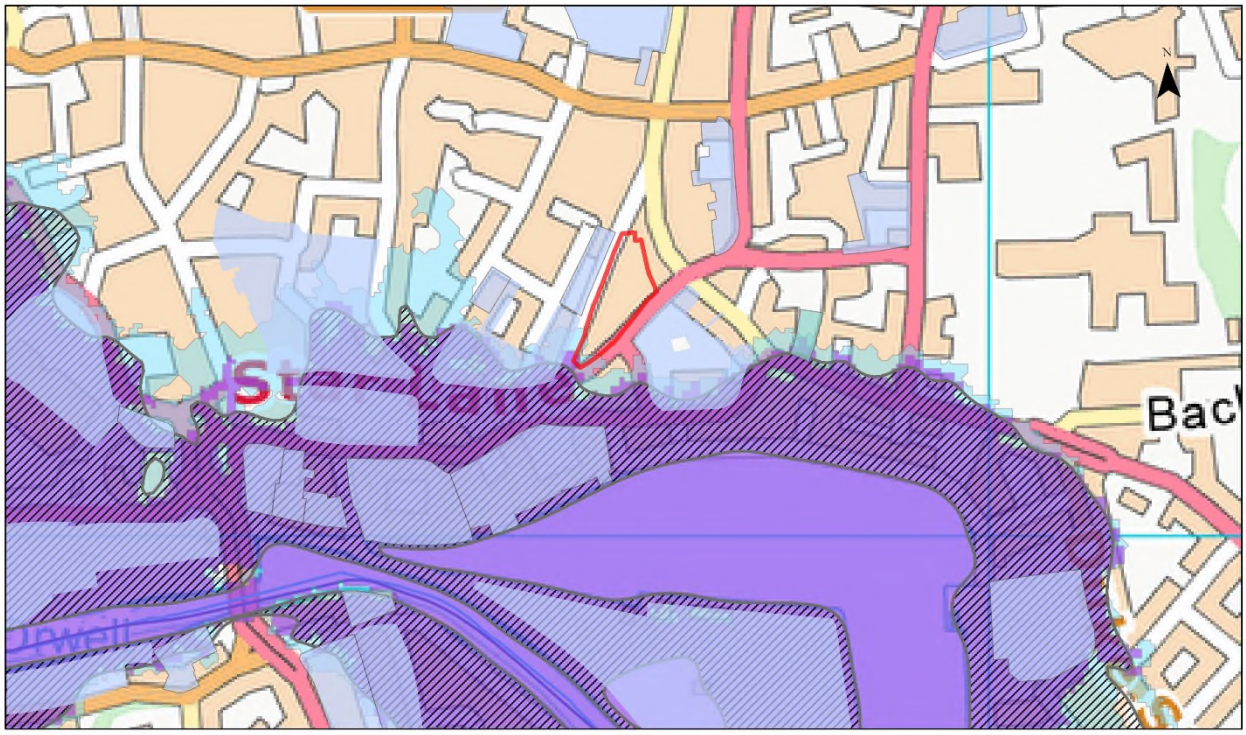
Climate Change

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change. (These modelled scenarios take account of the presence of defences).

Historic Records

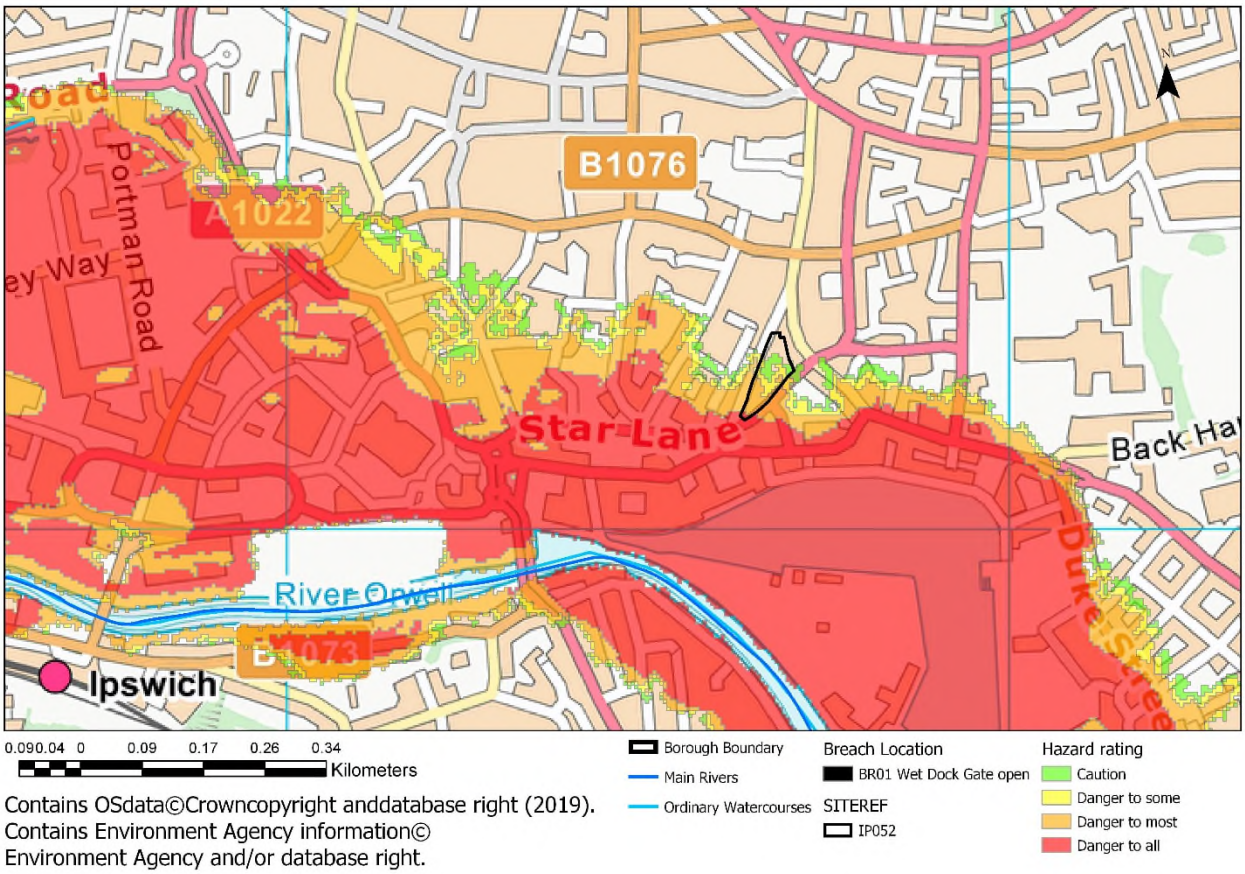
The Level 1 SFRA Figure 10 shows that this site is on the edge of the area that experienced flooding in 1953.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Land between Lower Orwell Street and Star Lane

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

A small section of the south east corner of the site at danger to most, with rating decreasing to the north east where it is caution. The majority of the site is located in Flood Zone 1.

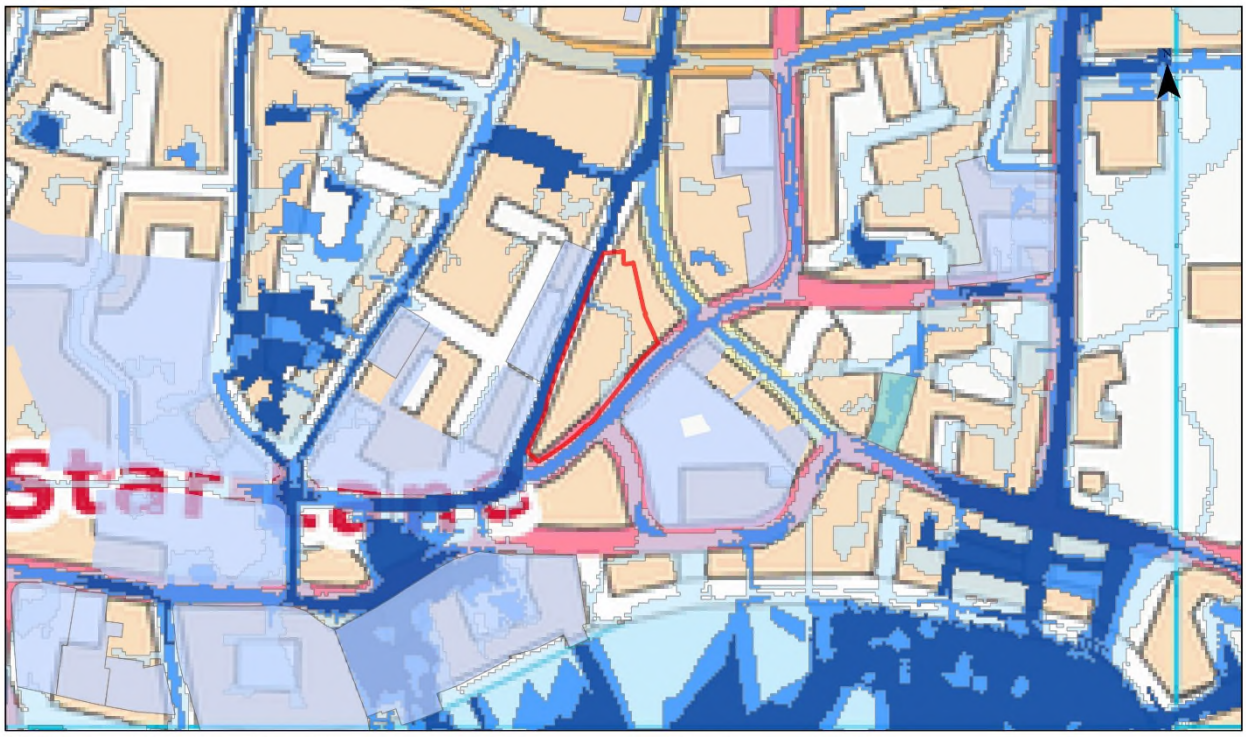
Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The RoFSW mapping shows that the roads in this area are at high risk of overland flow and flooding. Whilst the site itself is shown to have a low risk of surface water flooding (there is a surface water pathway across the site), the surrounding routes are at high risk.

Site Name: Land between Lower Orwell Street and Star Lane

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

Due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water, especially given the high risk of surface water flooding in the area immediately surrounding the site. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible). A sequential approach to development layout within the site is required to ensure that development with a higher vulnerability is prioritised in the north east.

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment

Site Name: Land between Lower Orwell Street and Star Lane

Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change.

Access / Egress

Access to the site is from Lower Orwell Street or Star Lane which are both located in Flood Zone 1 low probability of flooding from the tidal Orwell.

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the southern part of the site may not be possible. If it proposed to develop this part of the site, consideration of the escape route to the north of the site should be made.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Site Name: **Land between Old Cattle Market and Star Lane**					
Site ID:	IP54b	**Location:**	Land between Old Cattle Market and Star Lane	**Area (ha):**	1.09
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification**	More Vulnerable

Tidal/Fluvial Source:				
Flood Zone 1 (<0.1% AEP): 48%	**Flood Zone 2 (0.1% AEP):** 29%	**Flood Zone 3 (1% AEP):** 23%	**Flood Zone 3b (5%AEP): 0**%	**Area Benefiting from Defences:** 27%

Flood Zones and Flood Defences

As it flows through Ipswich, the River Gipping becomes the River Orwell. A channel of the River Gipping / Orwell flows south along the western edge of the site and joins with another main channel of the River Orwell. There are further watercourses to the north and east of the site. At this location the River Gipping / Orwell is tidally influenced. Most of the site is identified as Flood Zone 1. However, the parts of the site are located in Flood Zone 2 and Flood Zone 3, medium to high probability of flooding respectively, in the absence of flood defences. The south-east part of the site is shown to benefit from the presence of defences; there is a flood defence wall to the south of the site, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk of fluvial or tidal flooding*, in the event of a failure of these defences.

Refer to Map 1 below for Flood Zone outlines

Climate Change

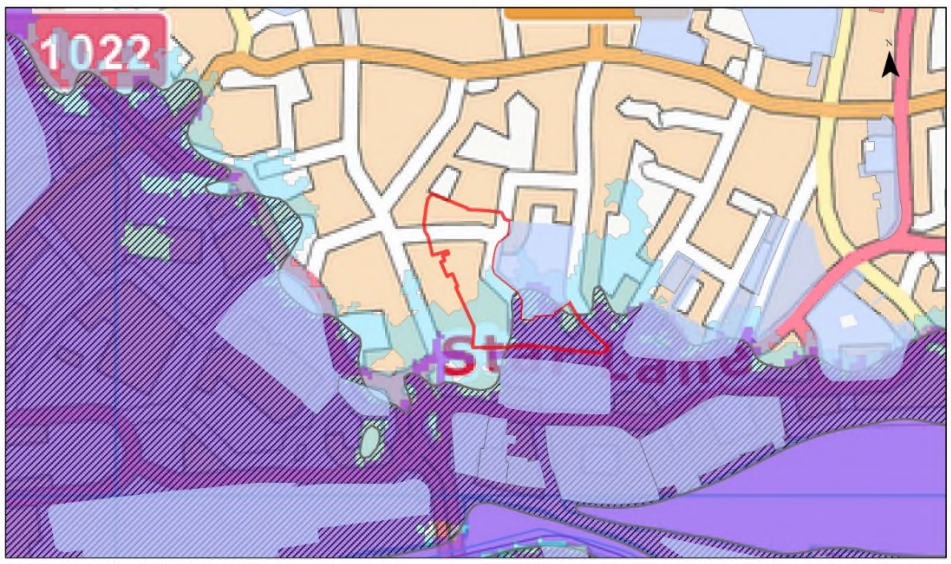
Modelling of the River Gipping shows that water remains in bank in this location during the 1% AEP event including a 20% allowance for climate change. An addendum to the SFRA report will be created early 2020 to include updated climate change model runs for the River Gipping which are currently being prepared by the Environment Agency.

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change i.e. there is no overtopping of flood defences. (These modelled scenarios take account of the presence of defences).

Historic Records

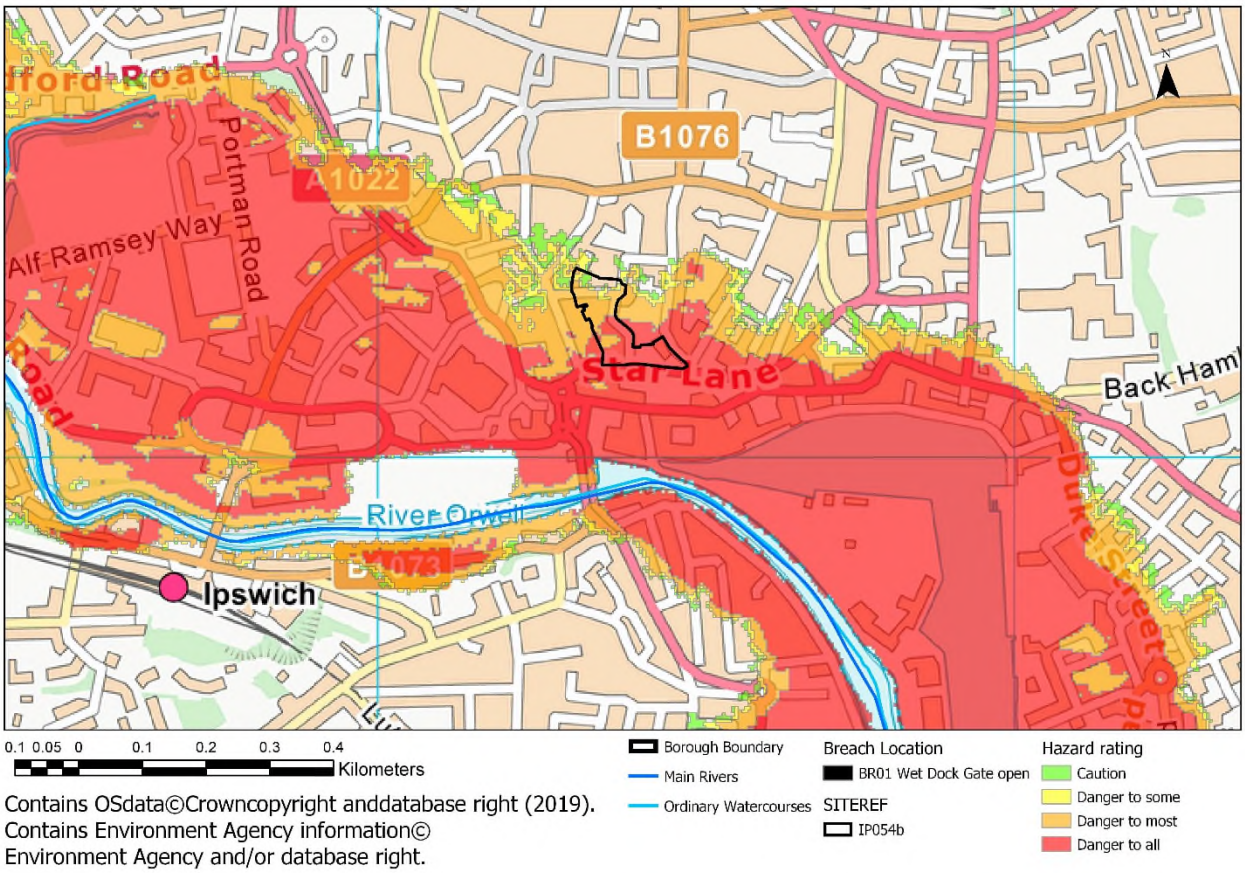
The Level 1 SFRA Figure 10 shows that this area has historically experienced flooding in 1953 which is recorded on the Environment Agency Historic Flood Map.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Land between Old Cattle Market and Star Lane

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



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Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 with the southern section of the site classified as danger to all with the hazard reducing to the north of the site where caution can be applied. The site is located on the edge of Flood Zone 3 and at the edge of hazard extent.

Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The RoFSW mapping shows that the south-east part of the site is susceptible to low risk of flooding from surface water. The surface water flow pathway of low risk arises from Site IP054a and the surrounding roads and flow towards site IP054b.

Site Name: Land between Old Cattle Market and Star Lane

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)

Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which 25%-50% is susceptible to groundwater emergence. The risk of groundwater flooding in this area should be further investigated during a site investigation survey.

The underlying geology in this location is White Chalk subgroup and Lambeth Group which may be permeable and suitable for infiltration techniques within SuDS. However, due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water, especially given the risk of surface water flooding in the area surrounding the site. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Site Name: Land between Old Cattle Market and Star Lane

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change.

Access / Egress

Access to the site may be from Turret Lane or Rose Lane. The routes that pass northwards are within Flood Zone 1 and therefore lead out of the tidal floodplain.

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the southern part of the site may not be possible. It will therefore be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.

Site Name: Transco, south of Patteson Road					
Site ID:	IP098	**Location:**	Transco, south of Patteson Road	**Area (ha):**	0.57
Current Use:	Commercial	**Proposed Use:**	Residential	**Vulnerability Classification :**	More Vulnerable

Tidal/Fluvial Source:				
Flood Zone 1 (<0.1% AEP): 0%	**Flood Zone 2 (0.1% AEP): 47%**	**Flood Zone 3 (1% AEP): 53%**	**Flood Zone 3b (5%AEP): 0%**	**Area Benefiting from Defences: 80%**

Flood Zones and Flood Defences

The tidal River Orwell is located approximately 80m to the west of the site. The majority if the site is identified as Flood Zone 3, high probability of flooding, in the absence of flood defences. This area is shown to benefit from the presence of defences; there is a flood defence wall and embankment along the edge of the River Orwell to the west of the site, and there is a tidal barrier further downstream on the River Orwell. The site is therefore at *residual risk of tidal flooding,* in the event of a failure of these defences.

Refer to Map 1 below for Flood Zone outlines

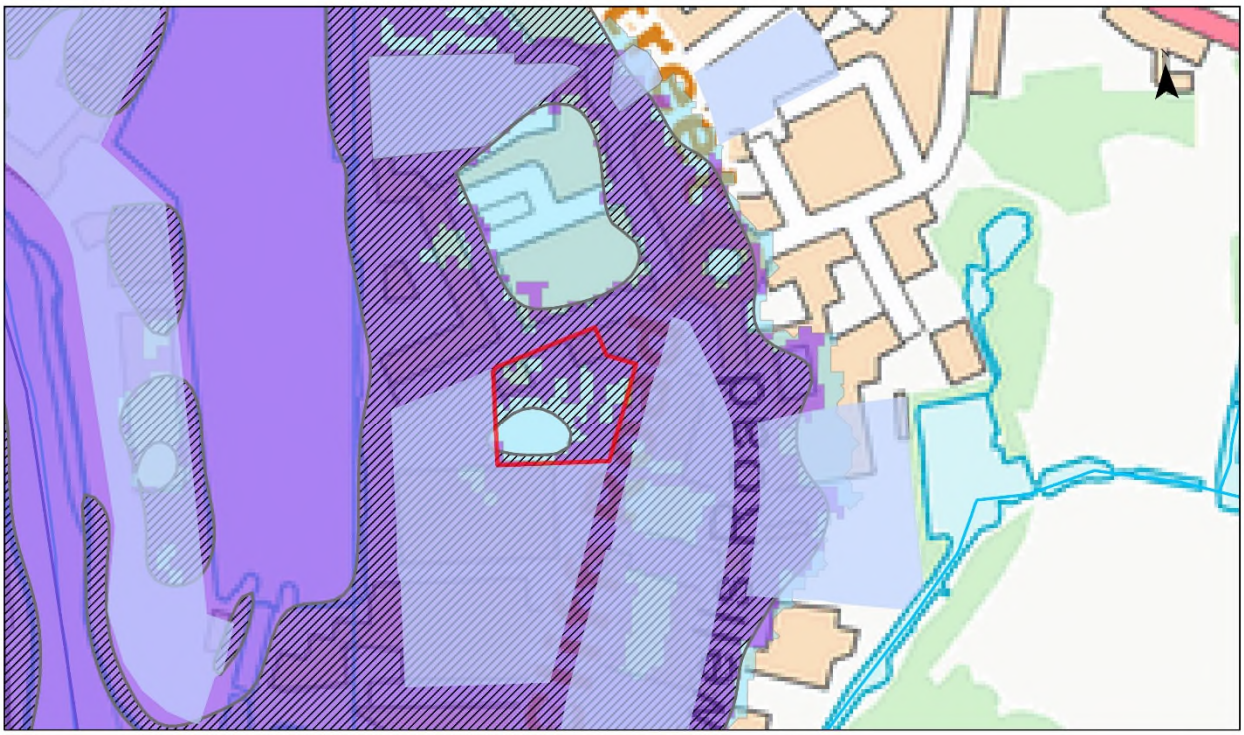
Climate Change

Modelling of the River Orwell shows that water remains in bank in this location during the 0.5% AEP event including an allowance for climate change. (These modelled scenarios take account of the presence of defences).

Historic Records

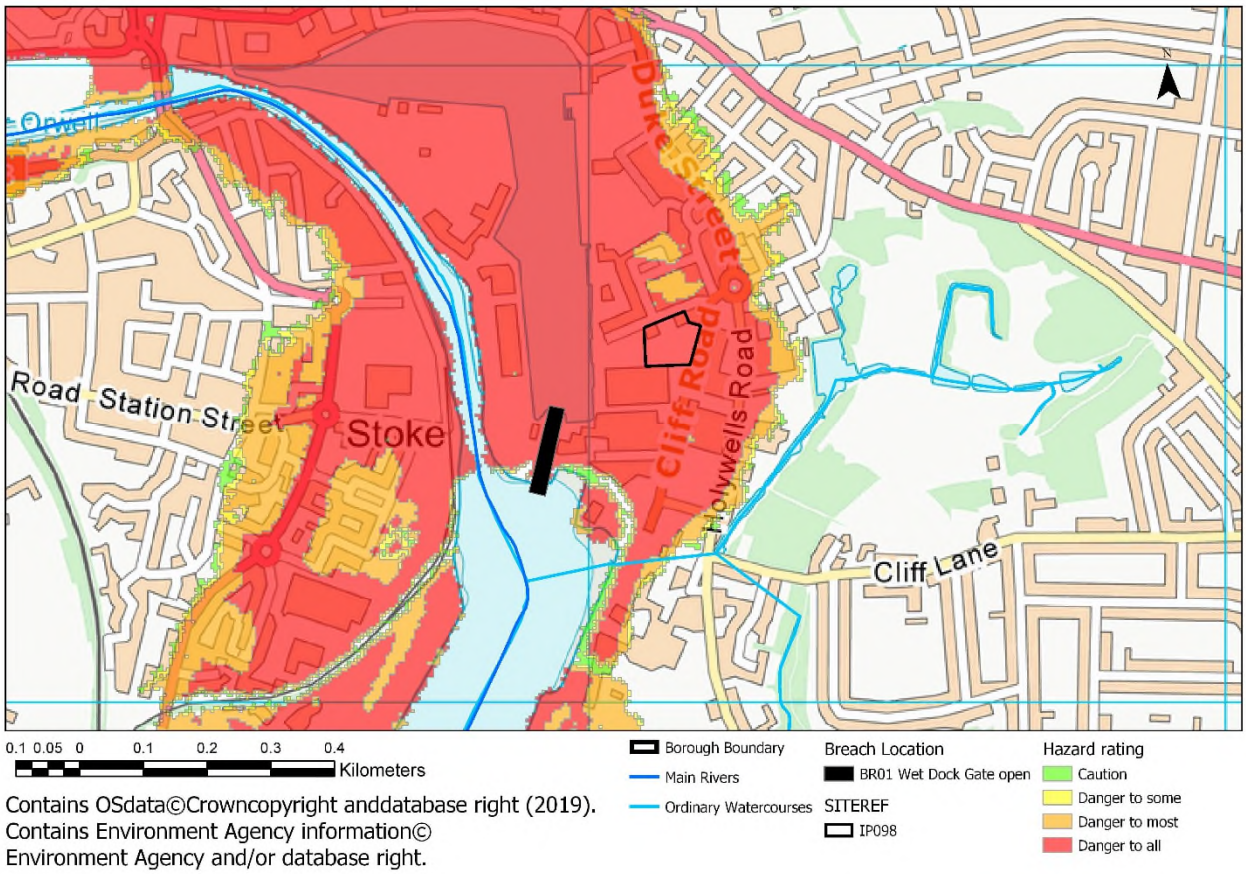
The Level 1 SFRA Figure 10 shows that this site is on the edge of the area that experienced flooding in 1953. Ipswich BC also hold records of flood incidents on Holywells Road adjacent to this location.

Map 1 – Environment Agency Flood Map for Planning Data



Site Name: Transco, south of Patteson Road

Map 2 - Residual Flood Risk – Flood Hazard Mapping at Breach location BR01 Wet Dock Gate Open 0.5% scenario including climate change to 2118



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Residual Flood Risk – Flood Hazard

This site is protected by the IFDMS and is at residual risk of flooding in the event of failure or exceedance of flood defences.
Hazard mapping above shows hazard ratings with Wet Dock Gate open at BR01 for the 0.5% scenario including climate change to 2118. This breach location has been chosen as it creates the highest residual risk on site – greater than if a breach were to occur at BR02 (refer to main SFRA report for mapping of residual flood risk from all breach locations).

The site is entirely within the defended floodplain; safe access may be achievable along Patteson Road to the east in the event of a breach, depending on the time of the breach and the warning period. Safe refuge should be provided above 5.3m AOD.

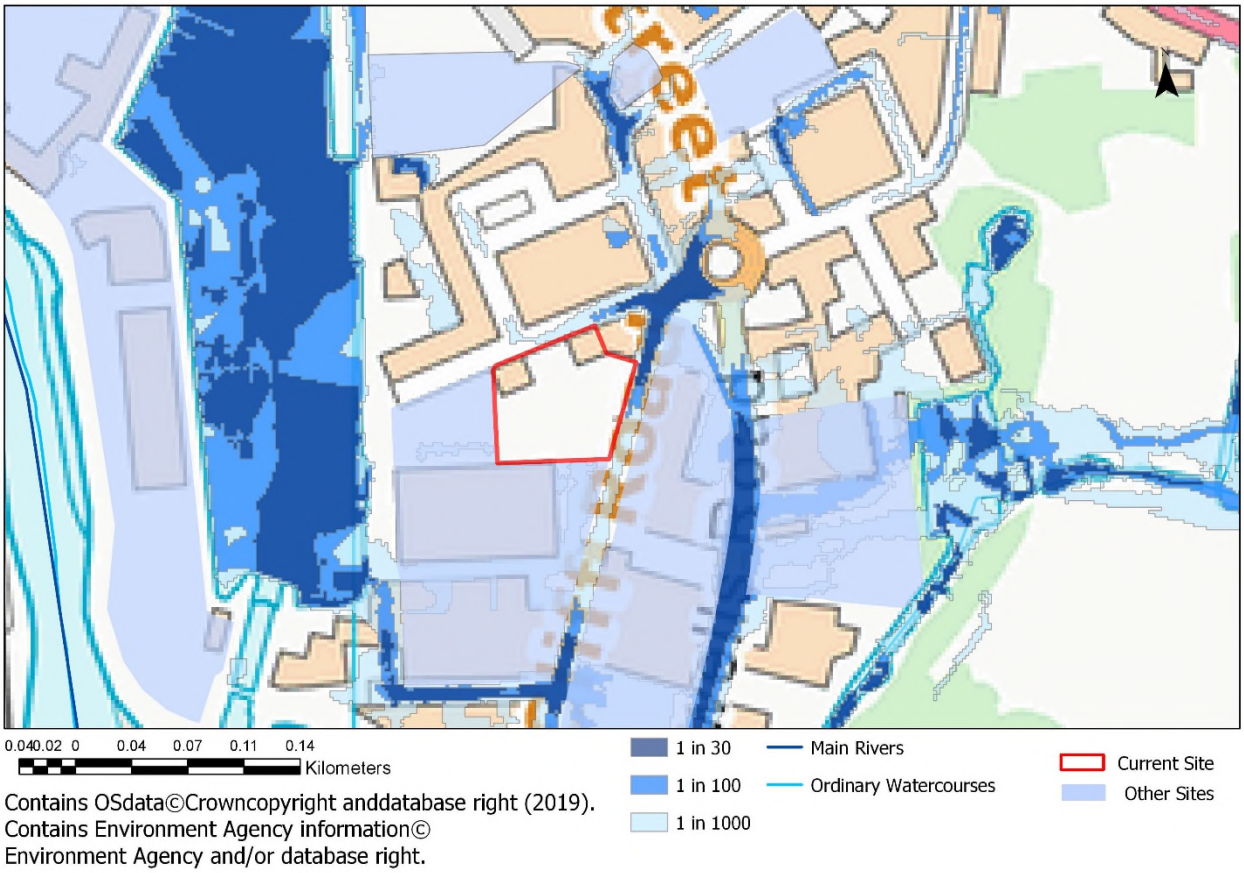
Surface Water Flood Risk

Risk of Flooding from Surface Water (RoFSW)

The RoFSW mapping shows that the roads in this area are susceptible to overland flow and ponding. Whilst the site itself is shown to have a low risk of surface water flooding, the surrounding routes are at high risk.

Map 3 - Environment Agency Risk of Flooding from Surface Water mapping (RoFSW)

Site Name: Transco, south of Patteson Road



Groundwater Flood Risk

The AStGWF mapping (Level 1 SFRA Figure 4) shows that the site is located within a 1km square of which <25% is susceptible to groundwater emergence.

Due to the brownfield nature of the site, it is likely that made ground is at the surface, a site level ground investigation including soakage tests will be required to inform drainage design.

The brownfield nature of the site could provide an opportunity to create a betterment on the current drainage discharge from the site.

Other sources

The Environment Agency 'Risk of Flooding from Reservoirs' mapping shows that the site is not at risk.

Site Specific Recommendations

Site Layout and Design

The drainage strategy for the site should be considered early in the site planning process to ensure adequate inclusion of SuDS and adequate provision for the management of surface water, especially given the risk of surface water flooding in the area surrounding the site. SuDS should be considered in accordance with the hierarchy of SuDS (i.e. considering infiltration measures first wherever possible).

Finished Floor Levels

The Environment Agency will seek finished floor levels for new development set 300mm above the 1% AEP including an allowance for climate change for fluvial flood risk. In areas at risk of tidal flooding, the Environment Agency will seek finished flood levels for new development to be set 300mm above the 0.5% AEP event including an allowance for climate change, or 300mm above the maximum water level 5.3m AOD (Table 7-1), whichever is greater.

Access / Egress

Access to the site may be from Cliff Road toward Mytle Road roundabout. The routes that pass north-east are within Flood Zone 1 and therefore lead out of the tidal floodplain.

Site Name: Transco, south of Patteson Road

In the event of a failure of the flood defence measures protecting this area, safe dry egress from the southern part of the site may not be possible. It will therefore be necessary to include provision of a safe place of refuge for residents above the 0.1% AEP flood levels including an allowance for climate change or >5.3mAOD, whichever is greatest.

Due to the proximity of the site to flood defences, consideration of the rate of onset is required to inform site access/egress and emergency planning.

Emergency planning

The site is shown to be within the Environment Agency Flood Warning Area for the tidal River Orwell at Ipswich wet dock and waterfront, to upstream of Stoke Bridge; occupants should register to receive the warning service. To manage the residual risk of flooding associated with a failure of the flood defence measures in this area, Flood Response Plans should be prepared by occupants of the site including details of egress routes and place of safe refuge.