19th March 2025

Mr. Clint Shaw
130 Kingsway
Chester
Cheshire
CH2 2LW

LAND OFF LLAY ROAD, CEFN-Y-BEDD, WREXHAM
FLOOD CONSEQUENCE ASSESSMENT

Dear Clint,

We have undertaken a brief review of the potential flood risks at and around the proposed site located off Llay Road in Cefn-y-Bedd (Wrexham). The purpose of this exercise was to identify and review the primary sources of potential flood risk to the site and any potential mitigation measures that may need to be incorporated where appropriate.

Site Context & Initial Consultations

The site is located off Llay Road in Cefn-y-Bedd (Wrexham), the nearest Ordnance Survey National Grid Reference is E: 331724, N: 355636 and the nearest postcode is LL12 9UG. The site is surrounded to the north, east, south, and west by undeveloped land. Adjacent to the northern boundary is Llay Road and adjacent to the west of site is Park Road, as illustrated in **Figure 1**.

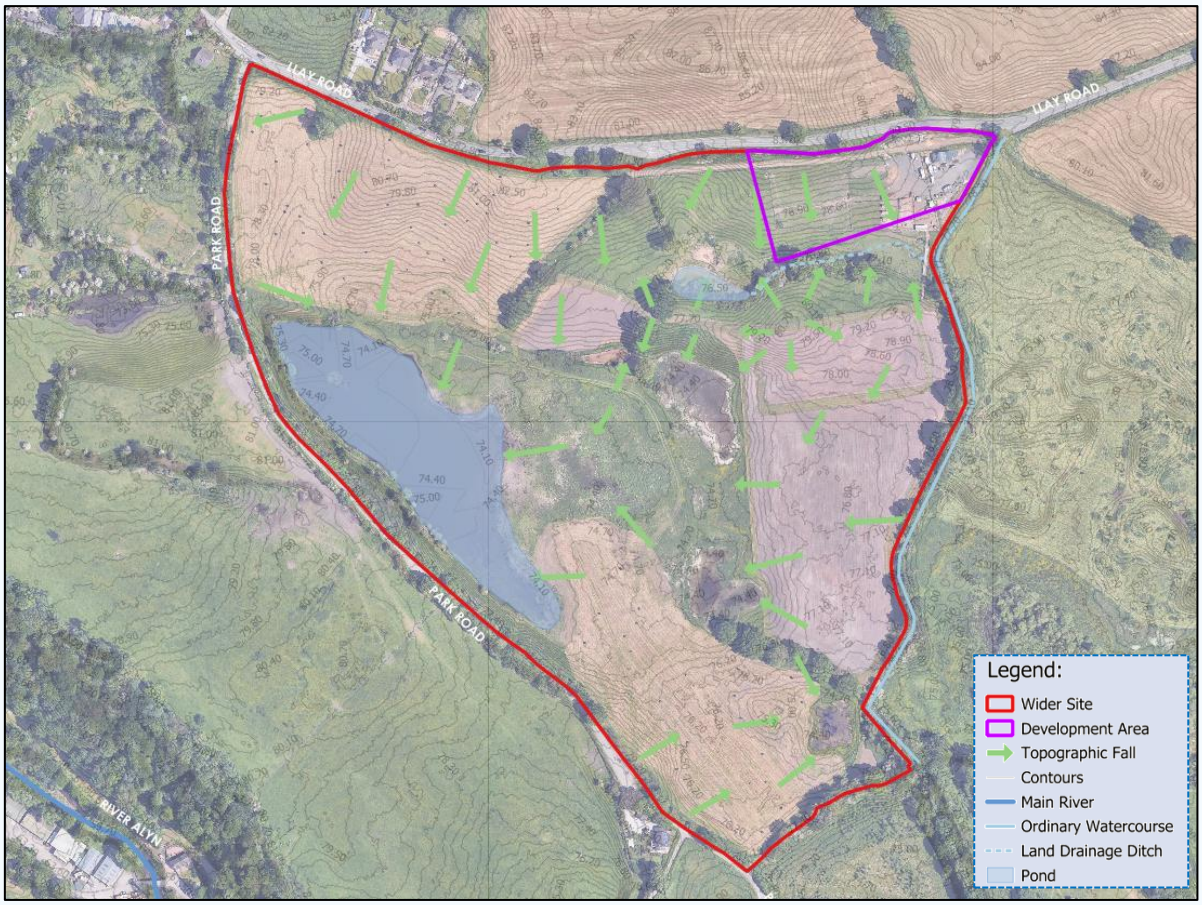


Figure 1: Site Location and Features (Betts Hydro, 2025)

Old Marsh Farm Barns
Welsh Road, Sealand
Flintshire CH5 2LY
Telephone: 01244 289 041

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A site-specific topographic survey has not been carried out to support this assessment however LiDAR data has been obtained and identified the ground levels onsite to vary from 84.00mAOD along the northern site boundary, down to 74.10mAOD within a low-lying depression to the south of the site. An Elevation Plan has been created and included in **Appendix D**.

Consultations were undertaken in 2021 with Natural Resources Wales (NRW), Welsh Water (WW) and Wrexham County Borough Council (WCBC) to obtain their historical records of flooding at the site and the most up-to-date flood data. The responses which were received have been included within **Appendix A**, **B**, and **C** for completeness.

Site Walkover

A site walkover has been undertaken in October (2021) by Betts Hydro. The site walkover confirmed the presence of an unnamed Ordinary Watercourse located adjacent to the eastern boundary of site. This Ordinary Watercourse is understood to assist with managing overland surface water flows from the undeveloped greenfield areas to the north of the site. From the mapping data the Ordinary Watercourse was understood to flow south towards the River Alyn. It was however identified during the site walkover that the original routing of the Ordinary Watercourse has been altered as the downstream channel was identified to be dry.

The Ordinary Watercourse however was identified to be routed into the site via a land drainage ditch. Several areas of ponding water were therefore identified within the low-lying areas within the north-eastern corner of the site, due to the incoming offsite surface water flows (see photographs included within **Appendix E**). Further discussion with the landowner where undertaken who confirmed the watercourse has been dealt with onsite for over 25 years and the ground is composed of sand and gravels. It was also noted that the existing ground levels onsite are varied, falling generally toward the waterbodies and the land drainage ditches identified within this scoping exercise.

Development Proposals

This FCA has been prepared to support a planning application for the development of an agricultural building located off Llay Road in Cefn-y-Bedd (Wrexham). The proposals are for the construction of a commercial building to provide an office, maintenance facility, hay/straw storage and sick/maternity bay for reindeer. The wider site will also be used as a tree farm for Christmas Trees. The proposals will be complete with access, cark parking, boundary fencing and drainage (refer to **Appendix F** for full planning layout).

Flood Zone Classification

The site is located within Flood Zone 1 based on the Flood Map for Planning (**Figure 2**), and Flood Zone A based on the Development Advice Map. Flood Zone 1 is defined as areas with "less than 1 in 1000 (0.1%) (plus climate change) chance of flooding in a given year". The proposed development is commercial in nature, considered as less vulnerable within TAN15, which confirms that this type of land-use is appropriate for Flood Zone 1, providing there is no increase in flood risk elsewhere due to the proposals.

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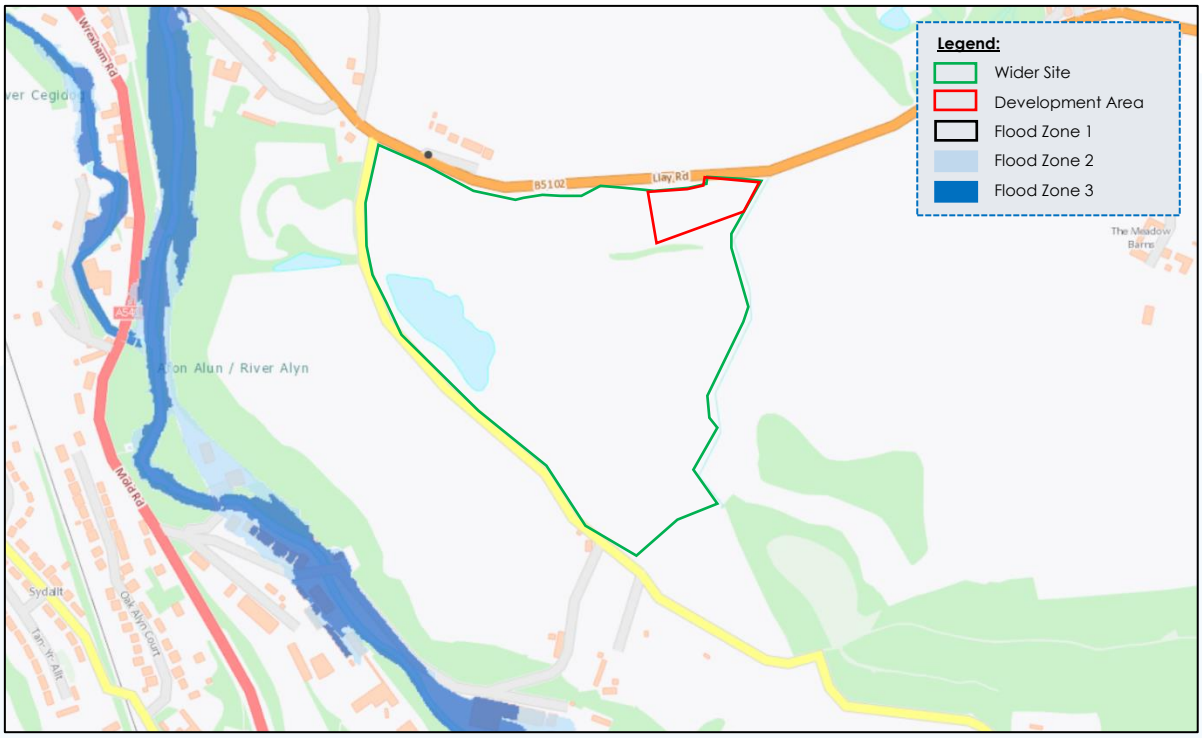


Figure 2: Flood Map for Planning Extract (NRW, 2021)

Flood Risk Summary

The focus of this exercise was to identify how the potential fluvial/surface water flood risks impact the development proposals. As part of this Flood Consequence Assessment, we have obtained and reviewed the most up to date flood data available. This flood mapping has identified the key development considerations relating to flood risk. **Table 1** summarises these key flood risks and the subsequent sections will consider how these risks might impact the development proposed.

Table 1: Key Flood Sources and Level of Risk (Betts Hydro, 2021)

SOURCE OF POTENTIAL FLOOD RISK		RISK RATING		COMMENT
Surface Water / Pluvial			Low/ Medium	The online national flood mapping shows that there are areas within the wider site at very low to high risk of surface water flooding, associated with a conveyance route and an existing waterbody onsite. This conveyance route flows through the development area via an Ordinary Watercourse and land drainage ditch, outfalling into the existing waterbody to the south-west of the wider site.
Groundwater			Low/ Medium	The site is located within a high Groundwater Vulnerability Zone, however, no records of historic flooding at the site have been identified. The risk from groundwater will be confirmed prior to development, in the form of a Phase 1 Ground Study Investigation.
Artificial Sources	**Reservoirs**		Low	The national flood mapping shows that the site is not at risk from reservoir flooding should a breach or failure occur.

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SOURCE OF POTENTIAL FLOOD RISK		RISK RATING		COMMENT
	Canals	🟢	Low	There are no canals located within proximity to site, the potential flood risk associated is therefore low.
	Sewers	🟢	Low	Welsh Water has not identified any historic sewer flooding within the vicinity of site. The potential risk associated is therefore low.
Fluvial • ***Main Rivers*** • ***Ordinary Watercourse*** • ***and Drainage Features***		🟢	Low	The nearest Main River is the River Alyn located 260m to the west of the site. The River Cegidog is also located 345m to the west of the site. It is therefore understood the risk to site from fluvial flooding is low given the proximity of the Main Rivers to site and the surrounding topography. The site walkover confirmed the presence of an unnamed Ordinary Watercourse located adjacent to the eastern boundary of site, identified to be routed into the site via a land drainage ditch. It is understood that these watercourse features have not been considered within the national flood mapping due to their relatively small catchment size (less than 2km^2). Due to scale and nature of the land drainage ditches and the natural topography of the site, the likelihood of these assets affecting the development site is therefore understood to be low.
Tidal		🟢	Low	The North Wales Coastline is located more than 35km from site and the Dee Estuary is located 15km to the north-west of the site. The tidal flood risks associated with these sources are 'low' due to the site's proximity.

Legend: 🟢 Very Low / Low 🟡 Medium 🔴 High

Surface Water Management

Surface water flooding occurs when rainwater is unable to drain away through the normal drainage systems or soak into the ground but lies on or flows over the ground instead. The risk associated with surface water flooding is indicated by the long-term flood mapping included in **Figure 3**.

The development area is predominantly at 'very low' risk from surface water flooding, however there are areas onsite shown to be at higher risk (shown in **Figure 3**). Those areas within the development area at higher risk from surface water are associated with a conveyance feature. This natural conveyance route is understood to route land drainage from the site in a south-westerly direction out of the development area to outfall into an existing lake located along the western boundary of the wider site.

The risk to the proposals from surface water flooding will be managed and reduced post-development through the design and implementation of a sustainable surface water management regime. The proposals are also to increase the size of the existing lake located adjacent to the western boundary of the wider site, to attenuate surface water flood risk within the wider site. To further mitigate for any residual risks, it is advised that (following any re-grade of the site) finished floor levels of the commercial building are elevated above the external levels to provide safe overland flood routes for any excess surface water run-off.

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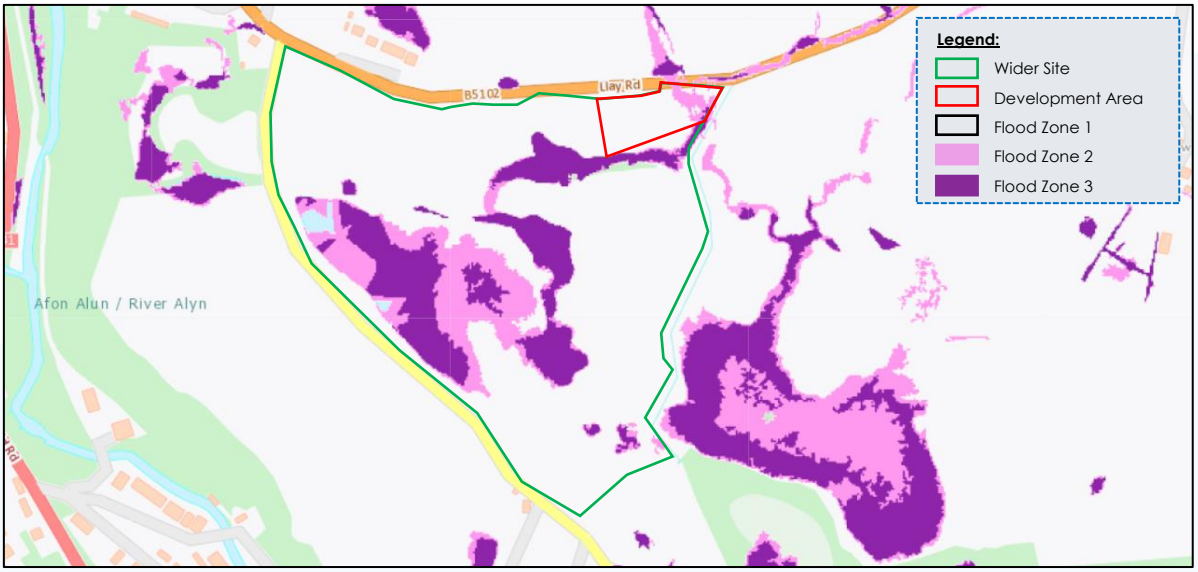


Figure 3: Welsh Flood Map for Planning Extract (NRW, 2021)

Mitigation Measures

The development parcels are located wholly within Flood Zone 1 and are at little risk of fluvial/tidal flooding. To observe a conservative approach however, mitigation measures have been proposed below to safeguard against other potential residual sources of flood risk. The mitigation measures also consider the uncertainties of climate change in accordance with the revised TAN15.

For 'less vulnerable' development located within Flood Zone 1, it is typical to set the Finished Floor Levels (FFL) of proposed buildings a minimum of 150mm above the existing ground levels. By ensuring the FFLs are raised sufficiently above the external levels (following any re-grade) should mitigate any risk of flooding from a variety of sources, including groundwater and surface water risks.

Any overland flows generated by the development must be carefully controlled. Safe avenues directing overland flow way from any existing and proposed buildings are advised. It is recommended that an interception drain is intercepted along the northern boundary of the proposed carpark to intercept any overland flows from the neighbouring undeveloped land before it can impact upon the proposals post-development.

The site walkover confirmed the presence of an unnamed Ordinary Watercourse located adjacent to the eastern boundary of site, identified to be routed into the site via a land drainage ditch. It is recommended that further investigation is undertaken to understand the exact condition, capacity and routing of the watercourses and waterbodies located onsite.

To minimise the flood risk to the neighbouring properties the surface water run-off generated by the proposals will be managed effectively with the peak rates of run-off being restricted to the equivalent of the pre-development situation (with betterment where required).

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If an extreme rainfall event exceeds the design criteria for the drainage system it is likely that there will be some overland flows that are unable to enter the system, it is important that these potential overland flows are catered for within the development site if the capacity of the drainage system is exceeded. A full Drainage Management Strategy (DMS) has been undertaken separately (Ref.: *HYD666_CEFN.Y.BEDD_DMS*). The DMS provides details of how the proposals will be sustainably drained in accordance with local and national policy.

Conclusion

This Flood Consequence Assessment has identified the key considerations in terms of flood risk to the site. The findings of this exercise are that the potential flood risks are either very low or can be sufficiently catered for through further detailed assessment and the implementation of mitigation measures.

I trust that the above information illustrates that the development proposals can be sustainably developed providing appropriate design and mitigation is implemented to safeguard future proposals against the potential flood risks identified. If you have any further queries or require further information, please do not hesitate to contact us.

Yours sincerely

Hannah Buchanan *BSc (Hons) MSc GradCIWEM*

Flood Risk Analyst

Attached:

Appendix A – NRW Consultation Response
Appendix B – Welsh Water Correspondence & Data
Appendix C – Flintshire County Council Correspondence
Appendix D – Elevation Plan
Appendix E – Site Photographs
Appendix F – Proposed Planning Layout

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Flintshire CH5 2LY
Telephone: 01244 289 041

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APPENDIX A – NRW CONSULTATION RESPONSE

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Hannah Buchanan

From: Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
Sent: 11 October 2021 14:13
To: Hannah Buchanan
Subject: ATI22214a P5&6, Land at Cefyn-y-Beth, Wrexham, LL12 9UG

Dear Ms Buchanan,

Further to your recent request concerning the above, please note that we do not have any detailed models for this location.

Self Service Open Data:

You can now make the most of open data provided **free online:**

- **NRW Flood Risk Map Viewer**: create and export an A4 or A3 PDF map at a scale of 1:5000. You will find many spatial risk layers, including the Development Advice Map, flood zones, surface water, reservoir hazard data and historic flooding.

- **"Lle" the Welsh Government Portal for Open Spatial data**: Spatial data is free to download, view and use within your own GIS system. The flood datasets includes Flood Zones, Flood Defences, Historic Flood Outlines, Areas Benefiting Defences, Surface Water, Development Advice Map, and LiDAR Composite Dataset. You can also download the 'Coastal Design – Extreme Sea Levels' report and data covering still water levels for the Welsh Coastline (wave overtopping is **not** calculated).

Please Note the Following:

- All information supplied will need to be verified by the recipient **PRIOR** to using in a Flood Consequences Assessment (FCA). We would expect to see a review of hydrology, in-channel survey, floodplain topography etc. to demonstrate the data is suitable for the purposes of producing an FCA.

- As of 1st of December, 2016 you will need to apply climate change allowances carefully to ensure compliance with Welsh Government climate change allowances and flood consequence assessments.

- **Pre-application Advice:** NRW are changing the way in which we provide advice to developers. We will continue to meet our duties as an adviser. In addition, we will offer a free initial opinion on your proposal. However, in cases where you would like to access any extra advice that falls outside of our statutory duties, we can only offer this as part of our Discretionary Planning Advice Service (DPA Service). For more information regarding free service and our discretionary planning can be found in the following links: Welsh Version / English version.

Your request for our free or charged discretionary advice service needs to be accompanied by the relevant 'Request Form' which is available to download from our website. You will then need to send the form to northplanning@cyfoethnaturiolcymru.gov.uk who will coordinate our response.

Apologies we could not have been of any further assistance to you on this occasion.

Yn gywir / Yours sincerely,

Michelle Lewis

Cyfoeth Naturiol Cymru / Natural Resources Wales
Ffôn/ Phone: 03000 653577
Symudol / Mobile: 07917243096
Office Location Llys Afon, Hwlffordd / 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.

Proud to be leading the way to a better future for Wales by managing the environment and natural resources sustainably.

cyfoethnaturiol.cymru / naturalresources.wales

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From: Hannah Buchanan <hannahbuchanan@betts-associates.co.uk>
Sent: 15 September 2021 17:03
To: Data Distribution <datadistribution@cyfoethnaturiolcymru.gov.uk>
Subject: Flood Risk Information Request

To whom it may concern,

Land at Cefyn-y-Beth, Wrexham, LL12 9UG

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the above site (location plan attached), including details of historical flooding and any predicted flood water levels; this would be greatly appreciated. If there are any specific requirements that you require in a scope of works for this site, please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards,

Hannah Buchanan *BSc (Hons)*
Graduate Flood Risk Analyst

BETTS HYDRO
Consulting Engineers

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Chester +44 (0)1244 289041

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FLOOD RISK MAPPING





FLOOD RISK MAPPING





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APPENDIX B – WELSH WATER CORRESPONDENCE & DATA

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Welsh Road, Sealand
Flintshire CH5 2LY
Telephone: 01244 289 041

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Head Office Betts Associates Ltd

Hannah Buchanan

From: Environmental Information Requests <EnvironmentalInformationRequests@dwrcymru.com>
Sent: 24 September 2021 09:38
To: Hannah Buchanan
Subject: Request for Information - Sewer Flood Risk Information

Our Reference: EIR/903/2021

Dear Ms Buchanan,

Request for Information

RE: Land at Cefyn-y-Beth, Wrexham, LL12 9UG

We write further to your request for information dated 16th September 2021, which we have been considering under the Environmental Information Regulations 2004.

We can confirm that we have reviewed our flooding database and we have no flooding history within the location or vicinity requested.

Turning to your query on specific drainage requirements, 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

_____ 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 dwr yn ddoeth yn www.dwrcymru.com/waterefficiency

_____

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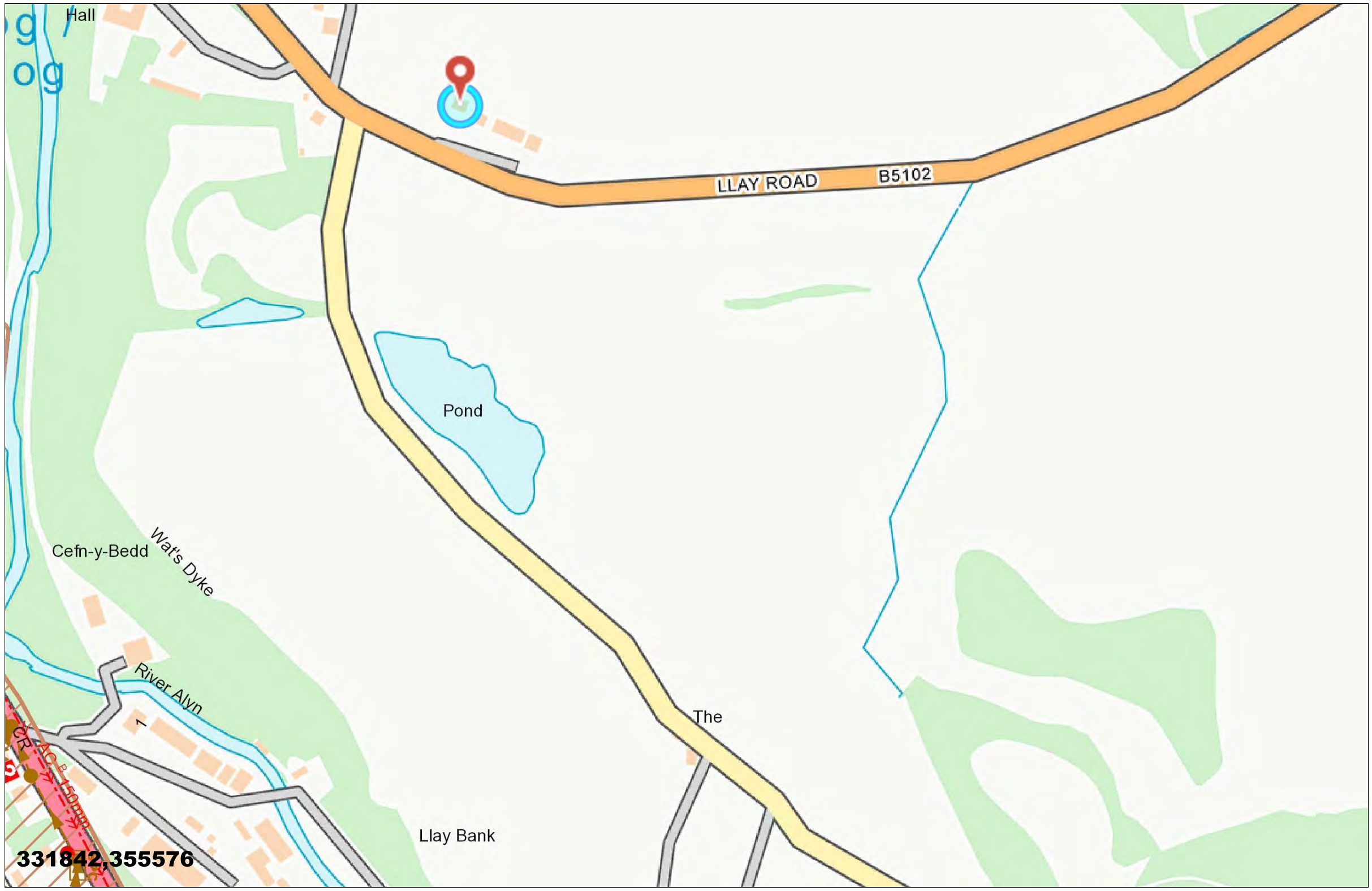
Dŵr Cymru
Welsh Water

Land off Llay Road, Cefn-y-Bedd, Wrexham

N
W E
S

14/10/2021

Scale: 1: 5000



LEGEND

Clean Water

- Sluice Val
- Air Val, SINGLE
- Tap
- Pressure Reducing Valve
- Meter
- BULK Meter
- FH
- Cap
- Existing Main
- NON COMPANY

Sewerage External

- Foul
- Surface Water
- Combined
- Rising Main
- Private
- Treatment Works
- Pumping Station
- Special Purpose
- Unknown End
- Change, Combined Overflow
- Outfall, FOUL
- Lamp Hole, Foul
- Private Sewer Transfer
- Lateral Drain
- Inspection Chamber

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EXACT LOCATION OF ALL APPARATUS TO BE DETERMINED ON SITE

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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 or Pitch Fibre) may be found to be Asbestos Cement (AC) or Pitch Fibre (PF). It 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

BETTS HYDRO
CONSULTING ENGINEERS

APPENDIX C – WREXHAM COUNTY BOROUGH COUNCIL CORRESPONDENCE

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Hannah Buchanan

From: Hannah Buchanan
Sent: 15 September 2021 17:07
To: 'sab@wrexham.gov.uk'
Subject: Historic Flood Risk Information
Attachments: Location Plan.pdf

To whom it may concern,

Land at Cefyn-y-Beth, Wrexham, LL12 9UG

Please could you confirm whether you have any information that you feel would be valuable to a Flood Risk Assessment and Drainage Management Strategy for the above site (location plan attached), including details of historical flooding and any predicted flood water levels; this would be greatly appreciated. If there are any specific requirements that you require in a scope of works for this site, please can you advise at this stage so that it can be fully incorporated into the proposals at an early stage.

Please do not hesitate to contact me on the details below to discuss further should you require additional information or clarification.

Kind Regards,

Hannah Buchanan *BSc (Hons)*
Graduate Flood Risk Analyst

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Consulting Engineers

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APPENDIX D – ELEVATION PLAN

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DO NOT SCALE

Legend:

- Wider Site
- Development Area
- Topographic Fall
- Contours
- Main River
- Ordinary Watercourse
- Land Drainage Ditch
- Pond

REV	DATE	BY	DESCRIPTION	CHK
B	18/03/25	HB	FINAL VERSION	RDN
A	17/09/21	HB	PRELIMINARY FOR ISSUE	MB

DRAWING STATUS:

BETTS HYDRO
CONSULTING ENGINEERS
Unit 6, Old Marsh Farm Barns, Welsh Road, Sealand, Flintshire CH5 2LY
Tel: 01244 288178enquiries@betts-associates.co.uk

GOODWIN
PLANNING SERVICES

PROJECT:

LAND OFF LLAY ROAD
WREXHAM

TITLE:

ELEVATION PLAN

DATE:	SCALE @ SIZE:	DRAWN:	CHECKED:
SEPT '21	1:2500@A3	HB	RDN

PROJECT No:	DRAWING No:	REV:
HYD666	100	A

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APPENDIX E – SITE PHOTOGRAPHS

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APPENDIX F – GENERAL ARRANGEMENT PLAN

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Welsh Road, Sealand
Flintshire CH5 2LY
Telephone: 01244 289 041

Q:\3001-3050\3034-01 Llay Road, Cefn-y-Bedd, Wrexham\Dwgs\CAD\3034-01-002D-ATR01C-D02D-D03C Revised Site Access Arrangement.dwg

Cedar-clad, twin pitch agricultural building 30 x 16m, to provide an office, machine & equipment storage/ maintenance facility together with hay/ straw storage and sick bay/ maternity bay space for the reindeer. Gravelled access on 3 sides (MoT type 1 or similar) for vehicle access to double machine doors on west and east elevations. Building location screened by landform to the north and retained woodland to the south. Additional tree planting to east and west to further assist with screening and to break up outline.

Approx. 65m hedgerow removed to allow for creation of a 158m left-hand junction visibility splay, reinstated as grass verge. New hedgerow/ trees between the verge and the stock fence.

147m right hand junction visibility splay.

Additional planting to thicken up gappy hedge

Park Road

B5102 Llay Road

PEDESTRIAN VISIBILITY SPLAY TO TANGENT POINT
158m FORWARD VISIBILITY
2.4m x 158m VISIBILITY SPLAY TO THE WEST.
158m PEDESTRIAN VISIBILITY SPLAYS
147m FORWARD VISIBILITY
2.4m x 147m VISIBILITY SPLAY TO THE EAST.
147m PEDESTRIAN VISIBILITY SPLAYS
79.6m
83.5m
82.3m

Improved two-way vehicular entrance off B5102 with approx. 15m pull-off before a stockproof entrance barrier. Car parking for 100No. vehicles, with 10% for disabled driver vehicles. Gravelled surface (MoT type 1 or similar) with timber posts marking parking bays. In/out lanes in tarmac.

See Drawing 3304-01-D03 for foul drainage details

2m wide bark path, no edgings, at slacker than 1:20 gradient to the lake.

Reindeer stock fencing 1.8m high along interior of retained site boundary vegetation

Existing lake extended to extent of natural floodplain by excavation of approx. 500mm. Excavated material used to create small islands for wildlife. Existing island retained.

Public Right of Way fenced on west side, offset from path edge by 1m. New unmanaged hedgerow/ linear scrub/ tree planting on west side of the fence, with gaps to allow views through.

The Sycamores

PROPOSED PLANTING

Trees

Oak, english	Feathered, 175-200cm

Hedgerow & Scrub

Hawthorn	60-80cm
Hazel	60-80cm
Wych elm	60-80cm
Honeysuckle	60-80cm
Dog rose	60-80cm

KEY

- Site application boundary
- Public right of way (Llay 12)
- Adopted highway boundary
- Existing tree, retained
- Existing woodland/ hedgerow/ scrub, retained
- Existing hedgerow, removed

Note - the junction visibility splays shown on this drawing are commensurate with the observed 85th percentile design speed of traffic, recorded by ATC in July 2021.

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N

revision: D desc: Drawing Border Changed / Notes Added date: 16-03-25

0 5 10 15 20 25m

0344 8700 007
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Client
Christmas Farm

Project
Christmas Farm, Llay Road, Cefn-y-Bedd

Drawing Title
General Arrangement

Scale **1:250 @A3**
Status **Prelim**
Date **Aug 2021**
Drawn **AR**
Checked **LK**
Dwg no **3034-01-002**
Rev **D**