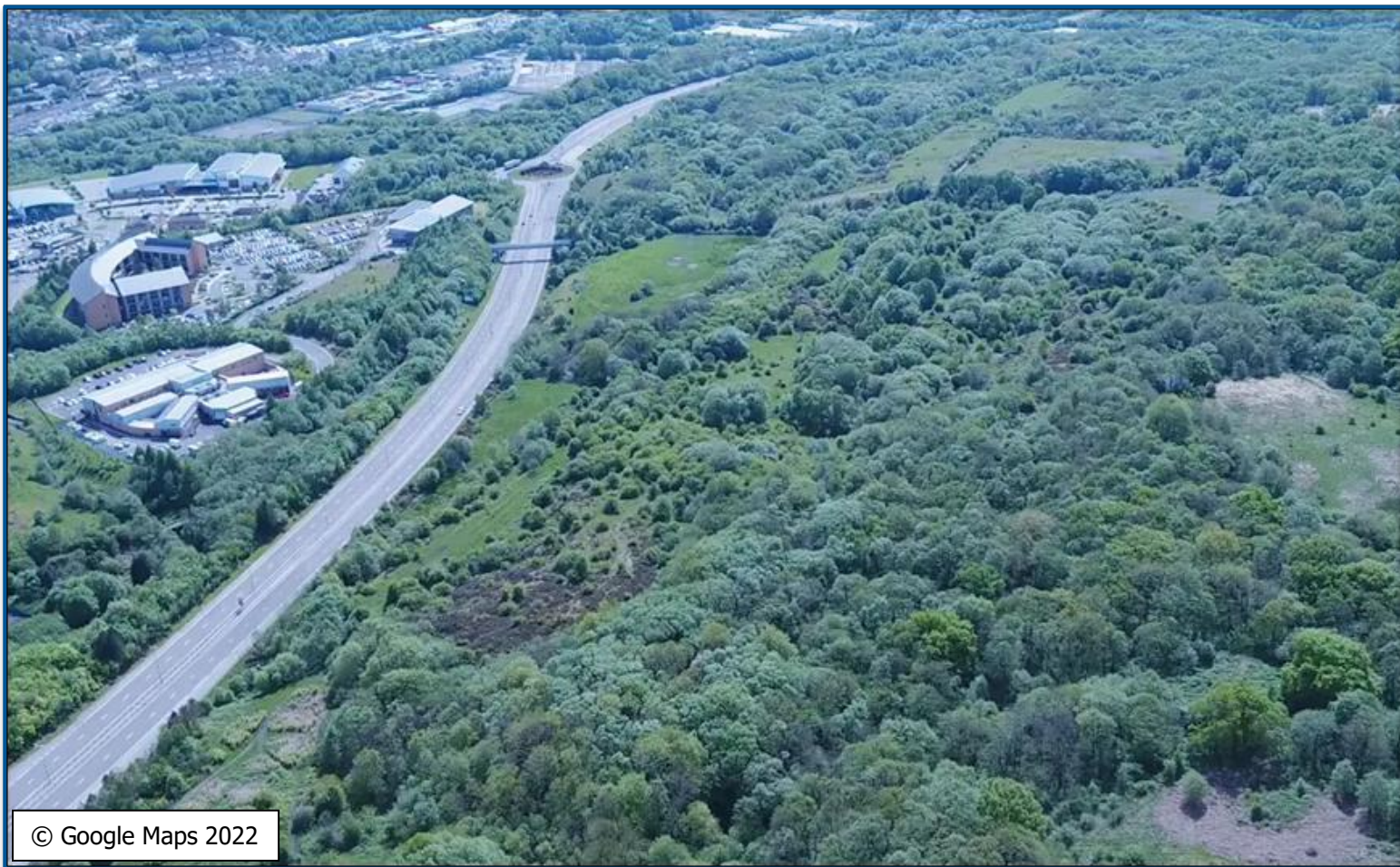




Rhydycar West, Merthyr Tydfil

Flood Consequence Assessment



9 December 2022

Version ISSUE 2

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PRESENTED TO

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EXECUTIVE SUMMARY

Consultation	Consultation has been undertaken with the SuDS Approving Body (SAB) throughout the production of this FCA and the associated SAB Pre-application and Drainage Strategy development. This included a meeting with Huw Williams, on 23 November 2021. The SAB accepted the concepts presented in the Drainage Strategy, agreed that formal approval for watercourse diversions and discharge consents, including the detail of discharge connections, could be deferred to a formal application after Outline Planning Permission has been granted and accepted that Greenfield Runoff Rates (GFR) are Q_{bar} rates. Furthermore, the SAB accepted permeable paving and a swale as the two levels of treatment required for the car park, and that the current strategy based on no infiltration, i.e. lined swales, was generally acceptable. In summary, the SAB accepted the principles proposed in the Drainage Strategy and raised no material concerns regarding the proposed development from a drainage and flooding perspective. Consultation has also been undertaken with Merthyr Tydfil County Borough Council (MTCBC) via the planning pre-application process. All matters pertaining to flood risk raised in the pre-application letter, 4 October 2022, i.e., the requirement for a SAB pre-application, ordinary watercourse applications, condition and capacity assessments, discharge rates, watercourse diversions and consultation with SAB, have been addressed in this FCA.
The Site	The application site is located west of the A470 road in Merthyr Tydfil, Wales. The nearest postcode to the site is CF48 1UN and the site's National Grid Reference (NGR) is 303834, 205496.
Existing Development	The existing site has been developed in the past. The northern and north-western parts of the site have a post-industrial landscape, where colliery spoil-heaps are present. The spoil-heaps are largely woodland but elsewhere they support acid grassland and dry heath. The southern part of the site supports large tracts of woodland and has more natural soils. Neutral or acidic grassland and bracken is present in more open, undrained parts of the application site. Marshy grassland is occurring in areas with restricted drainage. The Council undertook works on site around spring 2022 to improve drainage provisions and tip stability. These works have no material impact on pre-existing conditions which are the basis for this Flood Consequences Assessment (FCA).
Proposed Development	Outline application for erection of a mixed leisure development comprising indoor snow centre (up to 39,200 sq m), waterpark (up to 7,500 sq m), indoor activity centre (up to 9,000 sq m), external activity areas, hotel accommodation (up to 418 bedrooms), forest lodge accommodation (up to 30 units), car parking (up to 830 spaces) and associated earthworks, access, drainage, servicing and utilities connections/infrastructure.
Site Geology	The application site is underlain by made ground c. 10-12m deep.
Risk of River (Fluvial) Flooding	Natural Resources Wales (NRW) online flood maps indicate the application site is in Flood Zone A; it is not at risk from fluvial flooding.

Risk of Surface Water (Pluvial) Flooding	While NRW online flood maps indicate the application site is at risk from pluvial flooding, any potential pluvial flood risk to or from the proposed development will be mitigated using the measures detailed in this FCA; watercourses will be rerouted subject to appropriate consents and approvals, and a SuDS compliant drainage scheme will be implemented.
Risk of Marine Flooding	NRW online flood maps indicate the application site is not at risk from marine flooding.
Risk of Reservoir Flooding	The proposed development is outside of the reservoir inundation floodplain.
Risk of Groundwater Flooding	The flood risk from groundwater was identified as negligible.
Development Classification	The application site lies within Zone A land, which is land considered to be little or no significant risk of fluvial or marine flooding.
Proximity to Watercourses	There are several watercourses and other water features located within the application site. The River Taff is approximately 700m to the east of the site and the Nant Cannaid river flows along the southern boundary of the application site from west to east. Other water features present throughout the site are Cwm Pit Stream, Tub Boat Canal, Cyfarthfa Balance Pond, Glyndyrus Tip Springs and A470 Tip Springs.
Suitability for SuDS	Due to the risk of destabilising subsoils in the area, discharging surface water using infiltration is not recommended at this stage. SuDS have been incorporated into the proposed development's surface water management strategy without infiltration being relied upon. Further investigations will be made into the suitability for using infiltration at detailed design stage.
Surface water Discharge	A SAB Pre-application has been submitted to MTCBC in support of the Outline Planning Application for the proposed development. If necessary, this FCA will be updated on receipt of their response. Outline design has been completed for the drainage regime in accordance with Wales Sustainable Drainage Statutory Guidance to provide betterment in surface water flows from existing.
Foul Discharge	Foul water is to discharge to the existing foul sewer located 250m east of the A470, as per DŵrDŵr Cymru Welsh Water's (Welsh Water) Pre-Development Enquiry (PDE) response. A Sewer Requisition application will be lodged to Welsh Water at detailed design stage.
Conclusions	In summary, apart from pluvial flood risk, there is no risk of flooding to or from the proposed development from any of the flood sources explored within this FCA. Any potential pluvial flood risk to or from the proposed development will be mitigated using the measures detailed in this FCA; watercourses will be rerouted subject to appropriate consents and approvals, and a SuDS compliant drainage scheme will be implemented. Furthermore, the proposed development will add betterment in terms of surface water runoff rates for all events greater than Q_{bar} . Accordingly, no objections should be sustained on grounds of flood risk or drainage matters and there is an overall negligible flood risk to the site.

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ACRONYMS/ABBREVIATIONS

Acronyms/Abbreviations	Definition
AoD	Above Ordnance Datum
BGS	British Geological Survey
CC	Climate Change
FCA	Flood Consequences Assessment
FRMP	Flood Risk management Plan
GFR	Greenfield Runoff
MTCBC	Merthyr Tydfil County Borough Council
NGR	National Grid Reference
NRW	Natural Resources Wales
PDE	Pre-Development Enquiry
PPW	Planning Policy Wales
RWH	Rainwater Harvesting
SAB	SuDS Approving Body
SAM	Scheduled Ancient Monument
SuDS	Sustainable Urban Drainage System
TAN	Technical Advice Note
TfW	Transport for Wales

1. INTRODUCTION

This FCA has been prepared by Tetra Tech on behalf of Marvel Limited, in support of an Outline Planning Application for the proposed development. The application is for an outline application for erection of a mixed leisure development comprising indoor snow centre (up to 39,200 sq m), waterpark (up to 7,500 sq m), indoor activity centre (up to 9,000 sq m), external activity areas, hotel accommodation (up to 418 bedrooms), forest lodge accommodation (up to 30 units), car parking (up to 830 spaces) and associated earthworks, access, drainage, servicing and utilities connections/infrastructure. The proposed development is located to the west of the A470 in Merthyr Tydfil, Wales. The application site has been developed in the past.

A SAB Pre-application has been submitted in support of the Outline Planning Application for the proposed development.

This FCA considers the potential of the proposed development to increase flood risk elsewhere, as well as assessing flood risk to the proposed development itself owing to the number of watercourses within the site boundary.

The following methodology has been employed:

- Documentary review/desk-top study of potential sources of flooding near the proposed development;
- Review existing and proposed development details and accommodation schedules;
- Statutory Undertaker liaison to determine:
 - The nature and extent of any flood risk near the proposed development;
 - Details of any flood protection measures;
 - The requisite approach to the FCA; and
 - The nature and extent of drainage infrastructure near the proposed development.
- Review available existing drainage information (e.g. existing foul and surface water drainage provisions, existing accommodation, Welsh Water PDE response, MTCBC Land Drainage Consent and any other available information);
- Confirm pre-existing surface water and foul discharge rates;
- Confirm preliminary proposed developments surface water and foul discharge rates;
- Identify potential flood risks, discharge limits and mitigation options, e.g. attenuation / SuDS, flood protection/resilience/recovery measures, where necessary; and,
- Produce FCA in accordance with the requirements of Planning Policy Wales (PPW) 11 and Technical Advice Note (TAN) 15.

2. SITE INFORMATION

2.1 LOCATION

The application site, which extends to 30.42 ha, is located at lands west of the A470 road in Merthyr Tydfil, Wales. The nearest postcode is CF48 1UN and the NGR of the application site is 303834, 205496.

Merthyr Tydfil town centre is approximately 1000m to the north of the centre of the application site, with Heolgerrig 1900m to the northwest. The River Taff is approximately 700m to the east of the application site. Figures 1 and 2, and Appendix A, provide location details in context of the regional and local situation.

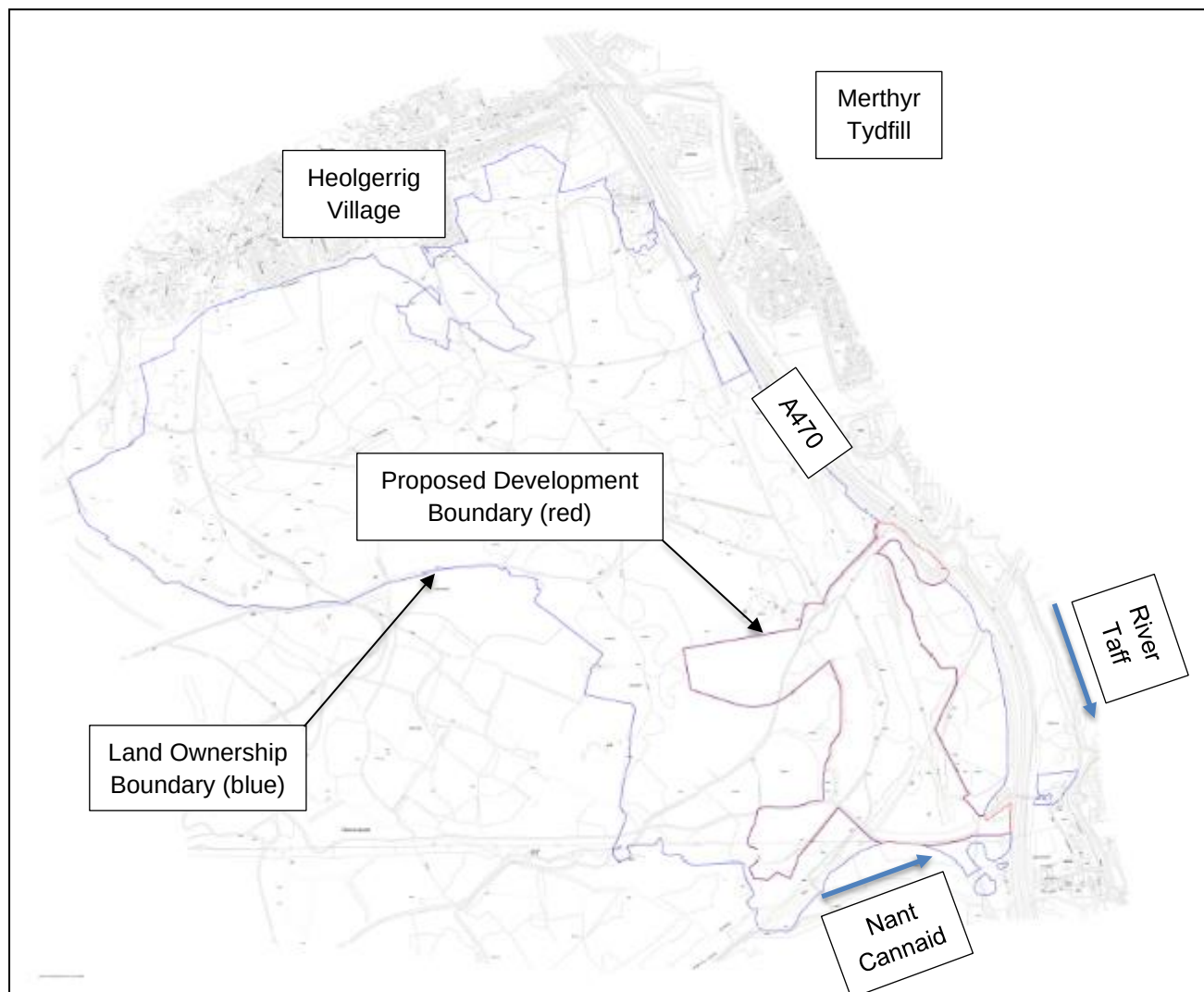


Figure 1 - Site Location

2.2 GENERAL AREA CONTEXT

Table 2-1 - Surrounding land uses

	Description
North	Undeveloped vegetated lands and beyond to Heolgerrig Village
East	A470 carriageway
South	Undeveloped vegetated lands including forestry
West	Undeveloped vegetated lands including forestry

2.3 SITE TOPOGRAPHY

The site lies between approximately 175m Above Ordnance Datum (AoD) to the east, rising to approximately 270m to the north and west, as shown in Figure 2 and Appendix B, and has a semi-upland character.



Figure 2 - Site Topography (land Ownership Boundary (red))

2.4 EXISTING DRAINAGE REGIME

There is no formal existing drainage within the site boundary. Informal drainage features are present throughout the site in the form of ponds and ditches.

2.5 PROXIMITY TO WATERCOURSES AND WATERBODIES

The nearest Main River to the application site is the River Taff which is c. 700m beyond the site's eastern boundary. There are several watercourses located within the site boundary as shown in Figure 3 and Appendix C. There is a main watercourse that flows along the southern boundary of the site called the Nant Cannaid.

There is a waterbody at the western boundary of the site which has an approximate volume of 4,260m³. The waterbody is classed as a pond as its volume is less than the minimum volume required for reservoir classification (10,000m³).

2.6 SOURCE PROTECTION ZONES

The entire application site is located outside any Groundwater Source Protection Zone as shown in Figure 4 and Appendix D. Therefore, the application site is at negligible risk to pollution.

2.7 SITE GEOLOGY

British Geological Survey (BGS) Mapping (Sheet 231) indicates that there are extensive deposits of made ground across the site in the form of large spoil heaps. The spoil heaps are located across the wider site (blue line boundary) and within an eastern part of the proposed development area (red line boundary). The site is underlain by superficial deposits of glacial till overlaying bedrock of the South of Wales Middle and Lower Coal Measures, comprising sandstones, mudstones and siltstones interspersed with ironstone veins, coal seams and seat earths. The natural geology of the application site has been disrupted by the creation of mine entries in the form of shafts and adits, disused workings, and the placement of soil. There are at least 12 coal seams that outcrop within the site boundary.

2.8 PROPOSED DEVELOPMENT

The application is for a mixed leisure development comprising:

Indoor snow centre (up to 39,200 sq m), waterpark (up to 7,500 sq m), indoor activity centre (up to 9,000 sq m), external activity areas, hotel accommodation (up to 418 bedrooms), forest lodge accommodation (up to 30 units), car parking (up to 830 spaces) and associated earthworks, access, drainage, servicing and utilities connections/infrastructure.

The proposed development is shown in Appendix E.

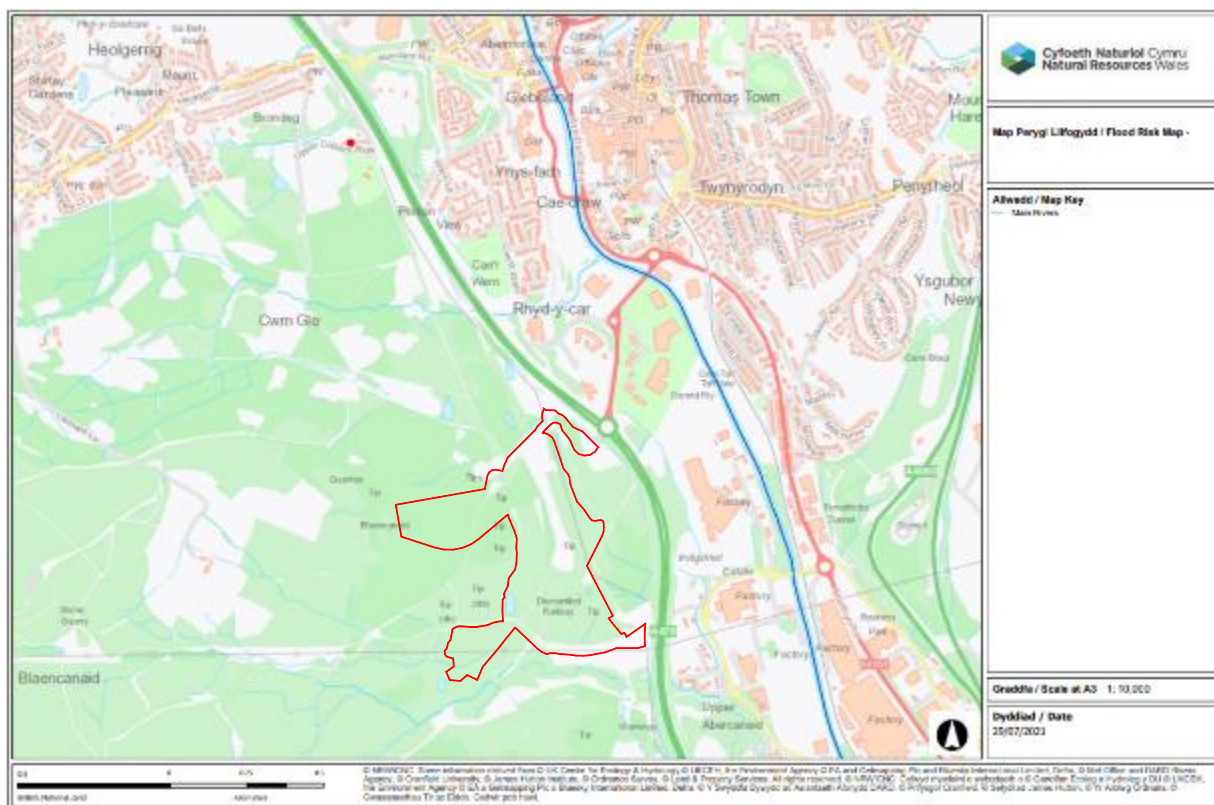


Figure 3 - Main Rivers and Ordinary Watercourses Map (NRW, April 2021)

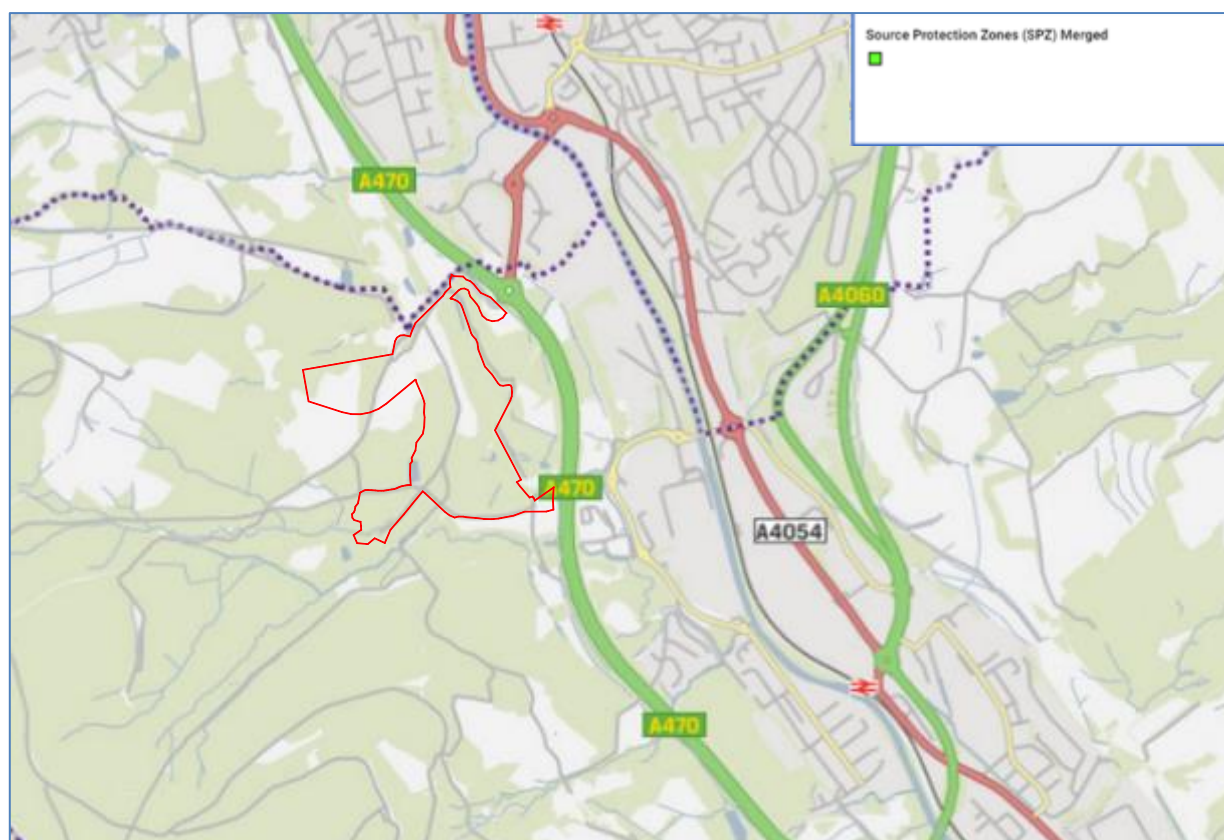


Figure 4 - Groundwater Source Protection Zone Map

3. POLICY AND LEGISLATION

3.1 NATIONAL POLICY AND LEGISLATION

Future Wales is the National Development Framework for Wales, with policy 8 providing the government's policy on flooding and flood management infrastructure. 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.

PPW (Edition 11: published in February 2021) sets out the general planning framework within Wales and is supported, in flood risk terms, by TAN 15: Development and Flood Risk.

The general approach of PPW11, supported by TAN15, 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. As stated in PPW11 Paragraph 6.6.22 the overarching aim of the precautionary framework is that planning authorities adopt a precautionary approach of positive avoidance of development in areas of flooding from the sea or from rivers.

In all zones, development should reduce and must not increase the risk of flooding on site or elsewhere, in accordance with PPW11 Paragraph 6.6.26 and TAN15 Paragraph 8.3.

TAN15 states that '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'. PPW also states that the priority should be to protect floodplains from development to prevent cumulative effects.

In line with the requirements of PPW11 Paragraph 6.6.27, Development should not cause additional run-off, which can be achieved by controlling surface water as near to the source as possible by the use of SuDS. The rate of surface water runoff from the proposed development is to be restricted to an existing GFR, thereby not increasing flood risk downstream.

In accordance with Schedule 3 to the Flood and Water Management Act 2010, as of January 7 2019, all new development with a construction area of 100m² or more requires sustainable drainage to manage on-site surface water. Separate SuDS approval is required from the SAB before construction work can commence. The new regulations require design option considerations against a SuDS hierarchy, whereby, the first preference is for re-use of water (water butts, Rainwater Harvesting (RWH) etc.), then conveyance/mitigation/attenuation at the surface before piped or tanked drainage solutions can be considered. Ultimately, all surface water drainage systems must be designed and built-in accordance with the mandatory SuDS Standards to align with TAN15 Paragraph 8.3.

When considering SuDS design, the Welsh Government SuDS Statutory Guidance should be consulted alongside the CIRIA C753 SuDs Manual for technical design in the hierarchical approach.

3.2 LOCAL POLICY

The MTCBC Flood Risk Management Plan (FRMP) highlights how the disposal of surface water is a key consideration even if the site is not in a flood risk area. It promotes the use of SuDS to make sure that flood risk is not increased downstream.

The MTCBC FRMP directs development to the local SAB application which states that all SuDS options should be explored in a hierarchical approach, with collection and infiltration the preferred options. SuDS options should be developed preferably in advance of the site layout, so land can be allocated for the effective use of SuDS.

4. FLOOD RISK ASSESSMENT – BASELINE INFORMATION

4.1 NRW MAPPING

Figure 5 and Appendix F, show the Development Advice Map published by NRW. The map demonstrates flood risk in the area and highlights the consequences of this in line with PPW and TAN 15: Development and Flood Risk. The Development Advice Map indicates that the entirety of the site is located within Zone A; land considered to be at little or no significant risk of fluvial or tidal/coastal flooding.

Areas located within Zone C2 and Zone B land, i.e. within areas of the floodplain without significant flood defence infrastructure, are c. 100m beyond the site to the east.

Similar information is shown by the NRW Fluvial Flood Risk map; Figure 6 and Appendix G, which indicates that the entirety of the site lies outside the fluvial floodplain extents.

The site is not in the vicinity of the marine floodplain as it is located 25 miles from the nearest marine floodplain and the elevation is >175m AoD. This is demonstrated via the NRW Marine Flood Risk Map in Figure 7 and Appendix H; the marine floodplain does not encroach the site boundaries.

A review of the NRW Surface Water Flood Risk Map, as shown in Figure 8 and Appendix I, indicates that the site is affected by the pluvial floodplain which is caused by surface water ponding and small watercourses. Pluvial flooding occurs at the southwest of the application site where the Outdoor Activity center will be located. This is not seen to be a significant risk as the area will be largely left in its natural state, possibly featuring high-ropes and boardwalks, allowing flood waters to flow through the area unhindered.

Pluvial flooding also occurs to the south of the application site where the Forest Lodges will be located. The Forest Lodges will be built on stilts to allow flood waters to flow under the structures and will not negatively impact pre-existing flood conditions. The area will be served by permeably surfaced roads with regular pipe crossings beneath to allow pluvial waters to pass unhindered.

There is a small pond located to the west of the western boundary of the application site; the Cyfarthfa Balance Pond. Since the volume of the pond is below the threshold to be considered a reservoir, it has not been assessed in accordance with the Reservoirs Act. However, for completeness, an assessment has been made here of the consequences of pond bank failure. In the unlikely event of bank failure along the eastern boundary of the pond, flood waters will enter the Outdoor Activity area and flow eastwards. This is not seen to be significant, as there is minimal development proposed in this area; any flood waters entering will pond near the southern site boundary and flow to the Nant Cannaid either via the existing boundary culvert or a proposed lined impermeable swale which flows along the eastern boundary of the Outdoor Activity area. The flow path from any flood waters will closely match that of the existing outlet from the Cyfarthfa Balance Pond.

Other mitigation measures detailed in Section 6.0 include the collection of flood waters flowing into the application site via lined, impermeable swales, which will be designed to mimic existing drainage features as closely as possible, and direct flood waters back into downstream watercourses.

It is proposed that several watercourses will be diverted as part of the proposed development. The proposed diversions will be subject to MTCBC consent and will further decrease pluvial flooding within the application site.

A review of the NRW Online Long-Term Flood Maps as shown in Figure 9 and Appendix J, identified that the site is not at risk of flooding as a result of reservoir failure. Areas located within the reservoir inundation area are c. 100m beyond the site to the east.

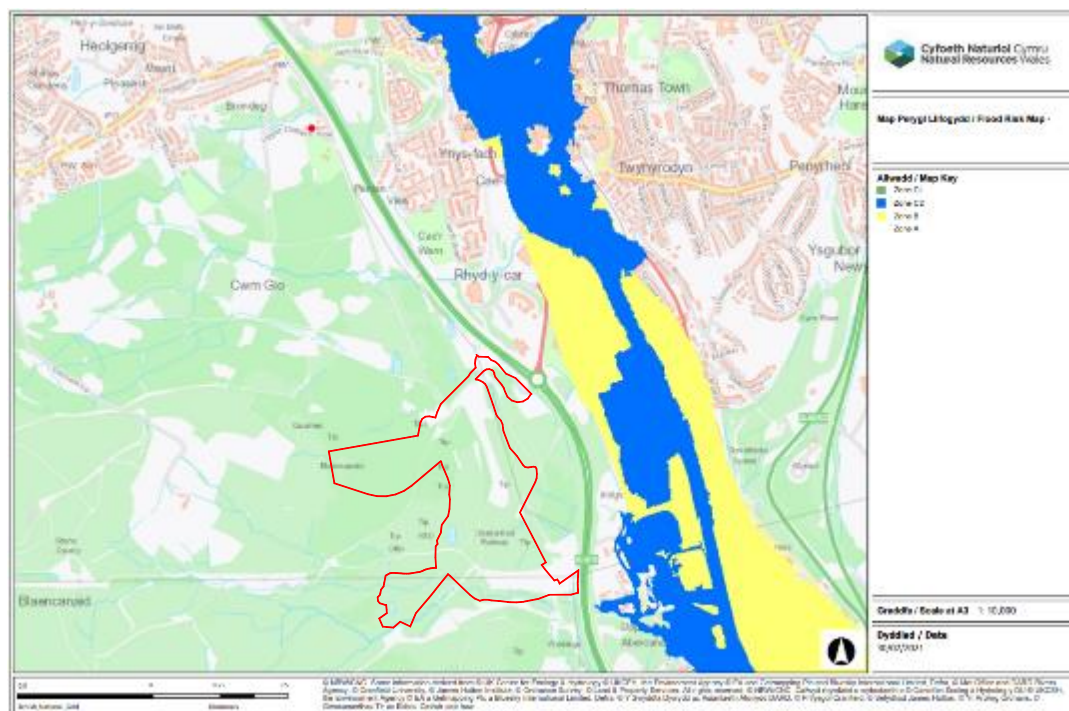


Figure 5 - Development Advice Map - Flood Zones (NRW, July 2021)

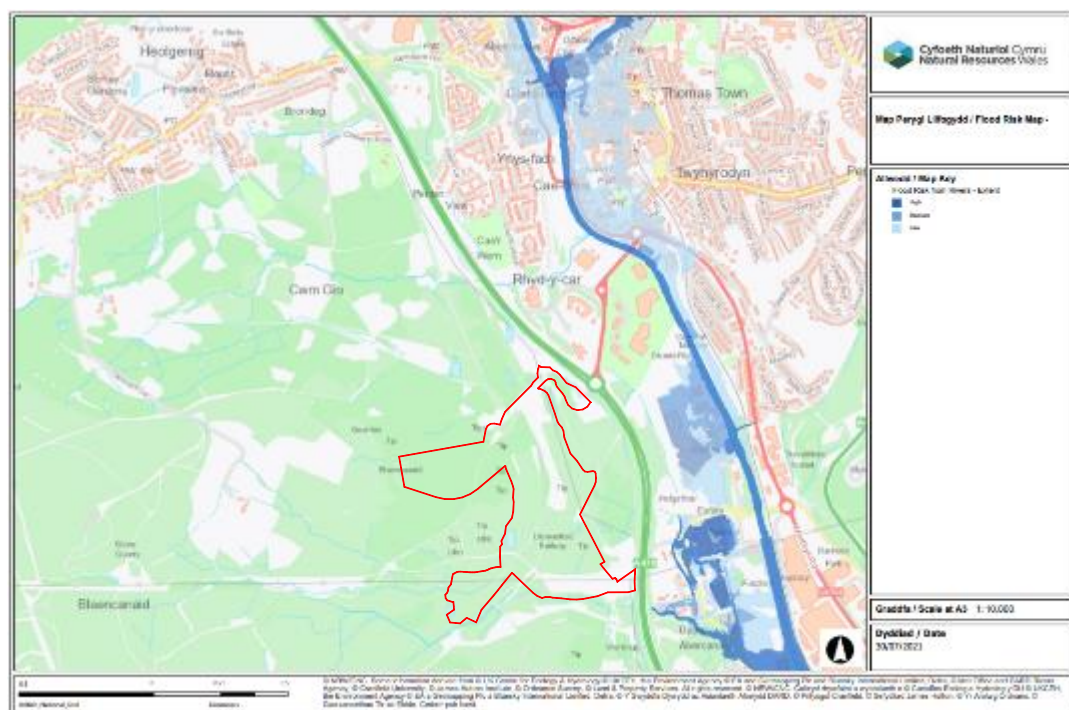


Figure 6 - Fluvial Flood Risk Map (NRW, July 2021)

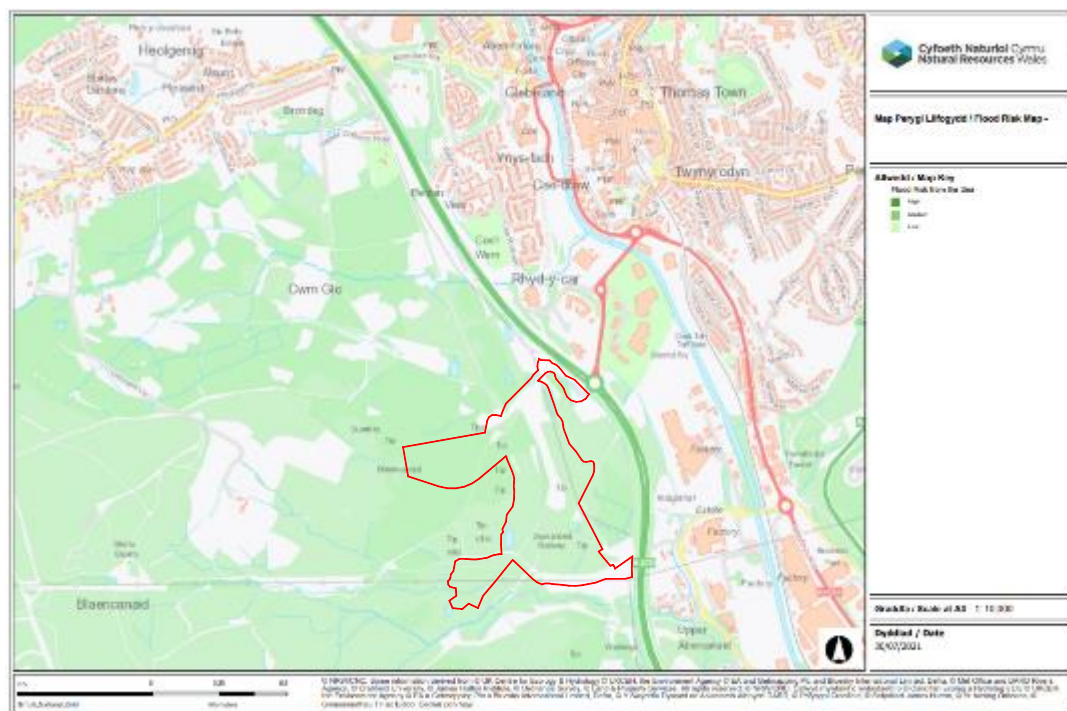


Figure 7 - Marine Flood Risk Map (NRW, July 2021)

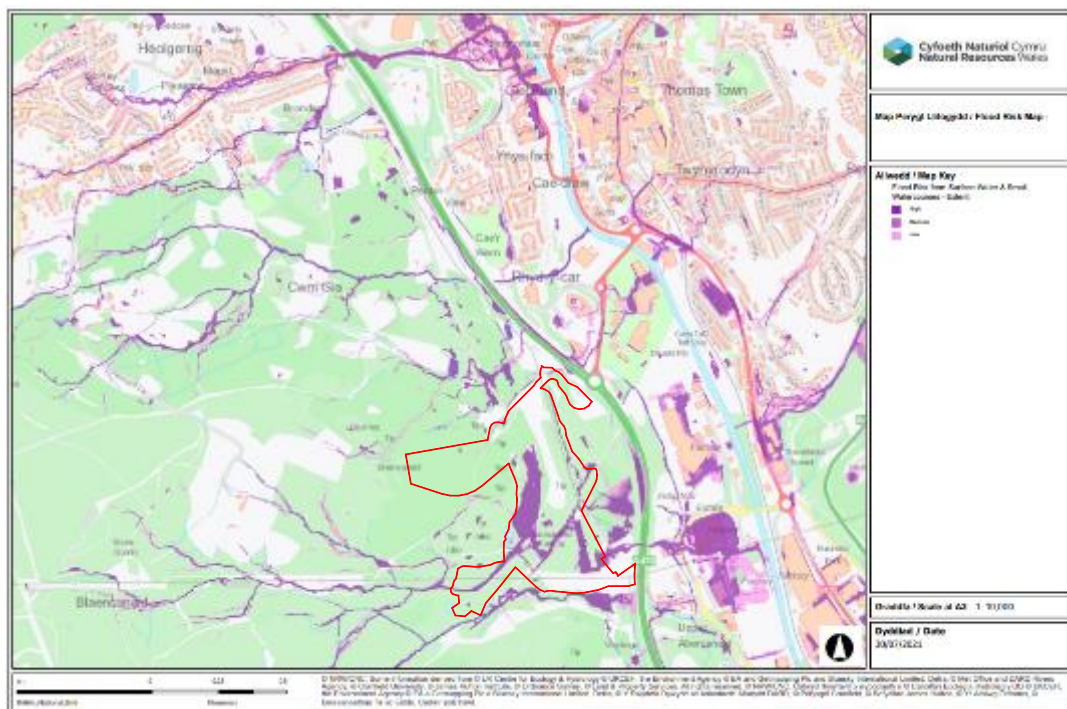


Figure 8 - Surface Water Flood Risk Map (NRW, July 2021)

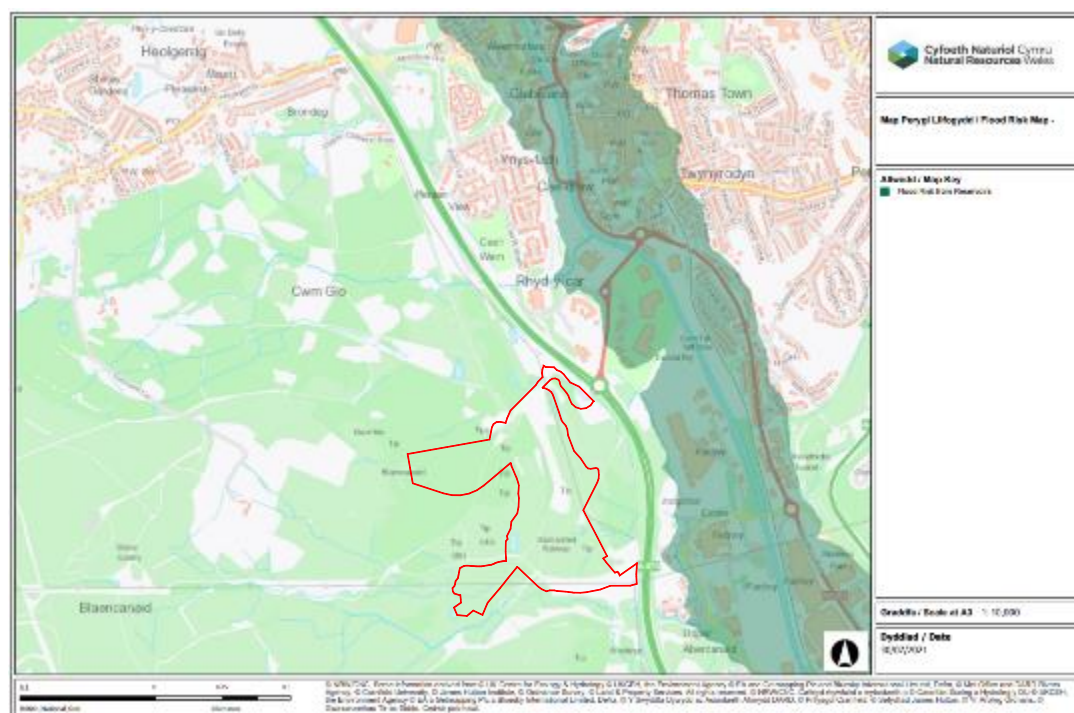


Figure 9 - Reservoir Flood Risk Map (NRW, July 2021)

4.2 WELSH WATER PRE APPLICATION ADVICE REQUEST CORRESPONDENCE

Tetra Tech filed a Pre-Application Advice Enquiry in March 2021. Welsh Water responded on 19 March 2021. Their response is shown in Appendix K and summarised below;

- The proposal comprises of a potential windfall development with no allocated status in the Local Development Plan (LDP);
- There is also a mandatory requirement to undertake pre-application consultation with all 'Specialist Consultees', including Welsh Water as the statutory water and sewerage undertaker, in accordance with Schedule 4 of Town & Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016;
- There is no public sewerage system in this immediate locality and therefore any new development will require provision of satisfactory facilities for sewage disposal. Alternatively, the site is located approximately 250 metres to the east (the other side of the A470 dual carriageway), of a public sewerage system that drains to Cilfynydd Waste Water Treatment Works, and it may be possible for the Developer to requisition sewers from Welsh Water under Sections 98 – 101 of the Water Industry Act, 1991;
- Some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011;
- Under the Water Industry Act 1991 Welsh Water has rights of access to its apparatus at all times;
- Surface Water Drainage – proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. As highlighted in these standards, the developer is required to explore and fully exhaust all surface water drainage options in accordance with a hierarchy which states that discharge to a combined sewer shall only be made as a last resort.

Disposal should be made through the hierarchical approach, preferring infiltration and, where infiltration is not possible, disposal to a surface water drainage body in liaison with the Land Drainage Authority and/or Natural Resources Wales;

- Please note that no highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system;
- Foul Water Drainage – Sewerage Network Whilst there is no immediate sewerage network, we have considered the impact of foul flows generated by the proposed development and concluded that flows can be accommodated within the public sewerage system at a point of connection to the 825mm trunk combined sewer at or between manhole SO0542701 and SO05042795 to the east of the site;
- It may be possible to requisition a new sewer under Sections 98 to 101 of the Water Industry Act 1991 from the boundary of the proposed development to the public sewerage system; and,
- Foul Water Drainage – Sewage Treatment No problems are envisaged with the Wastewater Treatment Works for the treatment of domestic discharges from this site.

In summary, sewer requisition is part of a standard process that will be implemented post approval.

4.3 WELSH WATER ENVIRONMENTAL INFORMATION REQUEST CORRESPONDENCE

On 23 August 2021 Tetra Tech submitted a baseline environmental information request to Welsh Water to obtain information on any watercourse and piped assets within the application site boundary, as shown in Appendix K. A response was received from Welsh Water on 8 September 2021 which has been summarised below;

- We can confirm that Welsh Water does not hold the information you have requested as we do not have any assets in the area you have requested;
- Watercourses, Culverts and Highway drainage would be the responsibility of the NRW, Local authority, riparian owner, or Highways department. We recommend you contact these who should be able to assist you further with your enquiries;
- Turning to questions 7,8, and 9 of your request, the following Impounding reservoirs are upstream of the proposed developments in a northerly direction:
 - *Llwynon,*
 - *Cantref,*
 - *Beacons,*
 - *Pontsticill reservoirs; and,*
- However, details on the inundation mapping are publicly available information and can be obtained from the Governments website.

In summary, Welsh Water Environmental raised no material concerns regarding the proposed development.

4.4 NRW CORRESPONDENCE

On 5 July 2021 Tetra Tech contacted NRW, requesting baseline information. Several responses were received from NRW, which are shown in Appendix L and summarised below;

- Plant Enquiry - Although Natural Resources Wales is classed as a statutory undertaker, we do not generally have plant equipment or pipelines situated in the public highway;
- If you want to carry out works in, over, under or near a main river or flood defence (including a sea defence), or within a floodplain you will need to apply for Flood Risk Activity Permit;
- The watercourses you queried (above attachments) are all ordinary watercourses so it's the Local Authority who have powers to carry out works on these watercourses and also consenting responsibility;

- FRA have advised that we have no detailed modelling for the watercourses within your site of interest;
- There are no NRW flood defence measures in place near the proposed site;
- NRW holds no historic records of flooding in this area;
- All nearby main river assets are privately /local authority owned and maintained;
- None of the area indicated on your W003(P03) Site Location Plan intersects with reservoir flood outlines that we have; and,
- Depth, Velocity, Hazard and travel times are Official-Sensitive data, as is the GIS data that provides the map.

In summary, NRW raised no material concerns regarding the proposed development.

4.5 TRANSPORT FOR WALES CORRESPONDENCE

On 23 August 2021 Tetra Tech contacted Transport for Wales, requesting baseline information. A response was received on 20 September 2021 shown in Appendix M. The response is summarised below;

- Thank you for contacting Transport for Wales (TfW). Upon receipt of your Freedom of Information request, the appropriate TfW SMEs (Subject Matter Experts) were consulted in order to respond. We can now confirm that TfW does not hold the information you require;
- The baseline information questions (Qs 1-11) can be answered by Merthyr Tydfil County Borough Council; and,
- Regarding the asset information questions (Qs 1-5), we can confirm that we have no assets in the vicinity of the proposed development.

In summary, Transport for Wales raised no material concerns regarding the proposed development.

4.6 SAB LIASON

Various discussions have taken place with the SAB throughout the development of this FCA and the associated SAB Pre-application and Drainage Strategy development for the project. A formal meeting was held with the SAB on 23 November 2021 with key outcomes summarised as follows (refer also to Appendix P):

- SAB's private development interest was in making sure that SAB requirements have been incorporated into the proposed development. A SAB Pre-app is required based on site area. Operation and maintenance of drainage features will remain the responsibility of the site owner unless offered for adoption to the local authority;
- It was agreed that the concepts presented in the Drainage Strategy are generally acceptable. The SAB was satisfied for green roofs not to be incorporated;
- Formalising the drainage channel adjacent to the Scheduled Ancient Monument (SAM) was agreed not to be a SAB matter;
- Formal approval for watercourse diversions, including the detail of discharge connections, could be deferred to a formal application after Outline Planning Permission has been granted;
- Ordinary Watercourse Discharge Applications have been lodged for the two proposed discharge locations which were noted to be at GFR. Formal applications for discharge are not required at this stage; these can be deferred and addressed at the same time as watercourse diversions. The SAB was content to send a response accepting proposed discharge rates and locations;
- GFR are Q_{bar} rates. Rates of 73.98l/s and 46.2l/s stated on the Drainage Strategy issued with the Consent to Discharge are corrected to 60.65l/s and 62.65l/s

[These discharge rates have been updated to 4.1 and 119.8 l/s, giving a total combined discharge rate of 123.9l/s as per Table 6-1, and will be further updated as the proposed development detailed design progresses];

- 2-levels of treatment are required for the car park drainage; these will be permeable paving and swale;

- It was noted that the Cyfarthfa Balance Pond may be considered a reservoir and that this is currently being explored. Discharges from this feature were summarised [refer to Section 4.1];
- Ponding to the Outdoor Activity and Forest Lodges areas to the south was noted. It was generally acceptable that, owing to the nature of development in these areas, mitigation measures are limited to raising proposed development out of potential ponding area, i.e. on stilts / boardwalks, raised accesses with cross-drainage to allow passage of water;
- The current strategy is based on no infiltration, i.e. lined swales, since infiltration rates will not be known until earthworks have been completed. This was generally acceptable; and
- FCA will be issued as an appendix to the SAB Pre-app and the ES Drainage and Flood Risk Chapter.

In summary, the SAB accepted the principles proposed in the Drainage Strategy and raised no material concerns regarding the proposed development.

4.7 MTCBC LIASON

As part of the planning application process, a pre-application discussion was undertaken with MTCBC. MTCBC issued a pre-application response by letter dated 4 October 2022. Matters raised by MTCBC, and responses to each are presented in this section (MTCBC matters shown in *italics* and responses in non-*italics*):

- **Matter:** *The Councils Drainage Engineer has considered the Hydrogeology and Hydrology Assessment and strongly advises that your clients submit a SAB pre-application in order to understand the overall drainage strategy and allow the Council to provide informed, constructive feedback. He has also point out:*
- **Response:** During a meeting with Huw Williams on 23 November 2021, he confirmed that a SAB pre-application is required. A draft SAB pre-application had been prepared at the time of the planning pre-application, with its issue pending outcomes of the planning pre-application process. The SAB pre-application has now been lodged along with this key accompanying document; the FCA.
- **Matter:** *The proposal indicates two surface water discharge locations. Formal ordinary watercourse applications would need to be submitted to the Lead Local Flood Authority (LLFA) for approval where discharge rates, flood mitigation measures and risk assessment measures are agreed.*
- **Response:** Ordinary watercourse applications were lodged by Tetra Tech. However, during a meeting with Huw Williams on 23 November 2021, he confirmed that no applications are required at this stage and that these could be deferred to a formal application after Outline Planning Permission has been granted.
- **Matter:** *A capacity and condition of receiving water bodies is unknown at this stage. A hydrology assessment would be required for downstream waterbodies to ensure the LLFA is satisfied that flood risk doesn't increase as result of additional flows from the development. It is possible that improvement work to these watercourses may be required, pending the results of the hydrology assessment.*
- **Response:** During the meeting with Huw Williams, he confirmed that condition and capacity assessments will be required prior to agreement of the ordinary watercourse applications, but that no applications are required at this stage and that these could be deferred to a formal application after Outline Planning Permission has been granted.
- **Matter:** *Discharge rates must be limited to "greenfield" rates up to a 1in100+40% storm event.*
- **Response:** Chapter 13 – Water, Drainage and Flooding of the Environmental Statement and this FCA confirm that discharges will be restricted to Greenfield Runoff Rates as required. Detailed designs have not been completed at this stage but will be completed to fully design attenuation systems to comply with this restricted runoff rate. Following the meeting with Huw Williams, he confirmed that discharges to the two proposed locations reduced to greenfield rates would be acceptable in principle (subject to Ordinary watercourse applications as mentioned before).
- **Matter:** *The proposal indicates that a watercourse within the development area needs to be diverted to facilitate the development. An ordinary watercourse application will be required for this work.*

- **Response:** During the meeting with Huw Williams, it was agreed that formal approval for watercourse diversions, including the detail of discharge connections, could be deferred to a formal application after Outline Planning Permission has been granted.
- **Matter:** *The Drainage Engineer is Huw Williams and his e-mail address is Huw.Williams@merthyr.gov.uk.*
- **Response:** As mentioned before, consultations have taken place with Huw Williams, as recorded in Chapter 13 – Water, Drainage and Flooding of the Environmental Statement and this FCA.

In summary, all matters raised by MTCBC pertaining to drainage and flooding matters have been addressed in this FCA.

4.8 SITE WALKOVER FINDINGS AND MITIGATION MEASURES

4.8.1 Introduction

A series of site walkover surveys have been complete at the application site to inform this FCA and other aspects of the proposed development. Findings of the walkover surveys, together with proposed mitigation measures, where required, are summarised in this section. A fuller description of the hydrogeology of the area, including these features, is also included in the Hydrogeology Chapter of the Environmental Statement prepared for the proposed development. The areas in question are detailed in Figure 10 and summarised as follows:

- Area 1: Cwm Pit and associated stream
- Area 2: Marshy Outdoor Activity Area and associated Cyfarthfa Balance Pond and Tub Boat Canal
- Area 3: Glyndyrus Tip Spring
- Area 4: Glyndyrus Tip Spring
- Area 5: Glyndyrus Tip / A470 Tip Spring
- Area 6: Vale of Neath Railway Tunnel Portal

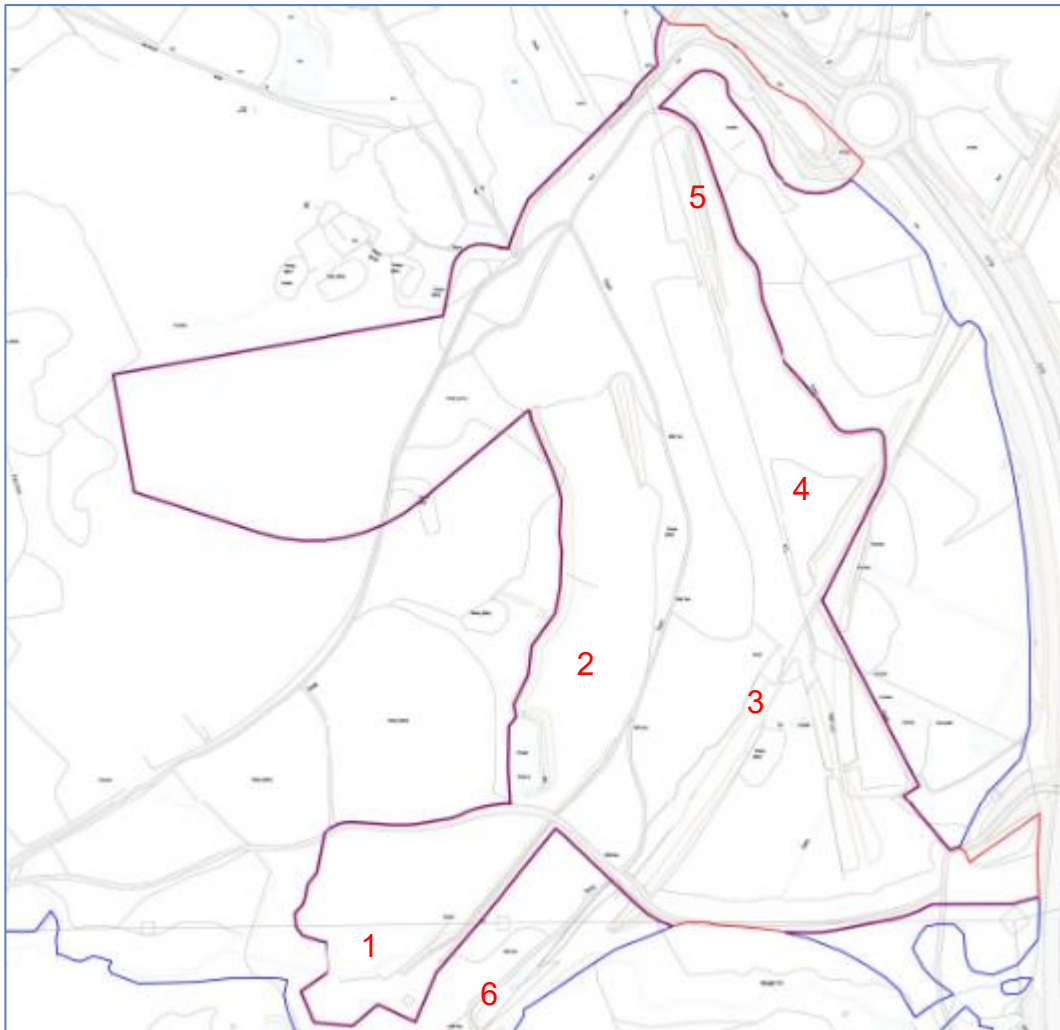


Figure 10 - Existing Drainage / Waterbody Features

4.8.2 Cwm Pit And Associated Stream

Cwm Pit is located to the southwest of the proposed development. At this location, two existing streams combined and spill to flow an informal drainage channel alongside a retaining / boundary wall which was a feature of the historical mining activities in the area. The wall has been classified as a Scheduled Ancient Monument (SAM). The flow terminates alongside the wall where it appears to sink into a pre-existing culvert where it flows to connect to the Nant Cannaid. The informal channel alongside the SAM is causing erosion. It is proposed to formalise the channel to offset it from the wall and use excavated material to replace the material eroded, subject to Scheduled Monument Consent (as required).

4.8.3 Cyfarthfa Balance Pond And Tub Boat Canal

This feature is also to the southwest of the proposed development. The Pond receives water from the surrounding lands to the west and discharges to the Canal which flows south to north alongside the proposed Outdoor Activity area. Flows then spill from the Canal and pond to the southern end of the Outdoor Activity area before exiting the site via an existing culvert. It is not proposed to undertake any measures in respect of this feature; ponding will be allowed to persist since the proposals for this part of the application site, i.e. outdoor activities, are unlikely to be affected by ponding.

In the unlikely event of pond failure, the anticipated destination of flood water is as per the current operation of the Pond, whereby, the proposed development in this area will not be affected.

4.8.4 Glyndyrus Tip Spring (West)

This feature is in the central part of the proposed Forrest Lodges area. Surface water in this area gathers from surrounding ground and ponds to the west side of the tip. Again, no intervention is planned for this area; existing flow paths will be retained, and Forrest Lodge accommodation will be positioned to suit and elevated on stilts to allow water to pass beneath.

4.8.5 Glyndyrus Tip Spring (East)

This feature is in towards the east of the proposed Forrest Lodges area. Surface water in this area springs from the base of the tip and flows through to Glyndyrus Pond to the east of the application site boundary. Again, no intervention is planned for this area; existing flow paths will be retained, and Forrest Lodge accommodation will be positioned to suit and elevated on stilts to allow water to pass beneath.

To the north of this area extensive earthworks is proposed to facilitate other features of the proposed development. An earth bank is proposed to the north of this area which will be drained using land drainage. To address the risk that earthworks and development to the north could reduce flow to the Glyndyrus Pond it is proposed to add a valve to the swale to the north of the earth bank so that, if necessary, flows can be diverted to the Glyndyrus Pond from the swale and the land drainage.

4.8.6 Glyndyrus Tip / A470 Tip Springs

This feature is located to the north of the proposed development. It is a linear feature that appears to collect water emerging from the base of the tip and convey this to the south, possibly to Glyndyrus Pond. Since this feature is in the location of extensive earthworks and construction activities of the proposed development, it will be replaced by the swales and detention ponds proposed. No other mitigation measures are required.

4.8.7 Vale Of Neath Railway Tunnel Portal

The tunnel emerges to the south of the application site together with a steady flow of water. It is understood that restoration of this tunnel is being progressed as part of a Vale of Neath Railway Cutting and Tunnel Portal restoration project. However, since this feature is outside the application site boundary and does not have an impact upon it, no mitigation measures are proposed.

4.8.8 MTCBC Tip Works

During Spring 2022, the MTCBC undertook works on site to improve drainage provisions and tip stability. These works included formalising some of the pre-existing informal drainage provisions at the site, including the formation of rock lined channels. Although these works are understood to have altered some of the flow routes through the site, they are considered to have no material impact on the overall movement of surface water drainage around the site, and no material impact on the measures proposed in this FCA for addressing surface water drainage and flood features.

4.8.9 Summary Of Constraints And Opportunities

The application site is subject to pluvial flooding at the south, southeast and southwest of the site. The flooding occurs where watercourses and ponds are present. It is proposed that several watercourses will be diverted subject to consent from MTCBC, which will reduce pluvial flood risk. There is also provision within the Drainage Strategy, detailed in Section 6.0 to collect any overland flows and discharge them to two separate watercourses within the redline boundary.

Pluvial flooding occurs at the southwest of the application site where the Outdoor Activity center will be located. This is not seen to be significant as the area will be largely undeveloped allowing flood waters to flow through the area unhindered. Pluvial flooding occurs to the south of the application site where the Forest Lodges will be located. The Forest Lodges will be built on stilts to allow flood waters to flow under the structures and will not negatively impact pre-existing flood conditions. Accesses will be permeably surfaced with regular cross-drainage to facilitate the flow of pluvial waters.

To make sure that pre-existing flood conditions are maintained, mitigation measures will be implemented. Proposed mitigation measures include the collection of flood waters flowing into the application site via lined, impermeable swales which direct the flood water around parts of the proposed development and back into downstream watercourses.

The entirety of the site is location within Zone A in the Development Advice Map and is not at risk from flooding from other sources including, groundwater, reservoirs, canals, and sewers.

Welsh Water advised surface water discharge should be infiltrated into the ground and, where infiltration is not possible, disposal to a surface water drainage body, in liaison with the Land Drainage Authority and/or NRW.

Subject to the measures outlined in this FCA, surface water runoff from the proposed development will not affect or exacerbate pre-existing drainage issues in the locality, and will not contribute to flood risk elsewhere. Therefore, the proposed development poses a negligible flood risk to other areas and, being in Flood Zone A, is exposed to negligible flood risk itself.

5. DRAINAGE MATTERS

5.1 DRAINAGE HIERARCHY

The management of runoff should be considered via a sequential approach, in line with Building Regulations and the mandatory SuDS Standards. The following options for the disposal of surface water runoff have been considered, in order of preference:

- Discharge to an adequate soakaway or some other adequate infiltration system (i.e. to ground);
- Discharge to a watercourse; and
- Discharge to a sewer.

5.1.1 Water Collection

A RWH system will be used to supply the proposed development with non-potable water collected from roof areas. There is no use for the remaining surface water run-off from the application site.

5.1.2 Discharge to Ground

It is assumed that ground conditions are not suitable to allow surface water infiltration. This has been determined by various site walk over visits which have concluded large areas of the application site to be wet marshy land. In addition to this, there are many large spoil tips located throughout the overall site. Surface water infiltration may cause ground instability to those areas.

At this stage of the project, it is not possible to carry out appropriate ground investigation testing to determine if surface water infiltration is suitable. Proposed works at the site include significant cut and fill, which makes it impossible to carry out representative testing at post-development ground levels. Once the proposed earthworks are completed, appropriate site investigation works, and infiltration testing will be carried out to determine if stormwater discharge to the ground is suitable. If surface water infiltration is deemed suitable, the FCA and drainage design will be revised accordingly showing unlined swales and detention ponds to allow for surface water infiltration. The current drainage design does not permit surface water infiltration; all swales and detention ponds to specified be lined with an impermeable medium due to the uncertainty of ground conditions outlined in this section. This represents a worst-case scenario in terms of the sizing of drainage features, including detention ponds and swales.

5.1.3 Discharge to Watercourse/Body

As outlined elsewhere, there are several watercourses flowing through the application site. Due to the assumption of ground conditions being unsuitable for infiltration, stormwater runoff that is not reused via RWH will discharge to watercourses. Discharge consent applications have been lodged with MTCBC / SAB, requesting consent to discharge to two separate watercourses at GFR / Q_{bar} equivalent rate. MTCBC / SAB has advised that, whilst they are satisfied with the proposals in principle, discharge consent is not required at this Outline Planning Application stage. MTCBC has confirmed that they are content with the discharge rates and locations proposed; refer to Appendix P.

5.1.4 Discharge to Sewer

Welsh Water advised that all surface water drainage options should be explored and fully exhausted, and that no highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system. Discharge to public storm sewer has been rejected by Welsh Water and, therefore, is not suitable and is not proposed as part of the proposed development.

5.2 REVIEW OF SUDS

Table 2 describes the different types of SuDS and their applicability to the proposed development. Using the Drainage Hierarchy identified in Section 5.1 as guidance, a variety of components could be used. A 'treatment train' of different SuDS components would have the additional benefit of improving the quality of runoff prior to discharge into the receiving watercourse(s).

A Drainage Strategy, incorporating suitable SuDS features from the following table, is detailed in Section 6.0. The Drainage Strategy makes use of a combination of the types of solution identified in Table 5-1. In conclusion, there are no issues from a Drainage Hierarchy perspective.

Table 5-1 - SuDS Options and Applicability to Proposed Development

Type	Description	Applicability to the Site	Present In Drainage Strategy
Source Control			
Water butts	Small storage tanks on each individual housing plot.	Not appropriate.	N
RWH	Recycling of water from roofs and impermeable areas.	Appropriate.	Y
Green roofs	Vegetated roofs that reduce runoff and remove pollutants.	Appropriate.	N
Pervious surfaces	Pavements that allow surface water to flow into underlying layers of the pavement and either infiltrate or drain to an on-site drainage network.	Appropriate.	Y
Rain Gardens and Bioretention Systems	Shallow depressions with free draining soil and planted with vegetation that withstands occasional flooding.	Appropriate (to be considered further at detailed design stage).	N
Site and Regional Control			
Filter Drains	Linear drains or trenches filled with granular material that allow infiltration to the surrounding ground.	Not appropriate.	N
Swales	Vegetated channels to convey store and treat runoff.	Appropriate.	Y
Detention basins and ponds	Shallow areas of open space that temporarily hold water and collect silt.	Appropriate.	Y
Infiltration basins	Shallow depression that stores runoff before it infiltrates into the subsoil.	Not appropriate.	N
Infiltration devices	Generally granular trenches or soakaways that store water and allow infiltration to the surrounding ground.	Not appropriate.	N

6. DRAINAGE STRATEGY

6.1 SURFACE WATER DISCHARGE

Surface water run-off from impermeable surfaces in the proposed development discharges to two discharge points on existing watercourses within the red line boundary. There are also three RWH points which will harvest rainwater from roofed areas for reuse within the proposed development. All other surface water runoff will discharge to the two watercourses.

Runoff from the Snow Centre, Main Building and Piazza is collected by a network of lined impermeable swales which direct the water to a lined, impermeable detention basin to the north of the site. A flow control device is fitted downstream of the detention basin to maximise storage potential. Runoff is then directed to another lined, impermeable detention basin via pipes and lined swales. This basin also collects surface water run-off from the northern access road. Flows are restricted downstream of the basin to a GFR / Q_{bar} equivalent rate and discharged into a watercourse to the southeast of the proposed development.

Surface water run-off is collected from the Car Park via porous asphalt and directed to a lined, impermeable detention basin in the middle of the application site. A flow control device is fitted downstream of the detention basin to maximise storage potential. Surface water is then directed to a second lined, impermeable detention basin located at the Outdoor Activity area by lined, impermeable swales. All other surface water run-off is collected by a network of lined, impermeable swales and stored in the detention basin at the Outdoor Activity area. A flow control device is located downstream of the detention basin to maximise storage potential. Surface water is then directed to the southeast discharge location via lined, impermeable swales, and pipes where appropriate to cross cuttings and other features. Surface water is discharged to a watercourse towards the southeast of the site and within the red line boundary at GFR / Q_{bar} equivalent rate.

A short length of the main access road, close to the A470 access roundabout is collected by a lined impermeable swale which directs the water to a lined, impermeable detention basin adjacent and to the southwest of the access road. A flow control device is fitted downstream of the detention basin to maximise storage potential. Flows are restricted downstream of the basin to a GFR / Q_{bar} equivalent rate and discharged into a watercourse to the northeast of the proposed development.

Surface water from surrounding lands beyond the red line boundary to the north will be collected by a separate lined, impermeable swale flowing parallel to the Hotel. This discharges the surface water into a proposed watercourse diversion to the northeast of the application site.

Surface water from various embankments constructed throughout the proposed development is collected in permeable land drains and discharged to the swales detailed in this section. Again, flows are controlled to limit the overall discharge from the proposed development to a greenfield equivalent runoff rate.

Drainage discharge consents have been applied for, however, MTCBC have indicated that they are satisfied that such consents are not required but that they are satisfied in principle with the discharge rates and locations proposed.

The Drainage Strategy is shown in Figure 11 and Appendix O – Drainage Strategy.

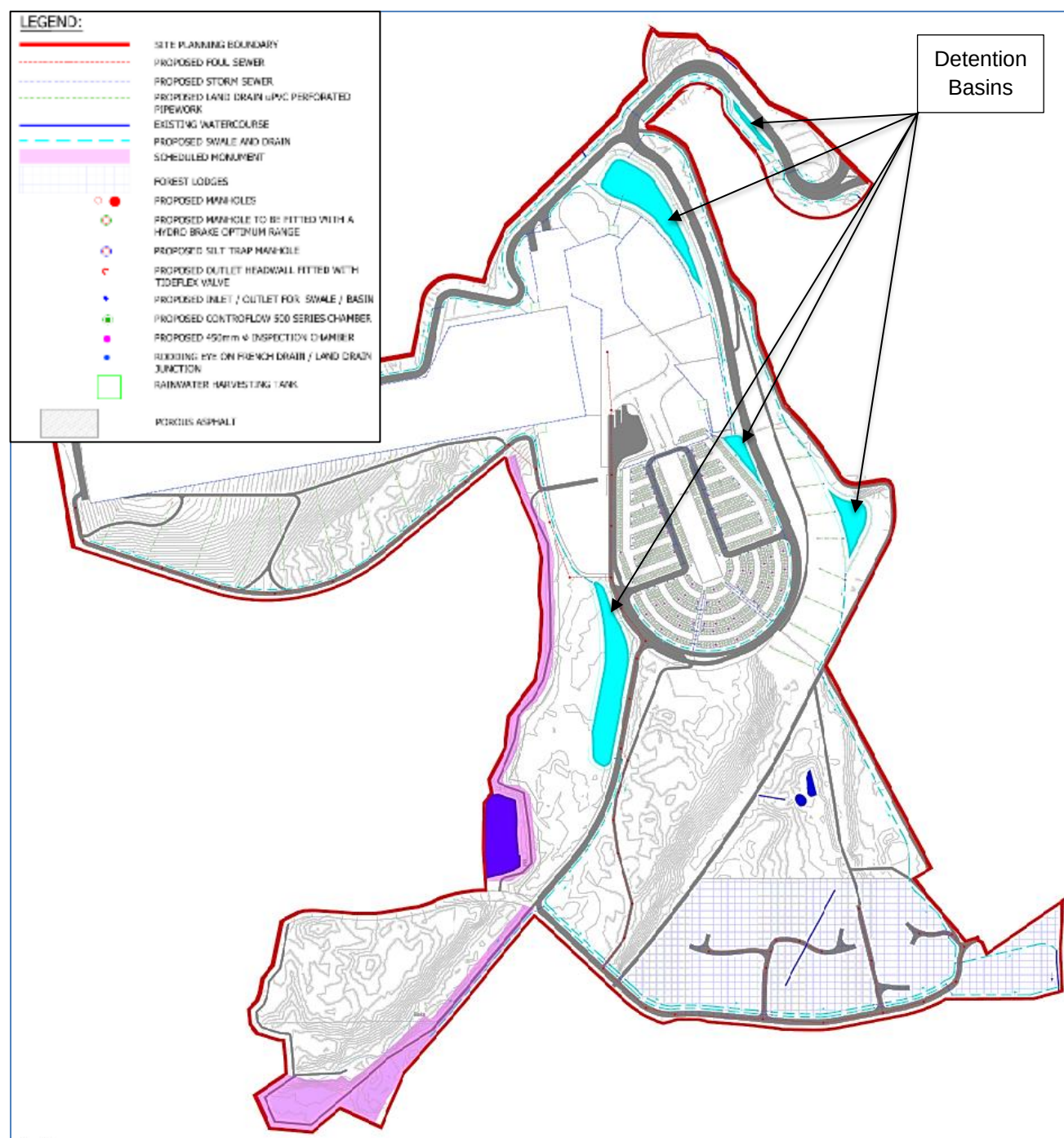


Figure 11 - Drainage Strategy

6.2 DRAINAGE RATES AND ATTENUATION VOLUMES

Based on the Drainage Hierarchy assessment, it is proposed that surface water run-off from roofed areas of the proposed development will be harvested from onsite RWH systems, for reuse within the development. The remaining surface water run-off will discharge to two watercourses within the site boundary at GFR / Q_{bar} rate, subject to formal discharge consent from MTCBC.

To make sure that flood risk is not increased downstream, discharge rates will be limited to GFR / Q_{bar} rate, and proposed development discharges are considered for events up to a 1 in 100 year return period include a 40% allowance for Climate Change (CC). CC allowance is as detailed in Table 2 of 'Welsh Government Flood

Consequences Assessments: Climate change allowances' document, September 2021. Calculations are shown in Appendix N.

Table 6-1 - Pre- and Post-Development Discharge Rates (l/s)

Status	Q_{bar}	1 in 1 year	1 in 30 year	1 in 100 year
Pre-development (full redline planning boundary)	287.5	253.0	507.0	626.9
Pre-development (areas changing from permeable to impermeable)	123.9	109.1	218.6	270.3
Post-development	123.9	123.9	123.9	123.9

Table 6-2 - Pre and Post-Development Areas

Status	Permeable Area (ha)	Impermeable Area (ha)
Pre-development	30.42	0.00
Post-development	21.19	9.23

Table 6-1 demonstrates that for return periods greater than Q_{bar} the proposed development results in betterment in terms of the surface water runoff from the application site; runoff rates reduce from 218.6l/s and 270.3l/s to 123.9l/s for 1 in 30-year and 1 in 100-year events respectively.

6.3 WATERCOURSE DIVERSIONS

There are three proposed watercourse diversions to the north and northeast of the application site. These diversions are necessary to facilitate site accesses. Measures have been taken to minimise diversion lengths and the use of piped networks.

1. The watercourse entering the site to the north of the redline boundary will be diverted, via a drainage pipe and swale, to an existing watercourse to the south of the proposed access road. This is understood to be its existing discharge location;
2. The watercourse to the south of the access road will be rerouted around the road to match the road alignment, via a swale; and
3. The watercourse to the northeast of the application site will be diverted into the rerouted watercourse to the south of the access road, via a drainage pipe.

Whilst MTCBC have accepted the principle of the proposed watercourse diversions described above and shown in Figure 12, appropriate consents will be obtained before diversions are carried out.

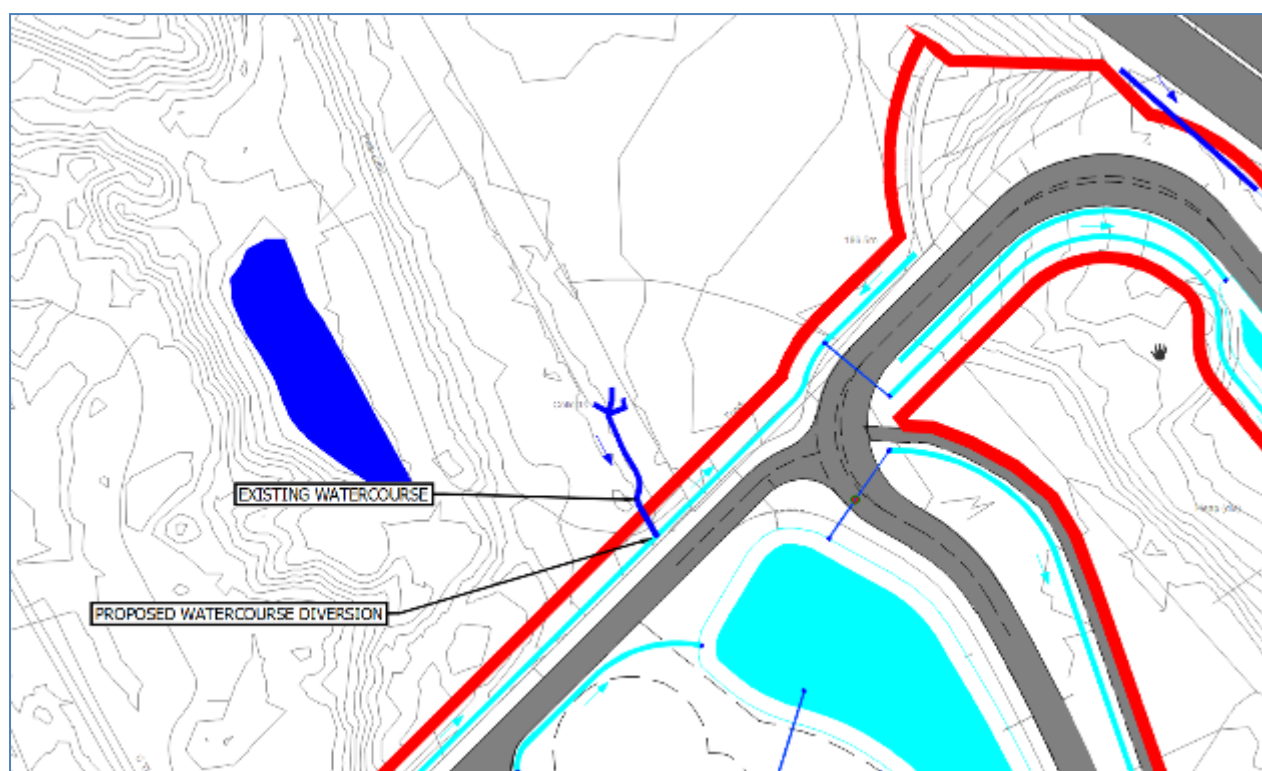


Figure 12 - Proposed Watercourse Diversions

6.4 PLUVIAL FLOODING MITIGATION MEASURES

To make sure that pre-existing pluvial flooding conditions are addressed, mitigation measures will be implemented.

Pluvial flooding occurs in the centre of the application site where the Forest Lodges will be located. The Forest Lodges will be built on stilts to allow flood waters to flow under the structures, thereby avoiding any negative impact pre-existing flood conditions. Accesses in this location will be elevated, constructed of impermeable surfacing and will be provided with regular cross-drains to allow water to pass through uninhibited.

The Outdoor Activity area is also situated on a pluvial floodplain. This area will be largely undeveloped, i.e. left in its natural state, allowing flood waters to flow through the area without any hinderance.

Floodwaters entering the application site along the northern boundary will be collected by a lined, impermeable swale, which runs parallel to the Snow Center and Hotel Accommodation. The swale will redirect flood waters to a watercourse diversion downstream.

The informal drainage channel currently flowing alongside the SAM, and eroding lands to its southeast, will be formalised, with excavated material used to restore eroded ground.

6.5 FOUL DISCHARGE

A foul drainage network is proposed to be constructed, connecting to all the major foul discharge locations. It is proposed to connect to a requisitioned foul sewer constructed to the southeast site boundary. A sewer requisition application will be lodged with Welsh Water to facilitate this connection. Final discharge will be to the east of the A470 between manholes SO0542701 and SO05042795 as per Welsh Water Pre-Development Enquiry Response (ref: PPA0005563) from 19 March 2021 as shown in Appendix K.

7. CONCLUSION

The following conclusions are drawn from this FCA:

7.1 FLOOD RISK

- The site is located in Zone A within the Development Advice Map. Therefore, it is viable for development;
- The site is at risk from pluvial flooding;
- Three watercourse diversions are proposed as part of the development works which will decrease pluvial flood risk significantly. Built development will be limited in locations effected by pluvial flooding, with appropriate mitigation measures implemented to make sure that the impact on pre-existing flood conditions is either made no worse or improved;
- The site is not at risk of fluvial flooding, or flooding from other sources, including the marine environment, groundwater, canals, reservoirs and sewers; and
- It can be determined that the overall flood risk to the site is negligible.

7.2 DRAINAGE

- At this stage, evidence cannot be obtained to support the use of infiltration for surface water disposal. Further, infiltration could have the effect of destabilising material at the site. Site investigation works will be completed once ground works have been undertaken to assess this destabilisation risk and to verify whether infiltration presents a feasible surface water discharge option;
- The option of discharging surface water using the hierarchical SuDS approach was explored. As explained, infiltration techniques are not recommended until site investigation works have been completed;
- SuDS have been incorporated into the proposed development's surface water management strategy without infiltration being relied upon. Further investigations will be made into the suitability for using infiltration at detailed design stage;
- RWH systems will be used to collect surface water runoff from roofs. Harvested rainwater will be used as a non-potable water supply. The remaining surface water runoff from the site will be collected via lined, impermeable swales discharging to separate watercourses at GFR / Q_{bar} equivalent rates;
- Porous asphalt will be used to catch and treat surface water run-off from the proposed carpark;
- Attenuation will be provided by means of lined, impermeable detention basins;
- A foul drainage network will connect to a requisitioned foul sewer constructed to the southeast boundary of the application site, subject to a formal application to Welsh Water. Final discharge will be to a foul sewer to the east of the A470 in accordance with Welsh Water PDE response; and,
- It is considered that a SuDS compliant drainage scheme in accordance with the statutory Welsh Government SuDS standards for Wales (2018) and key objectives of Schedule 3 of the Flood and Water Management Act 2010, which satisfies the requirements of the local SAB, can be delivered at this site.

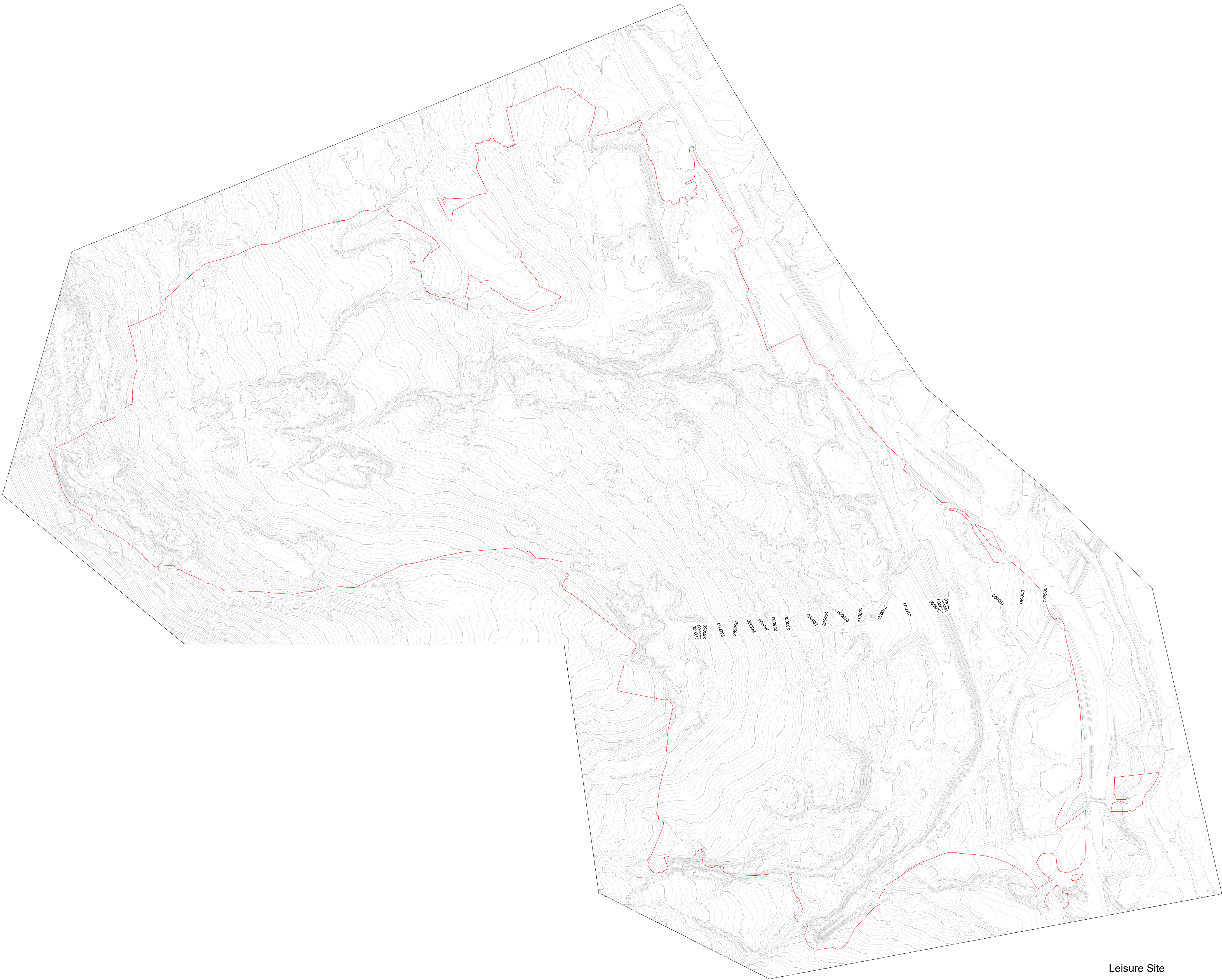
7.3 SUMMARY

In summary, apart from pluvial flood risk, there is no risk of flooding to or from the proposed development from any of the flood sources explored within this FCA. Any potential pluvial flood risk to or from the proposed development will be mitigated using the measures detailed in this FCA; watercourses will be rerouted subject to appropriate consents and approvals, and a SuDS compliant drainage scheme will be implemented. Furthermore, the proposed development will add betterment in terms of surface water runoff rates for all events greater than Q_{bar} . Finally, consultations have been undertaken widely with all pertinent stakeholders to produce this FCA, including the SAB and MTCBC, and all matters raised have been addressed. Accordingly, no objections should be sustained on grounds of flood risk or drainage matters.

APPENDICES

APPENDIX A – SITE LOCATION PLAN

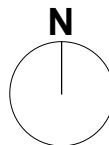
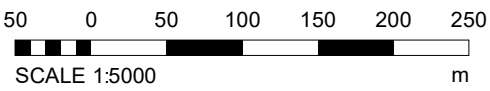
APPENDIX B – TOPOGRAPHICAL SURVEY



Leisure Site

- Site Boundary
- Watercourse
- Site of Special Scientific Interest (SSSI)
- Site of Interest for Nature Conservation (SINC)
- Scheduled Ancient Monument (SAM)
- Cwm Glo Pit and Ironstone Tip
- Cwm Glo Chapel
- Cwmdu Air Shaft and Fan
- Cylfartha Canal Level
- Black Pins Early Ironstone Workings
- Cylfartha Balance Pond and Leat
- Cwm Pit and Head of Railway
- Waive of Neath Railway Cutting and Tunnel Portal
- Other Heritage Asset
- Vehicular Access
- Rhydyar Roundabout
- Upper Collier's Row from Heolgerrig
- Existing Underpass
- Pedestrian and Cycle Access
- Existing bridge to Llwnceilin Lane
- Existing Rhydyar bridge

1 Site Constraints - Topography
1 : 5000



P1	S0	04/12/20	WS	Information Exchange
Rev.	Status	Date	Check	Description

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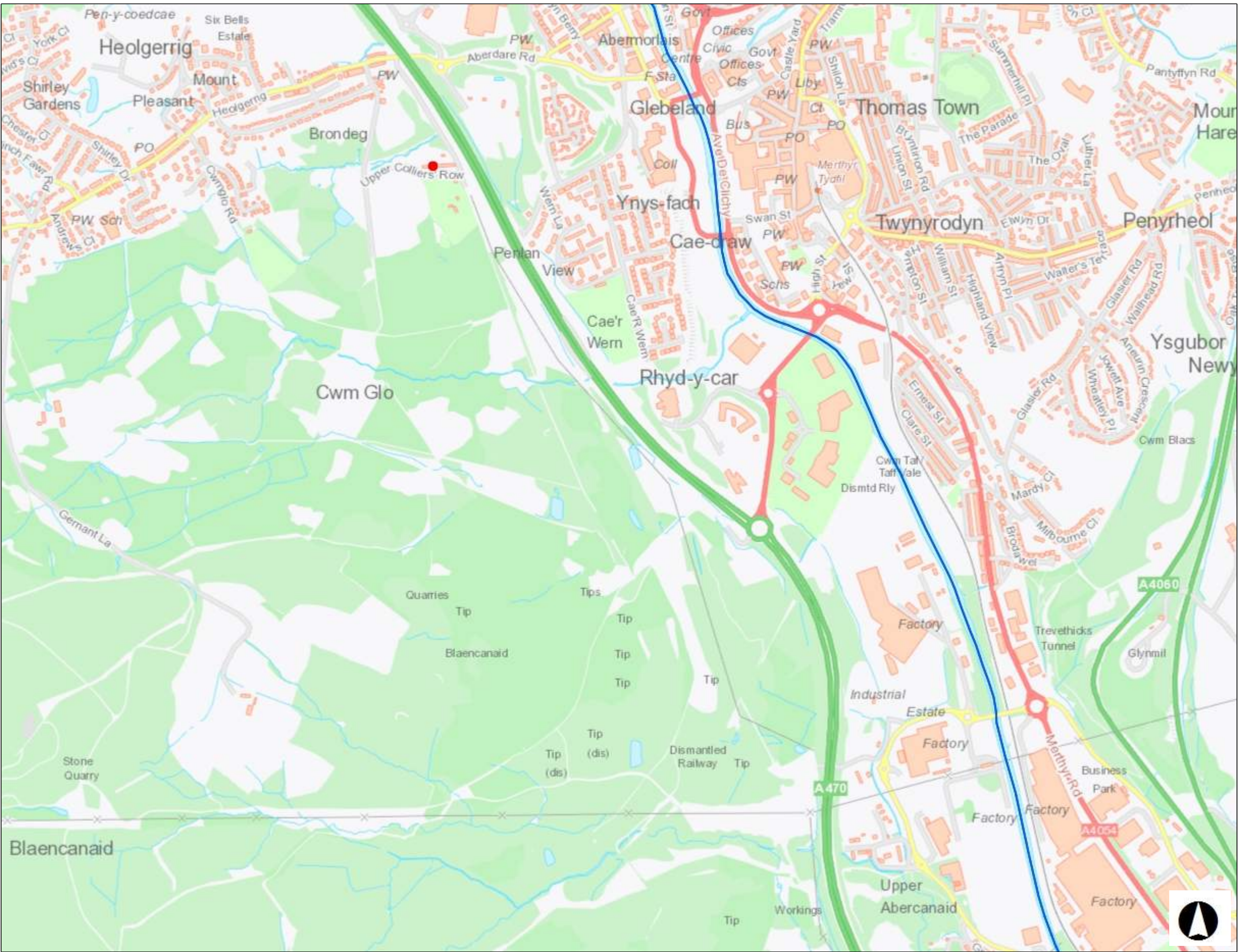
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Rhydyar West
Merthyr Tydfil
Marvel Ltd

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APPENDIX C – NRW MAIN RIVERS AND ORDINARY WATERCOURSES MAP



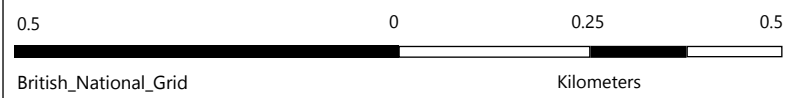
Map Perygl Llifogydd / Flood Risk Map -

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- Main Rivers

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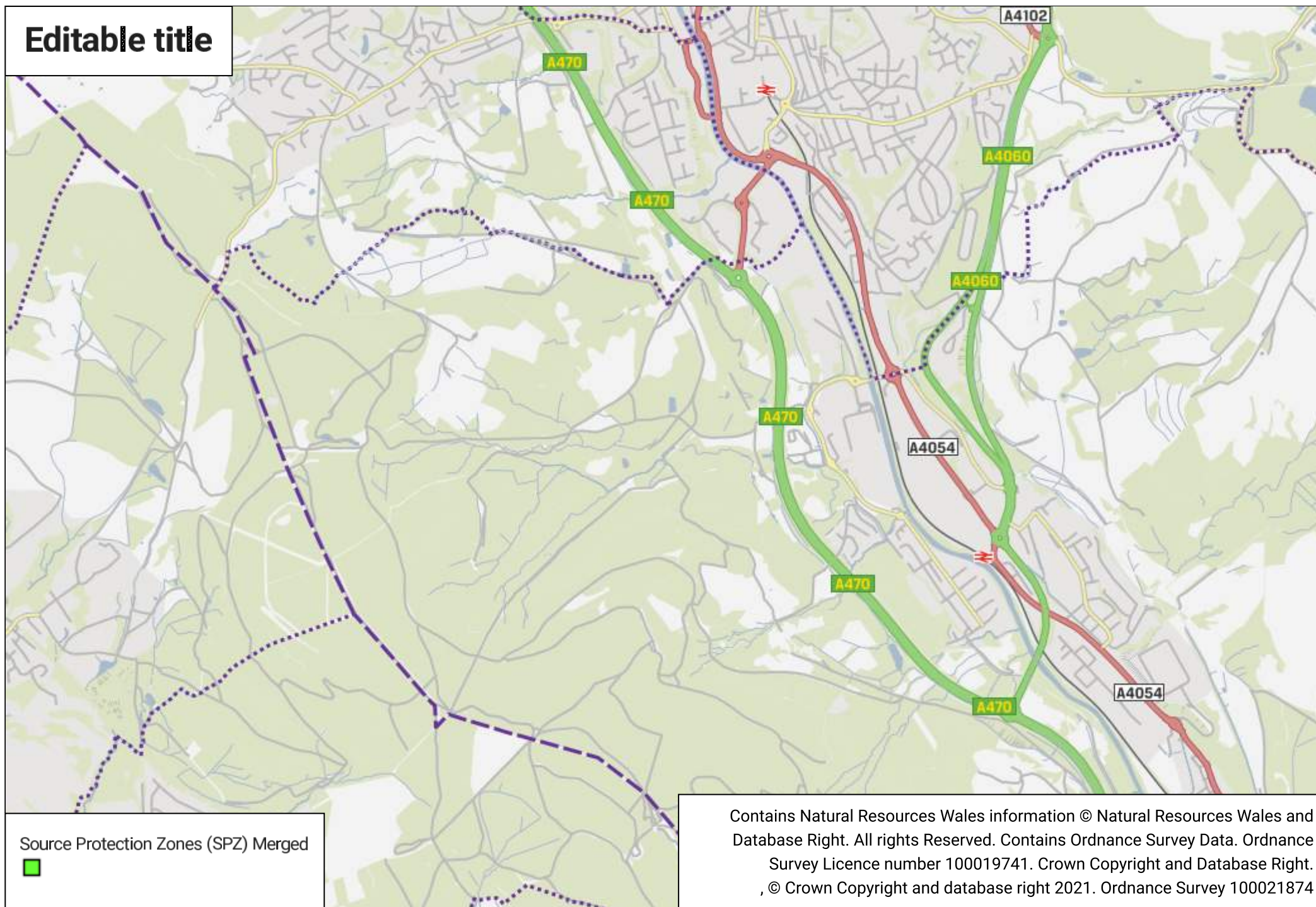
Dyddiad / Date
29/07/2021



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APPENDIX D – NRW SOURCE PROTECTION ZONES MAP

Editable title

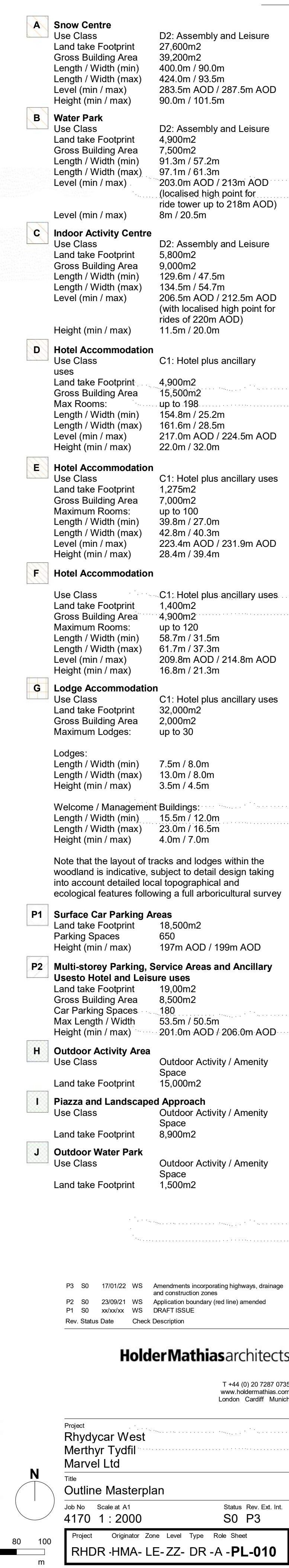


Source Protection Zones (SPZ) Merged

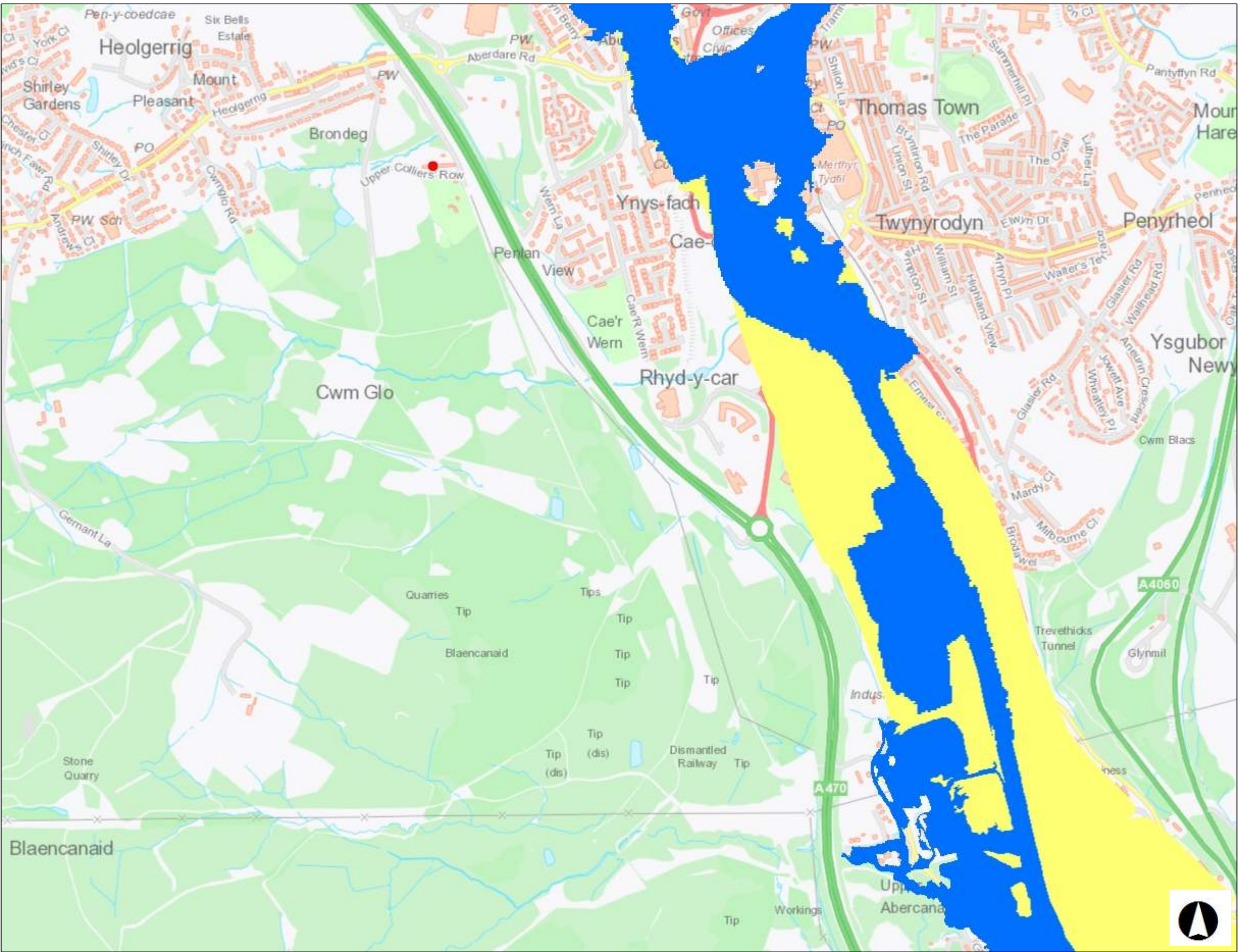


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APPENDIX E – PROPOSED DEVELOPMENT



APPENDIX F – NRW DEVELOPMENT ADVICE MAP

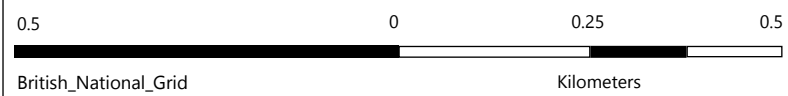


Map Perygl Llifogydd / Flood Risk Map -

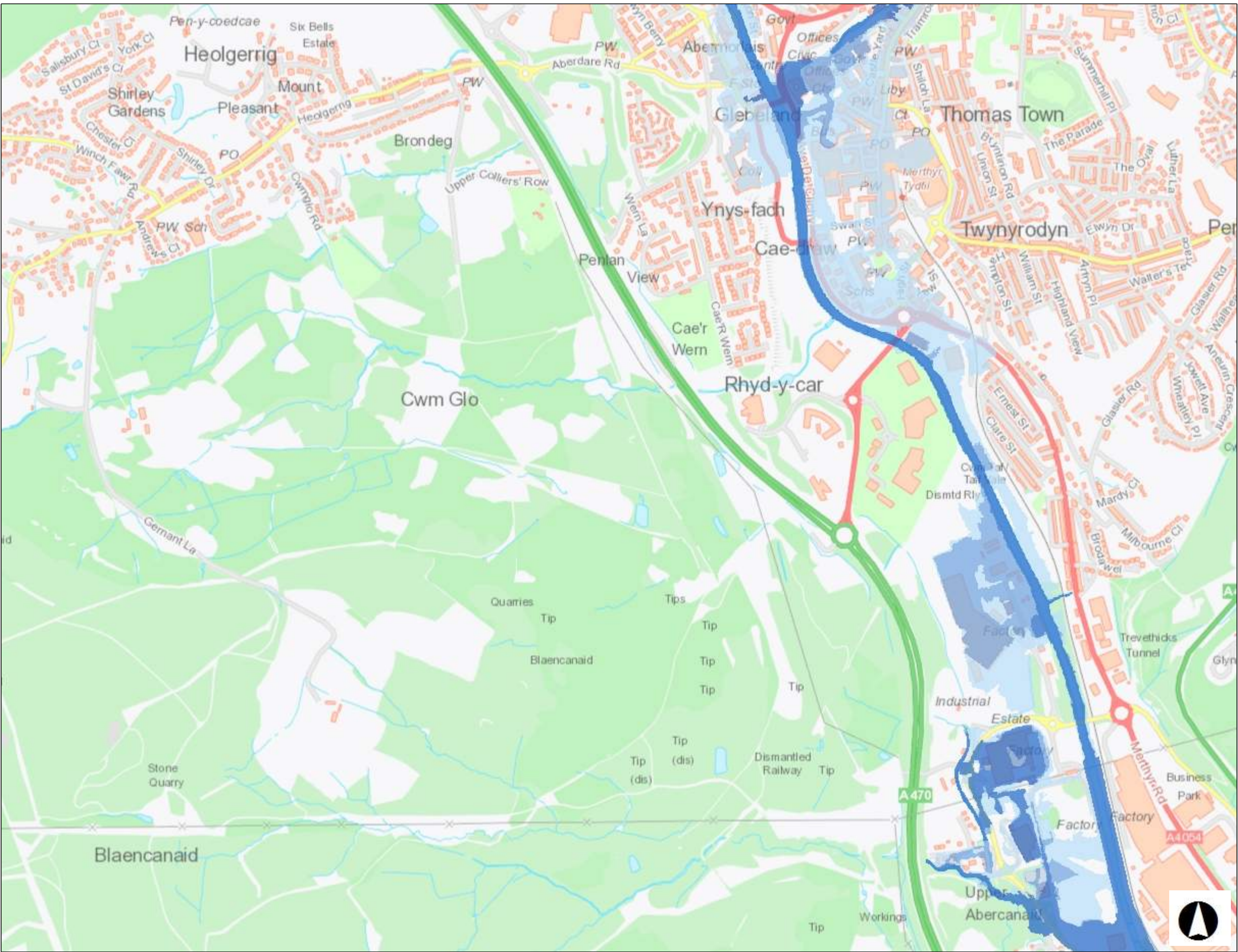
- Allwedd / Map Key**
- Zone C1
 - Zone C2
 - Zone B
 - Zone A

Graddfa / Scale at A3 1: 10,000

Dyddiad / Date
30/07/2021



APPENDIX G – NRW FLOOD RISK FROM RIVERS MAP



Map Perygl Llifogydd / Flood Risk Map -

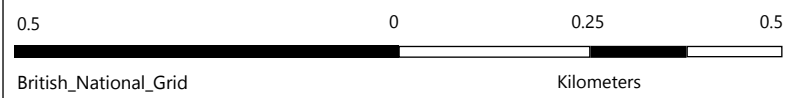
Allwedd / Map Key

Flood Risk from Rivers - Extent

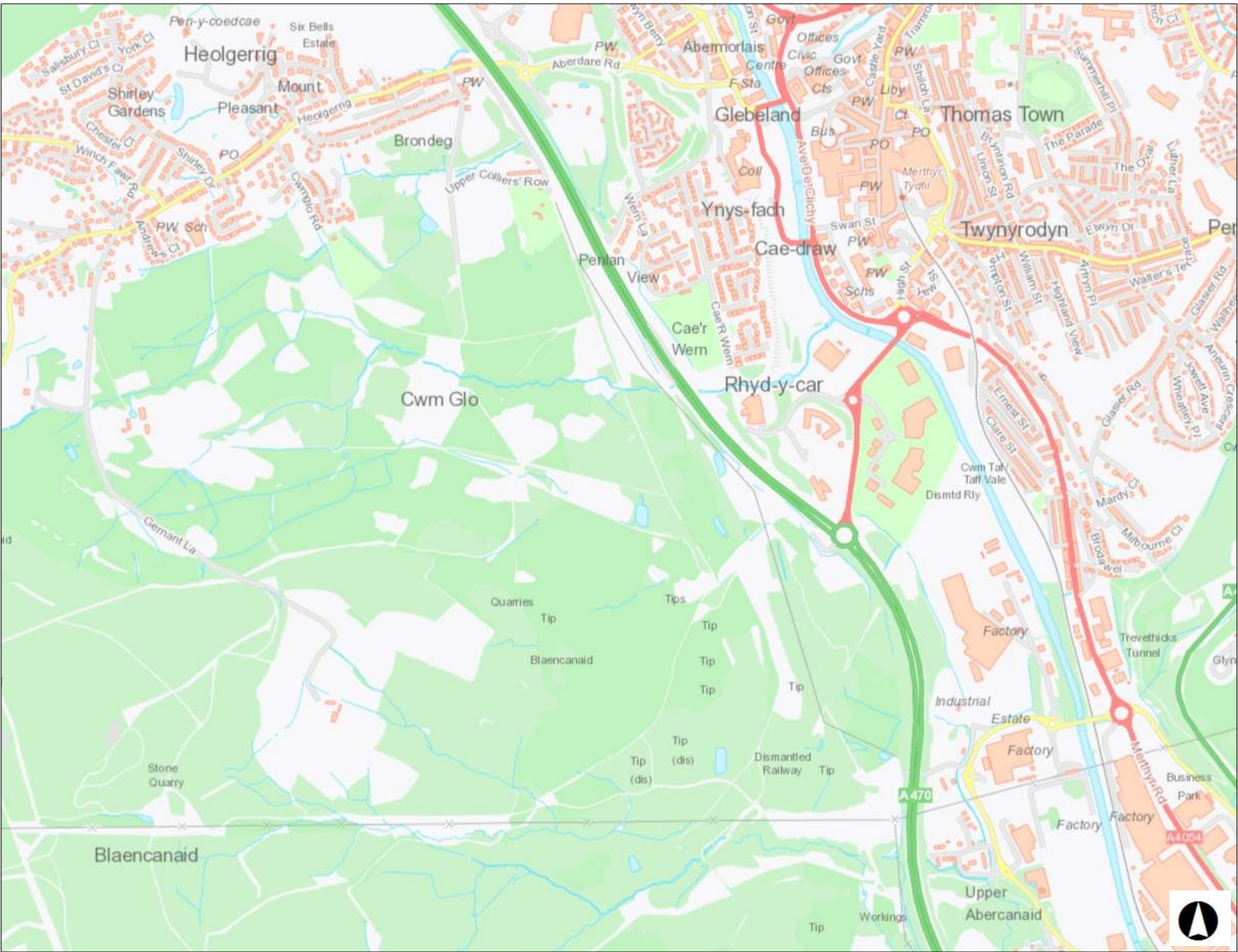
- High
- Medium
- Low

Graddfa / Scale at A3 1: 10,000

Dyddiad / Date
30/07/2021



APPENDIX H – NRW MARINE FLOOD RISK MAP



Map Perygl Llifogydd / Flood Risk Map -

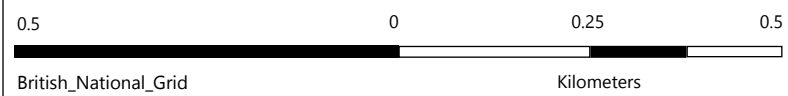
Allwedd / Map Key

Flood Risk from the Sea

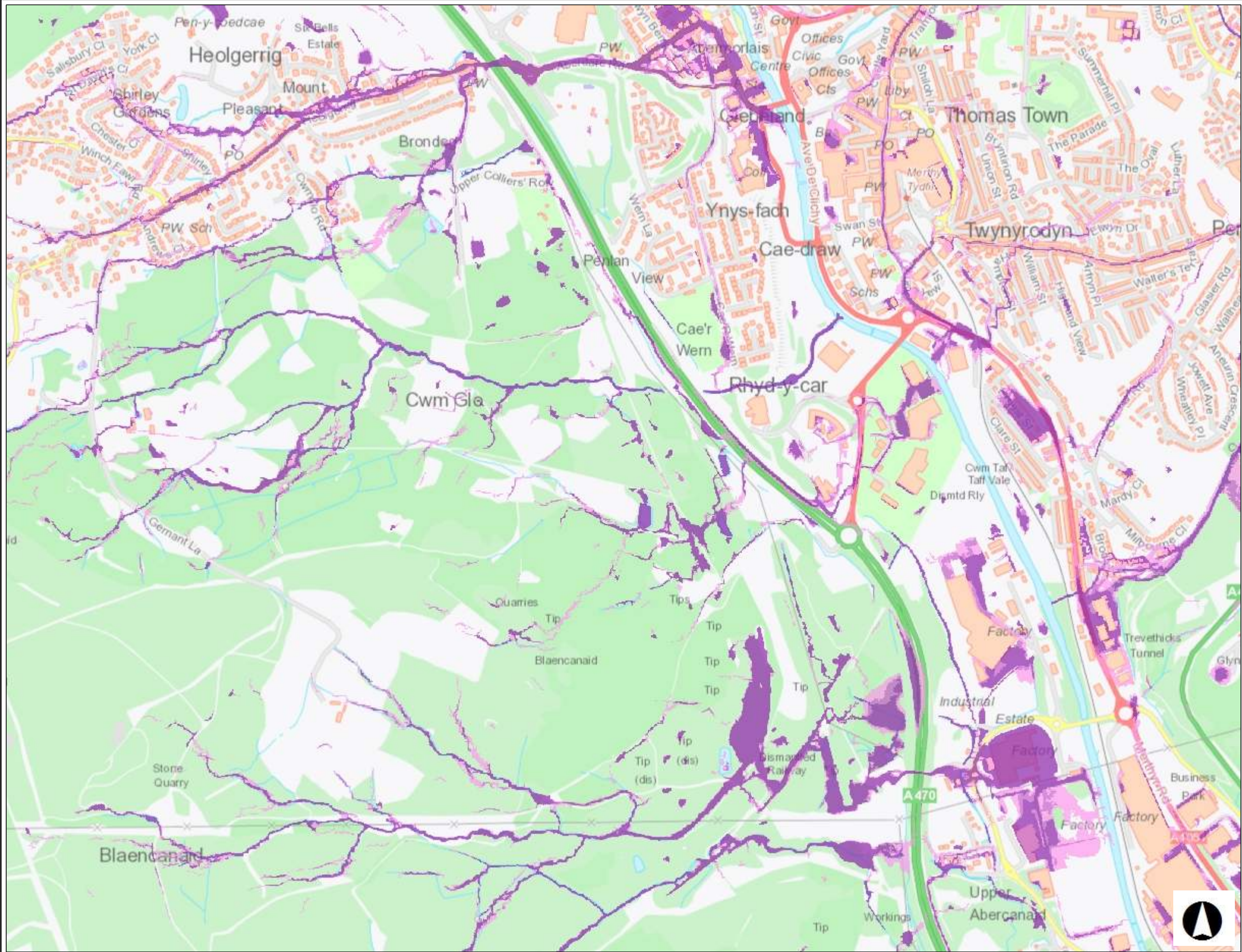
- High
- Medium
- Low

Graddfa / Scale at A3 1: 10,000

Dyddiad / Date
30/07/2021



APPENDIX I – NRW SURFACE WATER FLOOD RISK MAP



Map Perygl Llifogydd / Flood Risk Map -

Allwedd / Map Key

Flood Risk from Surface Water & Small Watercourses - Extent

- High
- Medium
- Low

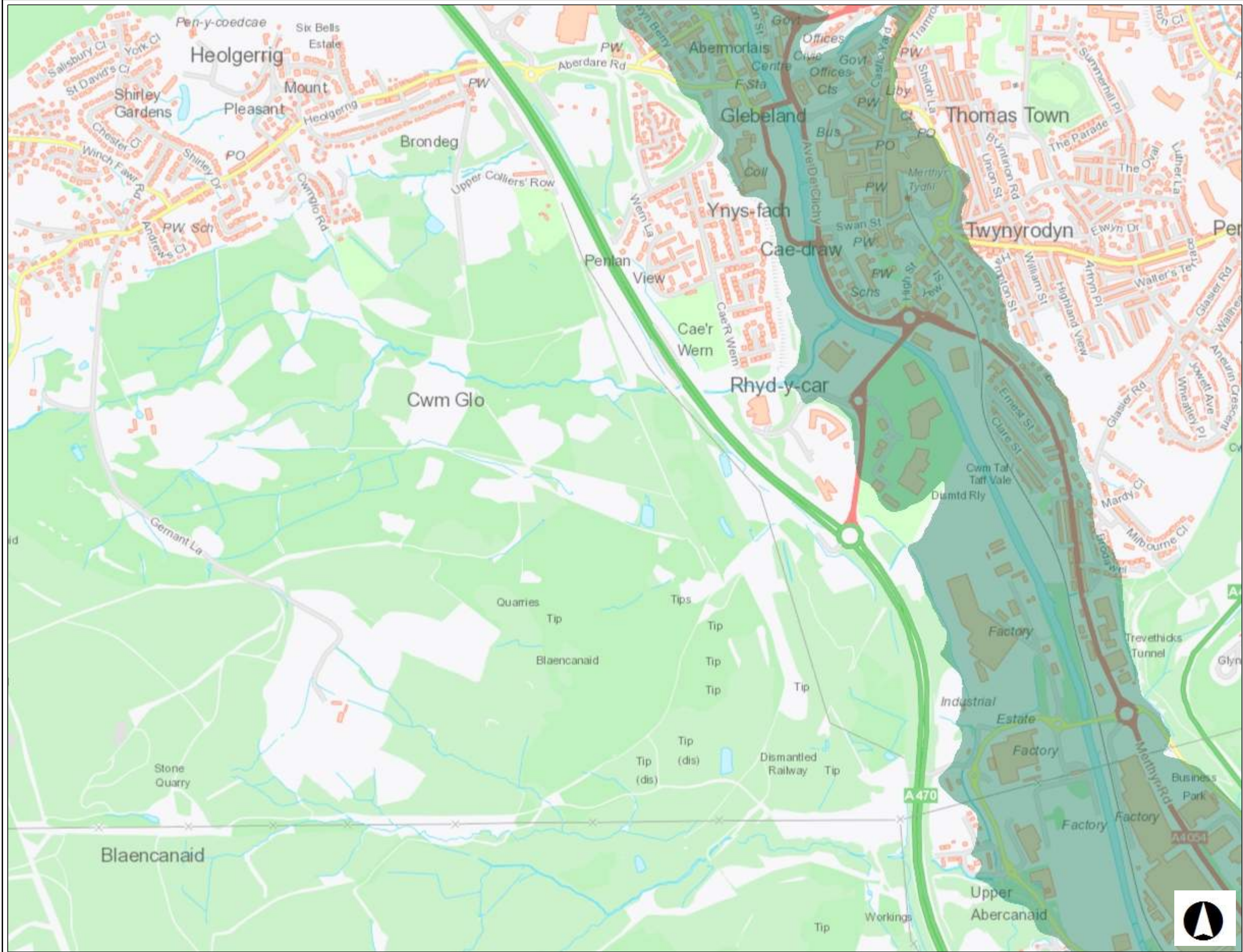
Graddfa / Scale at A3 1: 10,000

Dyddiad / Date
30/07/2021



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APPENDIX J – NRW RESERVOIR FLOOD RISK MAP



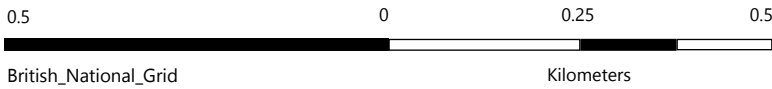
Map Perygl Llifogydd / Flood Risk Map -

Allwedd / Map Key

-  Flood Risk from Reservoirs

Graddfa / Scale at A3 1: 10,000

Dyddiad / Date
30/07/2021



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APPENDIX K – WELSH WATER CORRESPONDENCE

Tetra Tech Limited
Executive Park Avalon Way
Anstey
Leicestershire
LE7 7GR

Date: 19/03/2021
Our Ref: PPA0005563

Dear Ms Martin

Grid Ref: 304651 204736
Site Address: Land west of Rhyd-Y-Car West, Merthyr Tydfil
Development: Commercial and leisure development

I refer to your pre-planning enquiry received relating to the above site, seeking our views on the capacity of our network of assets and infrastructure to accommodate your proposed development. Having reviewed the details submitted I can provide the following comments which should be taken into account within any future planning application for the development.

APPRAISAL

Firstly, we note that the proposal comprises of a potential windfall development with no allocated status in the Local Development Plan (LDP). Accordingly, whilst it does not appear an assessment has been previously undertaken of the public sewerage system, we offer the following comments as part of our appraisal of this development.

Please note, notwithstanding the following assessment, we would advise there is also a mandatory requirement to undertake pre-application consultation with all 'Specialist Consultees', including Dwr Cymru Welsh Water as the statutory water and sewerage undertaker, in accordance with Schedule 4 of Town & Country Planning (Development Management Procedure) (Wales) (Amendment) Order 2016. As a major development, you will be statutorily required to consult Welsh Water and a substantive response will be issued within 28 days from the date of the notice as per the requirements of Article 2E.

Public Sewerage Network

As you may observe from the attached public sewer record plan there is no public sewerage system in this immediate locality and therefore any new development will require provision of satisfactory alternative facilities for sewage disposal. Alternatively, the site is located approximately 250 metres to the east (the other side of the A470 dual carriageway), of a public sewerage system that drains to Cilfynydd Waste Water Treatment Works, and it may be possible for the Developer to requisition sewers from Dwr Cymru Welsh Water under Sections 98 – 101 of the Water Industry Act 1991.

You are also advised that some public sewers and lateral drains may not be recorded on our maps of public sewers because they were originally privately owned and were transferred into public ownership by nature of the Water Industry (Schemes for Adoption of Private Sewers) Regulations 2011. Please be mindful that under the Water Industry Act 1991 Dwr Cymru Welsh Water has rights of access to its apparatus at all times.

Surface Water Drainage

As of 07/01/2019, this proposed development is subject to Schedule 3 of the Flood and Water Management Act 2010. The development therefore requires approval of Sustainable Drainage Systems (SuDS) features, in accordance with the 'Statutory standards for sustainable drainage systems – designing, constructing, operating and maintaining surface water drainage systems'. As highlighted in these standards, the developer is required to explore and fully exhaust all surface water drainage options in accordance with a hierarchy which states that discharge to a combined sewer shall only be made as a last resort. Disposal should be made through the hierarchical approach, preferring infiltration and, where infiltration is not possible, disposal to a surface water drainage body in liaison with the Land Drainage Authority and/or Natural Resources Wales.

It is therefore recommended that the developer consult with Rhondda Cynon Taff Council as the determining SuDS Approval Body (SAB), in relation to their proposals for SuDS features. Please note, DCWW is a statutory consultee to the SAB application process and will provide comments to any SuDS proposals by response to SAB consultation. Please refer to further detailed advice relating to surface water management included in our attached Advice and Guidance note. In addition, please note that no highway or land drainage run-off will be permitted to discharge directly or indirectly into the public sewerage system.

Foul Water Drainage – Sewerage Network

Whilst there is no immediate sewerage network, we have considered the impact of foul flows generated by the proposed development and concluded that flows can be accommodated within the public sewerage system at a point of connection to the 825mm trunk combined sewer at or between manhole SO0542701 and SO05042795 to the east of the site, as indicated on the extract of public sewer record provided. Should a planning application be submitted for this development we will seek to control these points of communication via appropriate planning conditions and therefore recommend that any drainage layout or strategy submitted as part of your application takes this into account. However, should you wish for an alternative connection point to be considered please provide further information to us in the form of a drainage strategy, preferably in advance of a planning application being submitted.

Please note however, the alternative connection point may not have sufficient capacity to accommodate your development without causing detriment to the existing services we provide to our customers, or in regard to the protection of the environment. Therefore, a Hydraulic Modelling Assessment of the local public sewerage network, may be required, which is at the developer's expense. This Assessment will examine the existing network and consider the impact of the introduction of flows from your development upon its performance.



Welsh Water is owned by Glas Cymru – a 'not-for-profit' company.
Mae Dwr Cymru yn eiddo i Glas Cymru – cwmni 'nid-er-elw'.

We welcome correspondence in
Welsh and English

Dŵr Cymru Cyf, a limited company registered in
Wales no 2366777. Registered office: Pentwyn Road,
Nelson, Treharris, Mid Glamorgan CF46 6LY

Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.

Where required appropriate, the Assessment will then identify solutions and points of communication to ensure that your site can be accommodated within the system.

For the developer to obtain a quotation for the hydraulic modelling assessment, we will require a fee of £250 + VAT. Please note that we will seek to control the outcomes of the Hydraulic Modelling Assessment via appropriate planning conditions. However, in the absence of known solutions to accommodate your site we may not be able to support your development through the planning process. We therefore recommend that further assessment is undertaken in advance of the planning application being submitted in order to avoid any subsequent delays. Further information as well as any implications on the planning process is provided in the attached Advice and Guidance note.

You may need to apply to Dwr Cymru Welsh Water for any connection to the public sewer under Section 106 of the Water Industry Act 1991. However, if the connection to the public sewer network is either via a lateral drain (i.e. a drain which extends beyond the connecting property boundary) or via a new sewer (i.e. serves more than one property), it is now a mandatory requirement to first enter into a Section 104 Adoption Agreement (Water Industry Act 1991). The design of the sewers and lateral drains must also conform to the Welsh Ministers Standards for Foul Sewers and Lateral Drains and conform with the publication "Sewers for Adoption"- 7th Edition. Further information can be obtained via the Developer Services pages of www.dwrcymru.com

In order to make a connection to the public sewerage system, it may be necessary to cross third party land, for which you must first gain permission from all the relevant landowners. Should you encounter difficulties in gaining the permission to do so, it may be possible to requisition a new sewer under Sections 98 to 101 of the Water Industry Act 1991 from the boundary of the proposed development to the public sewerage system. Should you require further information please write to us at the address given above.

Foul Water Drainage – Sewage Treatment

No problems are envisaged with the Wastewater Treatment Works for the treatment of domestic discharges from this site.

Potable Water Supply

The proposed development is in an area where there are water supply problems for which there are no improvements planned within our current Capital Investment Programme AMP7 (years 2020 to 2025). In order to establish what would be required to serve the site with an adequate water supply, it will be necessary for the developer to fund the undertaking of a hydraulic modelling assessment on the water supply network. For the developer to obtain a quotation for the hydraulic modelling assessment, we will require a fee of £250.00 + VAT.



Welsh Water is owned by Glas Cymru – a 'not-for-profit' company.
Mae Dŵr Cymru yn eiddo i Glas Cymru – cwmni 'nid-er-elw'.

We welcome correspondence in
Welsh and English

Dŵr Cymru Cyf, a limited company registered in
Wales no 2366777. Registered office: Pentwyn Road,
Nelson, Treharris, Mid Glamorgan CF46 6LY

Rydym yn croesawu gohebiaeth yn y
Gymraeg neu yn Saesneg

Dŵr Cymru Cyf, cwmni cyfyngedig wedi'i gofrestru yng
Nghymru rhif 2366777. Swyddfa gofrestredig: Heol Pentwyn
Nelson, Treharris, Morgannwg Ganol CF46 6LY.

I trust the above information is helpful and will assist you in forming water and drainage strategies that should accompany any future planning application. I also attach copies of our water and sewer extract plans for the area, and a copy of our Planning Guidance Note which provides further information on our approach to the planning process, making connections to our systems and ensuring any existing public assets or infrastructure located within new development sites are protected.

Please note that our response is based on the information provided in your enquiry and should the information change we reserve the right to make a new representation. Should you have any queries or wish to discuss any aspect of our response please do not hesitate to contact our dedicated team of planning officers, either on 0800 917 2652 or via email at developer.services@dwrcymru.com

Please quote our reference number in all communications and correspondence.

Yours faithfully,



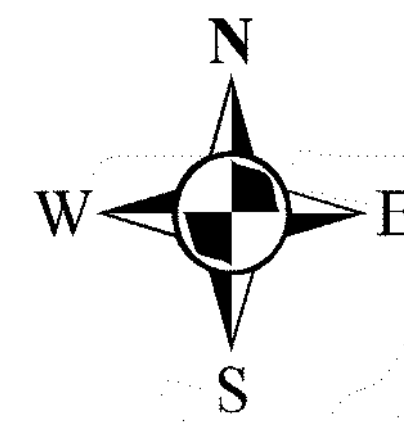
Owain George
Planning Liaison Manager
Developer Services

Please Note that demands upon the water and sewerage systems change continually; consequently, the information given above should be regarded as reliable for a maximum period of 12 months from the date of this letter.



Dŵr Cymru
Welsh Water

PPA0005563 Sewer Plan



LEGEND(Representative of most common features)

- Waste network:
- | | | | |
|---|-------------------------|-------|---|
| ● | Foul chamber | ⤵ | Outfall |
| ○ | Surface water chamber | LH | Lamp hole |
| ⊕ | Combined chamber | ⤵ | Storm Overflow |
| ⊕ | Combined sewer overflow | ⤵ | Rising main |
| ⊕ | Special purpose chamber | ⤵ | Gravity sewer |
| ⊕ | Treatment works | ⤵ | Private sewer |
| ⊕ | Pumping station | S 104 | Private sewer subject to Sect. 104 adoption agreement |
| ⊕ | | ⤵ | Private Sewer Transfer |
| ⊕ | | ⤵ | Lateral Drain |
| ⊕ | | ⤵ | Inspection Chamber |
- NB: Sewer symbol colour indicates the type.
RED - Combined
GREEN - Surface Water
BROWN - Foul
Purple - Former S24 sewers (for indicative purposes only)

Notes:

Whilst every reasonable effort has been taken to correctly record the pipe material of DCWW assets, there is a possibility that in some cases, pipe material (other than Asbestos Cement (AC) or Pitch Fibre (PF)) is therefore advisable that the possible presence of AC or PF pipes be anticipated and considered as part of any risk assessment prior to excavation

Dŵr Cymru Cyfngedig (the Company) gives this information as to the position of its underground apparatus by way of general guidance only and on the strict understanding that it is based on the best information available and to warranty as to its correctness is made upon the event of excavations or other works made in the vicinity of the Company's apparatus. The onus of locating apparatus before carrying out any excavations rests entirely on you. The information which is supplied by the Company is made as in accordance with statutory requirements of sections 188 and 199 of the Water Industry Act 1991 which is based upon the best information available and, in particular, but without prejudice to the generality of this, it should be noted that the records that are available to the Company may not disclose the existence of a water, main, service pipe, sewer, lateral drain or disposal main and any associated apparatus laid before 1 September 1989, or, if they do, the particulars thereof including their position underground may not be accurate. It must be understood that the furnishing of this information is entirely without prejudice to the provision of the New Roads and Street Works Act 1991 and the Company's right to be compensated for any damage to be repaired.

Service pipes are not generally shown but their presence should be anticipated.

EXACT LOCATIONS OF ALL APPARATUS TO BE DETERMINED ON SITE.

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Map Ref: 304902,204683
Map scale: 1:1250
Printed by: Chris Trower
Printed on: 19 Mar 2021

Our Ref: B027142/sm/p-03/050721

Your Ref: TBC

FAO:

Dwr Cymru Welsh Water
PO BOX 690
Linea
Fortran Road
Cardiff
CF3 5WL

23 August 2021

BY EMAIL

Dear Sir/Madam

PROPOSED DEVELOPMENT AT RHYDYCAR WEST, MERTHYR TYDFILL– ENVIRONMENTAL INFORMATION REQUEST

Tetra Tech has recently been commissioned to complete a Flood Consequences Assessment as part of a SAB application to achieve outline planning for the aforementioned site, the location of which is indicated on the enclosed drawing. The OS Grid Reference for the site is 303834, 205496. We would be grateful if you could provide us with the following information:

BASELINE INFORMATION:

1. Details on any watercourses, including culverted watercourses, which are likely to affect the site, including their location and route;
2. Details of any historical flooding known to have affected the site;
3. 100 year return period fluvial and/or 200 year return period marine flood levels that should be used to assess flood risk at the site, together with the method of assessment and currency of the same;
4. Estimated baseline 100 year return period flows for relevant watercourses;
5. Details of any flood defence measures in place, in addition to condition surveys associated with the same, where these exist;
6. Details of any capacity/discharge restrictions that may exist in any watercourses in the vicinity of the site;
7. Details of reservoirs whose flow paths inundate the application site, together with ownership and contact details for each to enable enquiries to be made regarding the condition, maintenance and management of the impoundments;
8. Details of the depth and velocity of flow associated with reservoir flood flows at the application site; and,
9. Copies of the Draft Reservoir Flood Map for each reservoir.
10. Details of the existing road drainage network in the vicinity of the application site; and,
11. Any historic flooding issues e.g. reports of flooding related to surcharging of the road drainage network or blockages of gullies, in the vicinity of the application site.

ASSET INFORMATION:

1. Condition assessments for Welsh Water assets in the vicinity of the site (culverts, pipes etc.);
2. Details of Welsh Water inspection and maintenance regime for the aforementioned assets;
3. Ownership details for assets (i.e. NRW, Traffic Wales, Dŵr Cymru etc);
4. Information which would allow the capacity of culverts to be assessed (i.e. invert levels, soffit levels, dimensions, material type, inlet and outlet details, lengths etc);

5. Any additional information that may be pertinent to completing the FCA for the proposed development.

We appreciate your assistance in this matter. If you have any queries, or require additional information, please do not hesitate to contact the undersigned.

Yours faithfully,



Stephen Mckeown
Graduate Civil Engineer
Tetra Tech Consulting (Northern Ireland) Limited

Enc: Location Plan.pdf, Master Plan.pdf

McKeown, Stephen

From: Environmental Information Requests
<EnvironmentalInformationRequests@dwrcymru.com>
Sent: 08 September 2021 10:05
To: McKeown, Stephen
Subject: RE: Rhydycar West_P-03_sm_230821_ Environmental Information Request

Our Reference: EIR/878/2021

Dear Mr McKeown

Request for information

We write further to your request for information dated 23rd August 2021 which we have been considering under the Environmental Information Regulations 2004.

We can confirm that Dŵr Cymru Welsh Water does not hold the information you have requested as we do not have any assets in the area you have requested.

Watercourses, Culverts and Highway drainage would be the responsibility of the NRW, Local authority, riparian owner, or Highways department. We recommend you contact these who should be able to assist you further with your enquiries.

Turning to questions 7,8, and 9 of your request, the following Impounding reservoirs are upstream of the proposed developments in a northerly direction:

- Llwynon,
- Cantref,
- Beacons,
- Pontsticill reservoirs.

However, details on the inundation mapping are publicly available information and can be obtained from the Governments website.

By way of reference, we have a dedicated Planning Team within our Developer Services function that can provide advice on the capacity in our infrastructure to accommodate new development.

Our pre-planning service will review the capacity available in our sewerage network, wastewater treatment works and clean water network to accommodate the flows/demand from a proposed development. It will also raise awareness of any of our assets crossing the site which will need to be factored into the layout of your development and provide general advice on surface water drainage.

An application for pre-planning advice can be submitted online via the following address <https://developers.dwrcymru.com/en/applications/planning/pre-planning>. If you wish to discuss in more detail our Planning Team are contactable on 08009172652 or alternatively by email developer.services@dwrcymru.com.

We hope that this response is clear. Should you have any questions, please contact us by email at EnvironmentalInformationRequests@dwrcymru.com

If you are dissatisfied with the handling of your request, you have the right to ask for an internal review. Internal review requests should be submitted within 40 working days of the date of receipt of this response and should be addressed to Company Secretary, Linea, Fortran Road, St Mellons, Cardiff CF3 0LT.

If you are not content with the outcome of the internal review, you have the right to apply directly to the Information Commissioner for a decision.

Yours sincerely,

R.Stevens

Dŵr Cymru Welsh Water

From: McKeown, Stephen <Stephen.McKeown@tetrattech.com>

Sent: 23 August 2021 09:23

To: Environmental Information Requests <EnvironmentalInformationRequests@dwrcymru.com>

Subject: Rhydyar West_P-03_sm_230821_ Environmental Information Request

***** External Mail *****

Dear Sir/ Madam

PROPOSED DEVELOPMENT AT RHYDYCAR WEST, MERTHYR TYDFILL- ENVIRONMENTAL INFORMATION REQUEST

Tetra Tech have recently been commissioned to undertake a Flood Consequences Assessment at the above site. Please find attached the location plan and masterplan layout to assist with the baseline information enquiry and asset information request. The OS Grid Reference for the site is 303834, 205496. Details of required information may be found in the cover letter attached.

Attached: Cover Letter Baseline Enquiry, Location Plan, Master Plan

If you have any queries or require additional information, please get back to me.

Regards,

Stephen McKeown MEng (Hons)

Civil Engineer

Tetra Tech

1 Locksley Business Park, Montgomery Road, Belfast, BT6 9UP

Tel: +44 2890 709 007

Mob: +44 7890 035 072

tetrattechurope.com



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Dwr Cymru Welsh Water is firmly committed to water conservation and promoting water efficiency. Please log on to our website www.dwrcymru.com/waterefficiency to find out how you can become water wise. Mae Dwr Cymru Welsh Water wedi ymrwymo i warchod adnoddau dwr a hyrwyddo defnydd dwr effeithiol. Mae cyngor i' ch helpu i ddefnyddio

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APPENDIX L – NRW CORRESPONDENCE

Our Ref: B027142/sm/p-03/050721

Your Ref: TBC

FAO

Natural Resources Wales
Chester Road
Buckley
CH7 3AJ
Wales

5 July 2021

BY EMAIL

Dear Sir/Madam

PROPOSED DEVELOPMENT AT RHYDYCAR WEST, MERTHYR TYDFILL– BASELINE INFORMATION ENQUIRY and ASSET INFORMATION REQUEST

Tetra Tech has recently been commissioned to complete a Drainage Assessment / Flood Risk Assessment for the aforementioned site, the location of which is indicated on the enclosed drawing. The OS Grid Reference for the site is 303834, 205496. We would be grateful if you could provide us with the following information:

BASELINE INFORMATION:

1. Details on any watercourses, including culverted watercourses, which are likely to affect the site, including their location and route;
2. Details of any historical flooding known to have affected the site;
3. 100 year return period fluvial and/or 200 year return period marine flood levels that should be used to assess flood risk at the site, together with the method of assessment and currency of the same;
4. Estimated baseline 100 year return period flows for relevant watercourses;
5. Details of any flood defence measures in place, in addition to condition surveys associated with the same, where these exist;
6. Details of any capacity/discharge restrictions that may exist in any watercourses in the vicinity of the site;
7. Details of reservoirs whose flow paths inundate the application site, together with ownership and contact details for each to enable enquiries to be made regarding the condition, maintenance and management of the impoundments;
8. Details of the depth and velocity of flow associated with reservoir flood flows at the application site; and,
9. Copies of the Draft Reservoir Flood Map for each reservoir.
10. Details of the existing road drainage network in the vicinity of the application site; and,
11. Any historic flooding issues e.g. reports of flooding related to surcharging of the road drainage network or blockages of gullies, in the vicinity of the application site.

ASSET INFORMATION:

1. Condition assessments for NRW assets in the vicinity of the site (culverts, pipes etc.);
2. Details of NRW's inspection and maintenance regime for the aforementioned assets;
3. Ownership details for assets (i.e. NRW, Traffic Wales, Dŵr Cymru etc);
4. Information which would allow the capacity of culverts to be assessed (i.e. invert levels, soffit levels, dimensions, material type, inlet and outlet details, lengths etc);

5. Any additional information that may be pertinent to completing the DA/FRA for the proposed development.

We appreciate your assistance in this matter. If you have any queries, or require additional information, please do not hesitate to contact the undersigned.

Yours faithfully,



Stephen Mckeown
Graduate Civil Engineer
Tetra Tech Consulting (Northern Ireland) Limited

Enc: Location Plan.pdf, Master Plan.pdf

McKeown, Stephen

From: Enquiries <enquiries@cyfoethnaturiolcymru.gov.uk>
Sent: 05 July 2021 16:15
To: McKeown, Stephen; Access to Information Team; Library
Subject: RE: B027142 - Rhydyar West_P-03_sm_050721_ Baseline Enquiry NRW:08004533

Dear Stephen,

Thank you for your plant enquiry for proposed works at the site in your e-mail below.

We now have a range of information on our website and the Geo-Portal for Wales - Lle - that will help you identify if any of our assets are affected by your proposed works.

Although Natural Resources Wales is classed as a statutory undertaker, we do not generally have plant equipment or pipelines situated in the public highway.

If you want to carry out works in, over, under or near a main river or flood defence (including a sea defence), or within a flood plain you will need to apply for Flood Risk Activity Permit. (This was previously called a Flood Defence Consent.) For further advice please visit our website <https://naturalresources.wales/permits-and-permissions/flood-risk-activities/flood-risk-activity-permits-information/?lang=en> Contact details for the relevant office are also included within the application forms.

For locations of Main Rivers you can view our Risk of Flooding maps online at this link <https://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk/?lang=en>

You can download GIS data on the locations of designated sites from the Lle web portal <http://lle.wales.gov.uk/catalogue?lang=en>

Further information about these sites can also be found on our website <https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/types-of-protected-areas-of-land-and-sea/?lang=en>

To confirm: This reply has been drafted without conducting a specific search of our records.

If you have reason to think that your proposal will affect land or equipment which we own, please resubmit your enquiry to datadistribution@naturalresourceswales.gov.uk, with details of the specific areas affected.

Yours sincerely,

Bethan

Bethan M Williams

Cymorth Cyswllt Cyfoeth / Customer Hub Support

Cwsmer, Cyfathrebu a Masnach/Customer, Communications and Commercial
Cyfoeth Naturiol Cymru/Natural Resources Wales
Ffôn/Tel: 0300 065 3000

Gwefan/Website: <http://www.cyfoethnaturiolcymru.gov.uk/> www.naturalresourceswales.gov.uk

Twitter: twitter.com/NatResWales

Facebook: facebook.com/nNatResWales

Flickr: Flickr.com/NatResWales

Youtube: youtube.com/NatResWales

----- Original Message -----

From: McKeown, Stephen <Stephen.McKeown@tetrattech.com>;
Received: Mon Jul 05 2021 10:44:23 GMT+0100 (British Summer Time)
To: Access to information team <accesstoinformationteam@cyfoethnaturiolcymru.gov.uk>;
library@cyfoethnaturiolcymru.gov.uk <library@cyfoethnaturiolcymru.gov.uk>; Enquiries Queue
<enquiries@cyfoethnaturiolcymru.gov.uk>;
Subject: B027142 - Rhydyar West_P-03_sm_050721_ Baseline Enquiry

Dear Sir/ Madam

PROPOSED DEVELOPMENT AT RHYDYCAR WEST, MERTHYR TYDFILL– BASELINE INFORMATION ENQUIRY & ASSET INFORMATION REQUEST

Tetra Tech have recently been commissioned to undertake a Drainage Assessment / Flood Risk Assessment at the above site. Please find attached the location plan and masterplan layout to assist with the baseline information enquiry and asset information request. The OS Grid Reference for the site is 303834, 205496. Details of required information may be found in the cover letter attached.

Attached: Cover Letter Baseline Enquiry, Location Plan, Master Plan

If you have any queries or require additional information, please get back to me.

Regards

Stephen McKeown MEng (Hons)
Civil Engineer

Tetra Tech

1 Locksley Business Park, Montgomery Road, Belfast, BT6 9UP

Tel: +44 2890 709 007
Mob: +44 7890 035 072
tetrattechurope.com



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McKeown, Stephen

From: Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
Sent: 05 July 2021 13:33
To: McKeown, Stephen
Subject: RE: B027142 - Rhydyar West_P-03_sm_050721_ Baseline Enquiry
Attachments: Briefing Note Flood Products -external.pdf; FAQs V2.pdf; NRW Flood Product Descriptions.pdf

Dear Mr McKeown,

Thank you for your email concerning the above. Further to this and in answer to your queries, please see the following links:

1. Details of any watercourses – <http://lle.gov.wales/catalogue/item/MainRivers/?lang=en>
2. Details of any historical flooding – <http://lle.gov.wales/catalogue/item/HistoricFl/?lang=en>
3. Flood levels – We will advise in due course but please see the attached documentation.
4. Flows – Please fill in the criteria below and submit to us:

1. Data Type -
2. Location -
3. Date From -
4. Date To -
5. Resolution -
6. Station Name -

5. For defences, please see the following link – <http://lle.gov.wales/Catalogue?lang=en&text=defences>
6. For drainage, please see our website and the following link – <https://naturalresources.wales/search?lang=en&query=drainage> & <http://lle.gov.wales/catalogue/item/ConsentedDischargesToControlledWatersWithConditions/?lang=en>
7. For reservoirs, please see the following link – <http://lle.gov.wales/Catalogue?lang=en&text=reservoir>
8. For reservoir flows, we will advise in due course.
9. Please see link number 7, as above.
10. For road drainage network, please contact the relevant Local Authority and drainage authority.
11. For historic flood issues, we will advise in due course.
12. For condition assessments for NRW assets, we will advise in due course.
13. For details of NRW's inspection and maintenance regime, we will advise in due course.
14. For asset ownership, we can only advise on NRW ownership. For all other assets you think may be in the area, please contact the relevant authorities.
15. Information which would allow the capacity of culverts to be assessed, we will advise in due course but please also check with the relevant authorities.

Please could you also provide a site map/plan of the area outlined in red, onto a basic OS map or similar.

I trust this information is of use to you and we look forward to hearing from you in due course concerning the additional information we require (purple text & map), before we can pursue your request further.

Yn gywir / Yours sincerely,

Michelle Lewis

Cyfoeth Naturiol Cymru / Natural Resources Wales

Ffôn/ Phone: 03000 653577

Symudol / Mobile: 07917243096

Office Location Llys Afon, Hwlfordd / Office Location River Court, Haverfordwest

Cwsmer, Cyfarthrebu a Masnach - Customer, Communications and Commercial

Oriau gwaith arferol/Normal working hours – Mon-Fri, 9 to 5

Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.

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cyfoethnaturiol.cymru / naturalresources.wales

[Twitter](#) | [Facebook](#) | [LinkedIn](#) | [Instagram](#)

From: McKeown, Stephen <Stephen.McKeown@tetrattech.com>

Sent: 05 July 2021 10:44

To: Access to Information Team <accesstoinformationteam@cyfoethnaturiolcymru.gov.uk>; Library <library@cyfoethnaturiolcymru.gov.uk>; Enquiries <enquiries@cyfoethnaturiolcymru.gov.uk>

Subject: B027142 - Rhydyar West_P-03_sm_050721_ Baseline Enquiry

Dear Sir/ Madam

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Attached: Cover Letter Baseline Enquiry, Location Plan, Master Plan

If you have any queries or require additional information, please get back to me.

Regards

Stephen McKeown MEng (Hons)

Civil Engineer

Tetra Tech

1 Locksley Business Park, Montgomery Road, Belfast, BT6 9UP

Tel: +44 2890 709 007

Mob: +44 7890 035 072

tetrattechurope.com

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McKeown, Stephen

From: Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
Sent: 29 July 2021 15:38
To: McKeown, Stephen
Subject: A|TI 21890a - Rhydyar West_P-03_sm_050721_ Baseline Enquiry
Attachments: W003(P02)_Site Location Plan.pdf; W002(P01)_Proposed Storm Drainage Discharge Locations.pdf

Hi Stephen

Your data request has been logged with the above reference and is being processed.

In response to your query dated 28 July, I have been advised that the watercourses you queried (above attachments) are all ordinary watercourses so it's the Local Authority who have powers to carry out works on these watercourses and also consenting responsibility.

Regarding actual ownership (ie riparian), if the local authority doesn't know who the landowner is, then I can only suggest you enquire with the Land Registry to determine this.

[Culverts and Watercourses \(land-search-online.co.uk\)](http://land-search-online.co.uk)

I am making enquiries with our Flood Risk Analysis (FRA), Assets and Reservoir Teams about the data you have requested, and will be in touch once I hear back.

Regarding points 3 and 4 below, FRA have advised that we have no detailed modelling for the watercourses within your site of interest.

With regards to point 6 and 11 you will need to contact our Planning Team regarding your proposed development: [Natural Resources Wales / Planning and development](#)

Point 10 you will need to contact the local authority or possibly Planning – see above link.

Point 14 – Michelle has already advised that we can only provide information on NRW assets – you will need to contact other relevant organisations directly.

Point 15 – Michelle has already advised you to contact the local authority and could raise through Planning process.

REQUEST EXTRACT and links previously provided by Michelle:

1. Details on any watercourses, including culverted watercourses, which are likely to affect the site, including their location and route; <http://lle.gov.wales/catalogue/item/MainRivers/?lang=en>
2. Details of any historical flooding known to have affected the site; <http://lle.gov.wales/catalogue/item/HistoricFI/?lang=en>
3. 100 year return period fluvial and/or 200 year return period marine flood levels that should be used to assess flood risk at the site, together with the method of assessment and currency of the same;
4. Estimated baseline 100 year return period flows for relevant watercourses;
5. Details of any flood defence measures in place, in addition to condition surveys associated with the same, where these exist; <http://lle.gov.wales/Catalogue?lang=en&text=defences>
6. Details of any capacity/discharge restrictions that may exist in any watercourses in the vicinity of the site; - <https://naturalresources.wales/search?lang=en&query=drainage>

& <http://lle.gov.wales/catalogue/item/ConsentedDischargesToControlledWatersWithConditions/?lang=en>

7. Details of reservoirs whose flow paths inundate the application site, together with ownership and contact details for each to enable enquiries to be made regarding the condition, maintenance and management of the impoundments; <http://lle.gov.wales/Catalogue?lang=en&text=reservoir>
8. Details of the depth and velocity of flow associated with reservoir flood flows at the application site;
and,
9. Copies of the Draft Reservoir Flood Map for each reservoir.
10. Details of the existing road drainage network in the vicinity of the application site;
11. Any historic flooding issues e.g. reports of flooding related to surcharging of the road drainage network or blockages of gullies, in the vicinity of the application site.
12. Condition assessments for NRW assets in the vicinity of the site (culverts, pipes etc.);
13. Details of NRW's inspection and maintenance regime for the aforementioned assets;
14. Ownership details for assets (i.e. NRW, Traffic Wales, Dŵr Cymru etc);
15. Information which would allow the capacity of culverts to be assessed (i.e. invert levels, soffit levels, dimensions, material type, inlet and outlet details, lengths

Regards

Kathy Banner

Cymorth Technegol Cyswllt Cyfoeth/Customer Hub Technical Support
Cwsmer, Cyfarthrebu a Masnach/Customer, Communications and Commercial Directorate
Cyfoeth Naturiol Cymru/Natural Resources Wales
Llys Afon, Hwlfordd/River Court, Haverfordwest
03000 653568
Mobile: 07817 883574
Dysgw'r Cymraeg

Dw i'n gweithio Dydd Mawrth - Dydd Iau
I work Tuesday – Thursday

www.cyfoethnaturiol.cymru / www.naturalresources.wales

Yn falch o arwain y ffordd at ddyfodol gwell i Gymru trwy reoli'r amgylchedd ac adnoddau naturiol yn gynaliadwy.

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Croesewir gohebiaeth yn Gymraeg a byddwn yn ymateb yn Gymraeg, heb i hynny arwain at oedi.

Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.



From: McKeown, Stephen <Stephen.McKeown@tetrattech.com>
Sent: 28 July 2021 09:48

To: Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
Subject: RE: B027142 - Rhydycar West_P-03_sm_050721_ Baseline Enquiry

Hi Michelle,

I have attached a site location plan and proposed discharge location drawing.

Could you identify who owns the water courses that my proposed drainage network discharges to (there are three discharge locations). I have already contacted Merthyr Tydfil County Borough Council who have confirmed they do not own the associated watercourses.

If you do not deal with watercourse ownership, could you please advise on who I should contact to acquire the requested information.

Many Thanks,

Stephen McKeown MEng (Hons)
Civil Engineer

Tetra Tech

1 Locksley Business Park, Montgomery Road, Belfast, BT6 9UP

Tel: +44 2890 709 007
Mob: +44 7890 035 072
tetratecheurope.com



McKeown, Stephen

From: Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
Sent: 12 August 2021 15:16
To: McKeown, Stephen
Subject: ATI 21890a - Rhydycar West_P-03_sm_050721_ Baseline Enquiry

Hello Stephen

I have received the following response from our Assets Team to points in your data request.

5. There are no NRW flood defence measures in place near the proposed site.
11. NRW holds no historic records of flooding in this area.
12. Not applicable.
13. Not applicable.
14. All nearby main river assets are privately /local authority owned and maintained.
15. You will need to contact the relevant Local Authority

REQUEST EXTRACT:

1. Details on any watercourses, including culverted watercourses, which are likely to affect the site, including their location and route; <http://lle.gov.wales/catalogue/item/MainRivers/?lang=en>
2. Details of any historical flooding known to have affected the site;
<http://lle.gov.wales/catalogue/item/HistoricFI/?lang=en>
3. 100 year return period fluvial and/or 200 year return period marine flood levels that should be used to assess flood risk at the site, together with the method of assessment and currency of the same;
4. Estimated baseline 100 year return period flows for relevant watercourses;
5. Details of any flood defence measures in place, in addition to condition surveys associated with the same, where these exist; <http://lle.gov.wales/Catalogue?lang=en&text=defences>
6. Details of any capacity/discharge restrictions that may exist in any watercourses in the vicinity of the site; - <https://naturalresources.wales/search?lang=en&query=drainage> &
<http://lle.gov.wales/catalogue/item/ConsentedDischargesToControlledWatersWithConditions/?lang=en>
7. Details of reservoirs whose flow paths inundate the application site, together with ownership and contact details for each to enable enquiries to be made regarding the condition, maintenance and management of the impoundments; - <http://lle.gov.wales/Catalogue?lang=en&text=reservoir>
8. Details of the depth and velocity of flow associated with reservoir flood flows at the application site;
and,
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Regards

Kathy Banner

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Cwsmer, Cyfarthrebu a Masnach/Customer, Communications and Commercial Directorate
Cyfoeth Naturiol Cymru/Natural Resources Wales
Llys Afon, Hwlfordd/River Court, Haverfordwest
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Correspondence in Welsh is welcomed, and we will respond in Welsh without it leading to a delay.



From: McKeown, Stephen <Stephen.McKeown@tetrattech.com>

Sent: 05 July 2021 10:44

To: Access to Information Team <accesstoinformationteam@cyfoethnaturiolcymru.gov.uk>; Library <library@cyfoethnaturiolcymru.gov.uk>; Enquiries <enquiries@cyfoethnaturiolcymru.gov.uk>

Subject: B027142 - Rhydyar West_P-03_sm_050721_ Baseline Enquiry

Dear Sir/ Madam

PROPOSED DEVELOPMENT AT RHYDYCAR WEST, MERTHYR TYDFILL– BASELINE INFORMATION ENQUIRY & ASSET INFORMATION REQUEST

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Attached: Cover Letter Baseline Enquiry, Location Plan, Master Plan

If you have any queries or require additional information, please get back to me.

Regards

Stephen McKeown MEng (Hons)
Civil Engineer

Tetra Tech

1 Locksley Business Park, Montgomery Road, Belfast, BT6 9UP

Tel: +44 2890 709 007

Mob: +44 7890 035 072

tetratecheurope.com



TETRA TECH



McKeown, Stephen

From: Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
Sent: 17 August 2021 17:37
To: McKeown, Stephen
Subject: ATI 21890a - Rhydycar West_P-03_sm_050721_ Baseline Enquiry
Attachments: RESERVOIR NOTES KMB.docx

Hello Stephen

Apologies for the numerous responses.

In response to your points 7, 8 and 9 regarding reservoirs, we would advise as follows:

None of the area indicated on your W003(P03) Site Location Plan intersects with reservoir flood outlines that we have.

You have already been provided with [L1e - Large Raised Reservoirs \(gov.wales\)](https://l1e.gov.wales/catalogue/item/MainRivers/?lang=en) which provides information such as reservoir name, location, undertaker name and address.

You can view (but not download) the reservoir flood extent on the Flood Risk Assessment Wales interactive map viewer which has a specific layer "Flood Risk from Reservoirs" – see link below: [Geocortex Viewer for HTML5 \(cyfoethnaturiolcymru.gov.uk\)](https://geocortex.cyfoethnaturiolcymru.gov.uk/)

For your query regarding reservoir flow paths, we assume you mean flow paths as a result of dam failure? We don't provide these. Depth, Velocity, Hazard and travel times are Official-Sensitive data, as is the GIS data that provides the map.

We only have Reservoir Flood Maps (not "draft" ones) but these are Official-Sensitive data, so I'm not sure whether these can be released. I will be in touch as soon as I find out.

We are aware that Dŵr Cymru has recently remapped reservoir flood risk which may include your reservoirs of interest. We suggest you contact Dŵr Cymru direct for this more recent information as we do not hold a copy.

REQUEST EXTRACT:

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From: McKeown, Stephen <Stephen.McKeown@tetrattech.com>

Sent: 05 July 2021 10:44

To: Access to Information Team <accesstoinformationteam@cyfoethnaturiolcymru.gov.uk>; Library <library@cyfoethnaturiolcymru.gov.uk>; Enquiries <enquiries@cyfoethnaturiolcymru.gov.uk>

Subject: B027142 - Rhydycar West_P-03_sm_050721_ Baseline Enquiry

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Regards

Stephen McKeown MEng (Hons)

Civil Engineer

Tetra Tech

1 Locksley Business Park, Montgomery Road, Belfast, BT6 9UP

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APPENDIX M – TRANSPORT FOR WALES CORRESPONDENCE

McKeown, Stephen

From: Freedom Of Information <Freedomofinformation@tfw.wales>
Sent: 20 September 2021 20:28
To: McKeown, Stephen
Subject: RE: B027142_p03_sm_230821_ Rhydycar West Development, Baseline Information Enquiry & Asset Management Request

Good evening,

Thank you for contacting Transport for Wales (TfW). Upon receipt of your Freedom of Information request, the appropriate TfW SMEs (Subject Matter Experts) were consulted in order to respond. We can now confirm that TfW does not hold the information you require.

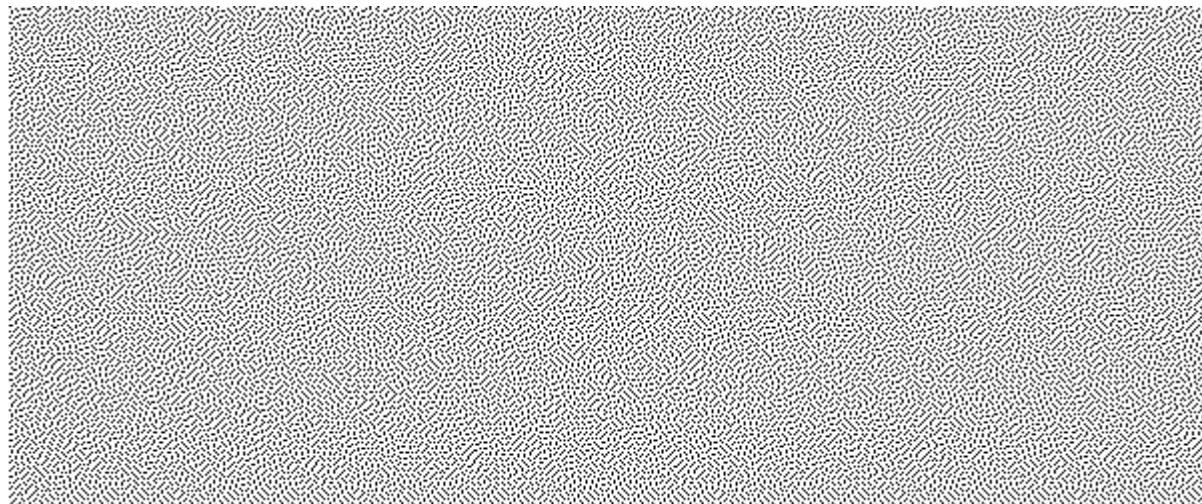
The baseline information questions (Qs 1-11) can be answered by Merthyr Tydfil County Borough Council. It is our suggestion that you redirect this part of your request to their FOI team at the following address:

FOI@merthyr.gov.uk

Regarding the asset information questions (Qs 1-5), we can confirm that we have no assets in the vicinity of the proposed development.

Kind regards,

Trafnidiaeth Cymru | Transport for Wales
3 Llys Cadwyn
Pontypridd
CF37 4TH



From: McKeown, Stephen <Stephen.McKeown@tetrattech.com>
Sent: 23 August 2021 09:43
To: Freedom Of Information <Freedomofinformation@tfw.wales>

Subject: B027142_p03_sm_230821_ Rhydycar West Development, Baseline Information Enquiry & Asset Management Request

Dear Sir/ Madam

PROPOSED DEVELOPMENT AT RHYDYCAR WEST, MERTHYR TYDFILL– BASELINE INFORMATION ENQUIRY & ASSET INFORMATION REQUEST

Tetra Tech have recently been commissioned to undertake a Flood Consequences Assessment at the above site. Please find attached the location plan and masterplan layout to assist with the baseline information enquiry and asset information request. The OS Grid Reference for the site is 303834, 205496. Details of required information may be found in the cover letter attached.

Attached: Cover Letter Baseline Enquiry, Location Plan, Master Plan

If you have any queries or require additional information, please get back to me.

Regards,

Stephen McKeown MEng (Hons)
Civil Engineer

Tetra Tech

1 Locksley Business Park, Montgomery Road, Belfast, BT6 9UP

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Mob: +44 7890 035 072

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Bwriedir yr e-bost yma (ac unrhyw atodiad) ar gyfer y dderbynnydd yn unig ac mae e'n gyfrinachol. Os ydych chi wedi derbyn yr e-bost yma er gamgymeriad, plis hanfonwch yn ôl i ni ar unwaith a ddilëwch y neges heb ei ddarllen, copïo neu ledaenu.

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APPENDIX N – DISCHARGE LIMITS AND ATTENUATION VOLUMES ESTIMATES

Development Area	Impermeable Area		Flow Estimation				Micro Drainage Quick Storage Estimate To Achieve Qbar Discharge Rate		Permeable Paving Design
	Impermeable Area (m²)	Impermeable Area (ha)	Greenfield Runoff Rate 1 Year Return Period Storm Event (l/s)	Greenfield Runoff Rate 30 Year Return Period Storm Event (l/s)	Greenfield Runoff Rate 100 Year Return Period Storm Event (l/s)	Discharge Limit Qbar (l/s)	Lower Attenuation Volume (m³)	Upper Attenuation Volume (m³)	Permeable Paving Sub-Base Depth Assuming 30% Sub Base Voids (m)
Car Park	18,500	1.85	20.9	42	51.9	23.8	1301	2347	0.42
Multi Story Car Park	1,900	0.19	2.8	5.5	6.8	3.1	118	212	
Piazza	8,900	0.89	10.9	21.9	27	12.4	602	1074	
Road	15,576	1.56	18	36	44.6	20.4	1089	1958	
Outdoor Water Park	1,500	0.15	2.2	4.5	5.5	2.5	91	166	
Snow Centre	27,600	2.76	29.9	59.9	74.1	34	1985	3600	
Indoor Activity Centre	5,800	0.58	7.5	14.9	18.5	8.5	382	682	
Hotel Accomodation 1	4,900	0.49	6.4	12.9	15.9	7.3	320	572	
Hotel Accomodation 2	1,275	0.13	2	3.9	4.9	2.2	79	143	
Hotel Accomodation 3	1,400	0.14	2.1	4.2	5.2	2.4	85	153	
Indoor Water Park	4,900	0.49	6.4	12.9	15.9	7.3	320	572	
Total	92,251	9.23	109.10	218.60	270.30	123.90	6,372.00	11,479.00	

Discharge Location	Discharge Rate Qbar l/s
North	4.1
South	119.80
Total	123.90

Detention Basin	Required Attenuation Volume (m³)			Provided (m³)
	Lower	Upper	Average	
1 & 2	2411	4346	3379	3623
3	109	196	153	230
4 & Carpark Sub-base Storage	1988	3574	2781	3037
5	1865	3363	2614	3222
Total			8927	10112

APPENDIX O – DRAINAGE STRATEGY

APPENDIX P – SAB MEETING MINUTES (23/11/21)

Cooke, Paul

From: Williams, Huw (Engineers) <Huw.Williams@merthyr.gov.uk>
Sent: 24 January 2022 10:58
To: McKeown, Stephen
Cc: Cooke, Paul
Subject: RE: B027142/pjc/p-03/231121 - Rhydycar West - SAB Liaison Meeting (23/11/21)
[NOT PROTECTIVELY MARKED]

Classification: NOT PROTECTIVELY MARKED

Hi Stephen,

As discussed, discharges to the 2 proposed locations reduced to Greenfield rates would be acceptable. Downstream condition and capacity assessments will be required prior to agreement of the ordinary watercourse application.

Regards,

Huw.

From: McKeown, Stephen <Stephen.McKeown@tetrattech.com>
Sent: 12 January 2022 11:18
To: Williams, Huw (Engineers) <Huw.Williams@merthyr.gov.uk>
Cc: Cooke, Paul <Paul.Cooke@tetrattech.com>
Subject: RE: B027142/pjc/p-03/231121 - Rhydycar West - SAB Liaison Meeting (23/11/21)

Hi Huw,

Could you provide a response to point 6.

Kind Regards,

Stephen McKeown MEng (Hons)
Civil Engineer

Tetra Tech

1 Locksley Business Park, Montgomery Road, Belfast, BT6 9UP

Tel: +44 2890 709 007

Mob: +44 7890 035 072

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TETRA TECH



From: Cooke, Paul <Paul.Cooke@tetrattech.com>
Sent: 23 November 2021 15:29
To: Huw.Williams@merthyr.gov.uk; McKeown, Stephen <Stephen.McKeown@tetrattech.com>
Subject: B027142/pjc/p-03/231121 - Rhydycar West - SAB Liaison Meeting (23/11/21)

Huw

Thanks for taking the time to meet us this morning. It was really useful to get your initial feedback on the Drainage Strategy, SAB Pre-app and Consent to Discharge Application for the Rhydyar West proposed development. Note the following brief meeting summary / actions:

Attendees: McKeown, Stephen Stephen.McKeown@tetrattech.com; Williams, Huw (Engineers)

Notes:

1. Paul outlined the nature of the proposed development including a summary of existing water features across the site;
2. Huw confirmed that SAB's private development interest was in making sure that SAB requirements have been incorporated into the proposed development. A SAB Pre-app is required based on site area. Operation and maintenance of drainage features will remain the responsibility of the site owner unless offered for adoption to the local authority;
3. Paul summarised the proposed drainage measures including existing watercourse diversions, swales, flow control and attenuation via detention ponds, land drains, car park porous asphalt and make-up storage, rainwater harvesting and discharge to soakaways; it was agreed that the concepts presented in the Drainage Strategy are generally acceptable. Huw stated that he was satisfied for green roofs not to be incorporated;
4. Paul advised that consideration is currently being given to formalising the drainage channel adjacent to the SAM to mitigate erosion. Huw confirmed that this is not a SAB matter;
5. It was agreed that formal approval for watercourse diversions, including the detail of discharge connections, could be deferred to a formal application after Outline Planning Permission has been granted;
6. Ordinary Watercourse Discharge Applications have been lodged for the two proposed discharge locations which were noted to be at Greenfield Runoff Rates (GFR). Huw stated that formal applications for discharge were not required at this stage; these can be deferred and addressed at the same time as watercourse diversions (refer to item 5). **Huw was content to send a response accepting proposed discharge rates and locations for reference in Tetra Tech's deliverables;**
[POST MEETING NOTE: GFR stated in the meeting are actually Q_{bar} rates. Rates of 73.98l/s and 46.2l/s stated on the Drainage Strategy issued with the Consent to Discharge are corrected to 60.65l/s and 62.65l/s];
7. It was noted that 2-levels of treatment are required for the car park drainage; these will be permeable paving and swale. Consideration could also be given to bio-detention pond;
8. It was noted that the Cyfarthfa Balance Pond may be considered a reservoir and that this is currently being explored. Discharges from this feature were summarised;
9. Ponding to the Outdoor Activity and Forest Lodges areas to the south was noted. It was generally acceptable that, owing to the nature of development in these areas, mitigation measures are limited to raising proposed development out of potential ponding area, i.e. on stilts / boardwalks, raised accesses with cross-drainage to allow passage of water;
10. Paul confirmed that the current strategy is based on no infiltration, i.e. lined swales, since infiltration rates will not be known until earthworks have been completed. This was generally acceptable; and
11. Stephen confirmed that the Flood Consequences Assessment would be issued as an appendix to the SAB Pre-app and the ES Drainage and Flood Risk Chapter.

Hopefully the above captures the key aspects of the meeting accurately but should you have any queries don't hesitate to come back to me or Stephen.

Stephen will send on the current Drainage Strategy drawing FYI shortly.

Regards

Paul Cooke BEng CEng CEnv MICE
Director

Tetra Tech
1 Locksley Business Park, Montgomery Road, Belfast, BT6 9UP

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Darllenwch ein [hysbysiadau preifatrwydd](#) i ddarganfod mwy am sut rydym yn defnyddio eich gwybodaeth bersonol.

Cyngor Bwrdeistref Sirol Merthyr Tudful

Canolfan Dinesig
Stryd Y Castell
Merthyr Tudful
CF47 8AN

Teleffon: 01685 725000

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