

AW2 USKMOUTH TECHNICAL NOTE

Date: 25 July 2025
To: Natural Resources Wales
From: RPS Hydrology
Pages: 5
Regarding: Breach Modelling Request

Introduction

RPS previously prepared a Flood Consequence Assessment (FCA) to accompany a full planning application for the installation of a new battery energy storage system (BESS) with associated drainage, infrastructure and engineering works on land at the former Uskmouth Power Station in Newport.

The application (25/0407) was submitted in May and NRW has subsequently raised concerns on the grounds that a breach assessment has not been undertaken. The aim of this technical note is to provide further information to the mitigation approach outlined in the FCA.

Background

The site, which is located south of Newport at National Grid Reference ST 32605 83546, is irregular in shape and occupies an area of approximately 4.6 hectares (ha). The site is currently brownfield land, that is used for the storage of pulverised fuel ash (PFA) bounded by concrete walls. The site is located within a heavily industrialised area, the Severn Power Station and to the northeast is Uskmouth Sustainable Energy Park.

NRW Flood Risk

The FCA concludes flood risk at the site is shown to be associated with Tidal sources.

The NRW's FMfP (for the sea) identifies that the majority of the site is classified as Flood Zone 3, whereby the annual probability of flooding is more than 1 in 200-year (0.5%). Areas of the site are also classified as Flood Zone 2, whereby the annual chance of flooding from the sea is between 1 in 1000-year (0.1%) and 1 in 200-year (0.1%). The Flood Map for Planning (Sea) is presented in Figure 1.

The area where the proposed BESS is located within Flood Zone 2 and 3, the existing access track is located within Flood Zone 3.

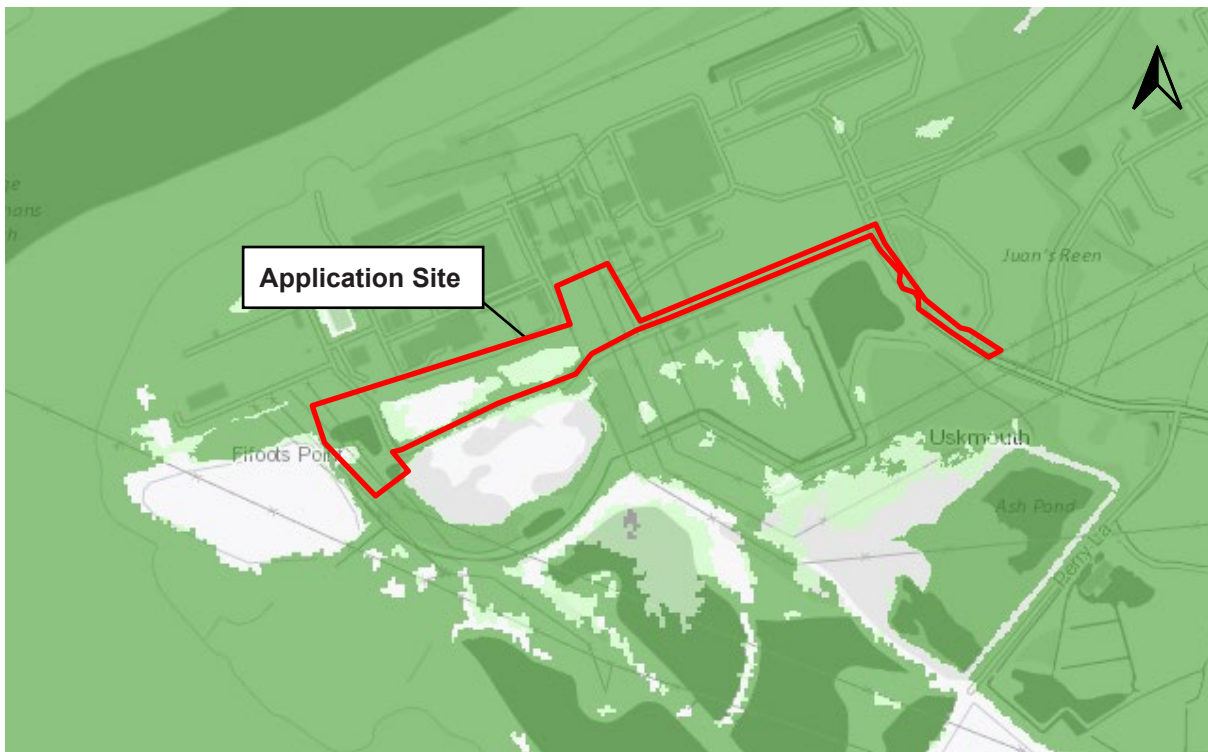


Figure 1: NRW Flood Map for Planning (Sea)

NRW were consulted during the production of the FCA, where they provided the Caldicot and Wentloog (2016) model. The FCA presented the modelling data and contained on site level nodes to inform mitigation on site.

Since the production of the modelling (in 2016) both the Extreme Sea Levels have changed (these are derived from the Coastal Flood Boundary Conditions for the UK Study which was originally undertaken in 2011 and then updated in 2018) and the Climate Change uplift magnitudes have been subject to revision.

The FCA presents a direct comparison of the events and scenarios in the modelling and the required scenarios for the 2025 FCA. The report concludes that the 2016 modelling presents a conservative proxy for the required scenarios, therefore the model outputs have been used to estimate levels of flooding on site.

Scenarios provided in the 2016 model are:

- Defended 1 in 200 year present day scenario
- Defended 1 in 200 year Climate Change horizon year 2100 Upper End 95th percentile confidence level scenario
- Defended 1 in 1000 year present day
- Defended 1 in 1000 year Climate Change horizon year 2100 Upper End 95th percentile confidence level scenario
- Undefended 1 in 200 year present day scenario

- Undefended 1 in 200 year Climate Change horizon year 2100 Upper End 95th percentile confidence level scenario
- Undefended 1 in 1000 year present day
- Undefended 1in 1000 year Climate Change horizon year 2100 Upper End 95th percentile confidence level scenario

Development Vulnerability

In accordance with TAN 15 (2025), the proposed development is classified as a ‘Highly Vulnerable’ development in flood risk terms.

‘The required design standard for new development is to be flood free during the 1% river flood (i.e. a flood with a 1 in 100 chance of occurring in any year) and the 0.5% flood from the sea (i.e. a flood with a 1 in 200 chance of occurring in any year), plus an allowance for climate change over the lifetime of development.’

Table 1. Flood events in which a development must remain flood free

Vulnerability Classification		Flood Event Type	
		Rivers	Sea
Highly Vulnerable	Emergency Services	0.1% +CC	0.1% +CC
	All other types	1% +CC	0.5% +CC
Less Vulnerable Development			
Water Compatible Development that may be occupied by people		1% +CC	0.5% +CC

Key: 0.1% = 1 in 1000, 1%= 1 in 100, 0.5%= 1 in 200

The site benefits from flood defences however, the undefended scenario has been used to inform mitigation on site. The FCA demonstrates that the new proposed development on site will be raised to 9.75m AOD (Undefended 1 in 200 year Climate Change horizon year 2100 Upper End 95th percentile confidence level flood level on site).

TAN15 (2025) guidance also states:

‘Where appropriate, an assessment against a breach and blockage scenario should be undertaken against return periods up to and including the 1 in 1000 year flood event, including an allowance for climate change. Detailed guidance on climate change allowances for planning purposes is published separately by the Welsh Government.’

The proposed site for development is brownfield in a heavily industrial area. The new proposed hardstanding area of the development makes up an area of approximately 3.1ha, with access being retained along the existing track. The FCA demonstrates the access track may be flooded during the defended and undefended scenarios.

Once in operation, it is not expected there will be site users regularly, limited to maintenance workers. The FCA states site users should sign up to receive flood warnings for the Usk Estuary at Uskmouth and Old Town Docks, and the to receive flood alerts for the Usk Estuary Area. The FCA also states a Flood Management Plan for Operational Site Users can be produced. We consider this appropriate mitigation for a site which does not require regular access.

Inundation mapping shows that for the 1 in 200-year Climate Change horizon year 2100 Upper End 95th percentile confidence level defended event at four and a half hours, water is not present within the site boundary. By five hours, the majority of the site is expected to be inundated with minor isolated areas within the centre and west near the pond remaining unaffected. Although inundation mapping is provided in the defended scenario, it gives an indication of the nature of flooding on site. It is expected that site users will have sufficient time to exit site if a flood warning is received.

Given the sites location, size, and access requirements, we consider it disproportionate to request breach modelling to inform levels on site. Through using an undefended model scenario, with conservative estimates of extreme water levels, the most appropriate level available has been used to inform levels of mitigation.

Nearby Planning Applications

The below planning applications are of a similar nature to the proposed development and in very close proximity to the site. On both applications no breach modelling was undertaken.

23/0949: Battery Energy Storage System with Associated Infrastructure and Works. Granted with Conditions in January 2024. Site located north of the proposed development.

25/0508: Discharge of Conditions approved 15 July 2025. Original application for BESS granted December 2022. Site located south of the proposed development.

Summary and Conclusions

Flood Risk

Flood risk at the site is deemed to be of a tidal nature. The FCA demonstrates that the 2016 model actually presents higher extreme water levels than those presented by the 2018 Coastal Extreme Water Levels with the 2021 Welsh Government Guidance Climate Change uplifts applied. Therefore the 2016 model results present a conservative approach than what would be produced if it were rerun with current sea level uplift values.

Despite the site benefitting from flood defences in 'fair' condition, the Undefended 1 in 200 year Climate Change horizon year 2100 Upper End 95th percentile confidence level flood level has been used to inform mitigation on site. Mitigation outlined in the FCA includes:

- At risk assets are to be raised to the 1 in 200-year Climate Change horizon year 2100 Upper End 95th percentile confidence level undefended scenario flood level.
- The final design will be developed cognisant of the Electrical Networks Association ETR138: Resilience to Flooding of Grid and Primary Substations.
- Site users should sign up to receive NRW Flood Warnings and Alerts
- Recommendation for a Flood Management Plan is produced for site management and operational staff, with instructions on appropriate measures to take in the instance of a flood.

The site does not need constant access and will only be accessed when maintenance is required, these site users should not access the site if a flood warning is received. Given this, and the brownfield industrial nature of the site and surroundings, we consider it disproportionate to request a breach model for the proposed development. The FCA demonstrates suitable mitigation measures against the 'most extreme/worst case' data available can be encompassed into the development, demonstrating it is safe for its lifetime without increasing flood risk elsewhere.