



Flood Consequence Assessment
AEG5020_LL207NP_Glyn_01

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Site Address: Ddol Hir
Llanarmon Road
Glyn Ceriog
LL207NP

UK Experts in Flood Modelling, Flood Risk Assessments, and Surface Water Drainage Strategies

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Document Issue Record

Project: Flood Consequence Assessment

Prepared for: Aisha Ali

Reference: AEG5020_LL207NP_Glyn_01

Site Location: Ddol Hir, Llanarmon Road, Glyn Ceriog, LL207NP

Issue	Date	Author	Check	Auth.	Comments
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Summary

Development Description	Existing	Proposed
Development Type	Undeveloped Land	Construction of no.5 glamping units
EA Vulnerability Classification	N/A	Highly Vulnerable
Ground Floor Level	Based on 1m LiDAR, the ground elevation of the site varies between approximately 174.5m AOD and levels on the eastern site boundary at approximately 251.8m AOD. The proposed glamping units are shown to be located on existing ground approximately 180m AOD.	No Change
Level of Sleeping Accommodation	N/A[2]	Ground floor
Ownership Boundary Size	c.51,583m²	No change
Risk to Development	**Summary**	**Comment**
NRW Advice Zone	C2	Areas of the floodplain without significant flood defence infrastructure
Flood Source	Fluvial	
PFRA Available	Wrexham County Borough Council Preliminary Flood Risk Assessment (2011)	
Management Measures	**Summary**	**Comment**
Ground floor level above extreme flood levels	Yes	All new glamping units will be located on land classified as Flood Zone A.
Flood Resilient Design	Yes	In accordance with the DCLG Report 'Improving the Flood Performance of New Buildings - Flood Resilient Construction' (2007).
Site Drainage Plan	Yes	Impermeable areas increase will be under 100m². SAB approval not needed.

Flood Warning and Evacuation Plan	Yes	The site manager of the glamping units should monitor Met Office Weather Warnings and the online Flood Warning and Alerts. Site will be closed upon receipt of a flood alert and not reopen until the warning has been lifted.
Offsite Impacts	**Summary**	**Comment**
Displacement of floodwater	No	All new glamping pods will be located on land classified as Flood Zone A.
Increase in surface run-off generation	No	Negligible increase in built footprint
Impact on hydraulic performance of channels	No	Does not affect channel

[1] not required for this assessment.

[2] data not available.

1. Introduction

1.1. Aegaea were commissioned by Aisha Ali to undertake a Flood Consequence Assessment (FCA) to facilitate a planning application for the proposed development. This FCA has been prepared in accordance with the requirements set out in the Technical Advice Note 15 (TAN15).

1.2. This FCA is intended to support a full planning application and as such the level of detail included is commensurate and subject to the nature of the proposals.

Site Overview

1.3. The ownership boundary and the proposed development is Ddol Hir, Llanarmon Road, Glyn Ceriog, LL207NP (Figure 1).

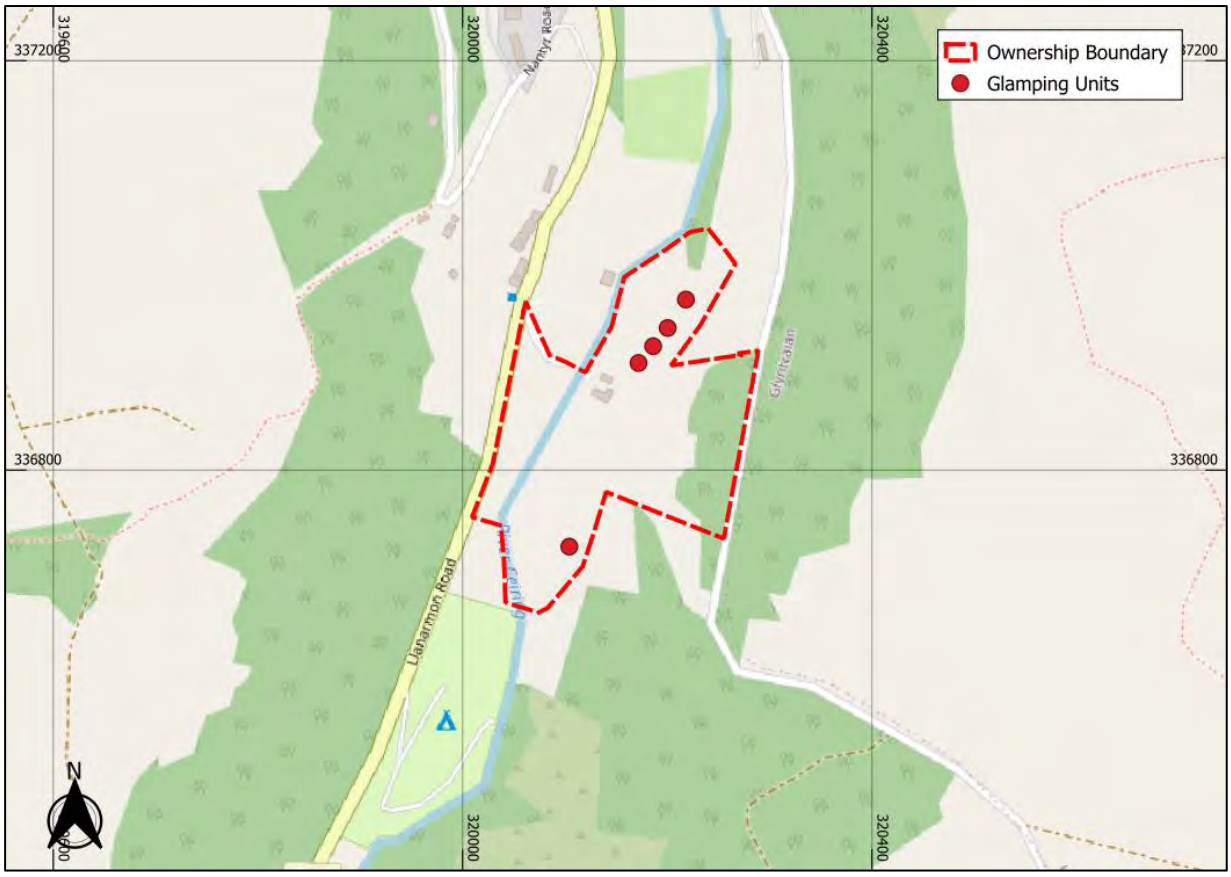


Figure 1: Site Location (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors)

1.4. It is understood that the development includes the construction of 5no. glamping units.

1.5. A topographic survey was undertaken at the site and provided to Aegaea by the client. Upon review of the topographic survey, the ownership boundary is shown to be located within a valley with high slopes east and west of the site, with elevations ranging between 174.5m AOD and levels on the eastern site boundary at approximately 251.8m AOD. The proposed glamping units are shown to be located on the eastern slope of the valley at approximately 180m AOD. Figure 2 provides a visual representation of the topography on site using Natural Resource Wales Light Detection and Ranging (LiDAR) data Digital Terrain Model (1m resolution).

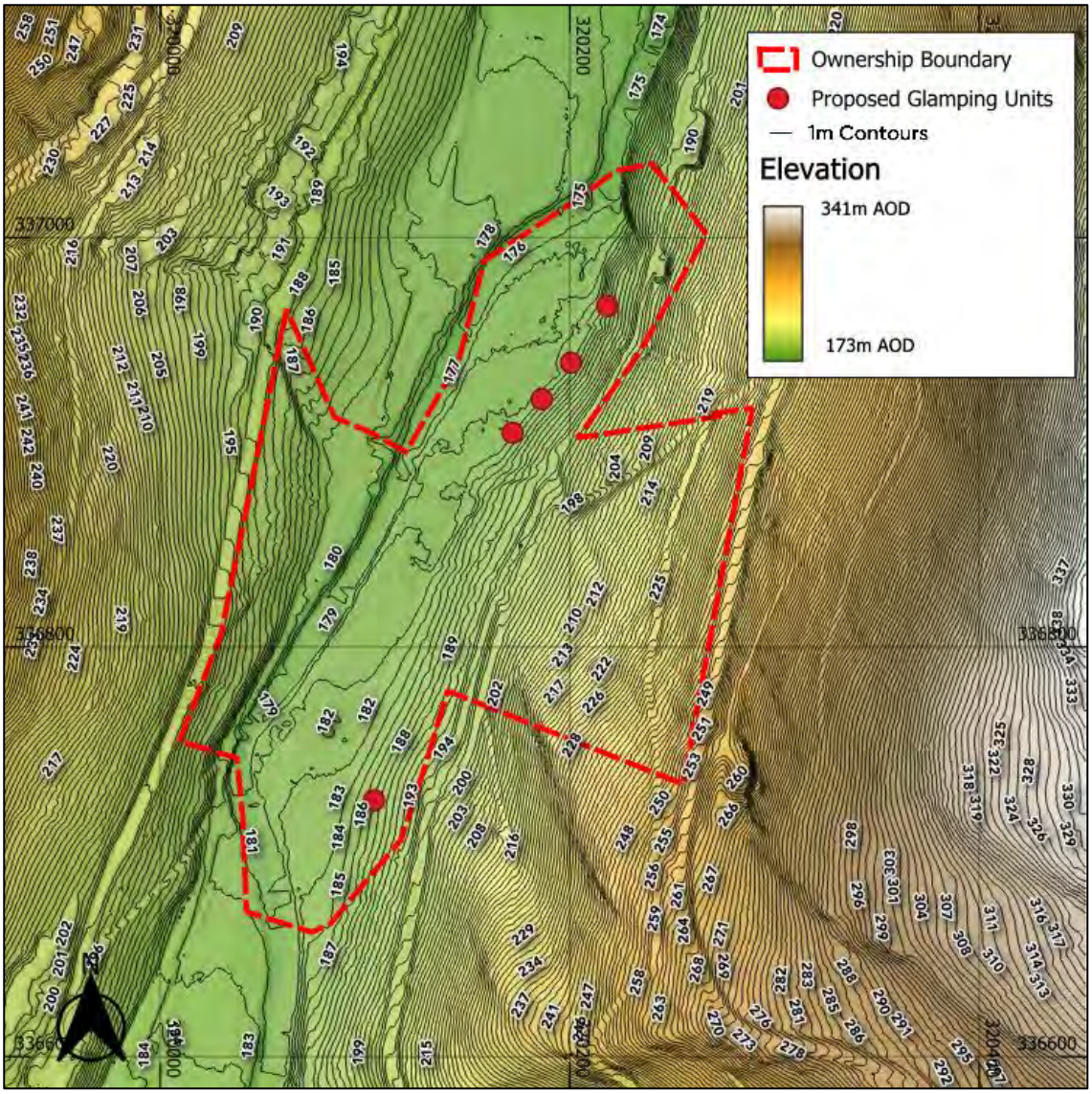


Figure 2: Site Topography (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

1.6. Wrexham County Borough Council is the Local Planning Authority (LPA) for the site and also the designated Lead Local Flood Authority (LLFA). The site sits within the Natural Resources Wales's Northeast Wales region.

Planning Policy and Guidance

1.7. Technical Advice Note 15 (TAN15), in conjunction with Planning Policy Wales (PPW) and any local planning documentation forms the basis for assessment of flood risk in Wales and its risk mitigation and development control.

1.8. For an application is to be acceptable, it must pass both a Flood Risk justification test and the assessment/acceptability of flooding consequences tests. As per paragraph 3 of TAN, the overall aim is as follows:

> *The general approach of PPW, supported by the TAN, is to advise caution in respect of new development in areas at high risk of flooding by setting out a precautionary framework to guide planning decisions. The overarching aim of the precautionary framework is, in order of preference, to: -*
>
> *• Direct new development away from those areas which are at high risk of flooding.*
>
> *• Where development has to be considered in high-risk areas (zone C) only those developments which can be justified on the basis of the tests outlined in section 6 and section 7 are located within such areas. 3.2*
>
> *The operation of the precautionary framework is governed by: -*
>
> *• A development advice map containing three zones (A, B and C with subdivision into C1 and C2) which should be used to trigger the appropriate planning tests in relation to sections 6 and 7 and appendix 1.*
>
> *• Definitions of vulnerable development and advice on permissible uses in relation to the location of development and the consequences of flooding.*
>
> *The precautionary framework should be used for both forward planning and development control purposes.*

1.9. The Flood Risk justification test is undertaken against both the development advice maps (DAM) and the Land Use Vulnerability Classification, provided within TAN15.

1.10. The DAM contains 3 zones – A, B and C, with C further subdivided into C1 and C2, summarised in Table 1.

Table 1: Development Advice Map Zone Classifications

Description of Zone	Zone	Use within the precautionary framework
Considered to be at little or no risk of fluvial or tidal/coastal flooding.	A	Used to indicate that justification test is not applicable and no need to consider flood risk further.
Areas known to have been flooded in the past evidenced by sedimentary deposits.	B	Used as part of a precautionary approach to indicate where site levels should be checked against the extreme (0.1%) flood level. If site levels are greater than the flood levels used to define adjacent extreme flood outline there is no need to consider flood risk further
Based on Environment Agency extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal)	C	Used to indicate that flooding issues should be considered as an integral part of decision making by the application of the justification test including assessment of consequences.
Areas of the floodplain which are developed and served by significant infrastructure, including flood defences.	C1	Used to indicate that development can take place subject to application of justification test, including acceptability of consequences.
Areas of the floodplain without significant flood defence infrastructure.	C2	Used to indicate that only less vulnerable development should be considered subject to application of justification test, including acceptability of consequences. Emergency services and highly vulnerable development should not be considered.

1.11. The land use vulnerability classifications are presented in Table 2.

Table 2: TAN15 Vulnerability Classifications

Development Category	Type
Emergency services	hospitals, ambulance stations, fire stations, police stations, coastguard stations, command centres, emergency depots and buildings used to provide emergency shelter in time of flood
Highly vulnerable development	all residential premises (including hotels and caravan parks), public buildings (e.g. schools, libraries, leisure centres), especially vulnerable industrial development (e.g. power stations, chemical plants, incinerators), and waste disposal sites
Less vulnerable development	General industrial, employment, commercial and retail development, transport and utilities infrastructure, car parks, mineral extraction sites and associated processing facilities, excluding waste disposal sites

1.12. Paragraph 6.2 of TAN15 states:

New development should be directed away from zone C and towards suitable land in zone A, otherwise to zone B, where river or coastal flooding will be less of an issue. In zone C the tests outlined in sections 6 and 7 will be applied, recognising, however, that highly vulnerable development and Emergency Services in zone C2 should not be permitted. All other new development should only be permitted within zones C1 and C2 if determined by the planning authority to be justified in that location. Development, including transport infrastructure, will only be justified if it can be demonstrated that: -

i. Its location in zone C is necessary to assist, or be part of, a local authority regeneration initiative or a local authority strategy required to sustain an existing settlement; **or**,

ii. Its location in zone C is necessary to contribute to key employment objectives supported by the local authority, and other key partners, to sustain an existing settlement or region.

and,

iii. It concurs with the aims of PPW and meets the definition of previously developed land (PPW fig 2.1); and,

iv. *The potential consequences of a flooding event for the development have been considered, and in terms of the criteria contained in sections 5 and 7 and appendix 1 found to be acceptable.*

1.13. With regards to Paragraph 6.2 of the TAN15, the proposal seeks to construct 5no. glamping units on an area within Flood Zone A, adhering to the first part (i) and (ii) of the justification test. The site is currently undeveloped, however is to be constructed as a sustainable development and therefore meets the definition of the second part (iii) of the justification test. The report sets out the risk of flooding to the site and appropriate mitigation measures; the proposed development would be considered 'Highly Vulnerable' (glamping pods) with appropriate mitigation measures recommended throughout this report, therefore also meeting the second part (iv) of the justification test.

Assessment/Acceptability of Flooding Consequences Test

1.14. If a development is to be located within Zone C1, or in Zone C2 (if defined as low vulnerability), and passes the initial Flood Risk Justification Test, then an assessment of flooding consequences will be required. This assessment will assess all potential flood mechanisms which could impact the development and establish if the consequences of flooding can be managed appropriately for the type of development being proposed.

Surface Water Run-Off from New Development

1.15. TAN15 states that flooding from all new development, in all zones, should not increase the risk of flooding elsewhere, via the creation of additional run-off when compared with the undeveloped situation.

1.16. The Welsh Sustainable Drainage (SuDS) Statutory Guidance (2019) requires that Sustainable Drainage Systems (SuDS) should be included in all new development proposals, irrespective of which zone they are to be located. Developments with an overall construction area of 100m^2 or more, or more than 1 dwelling, will require SuDS.

1.17. However, the proposals are for a placement of 5no. glamping units which is understood to total under 100m^2 of new impermeable surfacing. Total and peak surface water runoff rates and volumes will have a negligible difference. As such, there will not be an increase to the risk of flooding elsewhere.

Summary

1.18. This Flood Consequence Assessment has been prepared with due consideration to the above local and national policy. The Flood Risk justification test concludes that the situation of the proposed development should be acceptable.

2. Consultation and Review

Sources of Information

Consultation

2.1. NRW were consulted as part of the FCA process. They have stated that they do not hold any detailed modelling information for this part of the watercourse. The flood map in this area is based on a nationally generated JFLOW model, this was last updated in 2020. JFLOW modelling uses LIDAR data to generate flood outlines with assumptions made about the channel capacity. This modelling was carried out for the production of flood extents only and is not suitable for detailed site-specific assessments.

Documents

2.2. Local Governments and Lead Local Flood Authorities provide documents which contain data and policies on flood risk and new development in their areas. These documents are introduced and briefly summarised below. For the purposes of this FCA, these documents have been reviewed for relevant information and any relevant data is discussed within the appropriate sub heading of this report.

2.3. The following sources of information have been reviewed for this assessment:

- The Interactive Flood Risk Mapping available on the Natural Resources Wales website[1].
- The Technical Advice Note 15 (TAN15) (2004)[2]
- Geoindex Onshore (British Geological Survey, 2023)[3]

[1] **Natural Resource Wales, Flood Map, https://naturalresources.wales/flooding/check-your-flood-risk-on-a-map-flood-risk-assessment-wales-map/?lang=en**

[2] **https://gov.wales/sites/default/files/publications/2018-09/tan15-development-flood-risk.pdf**

[3] **https://www.bgs.ac.uk/map-viewers/geoindex-onshore/**

- The River Dee Preliminary Flood Risk Assessment (2018)[4]
- Wrexham County Borough Council Preliminary Flood Risk Assessment (2011) (Appendix B)

Preliminary Flood Risk Assessment (PFRA)

2.4. The PFRA is a high-level appraisal of flood risk across Lead Local Flood Authority Wrexham County Borough Council. The flood risk from all sources, including fluvial, surface water, groundwater, and surcharged sewers is evaluated. It is the basis upon which the Local Flood Risk Management Strategy is produced.

2.5. The PFRA summarises historical flood incidents in Wrexham County Borough Council. The site is not recorded as having been affected by any flood event.

Local Flood Risk Management Strategy (LFRMS)

2.6. The Local Flood Risk Management Strategy sets out roles and responsibilities for flood risk management, assesses the risk of flooding in the area, where funding can be found to manage flood risk, and the policies, objectives, and actions of the Lead Local Flood Authority.

2.7. The Wrexham County Borough Council LFRMS is used within this report to identify any flood management infrastructure and historical incidences of flooding.

[4] **https://naturalresources.wales/media/689107/dee-pfra.pdf**

3. Sources of Flood Risk

Fluvial

3.1. Flooding from watercourses arises when flows exceed the capacity of the channel, or where a restrictive structure is encountered, resulting in water overtopping the banks into the floodplain.

Main Rivers and Ordinary Watercourses

3.2. The River Ceiriog runs through the ownership boundary in a north south direction. The river is located approximately 40m west of the proposed location of the closest glamping unit.

3.3. An unnamed watercourse is shown to flow down the valley side west of the site and join into the River Ceiriog within the ownership boundary 50m west of the nearest glamping unit.

Development Advice Map

3.4. The site is primarily located within Zone A, which is all areas outside of Flood Zone B and C and considered to be at little or no risk of fluvial or tidal/coastal flooding. Some parts of the site along the western side of the ownership boundary are located in Flood Zone C2 (Figure 3). Zone C2 is defined as areas of the floodplain which are developed and served by significant infrastructure, including flood defences.

3.5. The access road off the B4500 west of the ownership boundary into the site is shown to be Flood Zone C2 and Flood Zone B (Figure 3). Flood Zone B is defined as areas known to have been flooded in the past evidenced by sedimentary deposits.

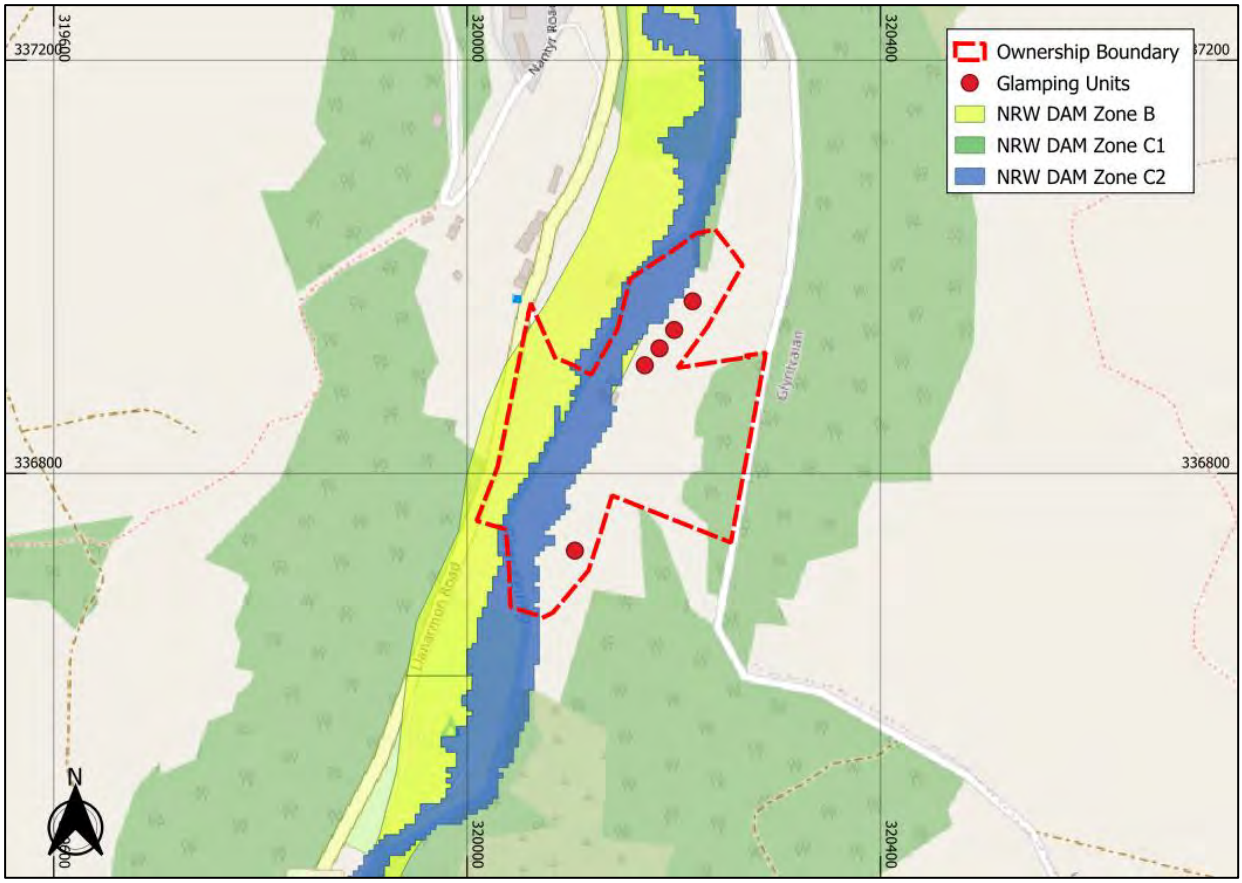


Figure 3: NRW Development Advice Map (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors. Contains public sector information licensed under the Open Government Licence v3.0)

NRW Flood Risk Mapping

3.6. The NRW Flood Risk Assessment Wales Flood Risk from Rivers dataset (Figure 4) indicates that the north and south, where the glamping units are proposed, is at a 'low' (between 0.1% and 1.0% in any year) risk of flooding from rivers (fluvial sources). The central area of the site confined within the riverbanks is shown to be at 'high' (greater than 3.3% in any year) risk, within riparian areas at a 'Medium' to 'Low' risk.

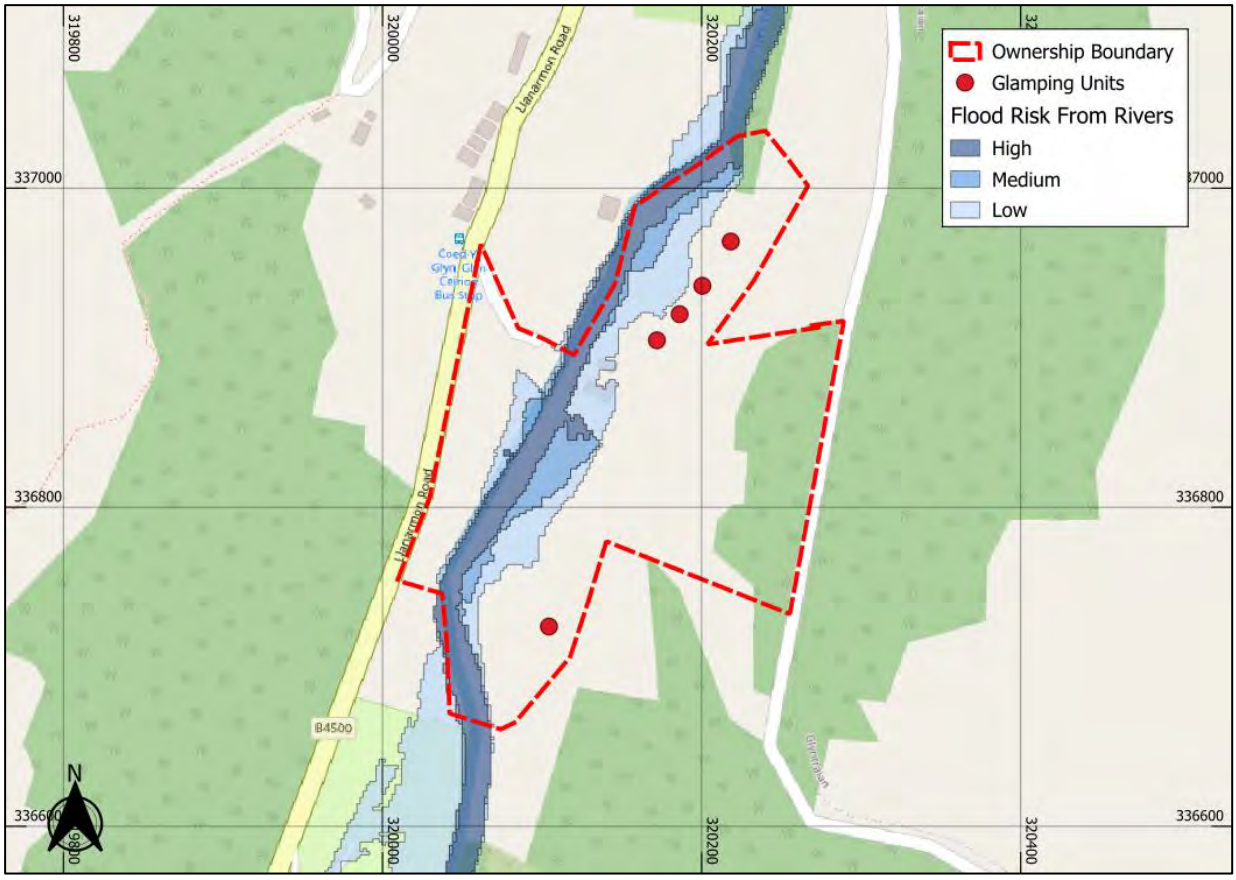


Figure 4: NRW Flood Risk Assessment Wales Flood Risk from Rivers Map (Base map and data from OpenStreetMap and OpenStreetMap Foundation (CC-BY-SA). © https://www.openstreetmap.org and contributors and Natural Resources Wales information © Natural Resources Wales and database right)

3.7. The NRW Recorded Flood Extents dataset shows that the site has not had recorded incidents of flooding in the past.

3.8. NRW were consulted as part of the FCA process. They have stated that they do not hold any detailed modelling information for this part of the watercourse. The flood map in this area is based on a nationally generated JFLOW model, this was last updated in 2020. JFLOW modelling uses LIDAR data to generate flood outlines with assumptions made about the channel capacity. This modelling was carried out for the production of flood extents only and is not suitable for detailed site-specific assessments.

3.9. Given that the majority of the site (specifically the proposed locations of the glamping units) is located in Flood Zone A, the risk of flooding to the development can be considered low. The risk of flooding along the access road can be considered to be moderate.

Tidal

3.10. The NRW Flood Risk Assessment Wales Flood Risk from Rivers dataset indicates that the site is not within an area shown to be at risk from the sea. Therefore, the site has a less than 1:1000 (0.1% AEP) chance of flooding annually from tidal sources.

3.11. The risk of flooding from tidal sources is therefore considered to be relatively low.

Canals

3.12. There are no canals in the vicinity of the site and therefore the risk of flooding from canals is considered low.

Pluvial

3.13. Pluvial flooding can occur during prolonged or intense storm events when the infiltration potential of soils, or the capacity of drainage infrastructure is overwhelmed leading to the accumulation of surface water and the generation of overland flow routes.

3.14. Annual surface water and small watercourses flood risk is labelled by NRW as:

- 'High Risk'; >3.3% AEP (annual probability greater than 1 in 30).
- 'Medium Risk'; 1.1% to 3.3% AEP (annual probability between 1 in 100 and 1 in 30).
- 'Low Risk'; 0.1% to 1% AEP (annual probability between 1 in 1000 and 1 in 100).
- 'Very Low Risk'; <0.1% AEP (annual probability less than 1 in 1000).

3.15. Examination of NRW's Flood Risk from Surface Water and Small Watercourse mapping for 'High Risk', 'Medium Risk', and 'Low Risk' AEP flood events (Figure 5).

3.16. The access road of the A555 from the west of the site is shown to be at a 'High' to 'Low' risk of flooding.

3.17. The majority of the ownership boundary and the proposed glamping units are shown to be outside the mapped risk areas, therefore at a 'Very Low' risk of flooding from surface water and small watercourse.

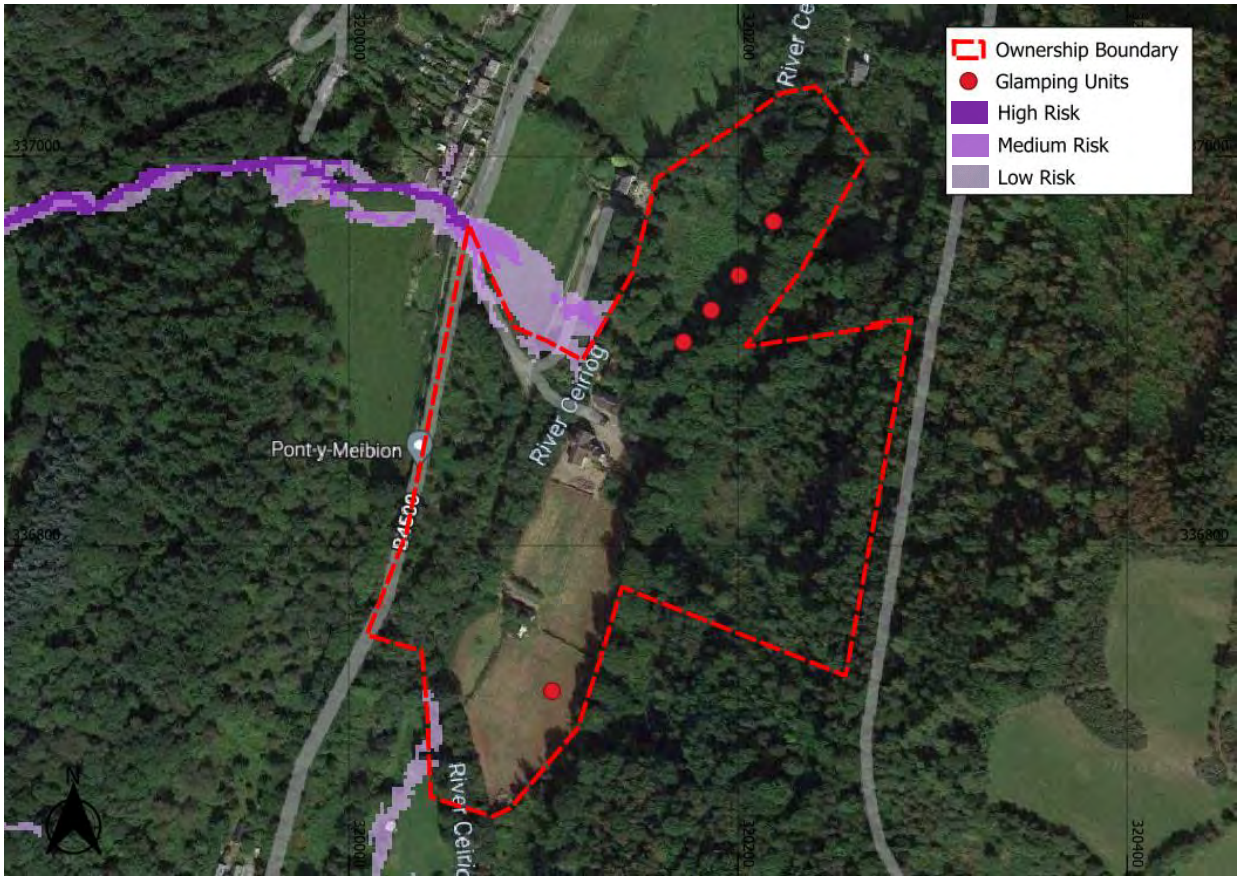


Figure 5: EA Surface Water and Small Watercourses Flood Risk Mapping (Base map Google Satellite Mapping). © https://www.openstreetmap.org and contributors and Natural Resources Wales information © Natural Resources Wales and database right)

3.18. Therefore, given the information above the proposed glamping units can be considered to be at a low risk of flooding from surface water and small watercourse.

Reservoirs

3.19. Flooding can occur from large waterbodies or reservoirs if they are impounded above the surrounding ground levels or are used to retain water in times of flood. Although unlikely, reservoirs and large waterbodies could overtop or breach leading to rapid inundation of the downstream floodplain.

3.20. The Risk of Flooding from Reservoirs map shows that the site wouldn't be affected in the event of failure of a reservoir.

3.21. Natural Resources Wales is the enforcement authority for the Reservoirs Act 1975 in Wales and undertake regular inspections on all reservoirs. Therefore, the risk of flooding from reservoirs is considered to be low.

Groundwater

3.22. Groundwater flooding occurs in areas where underlying geology is permeable, and water can rise within the strata sufficiently to breach the surface.

3.23. The British Geological Survey's (BGS) mapping shows superficial deposits of Alluvium comprised of Clay, Silt, Sand and Gravel underlying the site. The bedrock underlying the site is Dolhir Formation comprised of Mudstone and Limestone.

3.24. According to the River Dee Preliminary Flood Risk Assessment (2018):

> *"Since 2011, there have been no recorded events of groundwater flooding within the Dee River Basin District"*

3.25. There is also no mention of historical groundwater flooding within the Wrexham PFRA (2011).

3.26. Therefore, it can be concluded that the proposed glamping units would be considered to be at a low risk of groundwater flooding.

Sewers

3.27. Foul or surface water sewers can be a cause of flooding if the drainage network becomes overwhelmed, either by blockage or due to local development beyond the designed capabilities of the drainage system.

3.28. The River Dee Preliminary Flood Risk Assessment (2018) shows a pervious sewer flood event in 2013 which effected less than 5 properties in Wrexham.

> *"Excessive rainfall caused hydraulic overload to Welsh Water sewer system causing internal flooding of foul water"*

3.29. This flood event occurred in a built-up area within Wrexham town centre. Given the rural location of the proposed development it is considered that the proposed glamping units would be at a low risk of sewer flooding.

4. Flood Risk Mitigation

Fluvial

4.1. The site is primarily located within Zone A, which is all areas outside of Flood Zone B and C and considered to be at little or no risk of fluvial or tidal/coastal flooding. Some parts of the central to western side of the ownership boundary are located in Flood Zone C2. The access road into the site is shown to be Flood Zone C2 and Flood Zone B. The proposed development would be considered 'Highly Vulnerable' (glamping units), 'Highly Vulnerable' developments are considered appropriate in Zone A.

4.2. TAN15 requires the developer to demonstrate that the site is designed to be flood free for the lifetime (A1.5) of development for a 1 in 100 chance (fluvial) flood event including an allowance for climate change. Analysis within this report has indicated that the proposed glamping units are wholly located within Flood Zone A.

4.3. The proposed development should be fitted in a flood resilient manner, in accordance with the DCLG Report 'Improving the Flood Performance of New Buildings - Flood Resilient Construction' (2007). Standards for the installation and retrofit of resistance measures are available in British Standard (851188-1:2019+A1:2021). The following mitigation measures are recommended to be incorporated into the proposed development, where possible:

- Site manager to sign up to NRW Flood Warning/Alerts and formalise a flood plan.

Other Sources

4.4. Flood risk from canals, reservoirs, groundwater and sewers is considered to be low, therefore mitigation is not required.

Increase to Flood Risk Elsewhere

4.5. The proposed location of the cabins are wholly located within Flood Zone A. As such, there is likely to be no change in flood risk elsewhere as a result of the development.

Flood Warnings

4.6. The site is not in an area where NRW provide specific flood alerts and warnings. The site manager of the glamping units should monitor Met Office Weather Warnings and the online Flood Warning and Alerts to be prepared for extreme weather events.

4.7. Using the extrapolated flood level from the extent of Flood Zone C2, it is possible to determine the flood depths along the access route to the proposed glamping units. Figure 6 shows a cross section along the access/egress route and with an estimated maximum flood level of 178.2m AOD, flood depths will be confined to the east of the river Ceiriog due to the ground elevations being high to the west along the access road. Therefore, safe egress of the site will be possible if the Glamping units are evacuated on receipt of flood warnings.

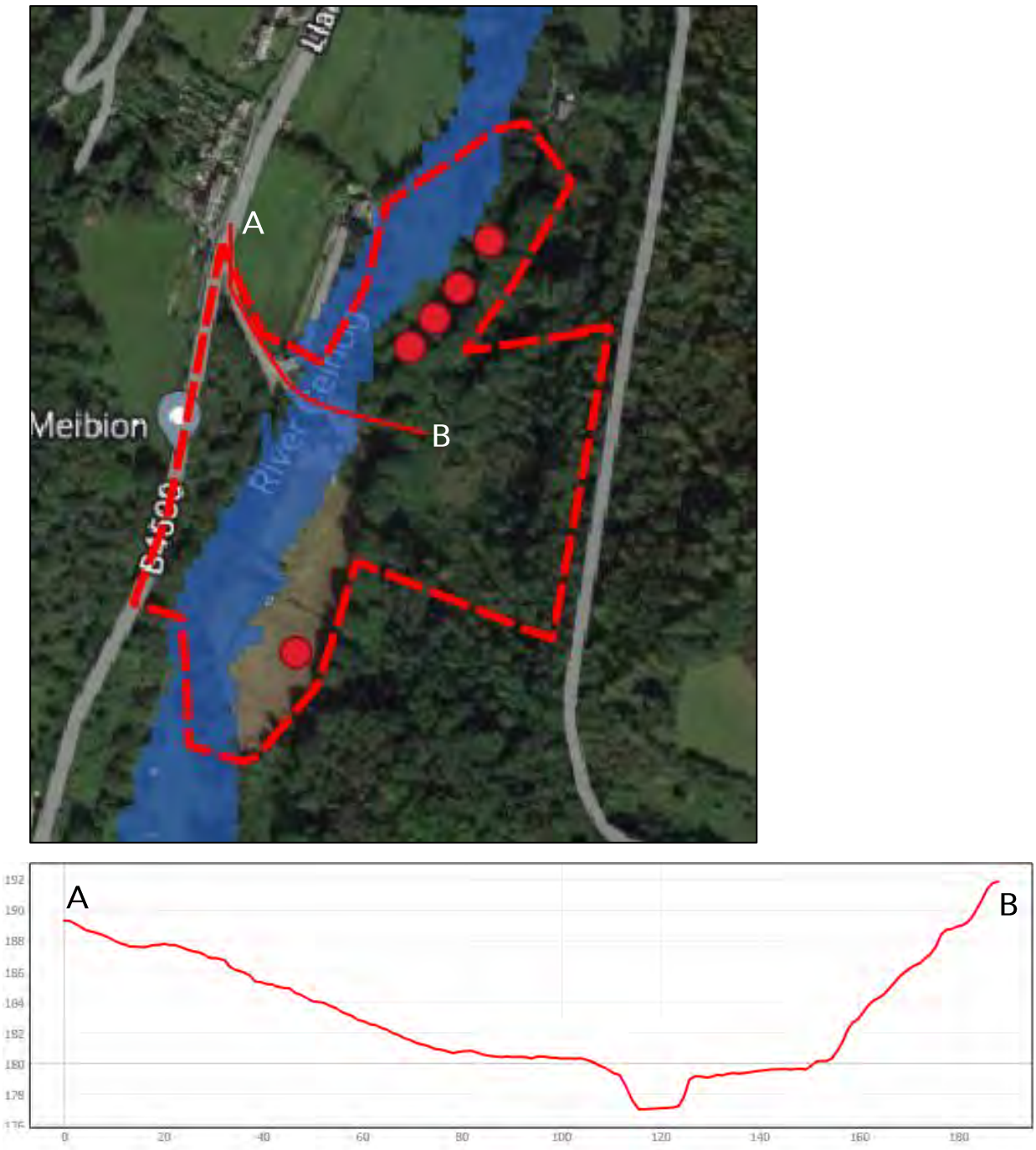


Figure 6: Cross section across the access route and River Ceiriog

4.8. Flood warnings/alerts can be enforced at any time of the day or night. Signing up for this service provides site owners some notice before a flood event. The amount of time afforded before a flood occurs depends on the site-specific location (e.g. proximity to the source of flooding, topography of the surrounding area) and the flood mechanism (e.g. bank over topping versus a breach event).

4.9. Flood alerts and warnings provide site managers with time to take necessary action, e.g. communication of the risk of flooding to occupants/employees etc, evacuation of occupants offsite or to a safe level, removal of valuable items out of reach of flooding and the mounting of site-specific flood defences.

4.10. It is also important to emphasise that the site is not to be used for permanent residential use and therefore, in the event of any flood warning or Met Office weather warning, the site will be immediately closed and not reopen until the warning has been lifted.

5. Conclusions

5.1. This FRA has been undertaken with reference to the requirements of NPPF and Planning Practice Guidance with respect to the development at Ddol Hir, Llanarmon Road, Glyn Ceriog, LL207NP. It has been written to support a planning application and prepared with due consideration to the nature of the proposed development to provide the appropriate level of detail.

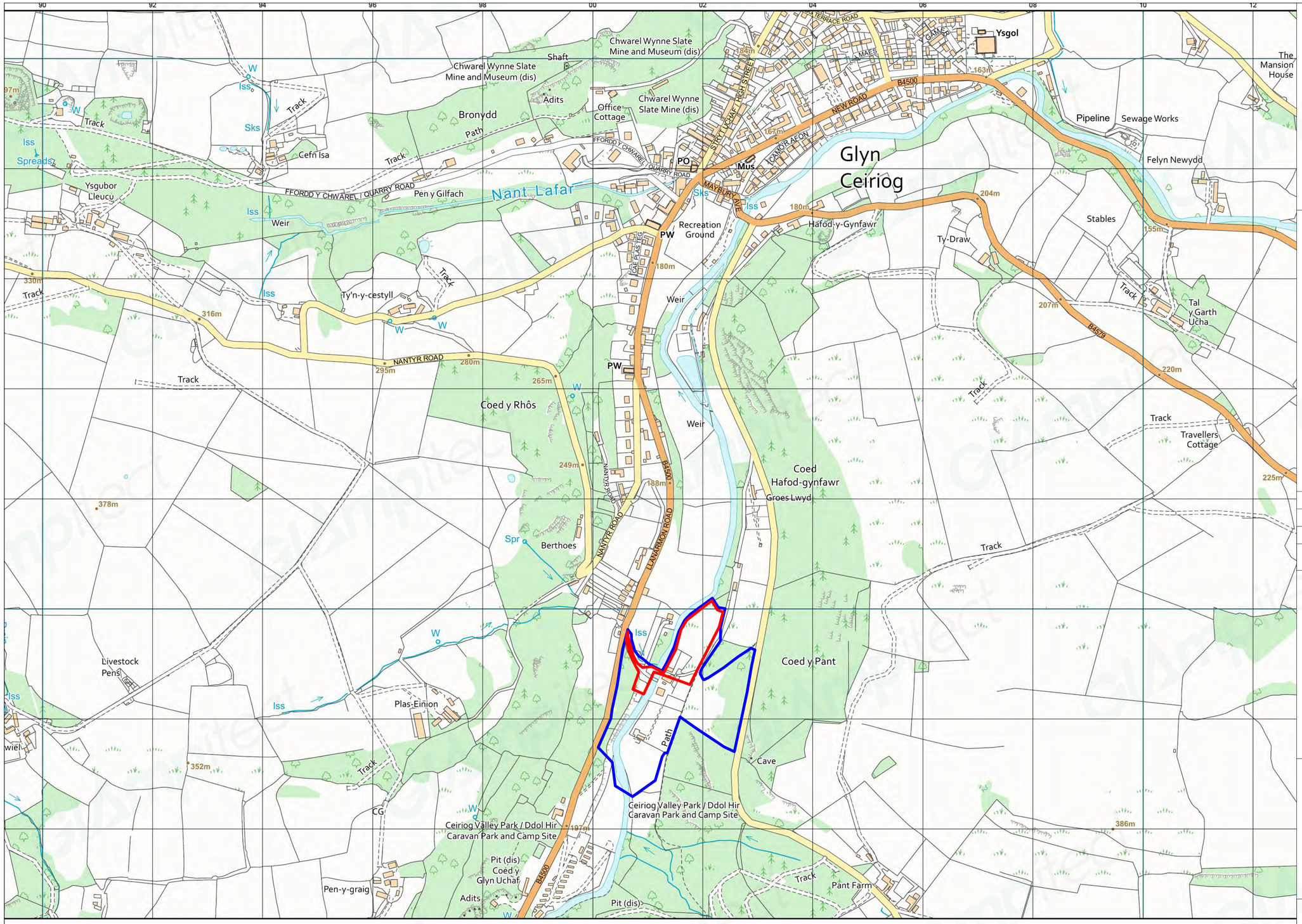
5.2. An assessment of the risk of flooding from all sources has been undertaken and is summarised in the table below:

Source of Flooding	Flood Risk Summary
Fluvial	The site is primarily located within Zone A, which is all areas outside of Flood Zone B and C and considered to be at little or no risk of fluvial flooding. Some parts of the site along the western and central are located in Flood Zone C2. The access road into the site is shown to be Flood Zone C2 and Flood Zone B. The proposed development would be considered 'Highly Vulnerable' (glamping units), 'Highly Vulnerable' developments are considered appropriate in Zone A.
Pluvial Tidal Reservoirs Groundwater Sewers Canals	The site is considered to be at low risk from other sources.

5.3. The FCA supports the planning application and demonstrates that there is an acceptable level of flood risk to the site if the mitigation strategies recommended are implemented in the scheme. The development does not increase flood risk off site or to the wider area.

5.4. This Flood Consequence Assessment should be submitted as part of the planning application to satisfy the requirements under NPPF.

Appendix A - Development Proposals



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OWNERSHIP BOUNDARY

SITE BOUNDARY

40 0 80 160 240 320 400
metres

NORTH

GLAmpitect
W: WWW.GLAMPITECT.CO.UK
E: CONTACT@GLAMPITECT.CO.UK
T: 0131 202 9002

Ordnance Survey
Licensed Data

Date	Description	Rev	By

Revision Description

Project:
Proposed Glamping Site - For Aisha Ali
Ddol hir, Llanarmon Road, Glyn ceiriog
LL207NP

Drawing Title:
LOCATION PLAN

Drawing Number:
240103-01-01

Revision:	-
Date:	30.01.2024
Scale:	1:5000 @A2
Drawn By:	TA
CAD Dwg File:	-
Checked By:	-

Issue Status:
Full Planning Application

A2

Appendix B - Wrexham PFRA

Preliminary Flood Risk Assessment: Cycle 1 review

This questionnaire is provided to enable each Lead Local Flood Authority (LLFA) in Wales to complete a phase 1 review of their cycle 1 Preliminary Flood Risk Assessment report that was completed in December 2011, as required under the Flood Risk Regulations (2009).

The PFRA cycle 1 phase 1 review for each LLFA comprises of:

- This completed questionnaire; and
- A completed addendum summarising the review to be published with the cycle 1 PFRA report.

To complete the review, every LLFA in Wales should complete all parts of this questionnaire. Part 4 of this document will need to be published as an addendum to each cycle 1 PFRA.

This review should be completed and submitted to the Flood Risk Strategy team in Natural Resources Wales no later than 22 September 2017 using the following mailbox: flood.risk.management.plan@cyfoethnaturiolcymru.gov.uk

All LLFAs should read the guidance document 'Preliminary flood risk assessment review: guidance' before completing this questionnaire.

Part 1: To be completed by LLFA

LLFA Name	Wrexham County Borough Council
Name of LLFA Officer completing the questionnaire	Neil Taunt
Job title	Senior Flood Management Officer
Telephone number	01978 729734
Email address	neil.taunt@wrexham.gov.uk

Part 2: To be completed by the Natural Resources Wales reviewer

Name and job title	Rachel Thomas, Flood Risk Strategy Advisor
Date questionnaire received	15th September 2017
Date review undertaken	11th October 2017 / 15th November 2017

Part 3: LLFA review of Preliminary Flood Risk Assessment produced in 2011

Historic flooding: Past floods experienced since Dec 2011 only

Activity for PFRA review

Have you experienced any flood events since the publication of the original PFRA report in December 2011 that had locally significant harmful consequences? (note - refer back to 1st cycle PFRA for the threshold that was used by your LLFA of locally significant and use the same methodology). Please include a summary of relevant floods in the next row.

Please try and include as much information as possible including, but not limited to: location description; start date; days duration; probability; main source of flooding; additional source(s) of flooding; confidence in main source of flooding; main mechanism of flooding; and main characteristic of flooding. Information is required in text format, but GIS layers can be included optionally as supporting information.

Please also comment on whether the event(s) happened in a Flood Risk Area identified under the initial PFRA.

PFRA review: LLFA response (LLFAs to enter response in this box. Use as much space as required)

Using the previous criteria, there have been 5 incidents identified as follows:

Date	Location	Description	Duration	Probability	Main Source	Additional Source	Confidence	Main Mechanism	Characteristic
07/10/12	Dee Lane Holt	Road closure for >5hrs	1 Day		Main river overtopped caused by extreme rainfall				
24/09/12	Cefn Road Bwlchgwyn	Road closure for >5hrs	1 Day		Surface water flooding due to extreme rainfall				
11/06/13	Glanrafon Rhos	>5 properties affected			Excessive rainfall caused road to flood resulting in internal flooding.				
11/06/	Lambou	>5			Excessi				

13	re Court Gwersyll t	properti es affected			ve rainfall caused hydrauli c overload to Welsh Water sewer system causing internal flooding of foul water				
17/11/ 13	Rivulet Road Wrexha m	>5 properti es affected			Blocked trash screen caused river to overtop due to excessiv e rainfall causing flooding to a number of properti es includin g industria l units				Within Hightown PFRA

Update 14/11/2017:

Following receipt of the NRW Reviewers comments, it is accepted that the previous PFRA was undertaken using the "significance threshold" criteria stipulated by EA at the time for the definition Flood Risk Areas. Although this definition has not been incorporated in to WCBCs Local Flood Risk Management Strategy as the local criteria for "Significant Harmful Consequences" it is accepted that the PFRA review needs to be consistent with the criteria used within the 2011 report. The addendum report has been amended accordingly.

NRW reviewer comments (NRW to enter review comments in this box)
We note you have recorded the events above as exceeding the threshold set in your Cycle 1 PFRA, however your report indicates the threshold to be 200 people/20 businesses/1 critical service. You indicated that the threshold for the Local Flood Risk Management Strategy would be lower therefore it may be that this threshold has been used for this review? We would advise that for continuity, please could the thresholds used in your Cycle 1 PFRA to record past floods, also be used in Cycle 2. If the above information needs to be amended, please could you also ensure the addendum is also changed.

Please be aware that we may require further information regarding any significant flood events since 2011 for the purposes of reporting to Europe. We will be in contact with you in January 2018 regarding this.

15th November 2017:

There have been no events since 2011 which have exceeded the threshold of 5 or more residential properties set in Cycle 1, therefore no further information is required.

Future flooding: Future flood information

Activity for PFRA review

Have you created or received new information on potential future floods that has added to or changed your understanding of significant flood risk in your LLFA area since publication of your original PFRA report in 2011? (note - refer back to 1st cycle PFRA for the threshold that was used by your LLFA of locally significant and use the same methodology).

Have you created or received new information to improve the understanding of the future impact of climate change on flood risk in the LLFA area? You may wish to refer to any updates that your LLFA is undertaking based on recent climate change guidance publication, any local climate change catchment modelling or the PAG guidance update.

Please try and include as much information as possible of details of relevant floods in the next row.

PFRA review: LLFA response (LLFAs to enter response in this box. Use as much space as required)

WCBC Projects:
River Gwenfro Update – December 2016: Updated model building on previous EAW/NRW study that was deemed to be out of date due to recent development within the flood risk area. Considers flood risk associated with the Gewnfro catchment for multiple return period events, including “as existing “ and “undefended” scinarios including lastest guidance climate change, multiple blockage runs. All data provide to NRW Buckley office to define Flood Zones. Included updated hydrological assessment and more current DTM/DSM using more recent lidar and topographical survey. This dataset is accepted as the most uptodate respresentation of risk within the Gwenfro catchment (both ordinary/main river sections)

Modelling reports supplied by NRW:
River Gwenfro at New Broughton – February 2013 (this has been incorporated into the above River Gwenfro Update)
Cefn Mawr & Acrefair – May 2013
Updated Flood Maps for Surface Water – 2015

Update 14/11/2017:

Following receipt of the NRW Reviewers comments, it is accepted that modelling work undertaken since the 2011 report has acted to refine risks that have already been identified and has not identified significant "new" areas at risk. The addendum report has been amended accordingly.

NRW reviewer comments (NRW to enter review comments in this box)
We note that your Authority have carried out a number of studies to further develop your understanding of flood risk in your area, however it is unclear if the new information provided by the above has led to a change in your understanding of significant flood risk. If your understanding of significant flood risk now differs from the assessment made in section 5 of your PFRA in 2011, whether this be the identification of a new area at significant risk or the reduction of an area identified in Cycle 1, please could you provide this information. If there have been any changes, as well as reporting this above, please could you amend the following addendum.

Please be aware that we may require further information regarding any change in your understanding of significant flood risk for the purposes of reporting to Europe. We will be in contact with you in January 2018 regarding this.

15th November 2017:

There has been no new information which has led to a change in understanding of significant flood risk or the future impact of climate change on flood risk, therefore no further information is required.

Part 4: Template for addendum to update the original Preliminary Flood Risk Assessment report

ADDENDUM

Update to the preliminary flood risk assessment report for Wrexham County Borough Council.

The preliminary flood risk assessment (PFRA) for Wrexham County Borough Council was reviewed during 2017, using all relevant current flood risk data and information, and agreed with Natural Resources Wales on 15 November 2017.

The below statements describe the review of the assessment of risk since the preliminary assessment report was published in 2011.

Past flood risk

There has been a review of flooding experienced since the publication of the first Preliminary Flood Risk Assessment Report in 2011 and there have been no floods experienced that caused locally significant harmful consequences.

Future flood risk

There has been no new information identified since the publication of the first Preliminary Flood Risk Assessment Report in 2011 that has led to a change in understanding of future flood risk.

Flood risk areas (FRAs)

The cycle 1 FRAs in Wales will be reviewed as part of a detailed consolidated PFRA that will cover all sources of flood risk by 22nd December 2018.