

**Flood Consequences Assessment (FCA) For:**

**170 – 172 Commercial Road**

**Newport**

**NP20 2PL**

**Prepared for:**

**S&B Developments Ltd**

**July 2024**

## Document Control

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### Document Checking:

Prepared By: L Davies

Signed:



Checked By: R Peskett

Signed:



Verified By: S Hardacre

Signed:



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## Purpose of the report

Vale Consultancy has been instructed by *The Client* to prepare a Flood Consequences Assessment (FCA) report to accompany a planning application for the proposed redevelopment of 170 – 172 commercial road (“The Site”) for retail and residential use.

The assessment has been undertaken in accordance with the requirements of Technical Advice Note 15 (TAN 15) dated July 2004 and taking into account the revised (draft version) of TAN 15 (January 2023).

## **1 INTRODUCTION**

### **1.1 Site Location**

The site is located east of Alma Street, north of Francis Street and west of Commercial Road at Ordnance Survey National Grid Reference ST 314 872.

### **1.2 Existing and Proposed Development**

The existing use of the site was previously used as a *Kwiksave* store on the ground floor with a service yard to the north and car parking to the south of the building. The first floor of the building was formerly used as office spaces.



*Figure 1 : Satellite Imagery of Existing Site*

Refer to the Proposed Development Plans, Appendix B.

The proposals are for a new shopfront, conversion of the first floor offices and roof-space to create 8 no. flats , renovation of existing car park , external shop loading area , security boundary fencing and walls. The application proposes the change of use from offices to residential flats. TAN15 classifies residential development as highly vulnerable development. The retail use of the ground floor is less vulnerable development.

### 1.3 Existing Topography

A topographic survey of the site has been undertaken by PM Consultants (UK) Ltd in June 2024 and LiDAR data has been used to develop a digital terrain model of the site and surrounding area.

Ground levels of the existing building are indicated to be in the region of 8.50 – 8.80 m AOD with levels generally rising from east to west. A Finished Floor Level (FFL) of 8.56 m AOD is indicated on the topography for the ground floor of the building and it has been assumed that the first floor will be located 2.3 m above this ground floor level as such to meet building regulations. Therefore, the minimum FFL of the first floor residential development is assumed to be in the region 10.86 m AOD.

Ground levels of the existing service area are in the region of 8.45 – 8.80 m AOD with levels generally rising to the south / southwest. A FFL has been indicated from the topographic survey for the service area and is recorded as 8.58 m AOD.

Ground levels of the existing car park are in the region of 8.20 – 8.50 m AOD.

Ground levels on access from commercial road are indicated to be in the region of 8.40 – 8.60 m AOD.

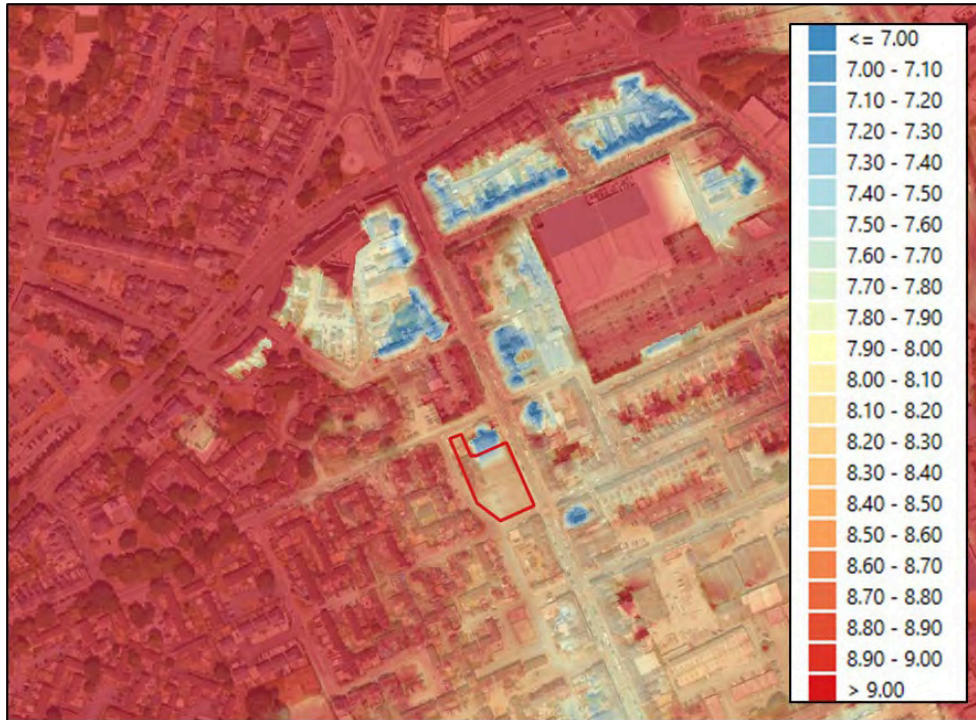


Figure 2 : LiDAR Map

#### 1.4 Existing Ground Conditions

According to Soilscape's soils dataset produced by the Cranfield Soil and AgriFood Institute, soil conditions at the site and within the surrounding area are described as loamy and clayey soils of coastal flats with naturally high groundwater.

British Geological Mapping of surface geology indicates the underlying bedrock formation comprises St Maughans Formation – Argillaceous rocks and sandstone, interbedded overlain by Tidal Flat Deposits – Clay and silt.

According to the British Geological Survey and Natural Resources Wales aquifer designation dataset the superficial deposits are described as an Unproductive aquifer whilst the bedrock is classified as a Secondary A aquifer. The site is not shown to be located in a designated groundwater source protection zone.

#### 1.5 Existing Site Drainage

The existing site and surrounding area are served by a positive and longstanding formal drainage infrastructure network.

#### 1.6 Proposed Drainage

The existing drainage system will be retained and designed in accordance with national and regional policy, guidance and legislation.

## 2 PLANNING POLICY

### 2.1 National Policy

Future Wales – The National Plan 2040 sets out the national 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.”

Planning Policy Wales (PPW) sets out the government’s planning policies for Wales and how these are expected to be applied. TAN15 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 at high risk of flooding by:

- Directing new development away from high risk areas
- Where development has to be considered in high risk areas (Zone C) only those developments which can be justified should be located in these areas

In accordance with paragraph 6 of TAN15, development will only be justified if it can be demonstrated that:

- 1) Its location in Zone C is necessary for local authority regeneration
- 2) Its location in Zone C contributes to key employment objectives

And,

- i) It meets the aims of PPW and meets the definition of previously developed land (PPW Figure 2.1; and,
- ii) The potential consequences of a flooding event for a particular type of development have been considered , and in terms of the criteria contained in sections 5 and 7 and Appendix 1 found to be acceptable

A revised version of TAN15 and updated Flood Map for Planning are due to be published in the near future ( albeit the timing is yet to be confirmed by Welsh Government ). The Flood Map for Planning currently holds no formal weight as it is not yet national policy , but Welsh Government advise this is the best available information.

National Policy requires that planning applications for new development proposals should incorporate sustainable drainage systems (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 is equal to or greater than 100m<sup>2</sup>. These standards set out how surface water runoff generated during the present day 1 in 1, 1 in 30 and 1 in 100 AEP rainfall events and for events exceeding the present day 1 in 100 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 SuDS Approval Body (SAB) before construction.

## 2.2 Local Planning Policy

### Newport City Council Local Development Plan 2011 -2026 (January 2015)

The Local Development Plan (LDP) is the development plan for Newport and is the basis for land use planning within the council's administrative area. The following policies refer to flood risk and drainage and are mentioned below:

#### SP1 – Sustainability

PROPOSALS WILL BE REQUIRED TO MAKE A POSITIVE CONTRIBUTION TO SUSTAINABLE DEVELOPMENT BY CONCENTRATING DEVELOPMENT IN SUSTAINABLE LOCATIONS ON BROWNFIELD LAND WITHIN THE SETTLEMENT BOUNDARY. THEY WILL BE ASSESSED AS TO THEIR POTENTIAL CONTRIBUTION TO:

MINIMISE THE RISK OF AND FROM FLOOD RISK, SEA LEVEL RISE AND THE IMPACT OF CLIMATE CHANGE;

#### SP3 – Flood Risk

NEWPORT'S COASTAL AND RIVERSIDE LOCATION NECESSITATES THAT DEVELOPMENT BE DIRECTED AWAY FROM AREAS WHERE FLOOD RISK IS IDENTIFIED AS A CONSTRAINT AND ENSURE THAT THE RISK OF FLOODING IS NOT INCREASED ELSEWHERE. DEVELOPMENT WILL ONLY BE PERMITTED IN FLOOD RISK AREAS IN ACCORDANCE WITH NATIONAL GUIDANCE. WHERE APPROPRIATE A DETAILED TECHNICAL ASSESSMENT WILL BE REQUIRED TO ENSURE THAT THE DEVELOPMENT IS DESIGNED TO COPE WITH THE THREAT AND CONSEQUENCES OF FLOODING OVER ITS LIFETIME. SUSTAINABLE SOLUTIONS TO MANAGE FLOOD RISK SHOULD BE PRIORITISED.

Flood risk management is a clear consideration for the LDP due to Newport's coastal location, the River Usk and the complex *reen* systems on the Gwent Levels. The tidal limit of the Usk extends beyond Newport's boundary making tidal and fluvial flood risk a key concern for a high proportion of the Authority area. In addition to tidal and fluvial flood risk developers must also consider their effect on surface, groundwater and flood risk from artificial sources, including reservoirs and canals. Watercourses within the Internal Drainage Board (IDB) area must not be culverted and development must avoid obstructing the water course by providing a buffer zone of 12.5m minimum for reens and 7m minimum for field ditches in order to allow on-going maintenance. It is recommended that developers seek advice and information from Natural Resources Wales, the Local Authority and Internal Drainage Board where relevant.

A Strategic Flood Consequence Assessment (SFCA) has been undertaken to collate and refine the extensive amount of existing information on flood risk within Newport to inform policy production, namely Policies SP3 Flood Risk and GP1 Climate Change and site selection. There are a range of statutory and non-statutory plans and strategies which affect how flood risk is to be managed by the LDP. The development of coastal strategies (Shoreline Management Plan) and catchment focused strategies (Catchment Flood Management Plans for River Usk and Eastern Valleys) deal with a range of flooding issues and a consistent approach towards such a complex issue is required and will be brought together in the SFCA. The Plan sets out its approach to planning within its Coastal Zone in Chapter 4.

There is a clear requirement to address the issue of flood risk and flood resilience and resistance measures in developments. The Plan sets out its approach to flood risk in Policy GP1: Climate Change.

### GP1 – Climate Change

#### DEVELOPMENT PROPOSALS SHOULD:

- i) BE DESIGNED TO WITHSTAND THE PREDICTED CHANGES IN THE LOCAL CLIMATE AND TO REDUCE THE RISK OF FLOODING ON SITE AND ELSEWHERE BY DEMONSTRATING WHERE APPROPRIATE THAT THE RISKS AND CONSEQUENCES OF FLOODING CAN BE ACCEPTABLY MANAGED, INCLUDING AVOIDING THE USE OF NON-PERMEABLE HARD SURFACES;
- ii) BE DESIGNED TO MINIMISE ENERGY REQUIREMENTS AND INCORPORATE APPROPRIATE RENEWABLE, LOW OR ZERO CARBON ENERGY SOURCES, INCLUDING ON SITE ENERGY PROVISION WHERE PRACTICABLE;
- iii) BE DESIGNED TO REUSE OR RECYCLE EXISTING CONSTRUCTION MATERIALS PRESENT ON THE SITE;
- iv) MEET THE RELEVANT BREEAM OR CODE FOR SUSTAINABLE HOMES LEVEL.

The sustainable development agenda is something that can be pursued at all levels, from global to local. Planning Policy Wales notes that tackling climate change is a fundamental part of delivering sustainable development. National guidance continues to outline how the planning system can play an important part in improving the sustainability of new developments whilst also tackling climate change. Therefore, the overall strategy that the Plan seeks to pursue has been developed in accordance with sustainability principles, and this Policy seeks to carry that through into individual developments, whether large or small.

Flood risk is a key concern for Newport due to its coastal proximity and its location on the River Usk. Legislation and Regulations set clear expectations for flood risk management, and these include The Flood and Water Management Act (2010), or as amended, and European Flood Regulations (2009). There is a clear requirement for developers to address the issue of flood risk and flood resilience in developments in line with TAN 15: Development and Flood Risk (2004) Flood mitigation and ancillary works associated with managing flood risk will be required to consider their impact upon sensitive environments as set out in Policy GP5 of the Plan.

Development will be directed away from flood risk areas, and layouts and buildings will be expected to incorporate high quality, sustainably designed systems. The use of Sustainable Drainage Systems (SUDS) is encouraged where appropriate. Policy SP4 sets out the Plan's consideration for the use of SUDS.

Development proposals may not only be at risk of flooding themselves, but may also exacerbate existing or create new flooding problems on other land or property through reductions in floodplain storage capacity or by impeding flood flows. Developers must ensure that flood flows and storage areas are not compromised. The impact of climate change and sea level rise will require continued and improved flood risk management schemes. Developments must reflect a lifetime appropriate standard of design. In the case of residential development 100 years is required and for employment and industrial development 75 years.

New developments may result in a substantial increase in surface water run-off as permeable surfaces are replaced by impermeable surfaces such as roofs and paving. As well as a consequent reduction in groundwater infiltration this can also result in risks of flooding downstream. Other consequential effects include increased pollution, silt deposition, damage to watercourse habitat and river channel instability. Developments will therefore only be permitted where the Council is satisfied that suitable mitigation measures and provision for the long term maintenance of these measures are included as an integral part of the development. All alleviation works must be detailed as part of the planning application.

General resource efficiency of energy, heat and water is an important element of good design. Minimising resource demand has huge benefits, including assisting meeting UK targets to tackle climate change, reducing pressure on local resources such as water resources, and reducing long term running costs to individual householders. Detailed guidance referring to standards and design advice on how to achieve energy efficiency in buildings and developments is set out in Planning Policy Wales (2014)28, and TAN 8: Planning for Renewable Energy (2010) 29. Government guidance sets out the level that is currently required.

Green roofs and green walls are a sustainability measure that can provide social and economic benefits as they: help to soften the urban environs; mitigate for the urban heat island effect; filter airborne and gaseous pollutants; help to absorb noise pollution; provide a public amenity / green space; and are aesthetically pleasing. Green roofs and walls also benefit the sustainability of the building itself by helping to regulate internal building temperatures and recycle rainwater. They can contribute to more innovative design scheme. They also contribute to green infrastructure more generally, which will help our environment adapt to the impacts of climate change, as well as helping to mitigate the causes. In addition green walls and roofs can also provide opportunities for biodiversity in buildings and provide a valuable part of a wider SUDS scheme.

### 2.3 Water Framework Directive

The Water Framework Directive provides a legal framework for the protection , improvement and sustainable use of inland surface waters , groundwater and coastal waters across Wales and aims to :

- Prevent deterioration in the status of aquatic ecosystems , protect them and improve the ecological of waters
- Achieve at least “good” status for all waterbodies by 2015
- Conserve habitats and species that depend directly on water
- Progressively reduce or phase out the release of individual pollutants that present threats and risks to Aquatic biodiversity
- Contribute to mitigating the risk of floods and droughts

The WFD applies to any proposed development which has the potential to impact on a waterbody (ies).

### 2.4 Environmental Permitting and Land Drainage Consents

Under the Environmental Permitting Regulations 2016 , an Environmental Permit for Flood Risk Activities is required from Natural Resources Wales for any permanent or temporary works, including works:

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

### 3 SOURCES OF FLOODING AND PROBABILITY

#### 3.1 Historical Records of Flooding

The Flood Map for Planning – Recorded Flood Extents and associated database and indicates that there has been no record of historic flooding at or within the vicinity of the site.

#### 3.2 Flood Risk from the Sea (Tidal)

Figure 1 of TAN15 defines three development advice zones:

- Zone A: Considered to be at little or no risk of fluvial / coastal flooding
- Zone B: Areas known to have been flooded in the past evidenced by sedimentary deposits
- Zone C: Based on Natural Resources Wales flood outline, equal to or greater than 0.1% (river, tidal or coastal). Zone C is subdivided into two zones:
  - 1) Zone C1: Areas of the floodplain which are developed and served by significant infrastructure
  - 2) Zone C2: Areas of the floodplain without significant defence infrastructure.

The Development Advice zones are shown on the Development Advice Map and are defined by the predicted extent of the 1 in 1,000 (rivers and sea) AEP event (zone C) and the British Geological Survey drift data (Zone B). The zones do not take into account the possible impact of climate change.

The Development Advice Map indicates the site to be located within zone B (Figure 3)

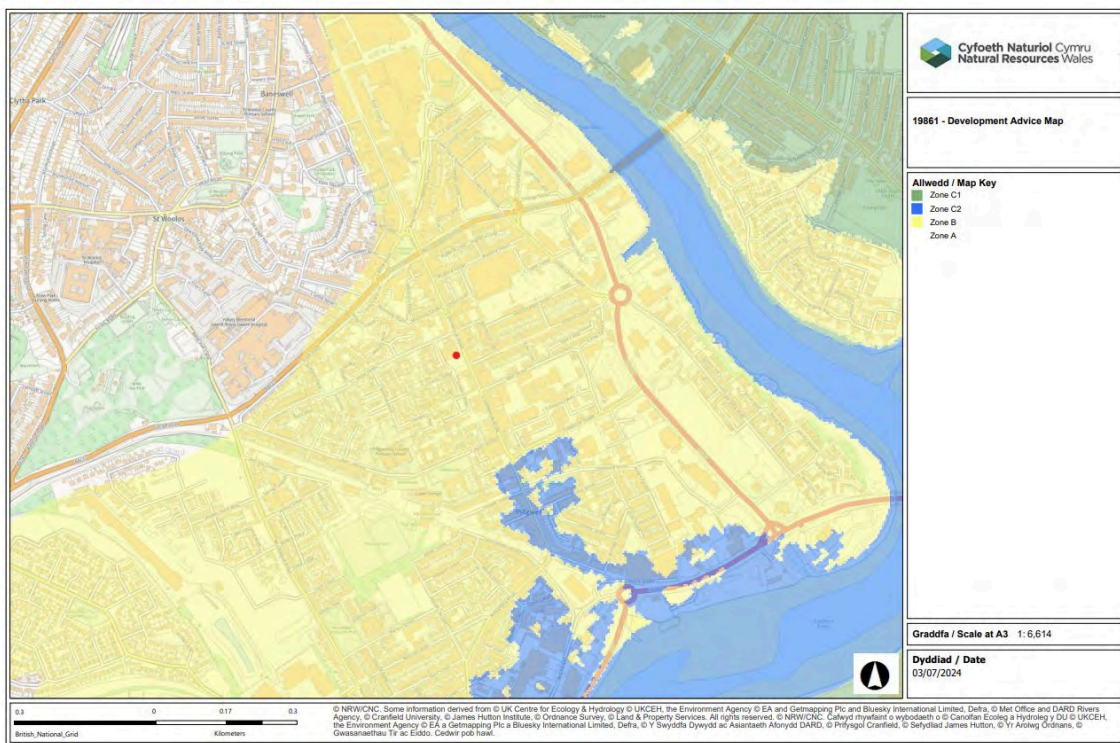


Figure 3 : Development Advice Map

The Flood Map for Planning – Rivers and Sea indicates the site to be located in flood zone 3 (sea). The site is also not in a TAN15 defended zone (Figure 4)

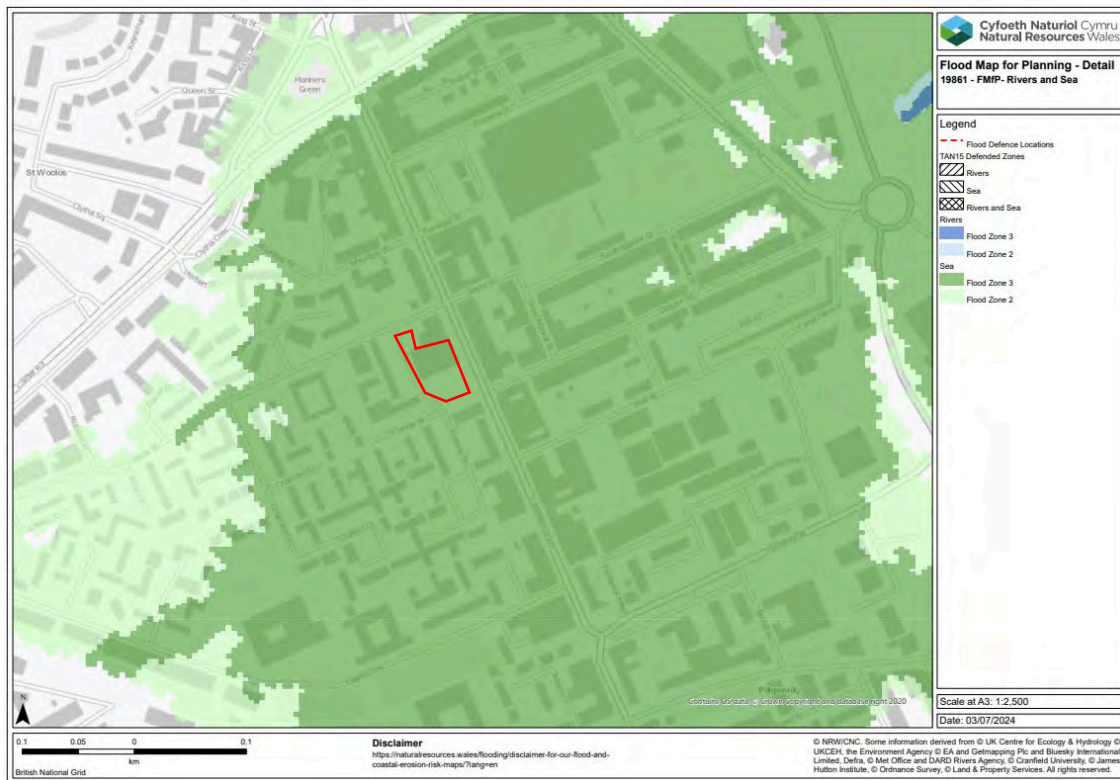


Figure 4 : Flood Map for Planning (Rivers and Sea)

The flood zones are defined as follows and include the effects of climate change:

- Flood Zone 1 (Rivers and Sea): Less than 1 in 1,000 chance of flooding from rivers and the sea in a given year
- Flood Zone 2 (Rivers): Areas with a 1 in 1,000 to 1 in 100 chance of flooding from rivers in a given year.
- Flood Zone 3 (Rivers): Areas with more than a 1 in 100 chance of flooding from rivers in a given year
- Flood Zone 2 (Sea): Areas with a 1 in 1,000 to 1 in 200 chance of flooding from sea in a given year
- Flood Zone 3 (Sea): Areas with more than a 1 in 200 chance of flooding from the sea in a given year
- TAN15 Defended Zones: Areas that benefit from Risk Management Authority flood defences with a present day 1 in 100 and 1 in 200 AEP standard of protection for rivers and the sea respectively.

The site is located approximately 500 metres from the River Usk; an NRW Main River and the primary flood source affecting much of Newport including the proposed site. The River Usk is tidally influenced in this location, joining the Severn Estuary just to the south of Newport.

The Environment Agency's Coastal Flood Boundary Conditions for the UK: 2018 Update , provides modelled peak tidal levels in vicinity to the development site:

- 1 in 200 (2017) AEP event 8.43 m AOD
- 1 in 1,000 (2017) AEP event 8.81 m AOD

TAN15 requires an allowance for climate change to be made. Using the allowance set out in Welsh Government Guidance and a development lifetime of 100 years (PPG – Flood Risk and Coastal Change para. 006), this allowance has been calculated as 1.13 m (70<sup>th</sup> percentile; 70P) and 1.53 m (95<sup>th</sup> percentile; 95P). The peak still tidal level for the 1 in 200 AEP event and 1 in 1000 AEP event plus climate change (2124) is therefore estimated to be 9.56 m AOD (70P) , 9.96 m AOD (95P) , 10.04 m AOD (70P) and 10.34 m AOD (95P).

The Welsh Government climate change guidance is based on UK Climate Projections (UKCP18) data and states “as a minimum, development proposals should be assessed against the relevant regional 70<sup>th</sup> percentile to inform design levels. An assessment should also be made against the 95<sup>th</sup> percentile to inform mitigation measures, access and egress routes and emergency evacuation plans”.

NRW have provided Vale Consultancy with the latest flood modelling for the Newport area being the Newport\_5\_V8.0\_2022 which included tidal data from the Caldicot & Wentlooge Coastal Study (2015). Peak still tidal levels have been provided by the Environment Agency from the Newport\_5\_V8.0\_2022 model for the defended and undefended scenarios up to 2121. Given there is residential development on the first floor, the site is assumed to have a development lifetime lifespan of 100-years, although in reality this lifespan will likely be lower.

#### Defended

- 1 in 200 year (2021) – No flooding
- 1 in 1000 year (2021) – No Flooding
- 1 in 200 year (2121) - 9.28 m AOD
- 1 in 1000 year (2121) – 9.76 m AOD

#### Undefended

- 1 in 200 year (2021) - No flooding
- 1 in 1000 year (2021) - No Flooding
- 1 in 200 year (2121) - 9.27 m AOD
- 1 in 1000 year (2121) - 9.77 m AOD

Given the lifetime expectancy of the development is 100 years, this data is 3 years short with the climate change calculations. Therefore, the Newport\_5\_V8.0\_2022 has been used for the present day 1 in 200 (2021) and 1 in 1000 (2021) with UKCP climate change projections being used for the 1 in 200 and 1 in 1000 AEP (70 + 95P) events (2124). This approach uses the best available data possible, and follows the guidance of NRW on the application of climate change allowances (CCA).

The respective data shows that the design tidal flood level for the present day 1 in 200 and 1 in 1000 AEP events (2124), the site is not expected to flood. However, during the 1 in 200 AEP event (70P) and 1 in 1000

(70P) AEP events the site could potentially flood by depths of up to 1.0 m and 1.48 m respectively on the ground floor of the building with inundation in the service area potentially reaching depths of up to 0.98 m and 1.46 m respectively. The car parking area could potentially flood by depths in the region 1.46 – 2.84 m.

The respective data shows that during the 1 in 200 AEP event (95P) and 1 in 1000 (95P) AEP events, flooding could occur to depths of up to 1.40 m and 1.88 m respectively on the ground floor of the building with depths in the service area potentially reaching depths of up to 1.38 m and 1.86 m respectively. The car parking area could potentially flood by depths in the region 1.86 – 3.24 m.

The HVD on the first floor will be raised to a minimum of 10.86m AOD which provides a freeboard of 0.52 m AOD above the 1 in 1000 AEP event (95P) (2124) design flood level (DFL) and will therefore remain flood-free.

A comparison between the undefended and defended modelled scenarios indicates that the flood levels show very minimal variation between the undefended and defended model runs. Thus, suggesting / indicating that the site does not benefit from defences and therefore not at risk of breach. The site is not shown to fall within a TAN15 Defended Zone or Zone C1 which corroborates the above.

### 3.3 Surface Water and Small Watercourses (Pluvial)

Surface water (Pluvial) flooding occurs when rainwater does not drain away through the normal drainage system or soak into the ground. It is usually associated with high intensity rainfall events but can also occur with lower intensity rainfall or melting snow where the ground is saturated, frozen or developed, resulting in overland flow and ponding in depressions in topography. Surface water flooding can occur anywhere without warning. However, flow paths can be determined by consideration of contours and relative levels.

The FMfP ‘Surface Water and Small Watercourses’ Map indicates that the large majority of the site is in Flood Zone 1 with areas of the northeast of the building , the north of the service area and the car parking being located in Flood Zone 2/3 (Figure 5).

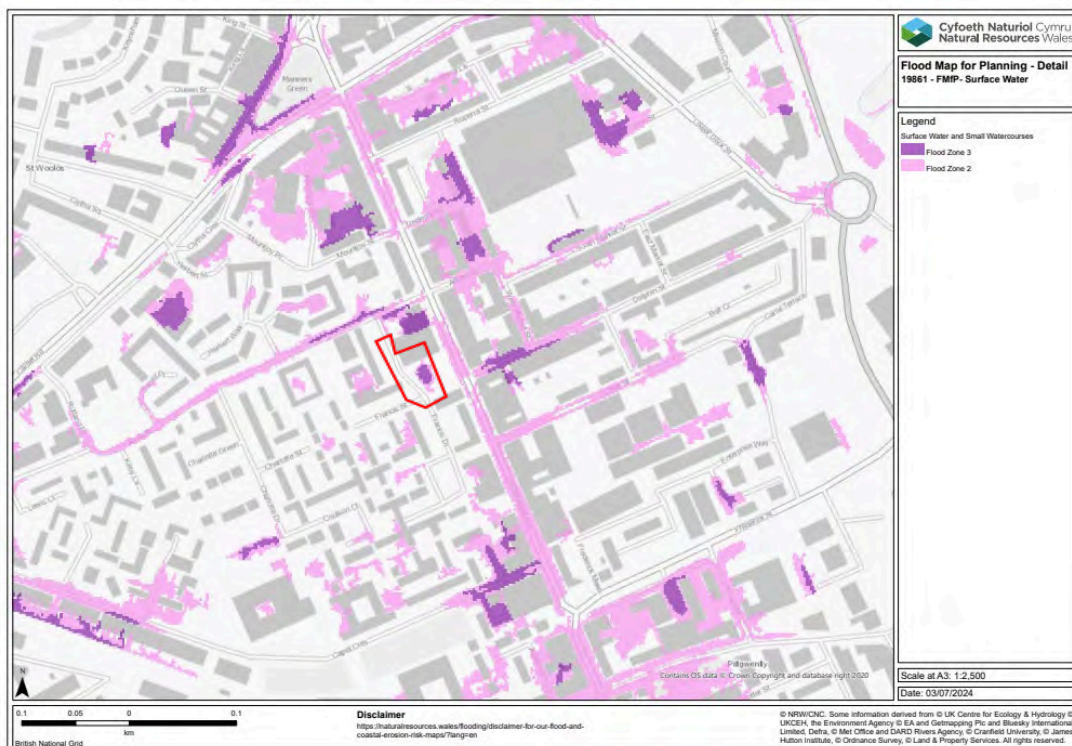


Figure 5 : Flood Map for Planning – Surface Water and Small Watercourses

Surface water is predicted to be at its highest around the boundary adjacent to the *New Testament Church of God* site which is identified to be a low spot in the topographic and LiDAR data assessed in Section 1.3.

During a low risk surface water flooding event (1 in 1000 AEP) , projected / estimated flood depths are in the region of 0.00 – 1.33 m , with a mean depth of 0.32 m. The perceived surface water flood risk is largely confined to the area around the New Testament Church of God, the north of the Service Area and the Car Parking. Associated velocities of surface water are indicated to be in the region of 0.00 – 0.71 m/s with a mean velocity of 0.09 m/s.

During a medium risk surface water flooding event (1 in 100 – 1 in 1000 AEP), projected depths are in the region of 0.00 – 1.26 m , with a mean depth of 0.96 m AOD. The surface water is confined to the area around the New Testament Church of God. Associated velocities of surface water inundation (flows) are indicated to be in the region of 0.00 – 0.52 m/s with a mean velocity of 0.07 m/s.

During a high risk surface water flooding event (1 in 30 AEP) , depths are in the region of 0.00 – 1.26 m , with a mean depth of 0.96 m AOD. The surface water is confined to the area around the New Testament Church of God. Associated velocities of surface water inundation (flows) are indicated to be in the region of 0.00 – 0.24 m/s with a mean velocity of 0.05 m/s.

Given that there is no surface water flooding identified at the building , surface water flood risk is considered to be low with the wider site (car park and service area) being at medium risk. The HVD on the first floor will evidently not be affected by surface water flooding in this instance, based on the information and data reviewed and will be situated well above the projected depths / levels.

Storm water falling on the roof of the building is collected via gutters and rainwater downpipes at the front and rear of the building. Google Streetview shows that the downpipes on the front elevation discharge storm water onto the footway which subsequently falls to the road to be presumably collected by a surface water drainage system serving the road.

It is not proposed to alter the roof nor the existing storm water drainage provision. No increase in impermeable surface area is proposed with the conversion of the existing building.

### 3.4 Sewer Flooding

Flooding from sewers can occur when a sewer is overwhelmed by heavy rainfall, becomes blocked, is damaged, or is of inadequate capacity. This can occur if there is a blockage in the network causing water to back up behind it or if the sheer volume of water draining into the system is too great to be handled. Sewer flooding tends to occur sporadically in both location and time. As such, any inundation flows emitting from / breaching the local sewer network would be confined to the highways around the development before either re-entering the water cycle via evapotranspiration, flow away from the site following the natural fall in topography, be absorbed by local surface water drainage as and where the capacity of the system is recovered.

The Newport City Council Preliminary Flood Risk Assessment (PFRA) (2011) states that Dwr Cymru Welsh Water (DCWW) have indicated 78 locations across the Newport area that had suffered historic sewer flooding but that the data suggests that flooding from sewer sources does not have significant consequences at a strategic scale.

The Newport City Council Local Flood Risk Management Strategy (LFRMS) (2014) states that the updated flood incidents from DCWW total 220 locations.

In the absence of a sewer asset map, it is assumed that DCWW assets are located within Commercial Road. The cover levels of any sewers within Commercial Road would therefore be higher than the lower ground floor level of the building. Its therefore possible that a significant sewer flood event within Commercial Road could

inundate the lower ground floor. However, the probability of this is very low and any associated consequences would be minimal; i.e. no threat to human life and / or structural integrity of the building.

### 3.5 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.

Both the LFRMS and the PFRA state that the predominant flood risks within Newport are from tidal and fluvial flood sources whilst ground water flooding is not significant in Newport

It can be concluded that the risk of groundwater flooding is *Low*.

### 3.6 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 indicates that the site is not at risk of flooding from reservoirs. Moreover, the risk of flooding from reservoirs is extremely unlikely to happen.

This is largely because 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*.

Refer to Appendix D.

### 3.7 Justification Test

The proposals will help to sustain the existing development and the site meets the definition of "previously developed land". Part i and iii of the justification test are therefore considered to have been addressed.

The proposals also comprise the change of use of the first floor from commercial to residential, therefore it should not be subject to the justification test but should still meet the requirements of a site-specific flood consequences assessment.

## 4 FLOOD RISK MITIGATION

### 4.1 Flood Risk Mitigation

In areas prone to tidal flooding, it is typical practice to raise the floor level of proposed buildings above the existing ground levels (i.e. to alleviate flood risk). In this case, the proposed development is a conversion of an existing building so the alteration of floor levels is not a practical option. Furthermore, it could be viewed as a cause for / of displacement of flood waters.

All sleeping accommodation (habitable spaces) is located across the first floor and would not be inundated by tidal events up to and including (at least) the 1 in 1000 AEP event (95P) (2124).

It is therefore suggested that the flood risk to the development be managed through the development of a flood evacuation plan for the ground floor however the first floor is schemed to be above the design flood levels. The site owner should undertake a Flood Evacuation Management Plan (FEMP) for implementation

during an extreme event. This should be done in conjunction with the appropriate professional bodies including and in particular Monmouthshire County Council Emergency Planning Department.

The FEMP should be a written document which should outline the course of action to all occupants during a flood. The evacuation procedure should address (but not limited to) the following topics:

- A list of important contacts, building services, suppliers and evacuation contacts for officers and users;
- A description or plan showing locations of key property, protective materials and service shut-off points;
- Basic strategies for protecting property and assisting recovery;
- Checklist of procedures that can be quickly accessed by users during a flood;
- Safe exit-plan (building and site);
- Safe exit route to higher ground outside the flood risk area (building and site), kept and displayed on site.

Additional internal alterations that should be introduced where practically possible to the building aspect (office) of the proposed development include:

- Raised electronic control units and sockets;
- Install smart air bricks or air brick covers;
- Provide low level flood guards on all access points;
- Use plastic and stainless-steel fixtures and fittings and avoid wooden alternatives;
- Use solid flooring (tiled, resin, concrete) at lower ground level, where possible;
- Ensure that with the time afforded by advance warning, evacuation of property via safe egress and removal of valuables from the building can be implemented;
- Clearance of the existing surface water drainage system to improve drainage of the site and follow necessary maintenance procedures (to new & existing SW drainage) to ensure that the system functions to optimum capacity;
- The predicted depths, rise, speed of inundation and velocities are likely to satisfy the TAN 15 suggested tolerable conditions for more extreme events;
- Use robust flood resistant construction techniques as detailed the RIBA publication - *"Improving the Flood Performance of New Buildings, Flood Resilient Construction" (May 2007).*

The site is not currently at high risk of tidal flooding but could become at risk over its design life. This is therefore not currently in a location which is covered by NRW's flood warning or alert service. The nearest flood alert area is called the "Usk Estuary" which includes part of Commercial Road to the south of the site. If not already in place, it is recommended that a subscription to NRW's Usk Estuary flood alert be arranged by the building management. Flood Warnings Direct is a free service that provides prior warnings of a fluvial flood event. Areas at risk of flooding from rivers (fluvial) and the sea (tidal) are warned, which relies on direct measurements of rainfall, river levels, tide levels, in-house predictive models, rainfall data and information from the Met Office. This service operates 24 hours / day 365 days a year. If flooding is forecast, warnings are issued using a set of easily recognisable codes.

Appropriate documentation should be displayed to inform any users of the site of the potential flood risk. Documentation will be displayed at an appropriate position. The documentation will indicate the risk of flooding and contain information on how prior warnings will be sent. Further information on the documentation will comprise of the Floodline Warnings Direct telephone number, emergency services numbers and exit plans and egress directions, as identified in the evacuation procedure for the site.

Flood proofing measures should be incorporated as far as is practically possible.

It is proposed that any new building elements will be constructed from materials with inherently good wet proofing performance. Wet proofing is the use of more flood resistant building materials in the floors, walls and doors.

Proper observation and implementation of these Mitigation Measures and Recommendations will mean that the risks and associated consequences of flooding to the site are acceptable, manageable and residual across the lifetime expectancy of the development (100 years).

#### **4.2 Safe Refuge Area and Flood Procedure**

In the unlikely event that the site floods the competent warning authority is NRW and a lead time of several hours in advance of flooding is typically provided. When a flood is expected, Newport City council and the local emergency services will be responsible for public care and safety. In the event of the site flooding before site users have an opportunity to evacuate via the route specified - the occupants should seek refuge on the upper floors as and where possible until flood waters have receded and it is safe to evacuate the site.

#### **4.3 Finished Floor Level (FFL)**

The FFL of the building (LVD) will be 8.56 m AOD with all residential development (HVD) being located on the first floor and set at a minimum of 10.86 m AOD.

#### **4.4 Flood Risk Elsewhere**

In accordance with A1.2 of TAN15 developers must ensure there will be no loss of flood flow or flood storage capacity for floods up to the severity of the 1 in 1,000 AEP event. Whilst not specified by TAN15, Natural Resources Wales generally recommends that this should be the case over the lifetime of the development (i.e should take into account climate change allowances) and should consider breach and blockage where necessary.

Compensatory storage is generally not required for the loss of floodplain storage or conveyance during a tidally dominated event. However, in such instances where overtopping of defences is expected by tidal floodwaters, and the predicted water level is not an extension of the water level within the estuary, then the developer should demonstrate no increase in flood risk.

It is not proposed to alter the roof nor the existing storm water drainage provision. No increase in impermeable surface area is proposed with the conversion of the existing building and therefore will not increase flood risk elsewhere. There will be no displacement of flood water / storage as a result of the proposed works.

## 5 CONCLUSIONS

Vale Consultancy has been instructed by *The Client* to prepare a Flood Consequences Assessment (FCA) report to accompany a planning application for the proposed redevelopment of 170 – 172 commercial road (“ The Site ”) for retail and residential use.

The assessment has been undertaken in accordance with the requirements of Technical Advice Note 15 (TAN 15) dated July 2004 and taking into account the revised (draft version) of TAN 15 (January 2023).

The Development Advice Map indicates the site to be located within Zone B.

The Flood Map for Planning – Rivers and Sea indicates the site to be located in flood zone 3 (sea). The site is also not in a TAN15 defended zone.

The ground floor is at high risk of tidal flooding from the River Usk, however the first floor residential development (HVD) will be placed above the design flood level up to and including the T1000 (95P) (2124) AEP event.

It is recommended that a flood emergency plan be developed to help manage the risk of flooding given raising of the ground floor, parking and service area is unfeasible although the first floor residential areas will remain flood free in all AEP events.