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Ipsen Biopharm Limited



Ipsen Unit 10

Flood Consequence Assessment

2026-09-18

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Flood Consequence Assessment

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Prepared for

Ipsen Biopharm Limited

Ash Road North, Wrexham Industrial Estate, Wrexham, LL13 9UF

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Executive Summary

Ipsen Biopharm Limited ('the Applicant') is seeking development consent for the proposed extension to expand the existing pharmaceutical manufacturing space and associated external works within the Ipsen site on Ash Road North, Wrexham Industrial Estate, Wrexham, LL13 9UF.

This Flood Consequence Assessment (FCA) report details the comprehensive desk review of the flood risk to the Site and outlines mitigation options to manage the identified flood risk. The management of surface water runoff is addressed separately in the Drainage Strategy Statement (DSS).

The desk-based review was undertaken using publicly available flood risk data on fluvial, pluvial, groundwater, costal and reservoir flooding to identify environmental flood risk to the Site. In addition to these sources, any historical flood risk to Site, existing flood protection schemes and flood risk management infrastructure were identified.

The FCA showed that the Site was not at risk of fluvial flooding as all critical infrastructure is located outside the Natural Resources Wales (NRW) Flood Zones based on the NRW flood maps. Similarly, the NRW flood map for surface water and small watercourses show localised risk of pluvial flooding in the surrounding area, proposed development has been located outside of these extents.

To manage any potential residual pluvial flood risk, a DSS has been developed for the Site to ensure a neutral or beneficial effect on the surface water flood risk on and off site.

The proposed development Site is not at risk of flooding from coastal, groundwater or reservoir sources.

1. Introduction

1.1 Background

1.1.1 WSP UK Ltd has been commissioned by Ipsen Biopharm Limited to undertake a Flood Consequence Assessment (FCA) to support a planning application for brownfield development to provide an extension to expand the existing pharmaceutical manufacturing space and associated external works within the Ipsen site on Ash Road North, Wrexham Industrial Estate, Wrexham, LL13 9UF.

1.2 Scope

1.2.1 The following sections of this report have been ordered as follows:

- Site Description
- Flood Risk
- Flood Consequence Assessment
- Conclusions
- Limitations Statement

1.3 Sources of Information

1.3.1 The following sources have been utilised to inform the analysis and recommendations within this report:

- Topographical Survey, WSP, February 2026
- Natural Resources Wales (NRW) Flood Map for Planning
- Phase 1 & 2 Site Investigation Report, GroundSolve Ltd, July 2023

2. Site Description

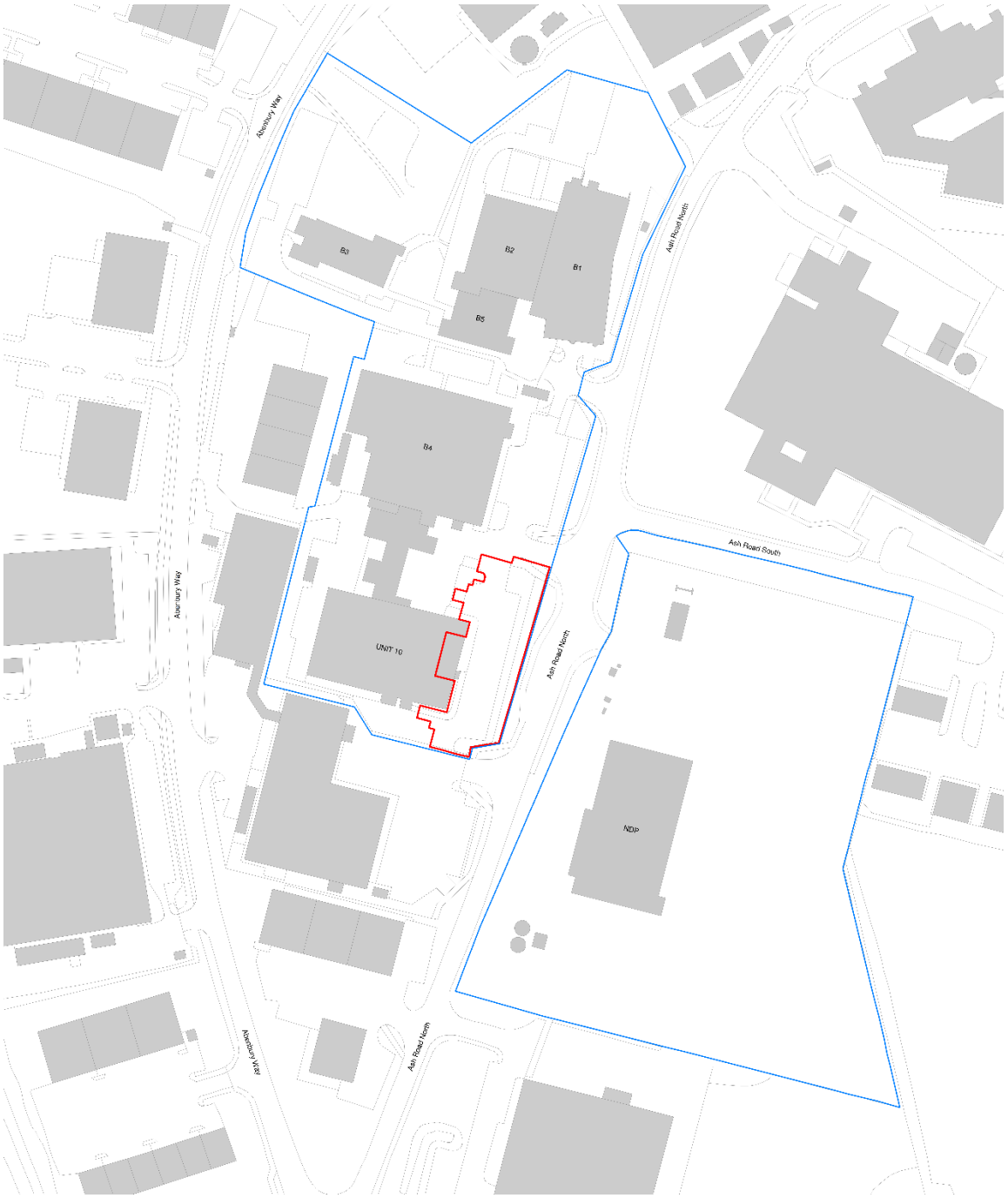
2.1 Location

2.1.1 The Site is located at Ipsen 10, Ipsen Biopharm Limited, Ash Road North, Wrexham, LL13 9UF (OS Grid Reference: SJ 37486 50189) (see Figure 2.1).

2.1.2 The approximately 0.22 hectare (2,164 m^2) Site is situated within Wrexham Industrial Estate and predominantly comprises a hardstand car park.

2.1.3 The surrounding landscape is dominated by industrial buildings and hardstand.

Figure 2.1 Site Location



2.2 Topography

2.2.1 Existing falls within the site are reasonably shallow with maximum and minimum levels across the hardstand of 37.53 mAD and 37.30 mAD respectively.

2.2.2 A mounded grass verge between the hardstand and the perimeter fence rises from the back of kerb at 37.50 mAD to between 37.70 & 37.90 mAD.

2.2.3 The topographical survey for the site has been included in Appendix A.

2.3 Proposed Development

2.3.1 The proposed development involves creation of an extension to expand the existing drug substance facility building.

2.3.2 During the construction phase, areas within the Site will be used for the temporary storage of materials and construction waste.

3. Flood Risk

3.1 Historic Flooding

3.1.1 Natural Resources Wales (NRW) has no recorded incidents of historical flooding at the site.

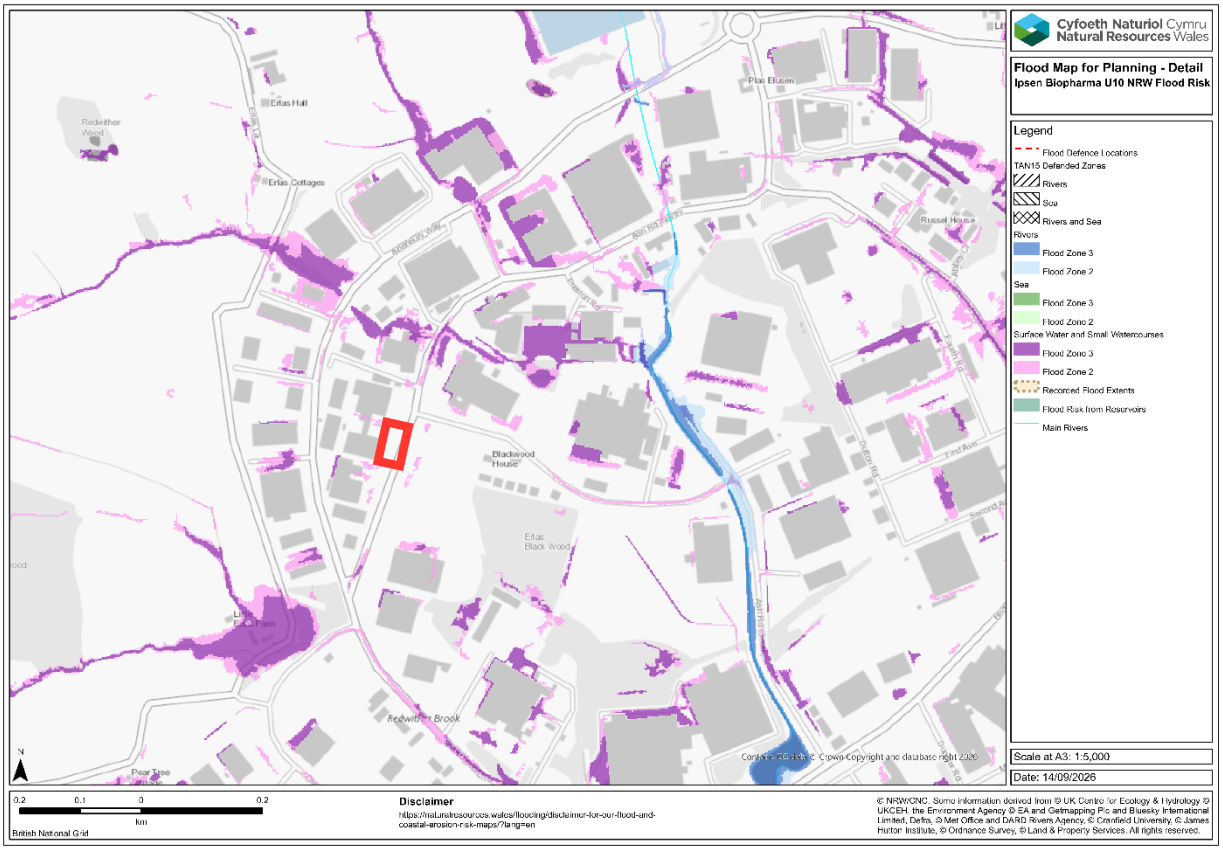
3.2 Existing Flood Defences

3.2.1 The NRW Flood Map for Planning shows the site is not in an area benefiting from existing flood defences, i.e., is not in a TAN15 Defended Zone.

3.3 Development Advice Map

3.3.1 To assess the risk of fluvial flooding on site the NRW Development Advice Map (DAM) flood map has been reviewed. The DAM shows areas at risk of flooding for the purposes of land-use planning. The DAM should be used alongside Planning Policy Wales and Technical Advice Note (TAN) 15 to guide new development away from areas at risk of flooding wherever possible. The DAM is shown below as Figure 3.1, with the site location indicated by the red rectangle, and included as Appendix B.

Figure 3.1 NRW Flood Map for Planning



3.4 Fluvial Flood Risk

3.4.1 The DAM indicates that the Site is not at risk of fluvial flooding during a 0.1% AEP event.

3.5 Surface Water Flood Risk

3.5.1 The DAM indicates that the Site is not at risk of surface water flooding.

3.6 Coastal Flooding

3.6.1 The DAM indicates that the Site is not at risk of coastal flooding.

3.7 Groundwater Flooding

3.7.1 Groundwater flooding is defined as the emergence of groundwater at ground level.

3.7.2 At the time of submission, the Phase 2 Site Investigation (SI) for the development is in progress.

3.7.3 However, a Phase 1 & Phase 2 SI report for the recent development at Ipsen East on the opposite side of Ash Road North indicates that the site is underlain by drift deposits comprising Glacial Till (Clay). The underlying bedrock is the Erbistock Formation, of Carboniferous age, mainly comprising mudstone and siltstone, which in turn are underlain by the Coal Measures at significant depth. A fault trending in a northwest-southeast orientation passes through the northern corner of the site, with the bedrock on the northeastern side shown to be the Kinnerton Sandstone of Triassic age, which comprises red brown and yellow brown sandstones.

3.7.4 The superficial deposits beneath the site are classified as an unproductive aquifer, whilst the Erbistock Formation is classified as a Secondary A Aquifer. The Kinnerton Formation to the northwest of the fault is classified as a Principal Aquifer. Groundwater is unlikely to be encountered at shallow depth beneath the Site, unless perched within the glacial till, with groundwater flow likely to be north towards the nearest watercourse.

3.7.5 Groundwater was encountered at depths of between 11.0m and 13.0m below ground level (bgl).

3.7.6 Extracts from the GroundSolve Ltd report ref. 2867/01 have been included as Appendix C.

3.7.7 The SI findings therefore indicate that the Site is not at risk of groundwater flooding.

3.8 Reservoir Flooding

3.8.1 The DAM indicates that the Site is not in an area at risk of reservoir flooding.

4. Flood Consequence Assessment

4.1 Introduction

4.1.1 This FCA serves to quantify the current level of risk posed with regards to the Site and its impact on flood risk elsewhere.

4.2 Planning Policy

4.2.1 TAN 15 outlines the requirements for planning policy in Wales in relation to development and flooding. TAN 15 requires that the development site will remain safe over its lifetime and will not increase flood risk elsewhere while ensuring minimal risk to life for site users. TAN 15 states that less vulnerable development can take place in DAM zone C2 subject to the application of the Justification Test. In terms of pluvial flood risk, TAN 15 requires that the infrastructure and buildings should be designed to be free from surface water flooding in rainfall events up to and including the 1.0% AEP + CC event. In addition, surface water drainage measures should have a neutral or beneficial effect on the risk of flooding both on and off the site, taking account of rain falling on the site and run-off from adjacent areas.

4.3 Justification for Development

4.3.1 All proposed buildings, hardstand and associated infrastructure will be located within an area on the Site that has little or no risk of fluvial, surface water, coastal, groundwater or reservoir flooding.

4.4 Residual Risk & Flood Resilience

4.4.1 To ensure that surface water runoff rates are not increased which could affect flooding both on and off the site, a drainage strategy for surface water is presented in the separate planning report Unit 10 Drainage Strategy Statement ref. UK0044126.1056-WSP-XX-XX-RP-CV-1352.

4.5 Access/Egress

4.5.1 Access and egress to the Site is provided by Ash Road North that links into the A534 and the wider road distribution network to the north and the A525 to the south.

4.5.2 The NRW DAM indicates that isolated sections of Ash Road North may be at risk of pluvial flooding for the 0.1% AEP event.

5. Conclusions

5.1.1 The proposed Site is not at risk of fluvial flooding.

5.1.2 The proposed Site is not at risk of pluvial flooding.

5.1.3 A drainage strategy statement has been developed for the Site to have a neutral or beneficial effect on the surface water flood risk on and off site.

5.1.4 The Site infrastructure is not at risk of flooding from coastal, groundwater or reservoir sources.

6. Limitations Statement

WSP has prepared this report in accordance with the instructions of their client, Ipsen Biopharm Limited, for their sole and specific use. Any person who uses any information contained herein do so at their own risk. © WSP UK Ltd 2026.

The conclusions and recommendations contained herein are limited by the availability of background information and the planned use for the site.

Third party information has been used in the preparation of this report, which WSP UK Ltd, by necessity assumes is correct at the time of writing. Whilst all reasonable checks have been made on data sources and the accuracy of the data, WSP UK Ltd accepts no liability for same.

APPENDICES

Appendix A – Topographical Survey



DO NOT SCALE

NOTES

Grid: Local Grid orientated to Ordnance Survey Grid (OSTN15)
Datum: Ordnance Survey Datum (OSGM15)
Site Centred about station STN2
Contour Interval: 0.2m

STATIONS

SURVEY STATIONS			
Name	Easting	Northing	Height
STN1	337477.230	350164.386	37.453
STN2	337487.408	350239.382	37.357

SURVEY LEGEND

- Bank - bottom
- Building
- Cabinet - outline
- Cover - Gully
- Cover - Inspection Line
- Cover - Manhole line
- Concrete - bottom
- Concrete - top
- Cover - Telecom
- Door
- Concrete - edge of
- Flagstones - edge of
- Metal - edge of
- Stone - edge of
- Tarmac - edge of
- Tactile paving - edge of
- Fence - close boarded
- Fence - chain link
- Fence - security
- Fence - temporary
- Fence - wooden P&R
- Grit bin
- Hedge
- Kerb - channel line
- Kerb - shoulder
- Name board
- Steps
- Bank - top
- Tarmac - indistinct edge
- Wall - bottom
- Wall - Top
- Gate
- CCTV Camera
- Cover Point - earthing rod
- Cover Point - gully
- Cover - rodding eye
- Cover - water stop valve (on main)
- Feeder Pillar Point
- Pipe - Point
- Pipe electric - Point
- Lamp Post
- Misc Point
- Marker Post
- Marker Post Gas
- Marker Post Water
- Mast Point
- Deciduous tree - manual
- Bollard
- Cover - IC round
- Gatepost
- Post
- Telegraph Pole

REV	DATE	BY	DESCRIPTION	CHK	APP

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CLIENT:

Ipsen Biopharm Limited

PROJECT / DRAWING TITLE:

Ipsen Wrexham Unit 10 Topographic Survey

DRAWING NAME:

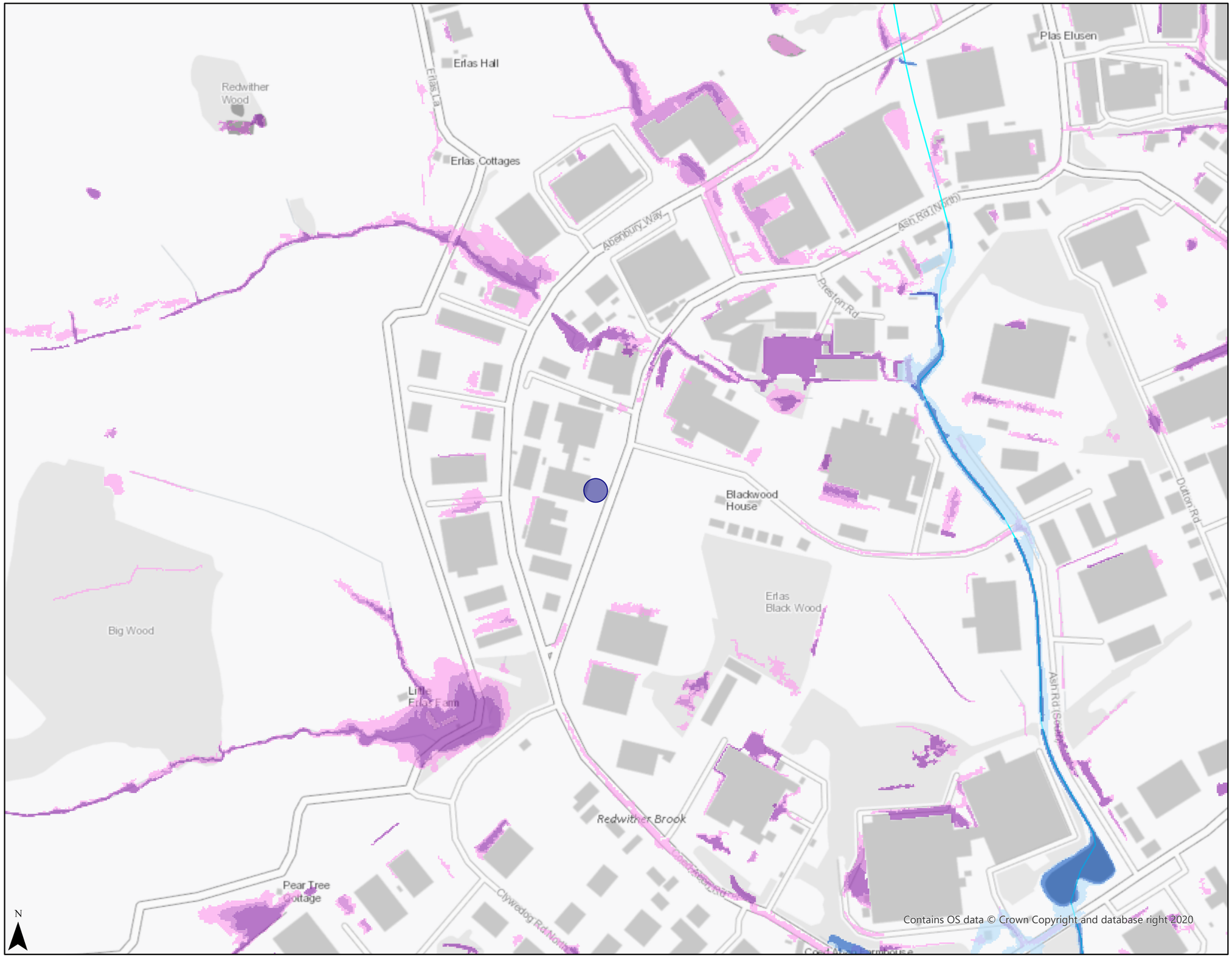
Ipsen Unit 10 Topographic Survey

SCALE:	SIZE:	DATE:
1:200	A1	10/02/2026
DRAWN BY:	CHECKED BY:	APPROVED BY:
MP	MR	CJ

DRAWING No: UK0044126.1056-WSP-DWG-0001-A1 REV:

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Appendix B – NRW Flood Map for Planning



Cyfoeth Naturiol Cymru
Natural Resources Wales

Flood Risk Maps

Ipsen Biopharma U10 NRW Flood Risk

Legend

- Flood Defence Locations

Areas Benefitting from Flood Defences

- Rivers
- Sea
- Rivers and Sea

Flood Risk from Rivers

- High
- Medium
- Low

Flood Risk from the Sea

- High
- Medium
- Low

Flood Risk from Surface Water & Small Watercourses

- High
- Medium
- Low
- Risk Level Under Review
- Recorded Flood Extents
- Flood Storage Areas
- Flood Risk from Reservoirs
- Main Rivers

Scale at A3: 1:5,000

Date: 19/07/2026

0.2 0.1 0 0.2
km

British National Grid

Disclaimer

https://naturalresources.wales/flooding/disclaimer-for-our-flood-and-coastal-erosion-risk-maps/?lang=en

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Appendix C – GroundSolve Ltd SI Extracts

5 ENVIRONMENTAL SETTING

5.1 GEOLOGY

Table 5.1 - Geological Summary

Made ground / artificial ground	Previous investigation has shown thin Made Ground anticipated to be between 1.0-2.0m predominantly comprising reworked natural deposits.
Drift geology	Glacial Till
Solid geology	Carboniferous Salop Formation, mainly comprising mudstone and siltstone. The northern corner of the site is underlain by Kinnerton Sandstone of Triassic age (red brown and yellow brown sandstones).
Faults	A fault trending in a northwest-southeast orientation between the Carboniferous and Triassic units
Coal seams	N/A

5.2 MINING AND QUARRYING

Table 5.2 - Coal Mining Activities

	Yes/No	Comments
Is the Site in an area of potential shallow coal workings?	No	
Is the Site in a high risk development area?	No	
Are there any known shafts, adits, tips, lagoons, or opencast workings likely to affect the Site?	No	
Is exploratory work required to investigate the potential risk from shallow mining or quarrying?	No	

1. No past underground mining recorded,
2. There are no probable unrecorded shallow workings beneath the site,
3. No spine roadways recorded at shallow depth,
4. No mine entries recorded within 100m of the site.

Table 5.3 - Other Extractive Industries

	Yes/No	Comments
Superficial drift deposits		
Evidence of extraction on or within 250 m of the Site?	No	
Action required?	No	
Solid Strata		
Any evidence of mineral extraction on or within 250 m of the Site?	No	
Action required?	No	

5.3 HYDROGEOLOGY

Table 5.4 - Groundwater Occurrence and Abstraction

	Presence/location	Comments
Environment Agency aquifer designation – Superficial Deposits	Secondary Undifferentiated Medium Vulnerability	
Environment Agency aquifer designation – Bedrock	Secondary A – Carboniferous Principal – Triassic Sandstone Medium Vulnerability	
Anticipated groundwater depth(s)	NR	
Direction of flow	NR	
Current licensed abstractions – potable	NR	
Source Protection Zones	NR	
Springs	NR	

NR - none recorded.

For definition of Source Protection Zones, see **Appendix A**.

5.4 HYDROLOGY

Table 5.5 - Surface Water Features

	Presence/location	Comments
Nearest surface water feature	Unnamed stream	100m to north (culverted)
Other surface water features	N/A	
Canals, ponds, lakes, etc.	N/A	
Licensed surface water abstractions	Closest 288m NE	Non-Evaporative Cooling. Downstream of site

Environment Agency GQA assessments: A = very good to E = poor

5.5 ENVIRONMENTAL DESIGNATIONS

Table 5.6 - Summary of Environmental Designations

	Presence/location	Comments
Sites of Special Scientific Interest (SSSI)	None within 2000m	
Conserved wetland sites (Ramsar sites)	None within 2000m	
Special Areas of Conservation (SAC)	None within 2000m	
Special Protection Areas (SPA)	None within 2000m	
National Nature Reserves (NNR)	None within 2000m	
Local Nature Reserves (LNR)	None within 2000m	
Designated Ancient Woodland	Closest 50m east	
Biosphere Reserves	None within 2000m	
Forest Parks	None within 2000m	
Marine Conservation Zones	None within 2000m	
Green Belt	None within 2000m	
Proposed Ramsar sites	None within 2000m	
Possible Special Areas of Conservation (pSAC)	None within 2000m	
Potential Special Protection Areas (pSPA)	None within 2000m	
Nitrate Sensitive Areas	None within 2000m	
Nitrate Vulnerable Zones	None within 2000m	

5.6 LANDFILL AND WASTE MANAGEMENT ACTIVITY

Table 5.7 - Waste Management Activities

	Presence/location	Comments
Active or recent landfill	None within 500m	
Historical landfill (BGS records)	None within 500m	
Historical landfill (LA/mapping records)	None within 500m	
Historical landfill (EA/NRW records)	None within 500m	
Historical waste sites	None within 500m	
Licensed waste sites	N/A	
Waste exemptions	N/A	
Evidence of other landfilling or potential infilling on or within 250m of Site	Infilled pond approx 50m to south of site (1930s)	
Walkover evidence of fly-tipping on Site?	N/A	
Is a landfill/ground gas risk assessment required?	No	

5.7 LOCAL INDUSTRIAL LAND USES

Other potentially contaminative activities are shown in **Table 5.8** below with those features considered pertinent to the conceptual site model highlighted in **bold**. The entries relate to activities within *circa* 250 m of the Site, with the exception of COMAH facilities where the assessment is extended to a distance of *circa* 500m from the Site.

Table 5.8 - Other Potentially Contaminative Processes in the Locality

	Location	Comments
Recent industrial land uses	On site	Former mineral railway and associated buildings as part of Royal Ordnance Facility Former building for logistics facility
Current or recent petrol stations	N/A	
Electricity cables	N/A	
Gas pipelines	N/A	
Sites determined as Contaminated Land	N/A	

	Location	Comments
Control of Major Accident Hazards (COMAH)	N/A	
Regulated explosive sites	N/A	
Hazardous substance storage/usage	N/A	
Historical licensed industrial activities (IPC)	N/A	
Licensed industrial activities (Part A(1))	N/A	
Licensed pollutant release (Part A(2)/B)	N/A	
Radioactive Substance Authorisations	N/A	
Licensed Discharges to controlled waters	N/A	
Pollutant release to surface waters (Red List)	N/A	
Pollutant release to public sewer	N/A	
List 1 Dangerous Substances	N/A	
List 2 Dangerous Substances	N/A	
Pollution Incidents (EA/NRW)	Closest 178NW	No impact
Pollution inventory substances	N/A	
Pollution inventory waste transfers	N/A	
Pollution inventory radioactive waste	N/A	

COMAH – Control of Major Accident Hazards (regulations); NIHHS – Notification of Installations Handling Hazardous Substances (regulations)

5.8 RADON RISK

Table 5.9 - Radon Risk Status

	Comments
Estimated properties affected	The property is in an Intermediate probability radon area (1 to 3% of homes are estimated to be at or above the Action Level).
Radon Protection Measures required?	No protection measures required

5.9 WASTE CLASSIFICATION AND MATERIALS RE-USE

If the Site is to be redeveloped and materials are disposed off Site, the material exported from the Site to Landfill should be hauled by a register waste carrier in accordance with Duty of Care Regulations 1991 and the Hazardous Waste Regulations 2005.

Based on the history of the Site and the anticipated potential contaminants of concern, it is considered unlikely that hazardous waste soil materials may be present beneath the majority of the Site; however, this will be subject to confirmatory investigation, sampling, laboratory analysis and waste classification in accordance with the Guidance on the Classification and Assessment of Waste (WM3).

It will be necessary to register the Site in advance of the intended reclamation works with the Environment Agency before disposal to landfill can take place. There will be requirement for the waste producer to provide appropriate Waste Acceptance Criteria (WAC) testing of the Soils for disposal to ensure that the soils are appropriately classified and that the landfill is licensed to receive such soils. A consignment note shall be completed, signed and retained by all parties involved. The consignment note shall state the volume of waste, a physical description of the material and statement of its chemical composition. The waste consignment notes shall be kept by the contractor for a period of at least two years.

Subject to volumetric fill requirements and a future assessment of suitability of re-use (both chemically and geotechnically), some materials *may* be considered for potential re-use in line with an appropriate end-of-waste protocol such as WRAP Quality Protocol for Aggregates from Inert Waste, U1 Exemption or a Materials Management Plan in accordance with the CL:AIRE Definition of Waste Code of Practice (DoWCoP).

6 PRELIMINARY GEOTECHNICAL ASSESSMENT

6.1 ANTICIPATED GROUND CONDITIONS

In addition to the environmental hazards, there are also geotechnical hazards associated with the stability of the ground (including load bearing capacity, slope stability and effects of ground (mining) cavities). Local Authorities follow NPPF (2012) which requires that "site is suitable for its new use taking account of ground conditions and land instability, including from natural hazards or former activities such as mining."

The load bearing capacity and geotechnical risks are discussed in **Section 10**. The results of the desk study and assessment of the effects of ground (mining) cavities) are presented in **Table 6.1** below:

A summary of the geotechnical considerations is provided below:

Table 6.1 - Summary of Geotechnical Hazards

Geohazards:	
Highly Compressible Ground	No – Peat or soft Alluvium or Made Ground of thickness greater than 1 m is not anticipated.
Collapsible Soils	No
Swelling Clay	Shallow clay anticipated on site
Running Sand	No
Ground Dissolution	No
Landslip	No
Mining & Quarrying	There is no evidence of mining or mineral extraction or quarrying at the site.
Geotechnical Design Considerations	
Site Clearance	Currently undeveloped commercial land.
Trees	Minimal vegetation on the site.
Existing Buildings / Obstructions	No buildings in the development area. Potential for foundations from previous buildings on site
Foundations	Deep foundations are anticipated to be required due to the loadings required for the proposed building
Floor Slabs	Suspended floor slabs envisaged.
Groundwater	Groundwater is likely to perched within the Glacial Till.
Earthworks	No significant earthworks expected as part of this development.
Retaining Walls	Not considered to be relevant to the proposed development
Chemically aggressive ground conditions	Possibility for low pH and high sulphate concentrations which could be detrimental to below ground concrete.

13.2 FOUNDATION RECOMMENDATIONS

For the purpose of this assessment it is assumed the site will not be subject to extensive reprofiling.

Due to the typical loads required for this construction, it is anticipated that shallow foundations are not suitable. It is recommended that deep foundation piles should be utilised.

Whilst final pile design will be the responsibility of the contractor **Table 13.5** below provides indicative capacities capacities for different pile diameters/lengths.

Table 13.5: Outline Pile Capacities

Pile diameter	Length	Skin Friction (S_u)	Base capacity (Q_u)	Ultimate capacity (P_u)
0.40	10.00	760	86	846
0.50	10.00	960	136	1096
0.60	10.00	115	201	1351
0.40	12.00	912	86	998
0.50	12.00	1152	136	1288
0.60	12.00	1380	201	1581

There will be some negative skin friction from the made ground but based on a maximum thickness of 2.00m this shouldn't be excessive.

A specialist piling contractor should be contacted with regards to the selection of appropriate pile design and construction method. Geotechnical information within this report should be provided to give design parameters.

When foundation and column loads have been determined then full design of these should be carried out in accordance with BS EN 1997-1: 2004 +A1 2013: Eurocode 7 – Geotechnical Design – Part 1: General rules (including UK National Annex of November 2007) and BS8004: 2015: Code of practice for foundations.

13.3 GROUND FLOOR SLAB RECOMMENDATIONS

It is recommended that suspended floors are adopted for the building to prevent differential settlement on floor slabs.

13.4 GROUNDWATER CONDITIONS

Groundwater was encountered between 11.0m and 13.0m bgl at or close to the base of the glacial clay.

13.5 GROUNDWATER & EXCAVATIONS

It is not expected that shallow excavations (<2.00m) will encounter significant groundwater entries. If encountered flows are likely to be confined to localised sand lenses and subordinate granular horizons and should be limited in both duration and flow. It is anticipated that any groundwater in excavations should be controllable by conventional pumping from sumps. If localised inflows are encountered, this may cause softening of the ground and require localised excavation support in order to prevent instability of the sides of excavations.

Excavations through the soils to a depth of about 2.0m should be stable in the short term (up to 3 to 4 hours). However, it is anticipated that these will gradually collapse into excavations, leading to instability of the sides of excavations. All excavations should be carried out in accordance with CIRIA Report 97 “Trenching Practice” and BS6031: 2009: Code of Practice for Earthworks. Further guidance on this aspect of site works is given in the British Standards for “Workmanship on Building Sites”, BS 8000, Parts 1 and 14, and in the Construction Industry Training Board’s Site Safety Note 10.

Excavation depths should generally be readily achieved using conventional hydraulic plant (e.g. wheeled JCB or similar) although larger plant will have higher excavation rates.

Although there was no evidence during the fieldwork, there is still the potential for buried obstructions associated with relict foundations. The buried structures may require excavation and removal prior to piling.

13.6 BURIED CONCRETE AND PIPEWORK

The results of laboratory pH and sulphate content indicate that ACEC Class AC-1 conditions prevail in accordance with BRE Special Digest 1, 2005 (the Design Concrete Class). Therefore, special precautions are not required at the site for the design of concrete in terms of the durability and structural performance.

13.7 SOAKAWAYS

Made Ground was proven to be present on site up to 2.0m and comprise reworked natural clay. Underlying the made ground is glacial clay proven to 14.7m.

Two falling head permeability tests were carried out in the Cable Percussion boreholes at 3.0m. The results recorded permeability rates between 6.54×10^{-8} and 3.28×10^{-7}, which is typical of glacial clay deposits. Consequently the use of soakaways for drainage is not recommended.

13.8 ROAD DESIGN

The performance of any hard standing will be determined by the weaker areas, therefore based upon the nature of the ground conditions encountered during the site investigations undertaken, it is recommended that a lower bound CBR value of 3% is adopted for design purposes assuming the existing topsoil layer is removed. All exposed formations should be proof rolled and any soft spots revealed should be excavated and replaced with suitable compacted granular fill.

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