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# **SIDMOUTH LIFEBOAT STATION, SIDMOUTH, EX10 8BE FLOOD RISK ASSESSMENT**

# SIDMOUTH LIFEBOAT STATION, SIDMOUTH, EX10 8BE FLOOD RISK ASSESSMENT

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## LIST OF ABBREVIATIONS

|                                    |       |
|------------------------------------|-------|
| Above Ordnance Datum               | AOD   |
| Agricultural Land Classification   | ALC   |
| Annual Exceedance Probability      | AEP   |
| Area Benefitting from Defences     | ABD   |
| British Geological Survey          | BGS   |
| Digital Terrain Modelling          | DTM   |
| Environmental Agency               | EA    |
| Flood Risk Assessment              | FRA   |
| Lead Local Flood Authority         | LLFA  |
| Light Detection and Ranging        | LiDAR |
| Local Planning Authority           | LPA   |
| National Planning Policy Framework | NPPF  |
| National Grid Reference            | NGR   |
| Internal Drainage Board            | IDB   |
| Standard of Protection             | SoP   |
| Strategic Flood Risk Assessment    | SFRA  |
| Sustainable Drainage Systems       | SuDS  |

## 1. EXECUTIVE SUMMARY

Ramboll UK Limited (Ramboll) has been commissioned by Sidmouth Lifeboat (the 'Applicant') to undertake a Flood Risk Assessment (FRA) to support a planning application for the construction and operation of an extension to the Sidmouth Lifeboat Station (the 'Proposed Development') located on land adjacent to the existing lifeboat station at The Esplanade, Sidmouth (the 'Site').

Under the National Planning Policy Framework (NPPF)<sup>1</sup>, an FRA is required where a development is within Flood Zones 2 or 3 and/or exceeds 1 hectare (ha) in area. The Site is located within Flood Zone 3. Therefore, this FRA is provided to support the planning application for the construction and operation of the Site.

According to the EA's fluvial and tidal Flood Map for Planning, the entire Site is located in Flood Zone 3 (High Probability). This zone comprises land assessed as having a 1 in 100 or greater annual exceedance probability (AEP) of river flooding (>1%) or a 1 in 200 or greater AEP of flooding from the sea (>0.5%). The Site is located within an area assessed to be of a very low probability (<1 in 1,000 (0.1%) AEP) of surface water flooding.

Modelled still water tidal flood levels are approximately 2.5 m lower than Site elevations during the 1 in 200 (0.5%) and 1 in 1,000 (0.1%) AEP events. Taking into account sea level rise allowances set out by the EA, the Site would remain at least 1 m above the more conservative (90th percentile) Upper End still water level. Therefore, it is confirmed that tidal flood risk identified from EA modelling in the east of Sidmouth, in the area of the Site, relates primarily to the potential for wave overtopping of defences.

The potential for shallow flooding to affect the southern boundary of the proposed extension in extreme weather conditions, as a result of wave overtopping, could be managed through:

- the use of flood resilient building methods;
- ensuring drains to the south of the Site and the beachfront remain clear; and
- by Site personnel signing up for flood warning alerts.

It should be noted that, based on the nature of operations at the Site, personnel are well informed of weather hazards and tidal conditions such that potentially hazardous conditions would be well understood and could be acted on promptly.

According to Annex 3 of the NPPF (Flood Risk Vulnerability Classification), Lifeguard and Coastguard Stations are specifically classified as water-compatible development. The NPPF guidance states that water compatible development is appropriate in all Flood Zones and is not subject to the Exception Test, including where development is proposed within Flood Zone 3.

The Proposed Development would not lead to an alteration in runoff rates, and as such would not lead to any potential increase in flood risk in areas outside the Site boundary.

Lifeboat stations are specifically named as 'water compatible' within guidance for the NPPF and there is no alternative reasonably-available location for the Proposed Development. It is therefore appropriate in flood risk terms under the NPPF.

<sup>1</sup> GOV.UK, National Planning Policy Framework, September 2023 [online]. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>. Accessed October 2023.

## 2. INTRODUCTION

### 2.1 Appointment and Brief

Ramboll UK Limited (Ramboll) has been commissioned by Sidmouth Lifeboat (the 'Applicant') to undertake a Flood Risk Assessment (FRA) to support the planning application for the construction and operation of an extension to the Sidmouth Lifeboat Station (the 'Proposed Development') located on land adjacent to the existing lifeboat station The Esplanade, Sidmouth (the 'Site').

Under the National Planning Policy Framework (NPPF)<sup>2</sup>, an FRA is required where a development is within Flood Zones 2 or 3 and/or exceeds 1 hectare (ha) in area. The Site is located within Flood Zone 3.

### 2.2 Scope and Objectives

This FRA considers the risks of various sources of flooding to the Site and the potential for the development to increase risk of flooding to downstream receptors (such as people, property, habitats, infrastructure and statutory sites) from the Proposed Development as a result of changes in surface water runoff. A comparison is made between the current situation and the future environment following completion of the Proposed Development.

This FRA has been carried out in accordance with the NPPF. It is to be used to assist the Local Planning Authority (LPA) and relevant statutory consultees when considering the flooding issues of the Proposed Development, as part of the planning application.

This report provides the following information:

1. A review of flood risks to the Site based upon flood data and maps provided by the Environment Agency (EA) and the relevant Strategic Flood Risk Assessment (SFRA);
2. An assessment of flood risk from all sources including tidal, fluvial, pluvial, groundwater and infrastructure failure to the Proposed Development;
3. An assessment of the compatibility of the Proposed Development for its location based on flood risk and its proposed usage;
4. An assessment of the impact of the Proposed Development in terms of surface water runoff; and
5. Proposals to mitigate any residual flood risks to the development.

A Site inspection was carried out by Jo Thorp of Ramboll on the 13<sup>th</sup> March 2024 and discussions were held with Naomi Cook and Phil Sheppard of Sidmouth Lifeboat Station.

### 2.3 General Limitations and Reliance

In preparation of the report, Ramboll has relied upon publicly-available information, information provided by the client and information provided by third parties. Accordingly, the conclusions reached in this report are valid only to the extent that the information provided to Ramboll was accurate and complete.

The key sources of information used to prepare this report are footnoted within the document. Ramboll cannot accept liability for the accuracy or otherwise of any information derived from third party sources.

Unless stated otherwise, the geological information provided is for general environmental interpretation and should not be used for geotechnical and/or design purposes.

<sup>2</sup> GOV.UK, National Planning Policy Framework, September 2023 [online]. Available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>. Accessed October 2023.

## 3. POLICY FRAMEWORK

### 3.1 National Policy Framework, 2021

The NPPF was most recently updated in September 2023, with flood risk remaining primarily regulated through planning policy<sup>3</sup>. The NPPF requires that an FRA should be submitted with planning applications for all development sites within Flood Zones 2 and 3; and all development sites over 1 ha in area to determine the risks of flooding from all sources including rivers, the sea, sewers, and groundwater. The NPPF sets out that flood risk should be defined according to Flood Zone 3 (High Probability), Flood Zone 2 (Medium Probability) and Flood Zone 1 (Low Probability).

In terms of flood risk, the NPPF classifies land uses according to vulnerability as follows:

- Essential infrastructure;
- Highly vulnerable;
- More vulnerable;
- Less vulnerable; and
- Water-compatible development.

### 3.2 Devon County Council (Lead Local Flood Authority)

As LLFA Devon County Council (DCC) are responsible for reviewing surface water management proposals and providing consultation response to the LPA, under Section 9 of the Flood and Water Management Act 2010. The Council's strategy is set out in the Devon Local Flood Risk Management Strategy 2021-2027.

However, Local Planning Authorities (LPAs) determine minor developments where the LLFA and Environment Agency are not statutory consultees. Minor developments are classified by DCC as residential development of less than 10 properties or a commercial development of under 1000 m<sup>2</sup>. DCC guidance states that LPAs should consider:

- the cumulative flood risk impact of minor developments
- ensure sequential development to help steer it towards areas with low risk of flooding; and
- consider safe access and egress from sites.

<sup>3</sup> <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

## 4. SITE DESCRIPTION

### 4.1 Application Site Description

The Site is located in the south east of Sidmouth on the Esplanade, approximately 15 m from the beach. The mouth of the River Sid is approximately 65 m east. The Site is centred at National Grid Reference (NGR) SY 12831 87288 and is currently in use for storage of small leisure boats.

The Esplanade is adjacent to the south of the Site with a flood defence wall, pedestrian walkway and beach beyond. Land to the north comprises a further boat storage area and building (set at a lower ground floor level) in use by boating clubs with a car park beyond. The entire footprint of the Site is impermeable hardstand (Appendix 1: Photodoc - Site Observations).

The existing lifeboat station is adjacent to the west and Sidmouth Sailing club is adjacent to the east. The Site is approximately 150 m east from Sidmouth town centre and land use in the wider surrounding area includes residential and commercial property, leisure and car parking.



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Coordinate System: British National Grid. Projection: Transverse Mercator. Datum: OSGB 1936.

Figure 1: Site Location Plan

### 4.2 Proposed Development

The Proposed Development would comprise the construction of an additional boat storage shed with crew facilities at first floor level adjoined to the east of the existing lifeboat station and some internal reconfiguration of the existing lifeboat station (Appendix 2: Proposed Site Layout). The built footprint of the new building would extend over approximately 57 m<sup>2</sup>.

It should be noted that the plans in Appendix 2 could be subject to alteration, within the parameters for which consent is sought, were the application successful.



## 5. REVIEW OF BASELINE DATA

### 5.1 Hydrological Setting

The site is approximately 15 m from the closest area of beach and approximately 65 m west of the mouth of the River Sid. The River Sid is classified as an EA Main River.



Figure 2: Hydrological Setting

### 5.2 Geological Setting

According to the British Geological Survey (BGS) Geology Viewer<sup>4</sup>, the Site is directly underlain by superficial deposits of Head (sand with clay and gravel) and potentially Marine Beach Deposits (sand and gravel) in the south, further underlain by bedrock geology comprising the Helsby Sandstone Formation (sandstone) (classified as a Principal Aquifer).

### 5.3 Hydrogeological Setting

According to BGS GeoIndex Onshore Hydrogeology data<sup>5</sup>, the underlying superficial (drift) geology forms a Secondary A Aquifer and sandstone bedrock is classified as a Principal Aquifer. The Site is not located within a groundwater Source Protection Zone.

<sup>4</sup> BGS Geology Viewer [online]. Available at: <https://geologyviewer.bgs.ac.uk>. Accessed October 2023.

<sup>5</sup> BGS British Geological Survey, GeoIndex Onshore [online]. Available at: <https://mapapps2.bgs.ac.uk/geoindex/home.html>. Accessed October 2023.

### 5.4 Site Topography

LiDAR (Light Detection and Ranging) aerial topographic survey data<sup>6</sup> have been provided by the EA for the catchment of the River Sid at a 50 cm horizontal resolution and Digital Terrain Modelling (DTM) shows that the Site is generally level and stands at 6.0 m AOD.

Elevations at the access point from the Esplanade to the south of the site are recorded at 5.8 m AOD. Offsite, ground elevations fall to the north of the property and car parking areas to the north of the Site stand at 3.9 m AOD. In general, areas to the north of the Site and the Esplanade are at lower elevations than the Site by approximately 2 m.

During the Site inspection it was noted that ground elevations are consistent from the Site to the main footprint of the existing lifeboat station. A tractor storage shed in the south of the existing lifeboat station is set at the same elevation as the car park to the north, forming a lower-ground floor level of the existing station. There is a partial void (approximately 1m high) below the northern footprint of the existing station.



Figure 3: LiDAR Topography

<sup>6</sup> Department for Environment Food & Rural Affairs, LIDAR Composite DTM 2022 – 1m [online]. Available at: <https://environment.data.gov.uk/dataset/13787b9a-26a4-4775-8523-806d13af58fc>. Accessed October 2023.

## 5.5 Fluvial and Tidal Flood Risk

### EA Flood Map for Planning

According to the EA’s fluvial and tidal Flood Map for Planning<sup>7</sup>, the entire Site is located in Flood Zone 3 (High Probability). This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1% in any year) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5% in any year). Flood Zone designations specifically ignore the presence of flood defences and do not presently take into account the potential for flood risk to increase in the future due to climate change.

According to EA Coastal Design Sea Levels<sup>8</sup>, the tidal level modelled at a location 2 km offshore could reach 3.3 m AOD during a 1 in 200 (0.5%) Annual Exceedance Probability tidal event (50<sup>th</sup> percentile) and 3.45 mAOD during a 1 in 1,000 (0.1%) AEP tidal event (50<sup>th</sup> percentile). Based on cumulative per-year sea level rises (using a 2018 baseline) for the South East river basin district a sea level rise of 1.21 m is predicted over the 100 year epoch to 2125.

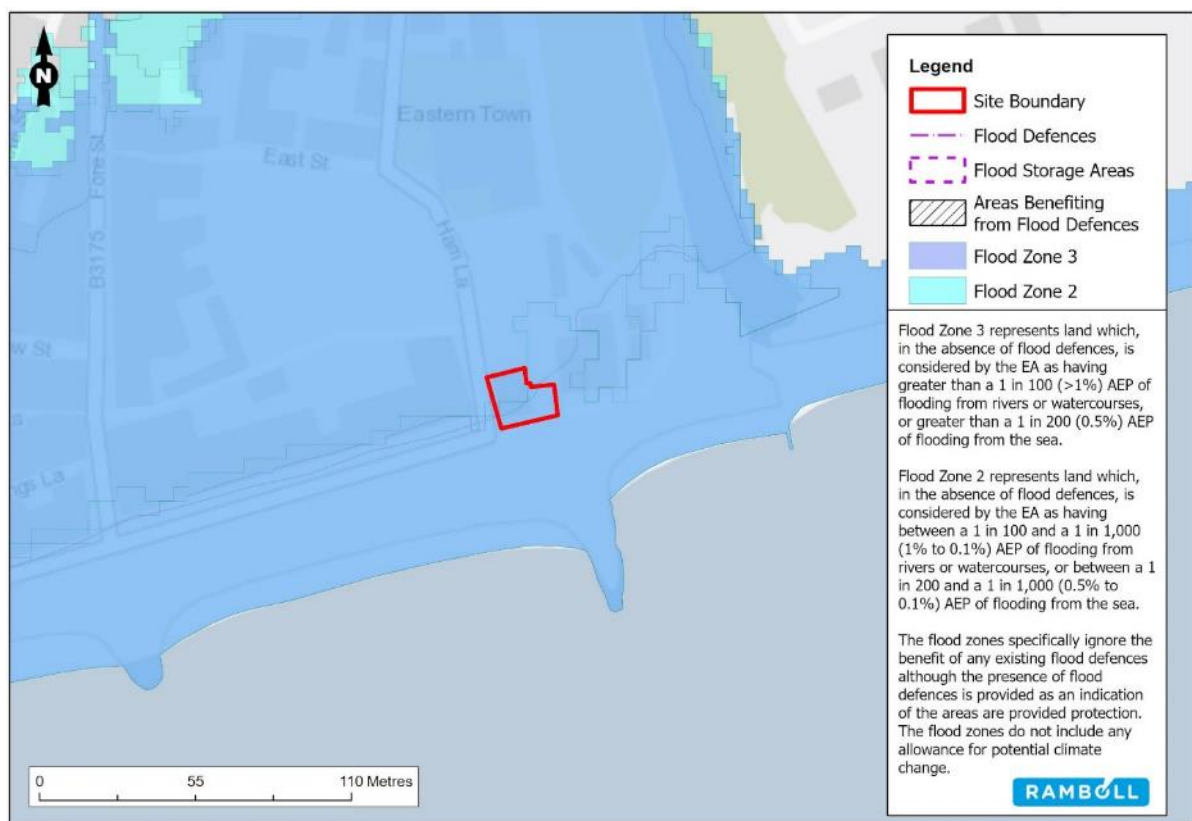


Figure 4: EA Flood Map for Planning

<sup>7</sup> GOV.UK, Flood map for planning [online]. Available at: <https://flood-map-for-planning.service.gov.uk>. Accessed October 2023.

<sup>8</sup> data.gov.uk, Coastal Design Sea Levels – Coastal Flood Boundary Extreme Sea Levels, 2018 [online]. Available at: <https://www.data.gov.uk/dataset/73834283-7dc4-488a-9583-a920072d9a9d/coastal-design-sea-levels-coastal-flood-boundary-extreme-sea-levels-2018>. Accessed October 2023.

### Hydraulic Modelling

Following a request for information by Ramboll the EA have provided detailed hydraulic modelling relevant to the Site. The EA provided modelling of fluvial flood extents from the River Sid Hydraulic Model prepared by Mott MacDonald (dated May 2014) and the Devon and Cornwall Coastal Flood Risk Modelling prepared by JBA Consulting (dated April 2021).

#### FLUVIAL

According to data provided by the EA, the Proposed Development is not within the modelled extent of the 1 in 100 (1%) AEP fluvial flood with climate change allowance to 2115, or the extreme 1 in 1,000 (0.1%) AEP fluvial flood from flooding of the River Sid (both scenarios are shown in Appendix 3: River Sid Flood Risk Modelling). Lower lying areas adjacent to the north west of the Proposed Development could be affected by the 1 in 1,000 (0.1%) annual probability fluvial flood. The Esplanade running away from the Site to the west would not be affected by flooding during these events.

#### TIDAL

As shown in Table 4.1 still water tidal flood levels are approximately 2.5 m lower than Site elevations during the 1 in 200 (0.5%) and 1 in 1,000 (0.1%) AEP event.

**Table 4.1: Modelled Extreme Still Water Levels per AEP event from Node 4820 (2019 Baseline)**

| AEP Events               | 20%  | 10%  | 5%   | 3.33% | 0.5% | 0.1% |
|--------------------------|------|------|------|-------|------|------|
| Still Water Level (mAOD) | 2.92 | 3.00 | 3.07 | 3.12  | 3.31 | 3.46 |

Current sea level rise allowances set out by the EA<sup>9</sup> indicate that, to take into account rises in sea levels to 2125, a cumulative uplift of 1.21 m (Higher Central) and 1.62 m (Upper End) should be added to modelling of present day conditions. As such the Site would remain at least 1 m above the more conservative (90<sup>th</sup> percentile) Upper End still water level.

However, reporting prepared by JBA Consulting (Devon and Cornwall Coastal Flood Risk Modelling Summary Report, dated April 2021) states that the main tidal flood risk driver at Sidmouth is wave overtopping of defences. While modelled still water heights do not surpass the crest elevations of the defences for the present-day or climate change adjusted design event flood at the Site, water resulting from modelled wave overtopping of defences and The Esplanade during a storm could enter the area of low-lying topography behind The Esplanade in the east of Sidmouth and propagate inland, affecting the town.

<sup>9</sup> <https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances#sea-level-allowances>

The footprint of the proposed lifeboat station extension is on a raised area of ground to the north of the Esplanade and is outside of the extent of the present day 1 in 200 (0.5%) AEP tidal flood modelled by JBA, which includes wave overtopping. Immediately surrounding areas including the Esplanade to the south of the Site are within the 1 in 200 (0.5%) AEP event. Lower-lying land adjacent to the north of the existing lifeboat station could be affected by flooding up to depths of 0.5 m during a 1 in 200 (0.5%) annual probability flood and lower ground floor area of the existing lifeboat station could be affected by this event. Modelling suggests that the northern façade of the existing station could be affected by flooding during a 1 in 200 (0.5%) AEP tidal event.

The 1 in 1,000 (0.1%) AEP tidal flood extent projects slightly onto the south of the Site of the proposed lifeboat station extension, where flood depths of less than 0.1 m could occur as a result of wave overtopping. During a 1 in 1,000 (0.1%) AEP tidal flood, depths of up to 0.9 m could occur adjacent to the north of the existing station and the modelled flood extent is shown to encroach onto the building footprint of the existing station.

Taking into account modelled sea level rises to 2120, the majority of the Proposed Development area would not be affected by flooding during the 1 in 200 (0.5%) AEP flood (70<sup>th</sup> percentile), although an area in the south of the Site, adjacent to The Esplanade, could be affected by wave overtopping to flood depths of less than 0.1 m. The footprint of the existing lifeboat station is within the modelled flood extent and flooding in excess of 1 m could occur adjacent to the north of the existing station.

During the extreme climate change adjusted 1 in 1,000 (0.1%) AEP tidal flood modelling suggests that the south of the Proposed Development area could be affected to a depth of 0.1 m as a result of wave overtopping. Areas adjacent to the north of the existing lifeboat station could be affected by flooding in excess of 1 m and the majority of the existing lifeboat station footprint is within the modelled flood extent.

Hydraulic modelling shows that potential flood depths on The Esplanade would remain shallow, with peak depths adjacent to the south of the Site reaching >0.1 m during a 1 in 200 (0.5%) AEP flood and 0.12 m during a 1 in 1,000 (0.1%) AEP flood. Flood depths as a result of wave overtopping in the south of the Site are predicted to reach 0.05 m during the 1 in 1,000 (0.1%) event.

During the present day 1 in 1,000 (0.1%) AEP event, flood depths on The Esplanade roadway to the west of the Site (the main access/egress route to the Site) would not exceed 0.2 m for the full extent of the frontage to areas in the west of Sidmouth that are outside of the modelled flood extent. Flood depths on the roadway of approximately 0.2-0.3 m could occur on the Esplanade roadway to the west of the Site during the 1 in 200 (0.5%) 2120 tidal event and peak depths of 0.3-0.4 m could occur during the extreme 1 in 1,000 (0.1%) 2120, were defences in the area not improved by this date.



Figure 5: EA Hydraulic Modelling, 1 in 200 (0.5%) AEP, Tidal Flooding, Present Day



Figure 6: EA Hydraulic Modelling, 1 in 1,000 (0.1%) AEP, Tidal Flooding, Present Day



Figure 7: EA Hydraulic Modelling, 1 in 200 (0.5%) AEP, Tidal Flooding, 2120



Figure 8: EA Hydraulic Modelling, 1 in 1,000 (0.1%) AEP, Tidal Flooding, 2120

## 5.6 Flood Defences

A flood defence wall is present to the seaward side of The Esplanade. According to EA GIS records the sea wall provides a 1 in 5 (20%) Standard of Protection (SoP). Several access gates are present along the flood barrier and during the site inspection it was reported that the Local Authority are responsible for closing flood gates during a period when high tides or storms are anticipated.

The planned Sidmouth and East Beach Management Plan and Scheme is proposed to improve the SoP of coastal defences on Sidmouth beachfront and to prevent the loss of beach material through coastal erosion. Funding has reportedly been secured for the scheme from the EA and East Devon District Council (EDDC). Plans available from EDCC indicate that the proposal will include the raising of the seawall adjacent to the Site to a height of 1.4 m above the Esplanade and the construction of an offshore breakwater to encourage beach recharge. According to the Sidmouth and East Beach Management Plan 92017) the aim of the proposed upgrade to defences is to maintain a SoP of 1 in 200 (0.5%) against wave overtopping.

## 5.7 Surface Water and Sewer Drainage Flood Risk

The EA has undertaken national-scale modelling of potential surface water flood risks (i.e., those associated with extreme rainfall events and associated overland flow rather than flooding from rivers or the sea). Such risks are categorised as High, Medium, Low or Very Low as follows:

- High – Greater than a 1 in 30 (3.33%) AEP;
- Medium – Between a 1 in 30 and 1 in 100 (3.33% to 1%) AEP;
- Low – Between a 1 in 100 and a 1 in 1,000 (1% to 0.1%) AEP; and
- Very Low – Less than a 1 in 1,000 (0.1%) AEP.

According to the EA Risk of Flooding from Surface Water (RoFSW) map<sup>10</sup>, the whole of the Proposed Development is shown to be at a Very Low risk of surface water flooding. There is, an area of High, Medium, and Low risk located adjacent to the Site's northern boundary on lower-lying car parking.

It should be noted that the EA's mapping of surface water flood risk does not consider specific drainage assets such as sewers and drains which might exist on or adjacent to the Site. Likewise, surface water drainage networks are typically designed to accommodate a 1 in 30 (3.33%) AEP rainfall event. It is, therefore, possible that potential risks are overestimated.

<sup>10</sup> GOV.UK, Check your long term flood risk [online]. Available at: <https://check-long-term-flood-risk.service.gov.uk/map>. Accessed October 2023.





Figure 5: EA Risk of Flooding From Surface Water

## 5.8 Groundwater Flood Risk

The Site is located on a raised promontory of land between the beach and lower lying areas of Sidmouth to the north. While according to BGS geology mapping the underlying bedrock geology is classified as a Principal Aquifer, superficial deposits directly underlying the Site are assessed to be of a limited productivity. Furthermore, it is understood that the footprint of the Proposed Development may comprise made ground (shingle infill). The topography of the Site, and particularly the raised footprint of the Proposed Development area is not indicative of a risk of flooding from groundwater.

## 5.9 Risk from Reservoirs, Canals, and other Artificial Sources

EA mapping of reservoir flood extents<sup>10</sup> shows that the Site is not within an area that could be at risk of flooding due to the failure of a reservoir dam. There are no other artificial sources of flooding identified that could present a risk of flooding at the Site.

## 5.10 Historic Flooding

According to the EA's online geospatial data regarding historical flooding events<sup>11</sup>, the Site has been affected by historical flooding in 1945, 1960 and 1969. Based on the time that has elapsed since these flood events, the historical flood extents are not necessarily indicative of current flood risk at the Site.

<sup>11</sup> Department for Environment Food & Rural Affairs, Recorded Flood Outlines [online]. Available at: <https://environment.data.gov.uk/dataset/8c75e700-d465-11e4-8b5b-f0def148f590>. Accessed October 2023.

According to the 2014 Sidmouth Surface Water Management Plan, areas of the town that have historically been affected by surface water flooding are located in the centre of the town and the area of the Site is not identified as an area likely to be affected by surface water flooding. It is noted that since the SWMP was written (and flooding which affected some areas of Sidmouth in 2014) the implementation of the Knowle Road Flood Storage Area has reduced the risk of flooding to central areas of Sidmouth. The Site was not affected during the 2014 flood event.

### 5.11 Flood Risk Summary

Table 5.1 shows what should be considered in the assessment of flood risk to any Proposed Development at the Site:

**Table 4.1: Flood Risk Summary**

| Sources of Flooding           | High | Medium | Low | Comments                                                                                                                                                                                                                       |
|-------------------------------|------|--------|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Tidal                         |      | X      |     | The Site is located in Flood Zone 3. The south of the Site could be affected by wave overtopping in the present day 1 in 1,000 (0.1%) AEP flood or climate change-adjusted (70 <sup>th</sup> percentile) 1 in 200 (0.5%) flood |
| Fluvial                       |      |        | X   | The Site is located in Flood Zone 3. The Site would not be affected by the present day 1 in 1,000 (0.1%) AEP flood or climate change adjusted (2115) 1 in 100 (0.5%) flood                                                     |
| Surface Water                 |      |        | X   | The Site is located in an area considered to be at a Very Low risk of flooding from surface water.                                                                                                                             |
| Groundwater                   |      |        | X   | The Site is at a Low risk of groundwater flooding.                                                                                                                                                                             |
| Reservoirs/Artificial Sources |      |        | X   | The Site is at a Low risk of reservoir flooding.                                                                                                                                                                               |

## 6. ASSESSMENT OF FLOOD RISK

### 6.1 Flood Risk Vulnerability

According to Annex 3 of the NPPF (Flood Risk Vulnerability Classification)<sup>12</sup>, Lifeguard and Coastguard Stations are specifically classified as water-compatible development. The NPPF guidance states that water compatible development is appropriate in all Flood Zones and is not subject to the Exception Test, including where development is proposed within Flood Zone 3.

### 6.2 Sequential Test

The Sequential Test is designed to ensure that areas at little or no risk of flooding from any source are developed in preference to areas at higher risk. Where it is not possible to exclusively locate all development in low-risk areas, the Sequential Test should go on to compare reasonably available sites:

- Within medium risk areas; and
- Then, only where there are no reasonably available sites in low and medium risk areas, within high-risk areas.

The sequential test defines 'reasonably available sites' as *"those in a suitable location for the type of development with a reasonable prospect that the site is available to be developed at the point in time envisaged for the development"*.

As the Proposed Development is for the purpose of lifeboat deployment and will enhance the services provided by the adjacent, existing lifeboat station, the proposed location of the Site is integral to the nature of the development. Furthermore, in the context of Sidmouth Seafront, the elevated location on which the lifeboat station extension is proposed is at a lower risk of flooding than other surrounding locations.

Therefore, according to NPPF guidance the location of the Proposed Development within Flood Zone 3 is appropriate as lifeboat stations are classified as 'water compatible' and there is no alternative reasonably available location for the Proposed Development.

### 6.3 Mitigation Measures

It has been identified that the proposed lifeboat station extension could be at risk from very shallow wave overtopping. Therefore, the following measures could be considered at the Site to ensure that assets are not damaged by flooding:

- Building materials at ground level (to an indicative height of 600 mm) should be flood resilient such that were they to come in to contact with water permanent damage would not occur. Typically, the use of concrete flooring and sealed block walls would provide suitable protection.
- Electrical fittings should fall from first floor level and sockets and fixtures should be set above 600 mm from ground level. If service entry points to the building are at ground level electrical fittings should be water resistant.
- Non-return valves could be fitted to foul drains leading from the Site to prevent backflow of sewage.
- Fuel storage (a limited number of 20 L jerry cans are stored in a locked container) should be carried out within the area of the Site identified to be outside of areas at risk of flooding due to wave overtopping (i.e. at a location level with the proposed lifeboat station extension).

<sup>12</sup> GOV.UK (2022) National Planning Policy Framework, Annex 3: Flood risk vulnerability classification <https://www.gov.uk/guidance/national-planning-policy-framework/annex-3-flood-risk-vulnerability-classification>

- It should be ensured that outfalls from the frontage of the lifeboat station to the beachfront are cleared and maintained, such that drainage of water from The Esplanade would not be impeded.

It is noted that funding has been secured for the improvement of flood defences under the Sidmouth and East Beach Management Plan and Scheme, specifically with the purpose of reducing the risk of wave overtopping on the Sidmouth Seafront. Proposed defences include the construction of an offshore breakwater and beach nourishment/protection. Therefore, it is anticipated that the risk of flooding at the Site would be mitigated in the future by the development of strategic defences.

There is the potential for development within a Flood Zone to lead to increased flood risk elsewhere as a result of the displacement of flood water. However, the Site is not within an area assessed to be at risk from fluvial flooding and flood risk on the Site (which is elevated above modelled tidal still water levels) relates to wave overtopping. Therefore, the development of the Site would not lead to an increase in flood risk elsewhere and there is no requirement for floodplain compensation.

#### **6.4 Management of Residual Risk**

The Site would only be affected by flooding were storm conditions to coincide with a high tide, such that wave overtopping of defences to occur. During storm conditions with winds in excess of Gale Force 7 the lifeboat would not be able to launch from the station. Therefore, during conditions in which wave overtopping could occur the station may not be operational. Provided flood resilient design were implemented at the Site as set out above, the proposed lifeboat extension could be closed and secured, such that there would be no residual risk to the Site from flooding.

Site staff should sign up to the EA's flood warning service to receive notifications of potential flood risk. Based on the nature of operations at the Site, personnel are well informed of weather hazards and tidal conditions such that potentially hazardous conditions would be well understood and could be acted on promptly.

Under present day conditions, flood depths on the roadway of The Esplanade are such that safe access is likely to be possible (depths would remain below 0.2 m). Were the standard of defences not improved in the future, greater depths of flooding could occur on the access road to the west of the Site. Were planned defence improvements in the area not to go ahead, use of the station may not be possible during periods of storms and high tides.



## 7. IMPACT OF DEVELOPMENT ON SURFACE WATER RUNOFF

### 7.1 Impact on Surface Water Runoff Rates

The site is set in a location served by existing surface water drains, with runoff draining either via a gully at the south extent of the Site on The Esplanade to outfalls from the seawall to the beachfront, or from surface water drains to the north to the sewer network, discharging via a pumping station adjacent to the Sid to the north east of the Site.

The Site is currently entirely hardstanding. The Proposed Development would continue to be served by the existing drainage network and would result in no change to surface water runoff rates in the area.

### 7.2 Surface Water Management

As the Site would not lead to an alteration in runoff rates, and as such would not lead to any potential increase in flood risk in areas outside of the Site boundary, no further surface water management measures would be implemented at the Site.

## 8. CONCLUSIONS

The Proposed Development would comprise the construction of a boat storage building with crew facilities at first floor level, adjoined to the east of the existing Sidmouth Lifeboat Station and some internal reconfiguration of the existing lifeboat station. The built footprint of the new building would extend over approximately 57 m<sup>2</sup> on an area of existing hardstanding which is currently in use for boat storage.

According to the EA's fluvial and tidal Flood Map for Planning, the entire Site is located in Flood Zone 3 (High Probability). This zone comprises land assessed as having a 1 in 100 or greater annual probability of river flooding (>1% in any year) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5% in any year). The Site is located within an area assessed to be of a very low probability (<1 in 1,000 (0.1%) AEP) of surface water flooding.

Modelled still water tidal flood levels are approximately 2.5 m lower than Site elevations during the 1 in 200 (0.5%) and 1 in 1,000 (0.1%) AEP event. Taking into account sea level rise allowances set out by the EA, the area of the proposed lifeboat station extension would remain at least 1 m above the more conservative (90th percentile) Upper End still water level. Therefore, it is confirmed that tidal flood risk identified by EA modelling in the east of Sidmouth, in the area of the Site, relates primarily to the potential for wave overtopping of defences.

The potential for shallow flooding to affect the southern boundary of the proposed extension in extreme weather conditions, as a result of wave overtopping, could be managed through:

- the use of flood resilient building methods;
- by ensuring drains to the south of the Site and the beachfront remain clear; and
- by Site personnel signing up for flood warning alerts.

It should be noted that, based on the nature of operations at the Site, personnel are well informed of weather hazards and tidal conditions such that potentially hazardous conditions would be well understood and could be acted on promptly.

According to Annex 3 of the NPPF (Flood Risk Vulnerability Classification), Lifeguard and Coastguard Stations are specifically classified as water-compatible development. The NPPF guidance states that water compatible development is appropriate in all Flood Zones and is not subject to the Exception Test, including where development is proposed within Flood Zone 3.

The Proposed Development would not lead to an alteration in runoff rates, and as such would not lead to any potential increase in flood risk in areas outside of the Site boundary.

Lifeboat stations are specifically named as 'water compatible' within guidance for the NPPF and there is no alternative reasonably-available location for the Proposed Development. Therefore, the Proposed Development is considered appropriate in flood risk terms under the NPPF.

## **APPENDIX 1 PHOTODOC – SITE OBSERVATIONS**



## **APPENDIX 2 PROPOSED SITE LAYOUT**

## **APPENDIX 3**

### **RIVER SID FLUVIAL MODELLING**