Vale Consultancy

CONSULTING CIVIL & STRUCTURAL ENGINEERS

FLOOD CONSEQUENCE ASSESSMENT (FCA)

Land West of Stockwood View,
Langstone,
NP18 2LU

Prepared for: United Welsh (C/O Martyn Savage and Alys Pride)
Project Ref: 23217_FCA_02

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DOCUMENT CONTROL

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Client:	United Welsh (C/O Martyn Savage and Alys Pride)
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Issue	Prepared by	Approved by	Date	Status
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CONTENTS

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1 INTRODUCTION

1.1 Purpose of Report

Boyer has commissioned Vale Consultancy on behalf of United Welsh (C/O Martyn Savage and Alys Pride) ("the client") to undertake an FCA in support of a planning application (ref: 25/0589) for the proposed development located at Land West of Stockwood View, Langstone, NP18 2LU ("the site").

1.2 Relevant Documents

This assessment has been informed by the following documents, policy and information:

- Technical Advice Note 15: Development, Flooding and Coastal Erosion, Welsh Government, March 2025.
- Planning Policy Wales, Welsh Government, February 2024.
- Future Wales - the National Plan 2040, Welsh Government, February 2021.
- Flood Consequences Assessments: Climate Change Allowances, Welsh Government, September 2021, https://gov.wales/sites/default/files/publications/2021-09/climate-change-allowances-and-flood-consequence-assessments_0.pdf
- Newport City Council (NCC) Local Development Plan 2011-26 – NCC, January 2015
- South East Wales – Strategic Flood Consequence Assessment (Stage 1) – JBA Consulting, November 2022.
- NCC Local Flood Risk Management Strategy 2024 – 2030
- Land off Chepstow Road, Langstone, Newport – Site Investigation Report – 12430/LW/19/SI, May 2019.
- Roads flooded and torn up after thunder and downpours hit Wales – Jonathon Hill, Wales Online – 12th May 2024
- A48 Chepstow Road, Newport, closed by burst water main – Sallie Phillips, South Wales Argus – 6th August 2024
- National Geoscience Data Centre's Single Onshore Borehole Index, https://www.bgs.ac.uk/products/onshore/SOBI.html.
- BGS Mapping of Surface Geology, https://www.bgs.ac.uk/map-viewers/geoindex-onshore/.

2 SITE DETAILS & PROPOSED DEVELOPMENT

2.1 Site Location

The approximately 0.7ha site is located at National Grid Reference (NGR) ST 36729 89741 (336729, 189741) as shown in **Figure 1 and Appendix A.**

Figure 1: *Site Location Satellite Imagery Plan*
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2.2 Existing and Proposed Development

The site comprises a vacant parcel of private land. The existing site plan is provided in **Appendix A**.

The proposals are for a development of nine residential dwellings, comprising detached four-bedroom units. Access to the development will be obtained from Stockwood View using the existing spur which connects to the eastern boundary of the site. The proposed site plan is provided in **Appendix B.**

TAN15 classifies residential development as Highly Vulnerable to flood risk.

2.3 Surface Waterbodies in the Vicinity of the Site

The nearest NRW designated main rivers to the site as seen in **Figure 2** is the Monk's Ditch (approximately 1.13km to the south-east). Moreover, the nearest ordinary watercourse is an Unnamed watercourse which flows in an easterly direction along the southern boundary of the site before its confluence with another Unnamed ordinary watercourse (approximately 1.4km to the east). This watercourse flows in a south westerly direction towards its confluence with the Monks' Ditch (approximately 1.67km to the southeast).

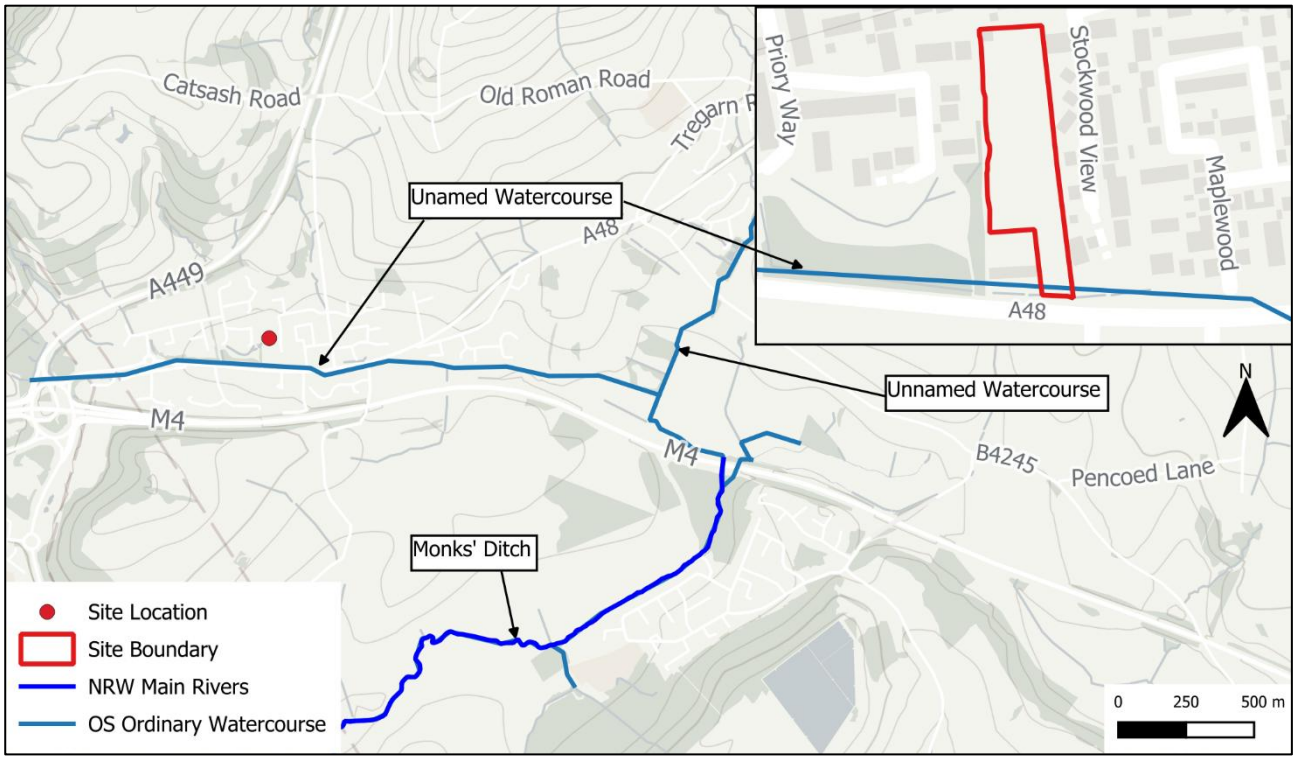

Figure 2: *Local Hydrology*
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2.4 Existing Topography

A topographic survey of the site has been provided to Vale Consultancy, and the levels are shown to be superimposed on the Drainage Strategy Plan (Planning ref: 25/0589 – January 2025) – **see Appendix C**. In addition, freely available 1m resolution LiDAR data has been downloaded for the site and local area. A visual representation of the LiDAR is presented within **Figure 3**. From a review of the LiDAR data, it was indicated to concur with the general findings of the site-specific topographic survey.

Site levels are shown to range between 24.42 – 28.27mAOD. This is a difference in ground level of 3.85m.

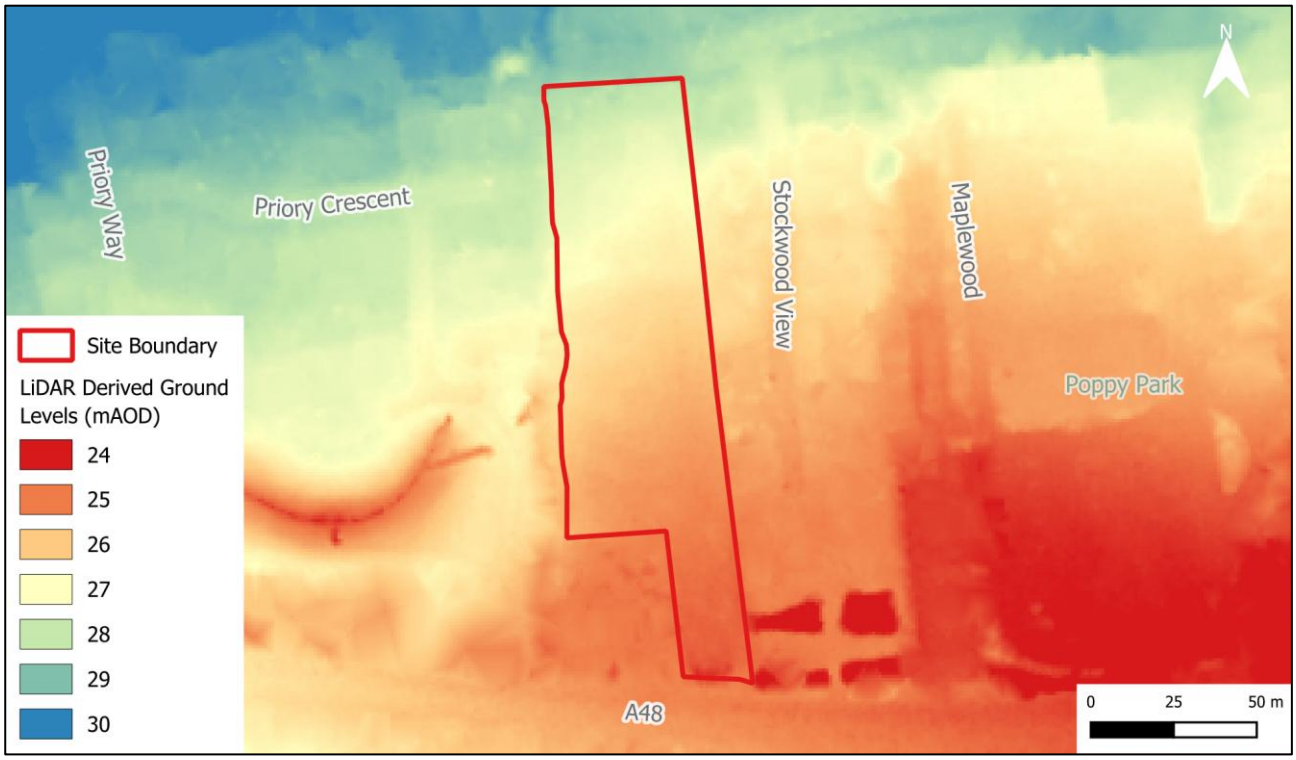

Figure 3: *1m Resolution LiDAR DTM (mAOD)*
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2.5 Existing Ground Conditions

Several trial pits (see **Appendix D**) were excavated at the proposed development site to a maximum depth of 3.50m below ground level (BGL). The ground conditions encountered during the excavation generally comprised a veneer of topsoil overlying the weathered strata of the Mercia Mudstone Group. The strata were noted as wet/damp below typically 1.5m and 1.6m depth and groundwater was encountered at depths of between 1.6m and 2.5m below existing ground level.

Online BGS mapping shows the bedrock geology beneath the site to consists of Mercia Mudstone Group-Mudstone. This is defined by NRW as a 'Secondary B' aquifer. This comprises predominantly lower permeability layers which have, in part, the ability to store and yield limited amounts of groundwater by virtue of localised features such as fissures, thin permeable horizons or weathering.

Most of the site's bedrock is not indicated to be overlain by any superficial deposits; however, the very southern point of the site boundary is indicated to be overlain by superficial deposits which comprise Alluvium-Clay, silt, sand and gravel. This is defined by NRW as a Secondary 'A' Aquifer. These are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers.

3 PLANNING POLICY

3.1 National Planning Policy

Future Wales - the National Plan 2040 sets out the national development framework for Wales with a strategy for addressing key national priorities through the planning system, including sustaining and developing a vibrant economy, achieving decarbonisation and climate-resilience, developing strong ecosystems and improving the health and well-being of our communities.

Policy 8 - Flooding states that "flood risk management that enables and supports sustainable strategic growth and regeneration in National and Regional Growth Areas will be supported. The Welsh Government will work with Flood Risk Management Authorities and developers to plan and invest in new and improved infrastructure, promoting nature-based solutions as a priority. Opportunities for multiple social, economic and environmental benefits must be maximised when investing in flood risk management infrastructure. It must be ensured that projects do not have adverse impacts on international and national statutory designated sites for nature conservation and the features for which they have been designated".

PPW sets out government's planning policies for Wales and how these are expected to be applied. TAN15 (2025) provides technical guidance which supplements the policy within PPW and seeks to ensure that flood risk is taken into account at all stages in the planning process and is appropriately addressed.

The general approach of TAN15 is to set out a precautionary framework to guide planning decisions in areas at high risk of flooding. The overarching aim of TAN15 is to provide a framework within which the flood risks arising from rivers, the sea and surface water, and the risk of coastal erosion can be assessed. It also provides advice on the consequences of the risks and adapting to and living with flood risk.

National policy requires that planning applications for new development proposals should incorporate SuDS to appropriate operational standards and with maintenance arrangements in place unless there is clear evidence that this would be inappropriate.

Statutory standards for sustainable drainage were published by Welsh Government in October 2018 in relation to the design, construction, operation and maintenance of sustainable drainage systems serving new developments of more than one house or where the construction area is equal to or greater than 100 m2 . These standards set out how surface water runoff generated during the 100%, 3.3% and 1% AEP rainfall events and for events exceeding the 1% AEP event should be managed, how peak runoff rates should be restricted and how runoff volumes should be controlled. Approval is subsequently required from the SAB before construction can commence.

3.2 Local Planning Policy

Newport Local Development Plan (LDP) 2011–2026 (Adopted Plan – January 2015)

The Newport Local Development Plan (LDP) 2011–2026 was formally adopted by the Newport City Council on 27 January 2015. This LDP provides the statutory framework for land use and development for the city through to 2026, replacing the previous Unitary Development Plan.

A number of key planning documents and context underpin the LDP and form part of the local planning framework:

- The adopted LDP 2011–2026;
- Supplementary Planning Guidance (SPG) documents, which provide further detail and guidance on specific issues; and,

- Background studies and evidence base documents (e.g. flood-risk assessments, water resource assessments, housing market studies, employment land reviews, transport and infrastructure analyses).

Local Development Plan Overview

The LDP establishes a strategic vision and spatial strategy for Newport's growth and land use change between 2011 and 2026. It seeks to achieve sustainable development by balancing social, economic, and environmental objectives: including housing delivery, employment and economic growth, retail/centre provision, transport and infrastructure, protection and enhancement of natural and built environments, environmental resilience (particularly flood risk), and health and wellbeing.

The LDP forms the statutory basis for decision making on planning applications across Newport, guiding where development should occur, where land should be protected, and the standards to which development should adhere.

Since adoption of the Newport Local Development Plan (2011–2026), the Council has been progressing the Replacement Local Development Plan (RLDP). The most recent consultation on the RLDP took place in October 2023 on the Preferred Strategy, which includes Draft Policy PS12 relating to flood risk and identifies the Langstone and Llanwern areas as a key focus for eastern expansion. While the RLDP has not yet progressed to Deposit Plan stage and carries no material weight in planning decisions, the proposed development is consistent with the principles set out in the emerging policy, including the Council's strategic approach to growth and flood risk management. Accordingly, this Flood Consequences Assessment has been prepared with reference to the adopted development plan and current national planning policy.

Key Policies Relevant to Flood Risk, Drainage and Environmental Management

Policy SP3 – Flood Risk

The policy recognises that Newport's coastal location, its rivers (notably the River Usk) and the complex network of drainage/channel systems (reens) on the Gwent Levels make flood risk a critical constraint. Development is required to be directed away from areas where flood risk is identified as a constraint and must ensure that flood risk is not increased elsewhere.

Where development is proposed in flood risk areas (e.g. tidal, fluvial, surface water, groundwater, reservoirs or canal related), a detailed technical flood risk assessment will be required to ensure the development is designed to cope with flood threats across its lifetime. Sustainable solutions to manage flood risk should be prioritised.

The approach draws on a Strategic Flood Consequence Assessment (SFCA) and takes into account both statutory and non-statutory flood risk plans (e.g. shoreline management, catchment flood management).

Additionally, where watercourses lie within the area overseen by an Internal Drainage Board (IDB), there are strict requirements: watercourses must not be culverted, and development must avoid obstructing them by maintaining buffer zones (e.g. minimum 12.5m for reens, 7m for field ditches) to permit future maintenance.

Policy SP4 – Water Resources (and Sustainable Water Management / Drainage)

The LDP includes a policy requiring that development proposals minimise water consumption, protect water quality during and after construction, and ensure no net increase in surface water runoff. This is to be achieved through sustainable drainage systems (SuDS), water reuse where possible, and careful consideration of the capacity of water supply and wastewater/sewerage infrastructure.

Developers must consider the impact on finite water resources, particularly in light of climate change, and ensure that development is appropriately located and phased so that existing water/wastewater infrastructure can accommodate it, while safeguarding water quality.

Policy SP9 – Conservation of the Natural, Historic and Built Environment
The Plan requires that the conservation, enhancement, and appropriate management of recognised sites within the natural, historic and built environment be sought in all proposals. This reflects an overarching intention to protect environmental and heritage assets as part of sustainable development.

Other objectives and background principles underpinning the LDP include health and well-being (through access to green space, open space, sustainable movement, environmental quality), climate change adaptation, and sustainable development more broadly.

Supplementary Planning Guidance (SPG)
The LDP is supported by a suite of Supplementary Planning Guidance (SPG) documents, which provide detailed guidance on how certain LDP policies should be implemented in practice. This helps guide developers and decision-makers on topics such as sustainable drainage, water management, design, environmental protection, conservation, and other aspects relevant to development proposals.

3.3 Water Framework Directive

The WFD provides a legal framework for the protection, improvement and sustainable use of inland surface waters, groundwater, transitional waters, and coastal waters across England and Wales, and seeks to:

- Prevent deterioration in the status of surface water and groundwater bodies;
- Protect, enhance and restore surface water and groundwater bodies (except artificial or heavily modified water bodies) with the aim of achieving good ecological, chemical and groundwater quantitative status by December 2021;
- Protect and enhance artificial and heavily modified water bodies with the aim of achieving good ecological potential and good chemical status by December 2021;
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment and progressively reduce pollution of groundwater. The WFD applies to any proposed development which has the potential to impact on a waterbody. Where this is the case, NRW may require evidence demonstrating that the proposed development does not compromise the aims of the WFD.

3.4 Environmental Permitting and Land Drainage Consent

Under the Environmental Permitting (England and Wales) Regulations 2016 an Environmental Permit for Flood Risk Activities is required from the Environment Agency for any permanent or temporary works, including works:

- In, over or under a designated main river
- Within 8 m of the top of bank of a designated main river or of the landward toe of a flood defence (16 m if it is a tidal main river or a sea defence).

In addition, any permanent or temporary works within the floodplain of a designated main river may also require an Environmental Permit for Flood Risk Activities. A permit is separate to and in addition to any planning permission granted.

Land drainage consent may be required from the lead local flood authority or drainage board for work to an ordinary watercourse.

Undertaking activities controlled by local byelaws also requires the relevant consent.

3.5 Ordinary Watercourse Consent

Ordinary Watercourse Consent may be required from Council for any temporary or permanent works to or within an ordinary watercourse

4 SOURCES OF FLOODING AND PROBABILITY

4.1 Historical Records of Flooding

The NRW Recorded Flood Extents (Figure 4) indicate that there are no records of flooding at or within the immediate vicinity of the site. The nearest recorded flood outlines to the site are located approximately 1.7km to the south (local drainage/surface water – 1999) and 1.8km to the northwest (channel capacity of the River Usk exceeded with no raised defences - 1979).

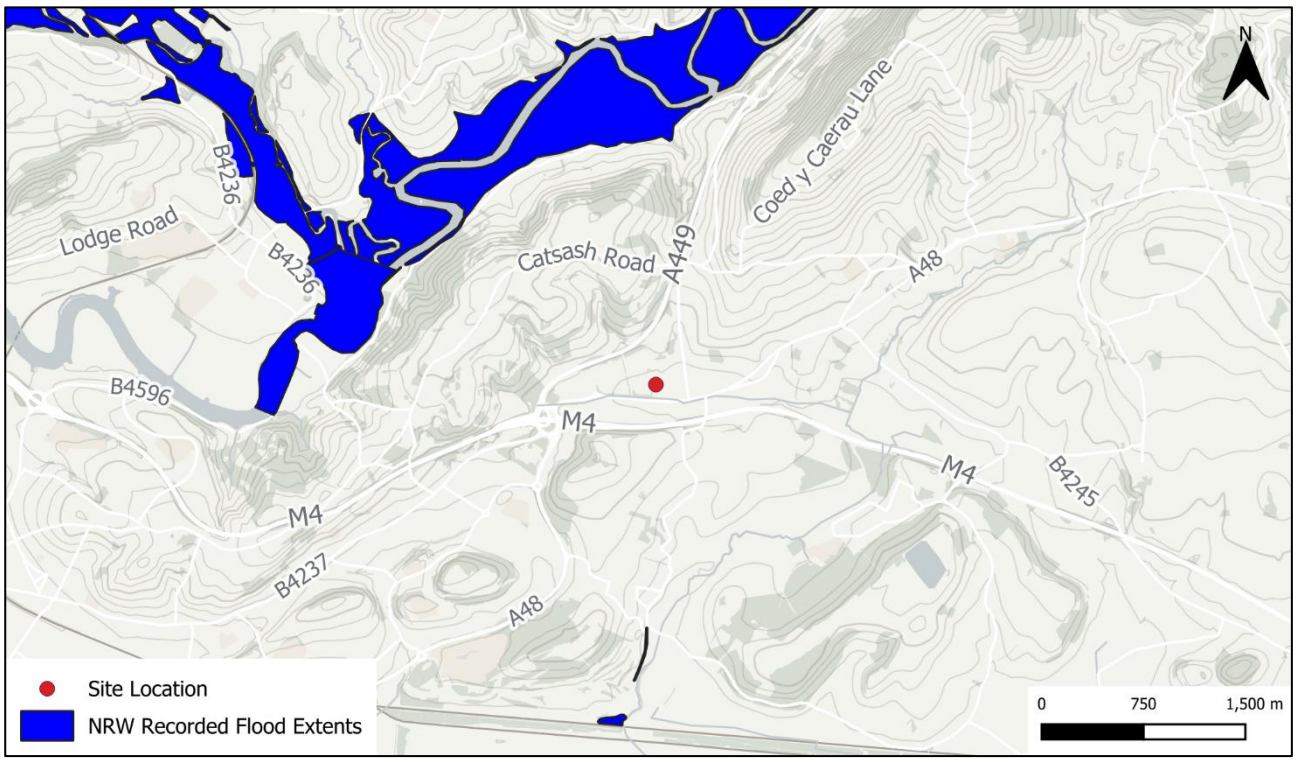

Figure 4: *NRW Recorded Flood Extents*
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Notwithstanding the above, comments received from the NCC SAB Team noted that "historical flooding at the site and adjacent properties, arising from issues along the watercourse on the southern boundary, must be acknowledged when considering the application and the proposed SuDS measures." However, a review of all relevant documentation identified in Section 1.2, together with online research, did not identify any site-specific or watercourse-specific flooding incidents.

Two flooding events were identified along Chepstow Road. A Wales Online article reported that on the 12th of May 2024[1], exceptionally intense rainfall over a short period resulted in significant surface water flooding, with vehicles experiencing difficulty navigating the road. In addition, on the 4th of August 2024[2], Chepstow Road was closed following a burst water main between Cats Ash Road and the roundabout near Springs Health Club.

[1] Roads flooded and torn up after thunder and downpours hit Wales - Wales Online
[2] A48 Chepstow Road, Newport, closed by burst water main | South Wales Argus

Based on a review of all available information, these represent the only confirmed flooding-related incidents within the vicinity of the site.

4.2 Flood Risk Summary

The Flood Map for Planning (FMFP) - indicates the site to be located within **Flood Zone 1** (Rivers & Tidal / The Sea) and a combination of **Flood Zones 1, 2 and 3** (Surface Water and Small Watercourses).

The flood zone definitions are as follows:

Flood Zone 1: Land that has been assessed as having a less than a 0.1% (1 in 1000) chance of flooding in a given year, including the effects of climate change.

Flood Zone 2: Land that has been assessed as having between a 1% and 0.1% chance of river flooding (fluvial) / surface water flooding (pluvial) or between a 0.5% and 0.1% chance of flooding from the sea (tidal) in a given year, including the effects of climate change.

Flood Zone 3: Land that has been assessed as having a greater than 1% chance of river flooding (fluvial) / surface water flooding (pluvial) or a greater than 0.5% chance of flooding from the sea (tidal) in a given year, including the effects of climate change.

4.3 Sea (Tidal / Coastal)

The site is located within Flood Zone 1. Moreover, the NRW Flood Risk Assessment Wales (FRAW) mapping (Tidal/Coastal) indicates that the site is not located in an area of high, medium or low risk of flooding from the sea. As seen in **Figure 5**, the site is located approximately 1.8km southeast of the nearest area of high risk. This mapping takes into consideration flood defences within the area.

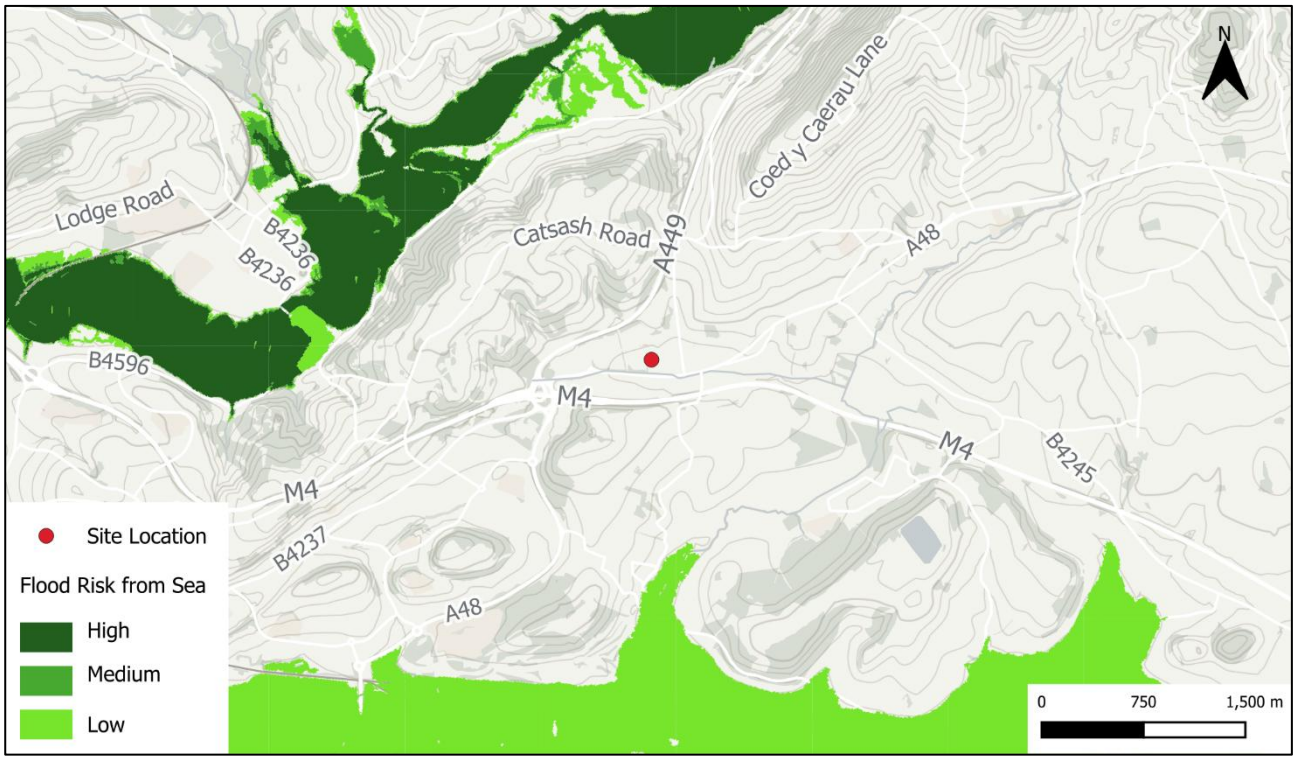

Figure 5: *NRW Flood Risk from Sea*
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Overall, the site is considered to be at a **Negligible** risk of flooding from tidal sources.

4.4 Rivers (Fluvial)

The site is located within Flood Zone 1. Moreover, the NRW Flood Risk Assessment Wales (FRAW) mapping (Rivers) indicates that the site is not located in an area of high, medium or low risk of flooding from rivers. As seen in **Figure 6**, the site is located approximately 875m west of the nearest area of high risk. This mapping takes into consideration flood defences within the area.

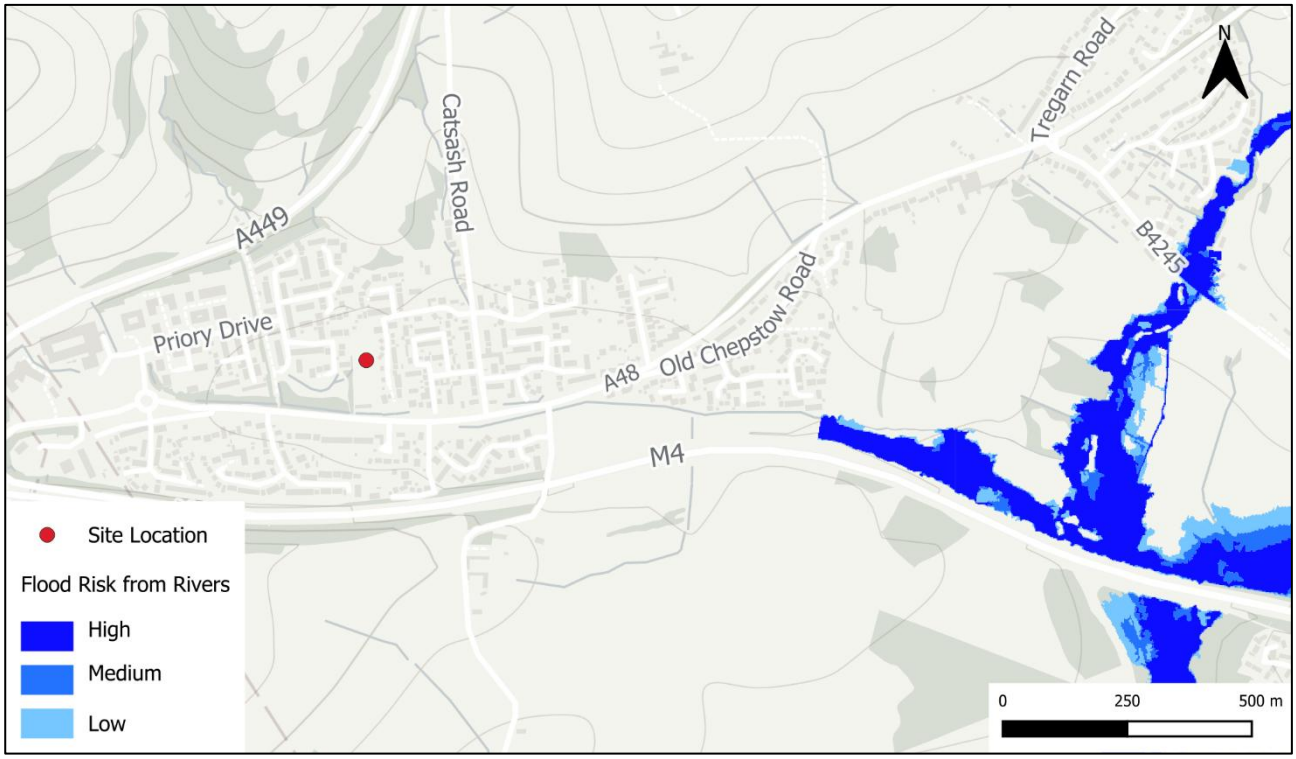

Figure 6: *NRW Flood Risk from Rivers*
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Overall, the site is considered to be at a **Low** risk of flooding from fluvial sources.

4.5 Surface Water & Small Watercourses (Pluvial)

The site is located within Flood Zones 1, 2 and 3. Moreover, the NRW Risk of Flooding from Surface Water and Small Watercourses mapping indicates that there are areas within the site boundary which are indicated to be at a high, medium and low probability of flooding. As seen in **Figure 7**, dwelling 1 is indicated to encroached by an area of low probability. All remaining eight proposed dwelling locations (**Appendix B**) are not shown to be at risk of surface water flooding in any probability event. Moreover, the existing access route to the site from Chepstow Road to the south is shown to be located within an area of high probability to surface water flooding. This projected flooding is indicated to align with the presence of the Unnamed watercourse which flows along the southerly boundary of the site.

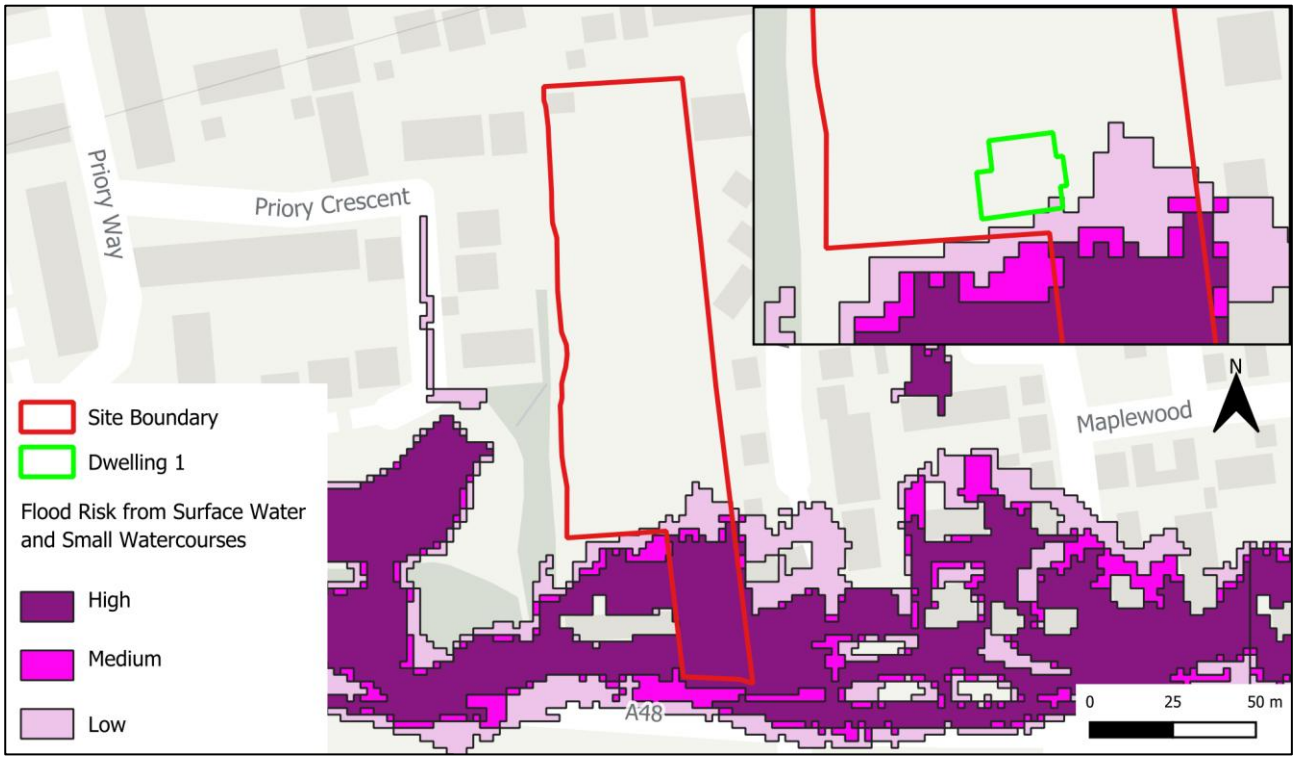

Figure 7: *NRW Risk of Flooding from Surface Water and Small Watercourses*
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The probability definitions can be seen below for reference:

- **High probability** – each year, this area has a chance of flooding of greater than 1 in 30 (3.3%);
- **Medium probability** – each year, this area has a chance of flooding of between 1 in 100 (1%) and 1 in 30 (3.3%); and,
- **Low probability** – each year, the area has a chance of flooding of between 1 in 1000 (0.1%) and 1 in 100 (1%).

At the high probability event, no surface water flooding is predicted at any of the proposed dwelling locations (**Figure 8**). Moreover, projected flood depths of up to ≥0.9m are shown along the alignment of the unnamed ordinary watercourse on the site's southern boundary (see **Figure 2**); however, this flooding is confined to the lowest topography within the wider site boundary and lies entirely outside the proposed residential development footprint and proposed access/egress route.

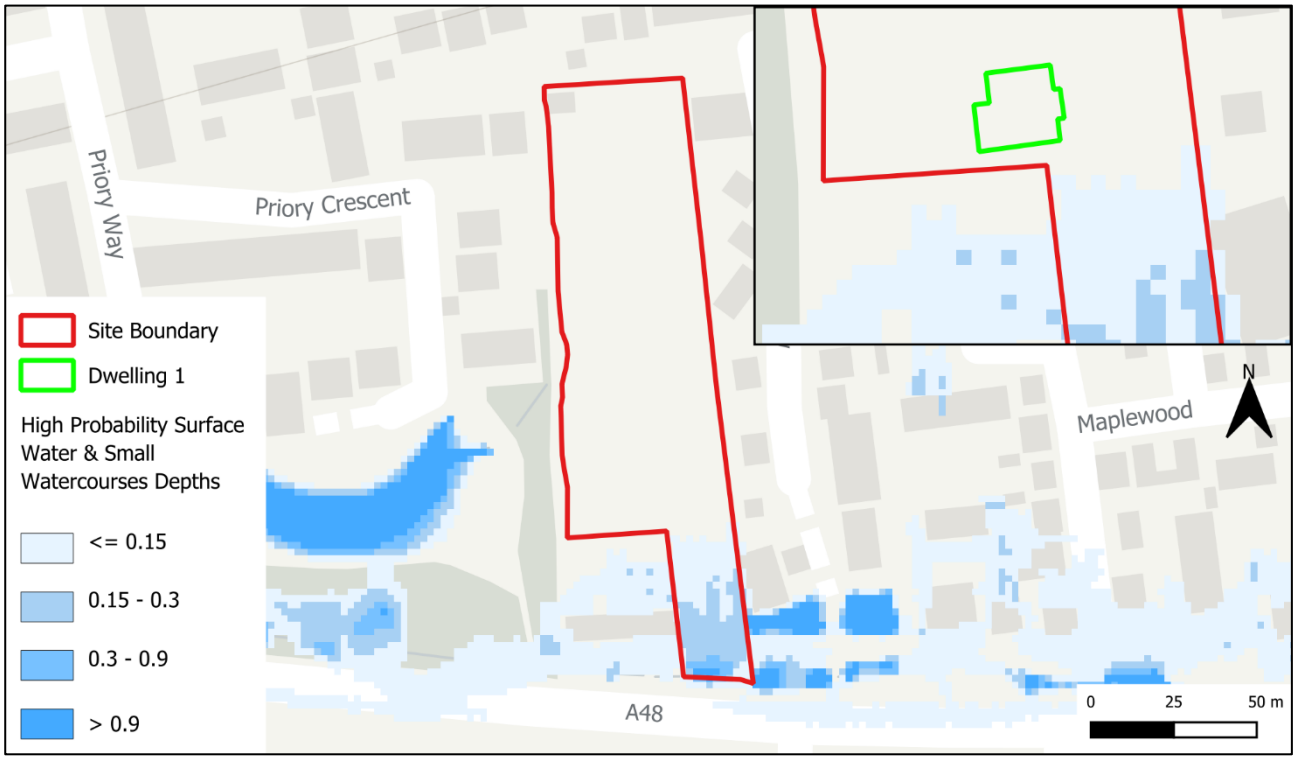

Figure 8: *NRW High Probability surface water Depths*
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Similarly to the high probability event, at the medium probability event, no surface water flooding is predicted at any of the proposed dwelling locations (**Figure 9**). Moreover, projected flood depths of up to ≥0.9m are shown along the alignment of the unnamed ordinary watercourse on the site's southern boundary (see **Figure 2**); however, this flooding is confined to the lowest topography within the wider site boundary and lies entirely outside the proposed residential development footprint and proposed access/egress route.

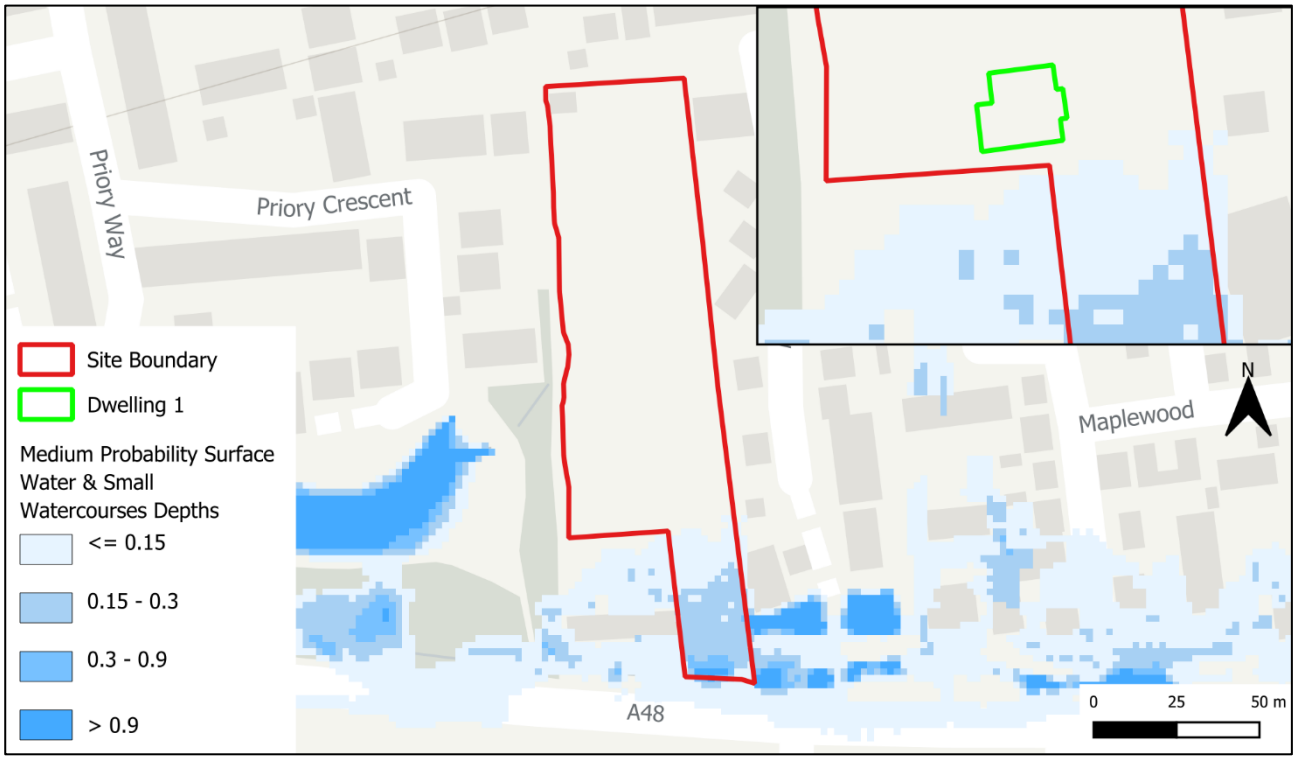

Figure 9: *NRW Medium Probability surface water Depths*
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At the low probability event, surface water flooding is predicted to encroach upon the proposed location of dwelling 1 to a depth of up to ≤0.15m (**Figure 10**). Velocity mapping indicates a maximum surface water flow velocity of approximately 0.09m/s at this location. When assessed against the Flood Hazard Matrix (Figure 7 of TAN 15), the combination of shallow depth and low velocity corresponds to a very low hazard classification and is considered tolerable for residential development.

Moreover, projected flood depths of up to ≥0.9m are shown along the alignment of the unnamed ordinary watercourse on the site's southern boundary; however, this flooding is confined to the lowest topography within the wider site boundary and lies entirely outside the proposed residential development footprint and proposed access/egress route.

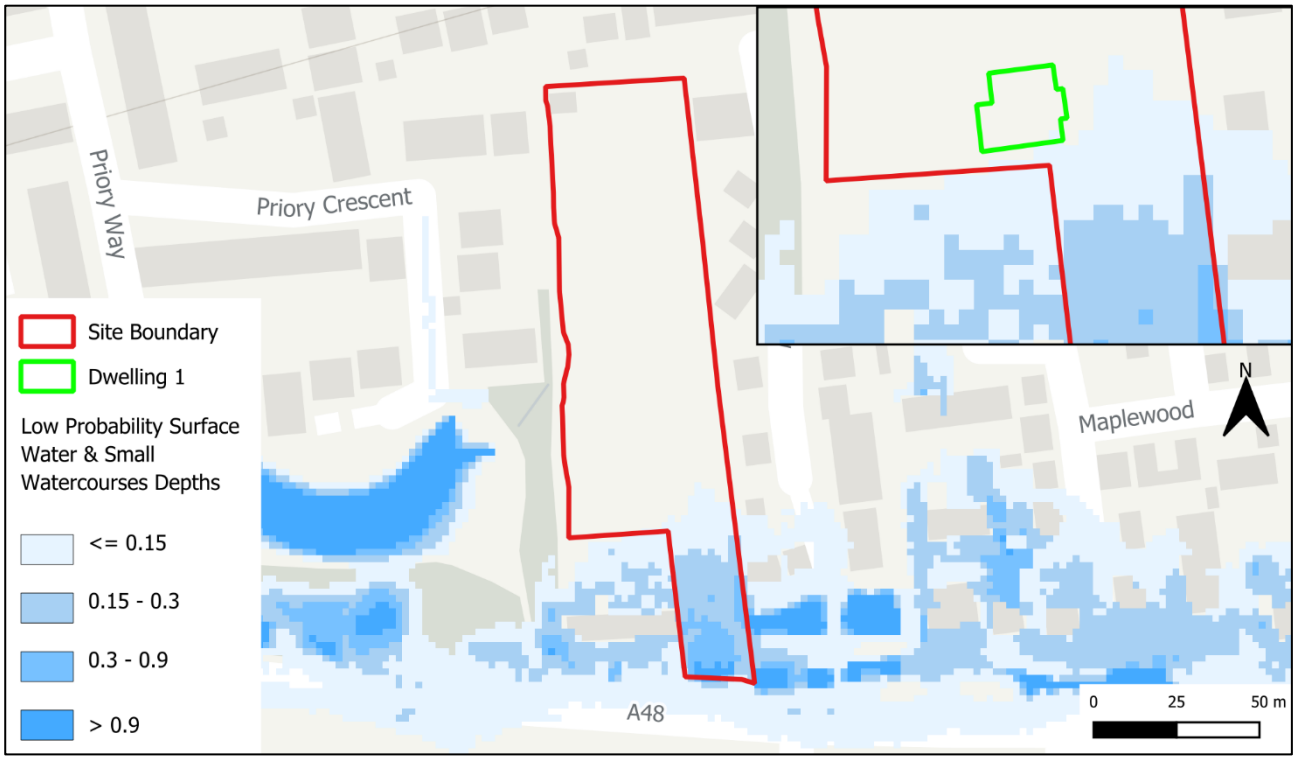

Figure 10: *NRW Low Probability surface water Depths*
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In the absence of a site-specific surface water model, the future CC 1 in 1000 year (0.1% AEP) year event flood depth has been estimated by applying the Welsh Government climate change rainfall intensity allowances to the present-day low probability surface water mapping. As noted above, the low probability surface water depth mapping indicates a maximum present-day flood depth of approximately ≤0.15m which encroaches upon dwelling 1. While this area of projected surface water flooding likely represents the lower end of the depth range given its spatial extent, for the purposes of this assessment, a baseline depth of 0.15m has been adopted to provide a conservatively high estimate.

Using the recommended peak rainfall intensity uplifts for the 2080s from the Welsh Government guidance on climate change allowances[3], indicative future depths have been calculated as:

- Upper Estimate for 2080s (40%): 0.15m x 1.40 = 0.21m
- Central Estimate for 2080s (20%): 0.15m x 1.20 = 0.18m

This approach provides a pragmatic quantitative assessment of the 1 in 1000 year + CC event and demonstrates that predicted depths remain within tolerable limits for the site.

This method is consistent with TAN15, which allows the use of the best available data, including mapped flood depths and climate change allowances, where site-specific hydraulic modelling is not available. All assumptions, including the use of uplifts from peak rainfall intensity allowances, are explicitly documented to align with TAN15 guidance for FCAs.

Overall, the surface water mapping is indicated to be aligned with the Unnamed ordinary watercourse which flows along the site's southern boundary. It must be noted that the channel of the watercourse is indicated to be situated at a lower elevation than that of each proposed dwelling location. This difference in elevation would provide the dwellings with protection of up to an equivalent depth.

[3] Flood Consequences Assessments: Climate change

Surface water flood risk at the proposed dwelling locations is generally low, with mapping indicating that only one proposed dwelling (dwelling 1) would be affected during the low probability event. In this event, depths encroach dwelling 1 to a depth of up to ≤0.15m and a maximum velocity of 0.09m/s. According to Figure 7 within TAN15, this corresponds to a very low hazard classification. Furthermore, when the climate change uplifts for the 2080s are applied to the present-day 1 in 1000 year event, indicative flood depths increase to approximately 0.21m (upper estimate) and 0.18m (central estimate). Even with these conservative allowances, the hazard classification remains within the very low category, confirming that the surface water flood risk to the proposed dwellings remains tolerable.

Moreover, the proposed site layout, shown in **Appendix B** and **Appendix C**, demonstrates that the existing southern access (identified as the primary area of surface water accumulation aligned with the Unnamed watercourse) will be replaced by a detention basin with an approximate storage volume of 151m³. A cellular storage solution could also be considered as an alternative attenuation approach, providing equivalent surface water management while maintaining compliance with SuDS principles

In addition, each dwelling will be served by a private rain garden and comprise areas of permeable paving providing local interception and attenuation of runoff. These SuDS features will significantly reduce on site surface water flood risk by managing exceedance flows and providing controlled discharge to the adjacent ordinary watercourse.

Lastly, the relocation of the primary access utilising an existing spur road ensures safe access and egress, as the connection to Stockwood View is situated entirely within Flood Zone 1 for surface water and Small Watercourses and is not affected in any probability event.

Section 5 of this report outlines how these SuDS measures, in combination with proposed Property Flood Resilience (PFR) measures and appropriate Finished Floor Level (FFL) setting, will further mitigate residual risk and ensure a compliant, safe development.

In conclusion, the risk of flooding from surface water and small watercourses at the proposed dwelling locations is considered **Low** and the risk to the wider site (southern region) is considered **High.**

4.6 Groundwater Flooding

Groundwater flooding occurs when water levels underneath the ground rise above normal levels. Prolonged heavy rainfall soaks into the ground and can cause the ground to become saturated. This results in rising groundwater levels which leads to flooding above ground.

As discussed in Section 2.5, several trial pits (see **Appendix D**) were excavated at the proposed development site to a maximum depth of 3.50m BGL. The ground conditions encountered during the excavation generally comprised a veneer of topsoil overlying the weathered strata of the Mercia Mudstone Group. The strata were noted as wet/damp below typically 1.5m and 1.6m depth and groundwater was encountered at depths of between 1.6m and 2.5m below existing ground level.

Moreover, there is no specific areas of historical groundwater flooding recorded in the area and therefore the risk of flooding from this source is considered to be small.

No further information regarding the susceptibility of groundwater flooding at the site was provided within any of the listed documents.

Therefore, the risk of groundwater flooding is concluded to be ***Low.***

4.7 Artificial Sources of Flooding

There are no canals or other artificial / man-made surface water bodies within the immediate vicinity of the site or surrounding area which would pose a flood risk to the site.

The NRW 'Risk of Flooding from Reservoirs' map shows that the site is not at risk of flooding from reservoirs. The risk of flooding from reservoirs is extremely unlikely to happen. For instance, all large reservoirs must be inspected and supervised by a reservoir panel engineer, as the enforcement agency the NRW ensure that reservoirs are inspected regularly, and essential safety / maintenance work is carried out.

Therefore, it can be concluded that the probability of flooding from artificial sources is ***Low***.

4.8 Justification Test

The proposed development would contribute to the housing supply of Newport, with the principle of development being previously considered acceptable. Moreover, the potential consequences of a flooding event for this type of development have been considered and found to be acceptable. Flood risk across the site is generally low, with only a single dwelling (dwelling 1) projected to be encroached by depths of up to ≤0.15m in the low surface water probability event. The proposed site layout, as shown in **Appendices B** and **C**, incorporates a detention basin with an approximate storage volume of 151m³ along with private rain gardens, and permeable paving for each dwelling, providing onsite attenuation and runoff management to reduce surface water flood risk. A cellular storage system has also been identified as an alternative attenuation approach, which could be considered to provide equivalent or improved surface water management if required, without altering the overall drainage strategy. Furthermore, the relocation of the primary access to Stockwood View, entirely within Flood Zone 1, ensures safe access and egress in all probability events.

In combination with the proposed PFR measures outlined in Section 5 and appropriate FFL, these features provide proportionate mitigation. Therefore, the site and proposals are in alignment with the policies, aims, and objectives within the Local Development Plan (LDP), including its definition of Sustainable Development, and the development therefore complies with the objectives of TAN15, ensuring that the site is safe, flood risk is not increased elsewhere, and residual risk to occupiers is appropriately managed.

5 FLOOD MITIGATION

5.1 Flood Risk Mitigation

The risk of flooding to the proposed development from tidal, fluvial, groundwater and artificial sources is assessed to be Low/Negligible. The risk of flooding from surface water and small watercourses is Low at the proposed dwelling locations and High within the wider site boundary. Below are a series of recommendations which should be incorporated to demonstrate the long-term resilience of the development to any future flood risk.

Given that the principal source of flood risk to the site is that of surface water flooding, the projected low probability depths have been used to inform this section of the report as this is the first event at which a proposed dwelling is projected to be at risk of surface water flooding.

In the low probability event, the maximum flood depth projected to encroach dwelling 1 is ≤0.15m with a maximum velocity of 0.09m/s. On this basis, the proposed FFL for dwelling 1 is recommended to be raised by 0.3m. As seen in Appendix C, the lowest existing ground level at dwelling 1 is 25.10mAOD. Consequently, the proposed FFL for dwelling 1 is recommended to be set at:

- Dwelling 1 – 25.40mAOD (providing a 0.15m freeboard to account for any residual flooding)

It is also noted that raising dwelling 1 to the suggested FFL not only provides a freeboard above the present day 1 in 1000 year event but also the conservatively high estimated flood depths at the 1 in 1000 + CC events:

- Upper Estimate (2080s, +40%) – 0.21m maximum flood depth (0.09m freeboard)
- Central Estimate (2080s, +20%) – 0.18m maximum flood depth (0.12m freeboard)

For each dwelling, ground levels should slope away from the building footprint to the nearest drainage point.

In addition to raising the FFL of Dwelling 1, all nine dwellings will incorporate private raingardens and areas of permeable paving (see **Appendix C**) to manage surface water sustainably. The proposed site layout also includes a detention basin with a storage volume of 151m³ to provide additional attenuation and manage exceedance flows. As an alternative, a cellular storage system has been identified conceptually, which could be considered to provide equivalent or enhanced surface water management if required, without altering the overall drainage strategy. The raingardens and permeable paving are designed to encourage infiltration and provide temporary storage of roof and surface water runoff, thereby reducing peak flows. Rainwater from roof downpipes and paved areas will be directed into these landscaped raingardens, where it will be temporarily stored and allowed to infiltrate. Any excess water will be conveyed to the detention basin where the discharge rate will be restricted by a flow control chamber to the Unnamed watercourse along the southern boundary. The utilisation of raingardens, permeable paving, and a detention basin for attenuation and controlled discharge ensures compliance with SuDS principles, protects downstream capacity, and mitigates surface water flood risk across the site.

As the site borders an ordinary watercourse. A Surface Water Drainage Strategy incorporating these SuDS features will be submitted for SAB approval (Newport City Council) and designed to achieve greenfield run-off rates and no net increase in flood risk. Any works affecting the watercourse (including outfalls) will be subject to Ordinary Watercourse Consent under Section 23 of the Land Drainage Act 1991 (Lead Local Flood Authority: Newport City Council). Natural Resources Wales will also be consulted to confirm whether an environmental permit is required for any discharge to controlled waters and to ensure appropriate pollution prevention measures are implemented.

To further manage any residual risk, PFR measures are recommended along all external elevations (up to the proposed FFL) and internally of the building footprints. It must be stated that these measures are focused on dwelling 1 but also recommended for all remaining dwellings to help mitigate any future residual risk. These measures include:

- **Floor Finish:** The floor finish on the ground floor should be kept as flood resilient as possible (resin/ceramic/concrete tiles as opposed to lino/vinyl/carpet) so the floor can be easily cleaned down following any residual flooding.
- **Critical Infrastructure/Electrical Sockets:** Raise all electronic control units and sockets 0.3m above external ground levels to mitigate against any residual flooding.
- **Drainage Systems:** Routinely maintained, inspected and cleared (ensuring it is performing to optimal capacity).
- **Duct Sealing:** Seal all cables and pipes entries below FFL with duct sealing.
- **Non-Return Valves (NRV):** NRVs could be installed to all drainage outlets to mitigate against residual risk of the local drainage network surcharging.
- **Airbricks:** Utilise self-closing airbricks where possible

Design measures should include the use of less permeable materials such as engineering bricks, along with an appropriate damp-proof membrane to enhance resilience.

Flood Awareness

A personal Flood Plan should be in use to ensure that each resident is aware of the potential risks from flooding in the locality, as well as understanding what to do in the instance of a potential flood event. The NRW Personal Flood Plan template can be seen within **Appendix E** of this report.

Moreover, despite the site not being located within a designated NRW Flood Warning or Flood Alert Area, it is advised that the client and future residents register for the nearest Flood Alert Area (Alert Ref: 103WAFuskmon), located approximately 870m east of the site. This alert zone covers the downstream section of the Unnamed watercourse, which flows along the site's southern boundary. Therefore, receiving an alert would provide a strong indication of potential flooding at the site, giving residents valuable time to prepare flood defences or evacuate. For this reason, registration is recommended as a precautionary measure.

Safe refuge is achievable in the upper level of the dwellings and the northern region of the site boundary; however, if there is a requirement to evacuate, this should be done at the 'Flood alert stage' with safe egress achieved to the east via the proposed new access road to the adjacent Stockwood View.

5.2 Acceptability of Flood Consequences

In accordance with Figure 2 and para. 11.4 of TAN15 developers must ensure that there is no increase in flooding elsewhere for floods up to the severity of the 1 in 1000 year event (0.1% AEP) including an allowance for climate change and should consider breach where necessary.

The proposal involves the construction of nine dwellings. While the total built footprint on the site will increase, the development will be required to obtain approval from the Sustainable Drainage Approval Body (SAB). As part of the SAB process, a compliant Sustainable Drainage System (SuDS) will be implemented to ensure runoff from the proposed development is managed such that post-development discharge rates and volumes do not exceed the existing (greenfield/brownfield) conditions.

The proposed SuDS strategy, comprising a detention basin (151m^3), private raingardens, permeable paving and controlled discharge via a flow control chamber will attenuate and manage surface water onsite and ensure there is no increase runoff to surrounding land or third-party property in accordance with national

SuDS standards. A cellular storage system has also been identified conceptually as an alternative attenuation approach, which could provide equivalent surface water management if required, offering flexibility in the drainage design without altering the overall SuDS strategy.

Given that:

- no works are proposed within the adjacent ordinary watercourse;
- the site does not currently provide functional flood storage;
- the predicted depths of inundation at the dwellings are shallow and do not result in meaningful on-site floodplain displacement; and
- SuDS will control post-development runoff to ensure no additional flows are transferred off-site,

The development is not considered to result in any material increase in flood risk elsewhere.

Any minor ponding or exceedance flows that could occur during extreme events will be safely contained within the boundaries of the application site through the proposed site levels, garden areas and internal exceedance routes. There is therefore no loss of flood storage, no measurable displacement of floodwaters, and no increased off-site flood risk to neighbouring land or infrastructure.

6 SUMMARY & RECOMMENDATIONS

This report has been prepared on behalf of United Welsh (C/O Martyn Savage and Alys Pride) for the proposed development at Land West of Stockwood View, Langstone, NP18 2LU ("the site"). This development is for a highly vulnerable use as per the TAN15 Vulnerability Classification.

This FCA concludes that the site is at a Low/Negligible risk from tidal, fluvial, groundwater and artificial sources. The risk of flooding from surface water and small watercourses at the proposed dwelling locations is considered Low and the risk to the wider site is considered High.

The risk to dwelling 1 will / can be mitigated through the implementation of the following measures:

FFL should be set at 25.40mAOD (Dwelling 1) with ground levels sloping away from the building footprint to the nearest drainage point. This level accounts for a maximum projected flood depth (0.15m) in the low probability event (the first event where flooding is projected at one of the dwellings), providing a 0.15m freeboard to account for any potential residual flood risk. Furthermore, raising Dwelling 1 to this FFL also provides a freeboard above the conservatively estimated future flood depths for the upper estimate (0.09m) and central estimate (0.12m) at the 1 in 1000 year + CC events. This ensures that flood risk remains tolerable under both present-day and future conditions.

In addition to the raised FFL, the proposed development includes SuDS features (raingardens, permeable paving and a detention basin/cellular storage). These features are proposed to encourage infiltration and provide additional storage capacity for the whole site to substantially reduce the likelihood and extent of surface water ponding during heavy rainfall events.

To further manage any residual risk, PFR measures are recommended along all external elevations (up to the proposed FFL) and internally of the building footprints. It must be stated that these measures are focused on dwelling 1 but also recommended for all remaining dwellings to help mitigate any future residual risk. These measures include:

- **Floor Finish:** The floor finish on the ground floor should be kept as flood resilient as possible (resin/ceramic/concrete tiles as opposed to lino/vinyl/carpet) so the floor can be easily cleaned down following any residual flooding.
- **Critical Infrastructure/Electrical Sockets:** Raise all electronic control units and sockets 0.3m above external ground levels to mitigate against any residual flooding.
- **Drainage Systems:** Routinely maintained, inspected and cleared (ensuring it is performing to optimal capacity).
- **Duct Sealing:** Seal all cables and pipes entries below FFL with duct sealing.
- **Non-Return Valves (NRV):** NRVs could be installed to all drainage outlets to mitigate against residual risk of the local drainage network surcharging.
- **Airbricks:** Utilise self-closing airbricks where possible

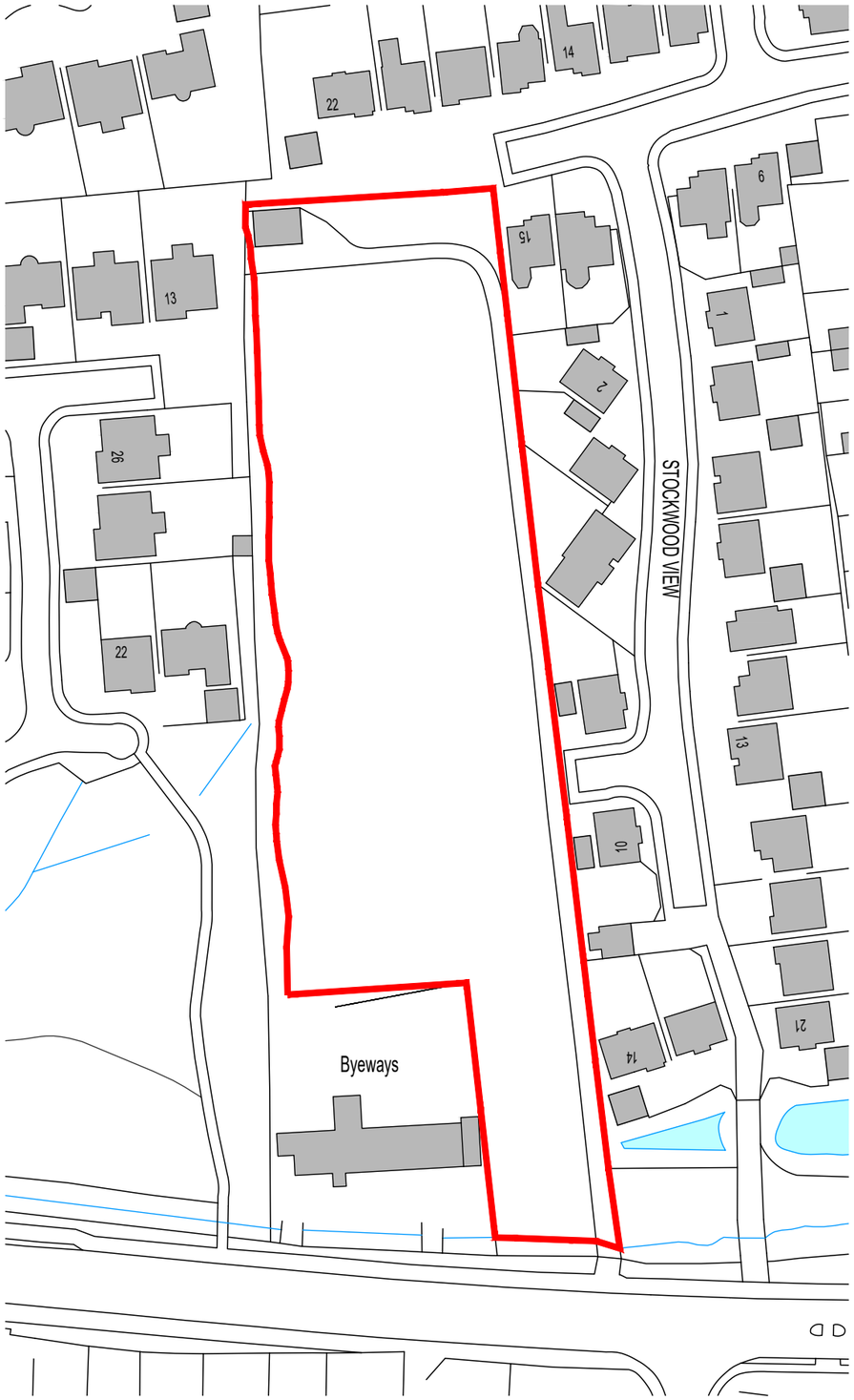
Overall, the raised FFL (dwelling 1), proposed drainage strategy, and SuDS provision ensure the whole development remains safe and resilient under the extreme low probability event.

Therefore, the proposals are not expected to adversely impact flood risk elsewhere.

This FCA has been undertaken by suitably qualified personnel.

APPENDIX A:

Site Location



Status: PLANNING

rev	date	description	by
A	09.07.25	Client name amended	CC

Drawn: MN
Checked: BJ
Date: 06.02.2019
Scale: 1:500 @ A3

Client: Harmoni Homes
Project: Langstone, Chepstow Road
Title: Site Location Plan
Ref: 2342 - 100
Rev: A

spring design
Unit 2 Chapel Barns | Merthyr Mawr
Bridgend | CF32 0LS | 01656 656267
mail@spring-consultancy.co.uk

APPENDIX B:

Proposed Site Plans

SITE KEY

- Site Boundary
- Indicates potential locations for mature tree planting
- Indicates existing trees & hedgerows
- Indicates opportunities for soft landscaping
- sw — 1.8m High brick screen wall with brick piers
- 1.8m High timber hit & miss fence
- 1.8m High lockable timber gate
- Timber lockable bicycle storage sheds

Accommodation Schedule

Ref	Description	m²	No.
1684	4 Bedroom Detached	156.5	2
1890	4 Bedroom Detached	175.6	3
2048	4 Bedroom Detached	198.5	4
	Total		9

Status: PLANNING

rev	date	description	by
A	20.05.19	Access Amended	CC
B	26.06.19	Amended Accommodation Schedule	MN
C	16.08.19	Plot 8 & 9 substituted	CC
D	08.07.20	Access amended	CC
E	22.09.20	Footpath & SUDS added	CC
F	08.10.20	Footpath amended	CC
G	24.01.21	Footpath omitted,Bin collection points & visitor spaces added	CC
H	18.06.25	Parking strategy	CC
J	09.07.25	Double garage amended	CC
K	28.10.25	Screen walls added to the rear of 1-3	CC

Drawn: MN
Checked: CTW
Date: 06.02.2019
Scale: 1:500 @ A1 & 1:1000 @ A3

Client: Harmoni Homes
Project: Langstone, Chepstow
Title: Site Layout
Ref: 2342 - 101
Rev: K

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APPENDIX C:

Drainage Strategy Plan

GENERAL NOTES:-

1. The contractor is to check and verify all buildings and site dimensions and levels, including existing sewer invert levels, before works start on site. The contractor is to comply in all aspects with the current building legislation, British Standards, building regulations etc.
2. Positions of existing services/statutory undertakers apparatus adjacent to or crossing proposed excavations are to be checked by the contractor prior to starting work.
3. This drawing is to be read in conjunction with and checked against all other drawings, engineering details, specifications and any structural, geotechnical or other specialist document provided.
4. This drawing is schematic for clarity only, positions of pipe runs and manholes may vary on site due to site conditions.
5. Where trees adjacent to the highway are proposed, root barriers of an approved type are required to prevent future structural damage to the highway.
6. Any anomaly or contradictions between any of the above is to be reported immediately to Spring Design.
7. Street Lighting to be designed by Others.

ROAD & SEWER ADOPTIONS:-

1. All works for adoption under a Section 38 agreement shall be carried out to the Highway Authority Specification for Road Construction in Residential Areas and to the approval of the Area Highway Authority.
2. The Developer must self-vet and certify that the design criteria, material standards and workmanship specifications for the proposed adoptable sewers are in accordance with those set out in "Sewers for Adoption" 7th Edition, and the requirements of the Statutory Sewerage Undertaker.
3. Subject to a Section 104 Adoption Agreement being complete, a Section 106 application to connect must be made to the Statutory Sewerage Undrtaker, the Developer shall give 21 days' notice prior to connection. The Works may only be undertaken by an SSIP Health & Safety approved contractor.
4. Any works carried out on site prior to confirmation of technical approval for Section 104 and Section 38 Agreements (including street lighting approval) are entirely at the developers risk.
5. Street lighting positions to be pegged on site and agreed by the Local Authority PRIOR to erection commencing.
6. A clause is to be included within the Section 38 Agreement requiring that, prior to adoption, the developer is to process a Traffic Regulation Order covering whatever restrictions may be determined to be necessary in relation to on-street parking restrictions within the site roads. The situation will be monitored once all new dwellings are occupied.
7. A clause is to be included within the Section 38 Agreement requiring that additional speed reducing measures are to be implemented if judged necessary by the Highway Authority in the event that excessive vehicle speeds become evident prior to adoption of the works.

DRAINAGE NOTES:-

1. All private drainage shall be in accordance with BS8301 and relevant sections of Approved Document H of the Building Regulations.
2. The contractor is to check the level of existing sewers being used as outfalls or crossing proposed drainage runs PRIOR to laying any pipes. Any discrepancies are to be reported to Spring Dsign.
3. Position of soil pipes, stubstacks, WC outlets, rainwater downpipes, etc.. positions are to be checked against the housetype working drawings.
4. Private house drainage will be flexibly jointed plastic or clay pipework. Diameter 100mm unless shown otherwise.
5. All connections for House Drainage shall be 100mm unless noted otherwise and must extend 500mm behind the back of footway/homezone road. All connections when laid shall be plugged, protected as necessary and marked with a stake for future use.
6. For private drains where cover to pipes is less than 900mm in vehicular areas or 600mm in other areas protection in the form of a 100mm thick concrete pad shall be provided over the pipe granular surround.
7. Where pipes pass through screen walls, footings or retaining walls, lintels are to be provided over. Under buildings pipes shall be surrounded with 150mm thickness of granular material. Where drains pass within 1m of buildings the wall foundation shall be taken down below the invert of the pipe.
8. Where drains do not exceed 600mm deep, plastic or clay access fittings minimum diameter 225mm shall be used. Elsewhere proprietary plastic or precast concrete inspection chambers shall be used. Unless shown otherwise FW inspection chambers are to be 750mm below dpc level and SW chambers and rodding eyes to be 600mm below dpc.
9. All gullies and rainwater downpipes connected directly to drains are to be roddable.
10. House levels shown are dpc and adjacent garage floors are to be 150mm lower unless shown otherwise. Levels at drainage access points are inverts.
11. Drainage runs should be laid at a minimum of 5.0m from the rear of properties where practical to allow for future extensions.
12. All drainage shall be laid upstream and each run between manholes shall be laid complete prior to backfilling. Where this is not practical trial holes or other means of identifying the line and level of services shall be carried out prior to works commencing.
13. All branch drains, or connections, are to discharge to the collectors obliquely, and in the direction of the main flow.
14. All low spots on hardstanding areas to have yard gullies unless permeable paving is used.

NOTE:-

This drawing is for preliminary pricing purposes only and should not be used for construction purposes. The information shown is subject to design of a satisfactory storm water strategy based upon approval by the Local SuDS Adopting Body (SAB)

KEY

- Foul Water Drain (Non-Adoptable)
- Foul Water Sewer (Adoptable)
- Existing Foul Water Sewer
- Type 4 FW Inspection Chamber (Non-Adoptable)
- Type 3 FW Inspection Chamber (Non-Adoptable)
- Type 4 FW Inspection Chamber (Adoptable)
- Type 3 FW Inspection Chamber (Adoptable)
- Foul Water Manhole (Adoptable)
- Surface Water Drain (Non-Adoptable)
- Rodding Eye Chamber (Non-Adoptable) Invert Level Indicated
- Type 3 SW Inspection Chamber (Non-Adoptable) Invert Level Indicated
- Type 4 SW Inspection Chamber (Non-Adoptable) Invert Level Indicated
- Orifice Control Chamber
- 83.00 Proposed FFL
- Permeable paving (500mm min depth Sub-Base)
- Direction of flow above ground (hardstanding)
- Rain Garden (Private)
- Rain Garden (Adoptable)

rev	date	description	by
-	-	-	-

Status: **PLANNING**

Drawn: MCC
Checked: MCC
Date: Jan 2025
Scale: 1:250@A1

Client: Harmoni Homes
Project: Chepstow Road, Langstone
Title: Drainage Strategy Plan
Ref: 2342 / 1500
Rev: /

spring design
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APPENDIX D:

Trial Pit Exploratory Hole Log

Intégral Géotechnique
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mail@integralgeotec.com

Project Name:	Project No.:	Trial Pit No.:
Land off A48 Chepstow Road	**12430**	**TP1** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Langstone	Waterstone Homes	LW	1:25

Equipment:	Coordinates:	Dimensions
JCB 3CX		2.80m; Depth : 2.50m; 0.70m
Date Excavated: 09/05/2019	Level:	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			Topsoil/Disturbed Ground: Brown slightly gravelly silty CLAY with plant remains and rare fine brick fragments.
			0.80			Soft to firm yellow brown slightly gravelly silty CLAY. Gravel is fine to coarse angular to subangular of mudstone and sandstone.
			1.60			Firm/medium dense red brown locally green grey silty gravelly CLAY, locally clayey gravel. Gravel is fine to coarse angular to subangular of mudstone and sandstone.
			2.50			Firm red brown locally mottled green grey sandy silty CLAY.
						End of Trialpit at 2.50 m

Remarks:

1. Trial pit terminated at 2.5m bgl for soakaway testing.

Groundwater: Wet/damp below 1.6m and groundwater encountered at 2.1m.

Stability: Stable

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Project Name:	Project No.:	Trial Pit No.:
Land off A48 Chepstow Road	**12430**	**TP2** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Langstone	Waterstone Homes	LW	1:25

Equipment: JCB 3CX

Coordinates:

Dimensions 2.80m

Depth : 2.40m

0.70m

Date Excavated: 09/05/2019

Level:

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			Topsoil/Disturbed Ground: Brown slightly sandy slightly gravelly silty clay with plant remains, siltstone gravel and rare ceramic and aggregate fragments.
			0.70			Firm, locally soft to firm, medium strength grey to grey brown silty CLAY. .. shear vane at 0.6m: 70, 70, 74kPa.
1.20	D					Firm red brown locally green grey silty CLAY with mudstone lithorelicts.
			2.40			End of Trialpit at 2.40 m

Remarks:
1. Trial pit terminated at 2.4m bgl for soakaway test

Groundwater: Groundwater encountered at 1.8m

Stability: Stable

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Project Name:	Project No.:	Trial Pit No.:
Land off A48 Chepstow Road	**12430**	**TP3** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Langstone	Waterstone Homes	LW	1:25

Equipment: JCB 3CX

Coordinates:

Dimensions 2.90m

Depth : 2.50m

0.70m

Date Excavated: 09/05/2019

Level:

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			Topsoil/Disturbed Ground: Sparse vegetation onto brown slightly gravelly silty clay with rare rootlets, plant remains and very rare ceramic fragments.
						Soft to firm orange grey brown silty CLAY.
0.50	ES		0.50			Firm red brown locally mottled green grey silty CLAY with mudstone lithorelicts.
						... Firm to stiff from 1.2m.
			2.50			End of Trialpit at 2.50 m

1
2
3
4
5

Remarks:

1. Trial pit terminated at 2.5m bgl for soakaway testing.

Groundwater: Groundwater encountered at 2.2m.

Stability: Stable

Key:

D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

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Project Name:	Project No.:	Trial Pit No.:
Land off A48 Chepstow Road	**12430**	**TP4** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Langstone	Waterstone Homes	LW	1:25

Equipment: JCB 3CX

Coordinates:

Dimensions 2.80m

Depth : 2.00m

0.70m

Date Excavated: 09/05/2019

Level:

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES					Topsoil: Sparse vegetation onto brown slightly silty clay with sparse rootlets and plant remains.
			0.30			Soft to firm yellow grey brown slightly sandy silty CLAY.
			0.50			Firm medium strength red brown locally mottled green grey silty CLAY. ... shear vane at 0.6m: 70, 74, 72kPa. ... mudstone lithorelicts below 1.5m.
			2.00			End of Trialpit at 2.00 m

Remarks:
1. Trial pit terminated at 2.0m bgl for soakaway test.

Groundwater: Groundwater encountered at 1.6m.

Stability: Stable

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Project Name:	Project No.:	Trial Pit No.:
Land off A48 Chepstow Road	**12430**	**TP5** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Langstone	Waterstone Homes	LW	1:25

Equipment:	Coordinates:	Dimensions
JCB 3CX		2.80m; Depth : 2.50m; 0.70m
Date Excavated: 09/05/2019	Level:	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.20			Topsoil/Disturbed Ground: Brown slightly sandy gravelly silty clay. Gravel is fine to coarse angular to subangular of siltstone and sandstone and very rare fine brick fragments.
0.40	ES		0.60			Soft to firm orange brown slightly sandy silty CLAY.
1.20	D		2.20			Firm, possibly locally soft to firm silty CLAY with local lenses of mudstone and some sandstone gravel.
			2.50			Medium dense red brown slightly clayey to clayey silty slightly sandy to sandy GRAVEL. Gravel is fine to coarse angular to subangular and tabular of mudstone and sandstone.
						End of Trialpit at 2.50 m

Remarks:
1. Trial pit terminated at 2.5m bgl.

Groundwater: Wet/damp from 1.0m and groundwater encountered at 2.0m.

Stability: Stable

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Project Name:	Project No.:	Trial Pit No.:
Land off A48 Chepstow Road	**12430**	**TP6** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Langstone	Waterstone Homes	LW	1:25

Equipment:	Coordinates:	Dimensions
JCB 3CX		2.90m; Depth : 3.50m; 0.70m
Date Excavated: 09/05/2019	Level:	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.15			Topsoil/Disturbed Ground: Brown slightly sandy silty clay with some plant remains and very rare brick fragments.
						Soft to firm grey brown slightly sandy slightly gravelly silty CLAY. Gravel is fine to coarse angular to subangular of mudstone.
			0.60			Firm red brown locally mottled green grey gravelly silty CLAY. Gravel is fine to medium angular to subangular of mudstone.
1.20	D					
			2.00			Firm red brown sandy slightly gravelly to gravelly silty CLAY. Gravel is fine to coarse angular to subangular of mudstone and some sandstone. ... very gravelly from 3.1m.
			3.50			End of Trialpit at 3.50 m

Remarks:
1. Trial pit terminated at 3.5m bgl.

Groundwater: Wet from 1.5m and groundwater encountered at 2.3m.

Stability: Spalling below 2.8m

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

Intégral Géotechnique
Intégral House, 7 Beddau Way
Castlegate Business Park
Caerphilly CF83 2AX
Tel. 029 20807991
Fax. 029 20862176
mail@integralgeotec.com

Project Name:	Project No.:	Trial Pit No.:
Land off A48 Chepstow Road	**12430**	**TP7** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Langstone	Waterstone Homes	LW	1:25

Equipment:	Coordinates:	Dimensions
JCB 3CX		2.80m; Depth : 2.90m; 0.70m
Date Excavated: 09/05/2019	Level:	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
			0.15			Topsoil/Disturbed Ground: Brown slightly sandy silty clay with some plant remains and very rare brick fragments.
						Soft to firm orange grey brown slightly sandy silty CLAY.
0.40	ES					
			0.60			Firm, medium strength, red brown locally green grey silty CLAY with frequent mudstone lithorelicts.
						... shear vane at 0.7m: 70, 72, 74kPa.
			2.90			End of Trialpit at 2.90 m

Remarks:
1. Trial pit terminated at 2.9m bgl.

Groundwater: Groundwater encountered at 2.5m.

Stability: Spalling below 2.5m.

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

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Project Name:	Project No.:	Trial Pit No.:
Land off A48 Chepstow Road	**12430**	**TP8** Sheet 1 of 1

Location:	Client:	Logged By:	Scale
Langstone	Waterstone Homes	LW	1:25

Equipment:	Coordinates:	Dimensions
JCB 3CX		2.50m; Depth : 2.70m; 0.70m
Date Excavated: 09/05/2019	Level:	

Samples & In-situ Testing			Depth (m)	Level (m AOD)	Legend	Stratum Description
Depth (m)	Type	Results				
0.10	ES		0.15			Topsoil: Brown slightly sandy silty clay with some plant remains.
						Soft to firm, medium strength mottled yellow grey brown silty CLAY.
						... shear vane at 0.5m: 50, 52, 50kPa.
			0.70			Firm red brown, locally green grey silty CLAY with sand lenses and mudstone lithorelicts.
1.20	D					...firm to stiff below 2.0m.
			2.70			End of Trialpit at 2.70 m

Remarks:
1. Trial pit terminated 2.7m bgl.

Groundwater: Groundwater encountered below 2.4m.

Stability: Spalling below 2.4m

Key:
D - Small disturbed sample
B - Bulk disturbed sample
ES - Environmental soil sample
W - Water sample

AGS

APPENDIX E:

NRW Personal Flood Plan

Personal flood plan

Before a flood

You can find more information about how to prepare online at naturalresources.wales/prepareforflood

Check your flood risk

You can find out the flood risk in your area by using the 'Check your flood risk by postcode' service or viewing the map online at naturalresources.wales/flooding. Or contact Natural Resources Wales's General Enquiries **0300 065 3000** or enquires@naturalresources.wales to request a hard copy to be sent to you.

Source of flooding	**Level of risk** **(High, medium, low or very low risk)**
Flooding from rivers	
Flooding from the sea	
Flooding from surface water and small watercourses	

This risk level takes into account the effect of any flood defences that may be in this area.

Sign up for flood warnings

Check if you can sign up for free flood warnings and alerts for flooding from rivers or the sea online at naturalresources.wales/flooding or contact Floodline **0345 988 1188** or **Type talk: 0345 602 6340.**

Flood code	**What could be happening**	**Actions to take**	**Your area**
 **Flood Alert** Flooding is possible, be prepared.	• Flooding of fields, recreation land and car parks • Flooding of minor roads • Flooding of farmland • Spray or wave overtopping on the coast • Low lying land and roads will be affected first	• Prepare your home, business or farm for a flood • Monitor local river levels online and the 5 day flood risk • Farmers should consider moving livestock and equipment away from areas likely to flood	Quickdial:
 **Flood Warning** Flooding is expected; immediate action is required.	• Flooding of homes and businesses • Flooding of rail infrastructure and roads • Significant waves and spray on coast • Extensive flood plain inundation (including caravan parks and campsites)	• Move family, pets and valuables to a safe place • Turn off gas, electricity and water supplies if it is safe to do so • Put flood protection equipment in place	Quickdial:
 **Severe Flood Warning** Danger to life.	• Deep and fast flowing floodwater • Debris in the water causing danger • Potential or observed collapse of buildings and structures • Communities isolated by floodwaters • Critical infrastructure for communities disabled • Communities evacuated • Military support	• Stay in a safe place with a means of escape • Be ready to leave your home • Cooperate with the emergency services • Call 999 if you are in immediate danger	Quickdial:

Find out how to turn off electricity, water and gas

Service	Description of location (delete or amend as appropriate)
Electricity	*Your electricity main is usually a red switch on your fuse box.*
Gas	*The gas valve is usually located next to your gas meter.*
Water	*Your water stopcock is usually under a kitchen sink or where the water pipe enters your home.*

Pack a flood kit

Discuss as a household what you would like to pack in a flood kit. There are suggestions below and you can add anything extra you need.

Copy of your flood plan (with useful numbers completed)		a first aid kit and prescription medication	
copies of your insurance documents		bottled water and non-perishable food	
a phone charger and battery pack		warm, waterproof clothing and blankets	
a torch with spare batteries		rubber gloves and wellington boots	
a radio – on your phone or battery operated		face masks and hand sanitiser	
baby food and baby care items		pet supplies	

Who can help / who can you help?

Identify friends, family or neighbours who could help you, or who you could help in the event of a flood. This could be to help moving possessions or providing somewhere else to stay if necessary.

Name	Contact details	How can they help or how can you help?

Plan what to do in an emergency situation

Write down the relevant information below for you.

Where to move cars: Identify areas outside flood risk area**.**	
Alternative communication methods: If power, mobile networks or landlines are disrupted.	
Safe places to meet: In the event of a flood, you can use this meeting place if you're not able to get in touch.	

Protect your property and belongings

Consider getting a chartered surveyor to carry out a flood survey. This will tell you where floodwater might enter your property, how fast it will flow and where it could cause the worst damage. The surveyor can then use this information to help you choose the best flood protection for your property. Installing the wrong flood protection products could mean they are ineffective, or even cause more damage in a flood.

Choose BSI kitemark certified flood protection products online at kitemark.com that meet the British standard for quality and safety.

You can also make changes to your property that will make it easier and cheaper to clean up if you do flood.

Follow the guidance and checklists in the property resilience Code of Practice online at ciria.org/pfr. To make sure the surveys, installations or building work are completed to the correct standard.

More information is available at naturalresources.wales/flooding or contact Floodline **0345 988 1188** or **Type talk: 0345 602 6340.**

More steps you can take now

Check insurance for home and vehicle covers you for flooding and the details of the policy. For example if it replaces or repairs items, or if it includes temporary accommodation if you can't stay in your home	
Take photos of your property and make a list of your belongings to help with future insurance claims	
Keep important and sentimental items in a safe place all year round (upstairs or on a shelf in a waterproof container)	
Plan what to do in an emergency, including a safe place to move yourself, family and pets to	
Check your local authority's evacuation centre procedure (for example, if pets are allowed)	
If you or a relative live in sheltered housing or assisted living, check with the warden or building manager if they have an emergency plan to keep you safe in the event of a flood	
If you or a relative relies on water, gas or electricity for medical reasons or other reasons. Sign up to the priority register with the supplier	
If there's a watercourse on or by the property or land you own, it is your responsibility to manage the flood risk. Find out about your responsibilities at naturalresources.wales/flooding	

During a flood

You can find more information about what to do in a flood online at naturalresources.wales/inaflood

Contacts and sources of information

In an emergency

- Call the emergency services **999**
  - The police have general control and co-ordination of response
  - Ambulance service for medical assistance
  - Fire and Rescue or Coastguard complete rescue operations
- Call the RSPCA emergency line **0300 1234 999** for animal rescues. Do not put your life or someone else's life in danger to attempt an animal rescue

If flooding is happening

- For information about the live flooding situation and advice call Floodline **0345 988 1188** or **Type talk: 0345 602 6340** (for the hard of hearing)
  naturalresouces.wales/flooding
- To report flooding inside a property or find out the response to the flooding in your area contact your Local Authority. Make a note of their details below:

Emergency telephone number:

Social media:

- To report or to get information about power cuts call **105**
- To report a gas or carbon monoxide emergency call **0800 111 999**
- To find out about road closures check with your local authority, or for motorways and trunk roads call Traffic.wales **0300 123 1213**
- To find out about impacts on public transport call Traveline.cymru **0800 464 00 00**

Live information

Online
5 day flood risk forecast for Wales: 5-day-flood-risk.naturalresources.wales
Flood warnings and alerts: flood-warning.naturalresources.wales
River levels, sea and rainfall: rivers-and-seas.naturalresources.wales

Telephone
Floodline is a 24/7 flood information service for Wales, England and Scotland.
Call **0345 988 1188** or **Type talk: 0345 602 6340** (for the hard of hearing)

Social media
Make a note of the social media accounts for organisations below. This could include your local authority, local police force, fire service or your water company:

twitter.com/NatResWales facebook.com/NatResWales

Make a note of social media accounts for local community groups below:

Radio
Make a note of local radio stations for relevant updates below:

Actions to take if you are about to flood

Listen to the advice of the emergency services	
Prepare to leave your home	
Contact the people that can help you	
Get your flood kit	
Prepare to move people and pets in your property to a safe place	
Move important, sentimental and valuable items	
Put flood gates and other protection equipment in place	
Turn off gas, electricity, and water - Do not touch plugs and other sources of electricity when standing in floodwater	
Block water entering through doors and windows with plastic bags filled with soil or other heavy objects	
Cover airbricks and vents	
Block sinks, baths and toilets and weigh down with heavy objects	
Unplug washing machines and dishwashers and disconnect them from the water supply. Block water inlet pipes with towels or cloths	
Move rugs, electrical items like laptops or computers, and lightweight items of furniture	
Throw curtains over the rail out of reach of floodwater, or remove them if you have time	
Lift items you can’t move with bricks or a pallet and cover the bottom with plastic	
Empty and move contents from kitchen base units and other low storage cupboards, to worksurface level or higher if possible	
Consider moving contents from your fridge or freezer to a higher place	
Move your car to higher ground or outside the flood risk area	
Any outside garden furniture or trampolines should be made secure	
Contact the people that you can help	

After a flood

You can find more information about what to do after a flood online at naturalresources.wales/afterflood

Stay safe

Never walk or drive through floodwater. It can sweep you off your feet, lift cars and carry other objects. Floodwater is often contaminated and it can hide dangers like open manholes.

Stay away from impacted areas. Floodwater may have damaged structures like bridges and riverbanks, and left large amounts of debris.

Turn around and find another route if a road is flooded, and respect road closure signs. Driving through floodwater is not only dangerous for yourself, but it can also worsen the problems of flooding in area, as a vehicle driving pushes waves of floodwater towards other vehicles and buildings.

If your property has flooded

- Contact your insurer and follow their advice
- If you rent your property, contact your landlord or agent and ask what their insurance covers for flooding
- If you do not have insurance, your local authority can provide information on hardship grants or charities that may be able to help you
- Contact your local authority if floodwater entered your property so they are aware of the impacts and can advise on any support available locally
- Check with the emergency services if it is safe to re-enter your property, floodwater may have damaged structures and buildings – your property may not be safe
- There could be damage to the electricity, gas or water supply. Do not turn it on before seeking professional advice

Your local authority can support you with

- Emergency accommodation if you can't stay in your home
- Information on hardship grants or charities that may be able to help you if you don't have insurance
- Community flood recovery grants
- Council tax exemptions
- Waste collections, including disposal of contaminated sandbags (that have been in contact with floodwater, sewage, or fuel)

Report flooding

Source of flooding	**Organisation and contact details**
• Main rivers • Sea • Internal Drainage Districts • If you're not sure where the water is coming from	**Natural Resources Wales** Call 24/7 incident line **0300 065 3000** or report a flood online naturalresources.wales/reportit
• Surface water • Ordinary watercourses • Roads (like gullies, the drain inlet by kerb)	**Your local authority** Emergency contact:
• Burst water main • Sewers	**Your water company** Water: Sewerage:
• Motorways and trunk roads	Traffic Wales Call **0300 123 1213**

Important contact details

Organisation	Contact details
Insurance for your home and vehicle	**Your buildings, contents and/or car provider phone numbers** Buildings: Contents: Vehicle: **Note your policy numbers** Buildings: Contents: Vehicle:
If you rent your property – note the details of your landlord or letting agent	**Your landlord or letting agent** Emergency contact:
Local Authority	**Your local authority** Emergency contact:
Electricity	**Your provider** Emergency contact:
Gas	**Your provider** Emergency contact:
Work	Contact:
School or nursery	Contact:
Doctor's surgery	Contact:
Vet, kennel or cattery	Contact:
Family or neighbours	Contact:

Where to find help

Physical and mental health

Advice about keeping physically and mentally well is available online at phw.nhs.wales

Whether you have just experienced flooding for the first time, or you've flooded before, it's a scary experience and can be traumatic. Being flooded is stressful, and you may feel a wide range of emotions.

Public Health Wales give the following advice:

- Do not underestimate the stress and strain of being flooded and cleaning up after floods. Take time to consider your and your family's mental health and wellbeing
- Do not overdo it when cleaning up, and remember that tiredness, difficulty sleeping and anxiety are normal in these circumstances
- Anyone with concerns for their own health, or a loved one's should contact their GP for advice or call **111**

There are also a number of organisations that can help if you are feeling down or anxious:

- Samaritans is available day or night, for anyone who's struggling to cope: samaritans.org or call **116 123**
- CALL is a free confidential listening and support service: callhelpline.org.uk, call **0800 132 737** or text the word HELP to **810666**
- Mind is a charity which provides confidential mental health information service: mind.org.uk or call **0300 123 3393**
- Meic Cymru is a free, confidential helpline for children and young people up the age of 25: meiccymru.org, call **0808 80 23456** or text **84001**

Financial support

- You may be able to apply for the Emergency Assistance Payment grant from Welsh Government: gov.wales/discretionary-assistance-fund-daf or call **0800 859 5924**

Advice and practical support

- National Flood Forum is a charity that helps support people at risk of flooding: nationalfloodforum.org.uk or call **01299 403 055**
- Shelter Cymru is a charity that provides free independent housing advice: sheltercymru.org.uk or call **08000 495 495**
- British Red Cross is a charity that provides support to people after a crisis: redcross.org.uk or call **03448 711 111**
- Citizens Advice Bureau offers confidential advice: citizensadvice.org.uk or call **03444 772 020**
- Association of British Insurers have advice on what to expect from your insurer: abi.org.uk/products-and-issues/topics-and-issues/flooding
- Flood Re is designed to help people living in flood risk areas have more options for affordable insurance. Check with your insurer if they are signed up to the 'Build Back Better scheme', which offers options to install Property Flood Resilience measures up to the value of £10,000: floodre.co.uk

Contact Natural Resources Wales if you have any general queries or find out more online at naturalresources.wales/flooding**,** call **0300 065 3000** or email enquiries@naturalresources.wales